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B.Sc. – I (ECS) (Semester – I) Examination, 2015
Paper – I : ENGLISH – I COMPULSORY (CGPA Pattern)

Day and Date : Wednesday, 1-4-2015
Time : 11.00 a.m. to 2.00 p.m.

Max. Marks : 70

N.B. : 1) **All questions are compulsory.**
2) **Figures to the right indicates full marks.**

1. Rewrite the following sentences by choosing correct alternative : 14
- 1) What did the policeman look like ?
 - a) Uniformed and frail and short
 - b) Uniformed and well-built
 - c) Dressed in ordinary clothes and frail and short
 - d) Dressed in ordinary clothes and well-built
 - 2) When the writer invited her to stay with her for a while, Miss Krishna agreed _____
 - a) Reluctantly
 - b) Shyly
 - c) Readily
 - d) With little enthusiasm
 - 3) The name of the psychologist who developed the IQ test was _____
 - a) Dr. Sigmund Freud
 - b) Carl Jung
 - c) Robert Smith
 - d) Mr. Binet
 - 4) The word 'intelligence' is derived from the Latin word _____
 - a) Intellegere
 - b) Intellectual
 - c) Intellect
 - d) None of these
 - 5) Krishna's first name was _____
 - a) Maya
 - b) Sheela
 - c) Mala
 - d) Nergis
 - 6) What did the policeman on the beat constantly do ?
 - a) Twirl his stick
 - b) Interrogate people on his beat
 - c) Smoke a Cigar
 - d) Unlock doors



- 7) What does 'shining loads' mean _____
 a) An unmarried woman's wrist b) bunches of bangles
 c) The flame of a marriage fire d) Sunlit corn
- 8) The words Kiltartan cross refer to _____
 a) A famous place in Ireland b) The battlefield
 c) An Irish Church d) None of the above
- 9) The poem 'Bangle Sellers' is written by _____
 a) W. B. Yeats b) Sarojini Naidu
 c) John Milton d) W. B. Keats
- 10) The speaker of the poem 'An Irish Airman Foresees His Death' is

 a) Irish Airman or Pilot b) Farmer
 c) Sailor d) None of the above
- 11) Can you give me _____ money ?
 a) Any b) Some c) Little d) A few
- 12) A man is known by _____ company he keeps.
 a) the b) a
 c) an d) none of the above
- 13) The woman _____ the car is my neighbour.
 a) of b) in c) on d) under
- 14) What is the capital _____ Switzerland ?
 a) of b) at c) on d) from

2. Answer **any seven** of the following questions :

14

- 1) Describe the weather in the story 'After Twenty Years'.
- 2) What sort of relationship did Bob and Jimmy share ?
- 3) What did Miss Krishna claim to be the 'Panacea for all (her) ills' ?
- 4) How can you define 'intelligence' ?
- 5) What are the areas in which the computer is much faster than human brain ?
- 6) What colours of bangles are suitable for a maiden's wrists ?
- 7) How does the speaker imagine he will die ?
- 8) Whom are the purple and gold-flecked grey bangles meant for ?



3. A) Write short note on **any two** of the following : 8
- 1) Jimmy Wells
 - 2) Miss Krishna's character
 - 3) The merits of artificial intelligence.
- B) Answer **any three** of the following questions briefly : 6
- 1) Describe the different types of bangles which the bangle-sellers carry.
 - 2) How does the poet describe the faithful wife who is now middle-aged ?
 - 3) What is the Irish airman's attitude towards the war he is fighting in ?
 - 4) What do you think is the speaker's attitude towards his 'poor' countrymen ?
4. 1) Write an essay on 'Impact of Mobiles on the lives of the Youth Today'. 14
- OR
- 2) Write paragraphs of **six to eight** sentences on **each** of the following :
- 1) Terrorism : Irrational and Inhuman
 - 2) Solar energy.
5. Read the following passage and make notes of it. Use an appropriate title for your notes : 14
- There are different forms of environmental pollution. Air pollution is caused by the burning of coal and oil. It can damage the earth's vegetation and cause respiratory problems in humans. A second type of pollution is noise pollution. It is the result of the noise of aircraft and heavy traffic. Further, loud music is also a cause of noise pollution, which has been seen to affect people's hearing and give them severe headaches and high blood pressure. Another source of pollution is radioactivity, which occurs when there is a leak from a nuclear power station. Radioactivity is a deadly pollutant, which kills and causes irreparable harm to those exposed to it. Land and water pollution is caused by the careless disposal of huge quantities of rubbish, sewage and chemical wastes. Pollution of rivers and seas kills fishes and other marine life and also becomes the cause of water-borne diseases. Land pollution, on the other hand, Poisons the soil, making the food grown in it unfit for consumption.
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Seat No.	
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**B.Sc. (Part – I) (E.C.S.) (Semester – I) Examination, 2015
MATHEMATICS (Paper – V) (Old)
Graph Theory**

Day and Date : Monday, 13-4-2015
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

- N.B. :** 1) *Use of scientific calculator is allowed.*
2) *All questions are compulsory.*
3) *Figures to the right indicate full marks.*

1. Choose correct alternative for **each** of the following : **10**
- 1) The number of edges in K_n is _____
- a) n b) $n + 1$
c) $\frac{n(n+1)}{2}$ d) $\frac{n(n-1)}{2}$
- 2) Sum of all entries of any row of incident matrix is equal to _____
- a) Total number of vertex
b) Total number of edges
c) Degree of corresponding vertex
d) Degree of corresponding edges
- 3) The complement of a null graph is _____ graph.
- a) Regular b) Null
c) Simple d) Complete
- 4) If G is a self complementary graph of n vertices then n is of the type _____ for some K .
- a) $4K$ b) $4K + 1$
c) $4K$ or $4K + 1$ d) None of these



- 5) The Union of two complete graphs K_3 and K_4 is
- | | |
|----------|-------------|
| a) K_3 | b) K_4 |
| c) K_7 | d) K_{12} |
- 6) A trail is a walk in which _____
- | | |
|---------------------------|----------------------------|
| a) No edge is repeated | b) No vertex is repeated |
| c) All edges are repeated | d) some edges are repeated |
- 7) A tree with 7 vertices has _____ no of edges.
- | | |
|------|------------------|
| a) 7 | b) 8 |
| c) 6 | d) none of these |
- 8) A bi-partite graph $K_{m,n}$ is regular iff _____
- | | |
|------------|---------------|
| a) $m > n$ | b) $m < n$ |
| c) $m = n$ | d) $m \neq n$ |
- 9) For any graph $G \oplus G$ is _____
- | | |
|----------------|---------------|
| a) G | b) G' |
| c) $G \cup G'$ | d) null graph |
- 10) A Graph G is called the self complementary if it is _____ with its own complement.
- | | |
|---------------|----------------|
| a) Isomorphic | b) Complement |
| c) Complete | d) Homomorphic |

2. Attempt **any five** from the following :

10

- 1) Define regular graph with suitable example.
- 2) Draw all possible non isomorphic simple graphs on 3-vertices.
- 3) Draw a graph corresponding to the following adjacency matrix.

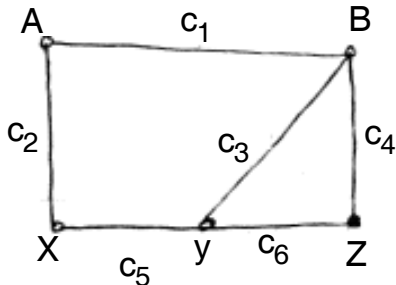
$$\begin{bmatrix} 1 & 0 & 1 & 0 \\ 1 & 2 & 1 & 0 \\ 0 & 1 & 0 & 2 \\ 1 & 0 & 2 & 0 \end{bmatrix}$$

- 4) Define union of two graphs.
- 5) Define cycle and trail
- 6) Find the vertex and edge connectivity of complete graph K_n ($n \geq 2$).



3. A) Attempt **any two** from the following : 6

1) For the following graph find all paths from vertex A to Z.



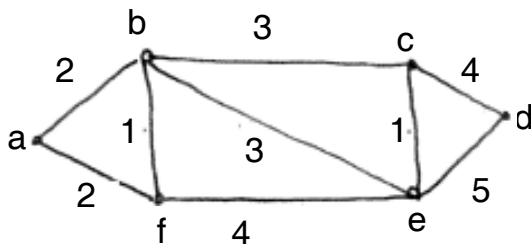
2) Explain the Fleury's Algorithm to find the Euler circuit for any graph G.

- 3) Give an example of a connected graph which is
- a) An Eulerian circuit but not Hamiltonian cycle.
 - b) A Hamiltonian cycle but not Euler circuit.

B) Explain travelling salesman problem. 4

4. Attempt **any two** from the following : 10

1) By using Kruskal's algorithm find the shortest spanning tree and its weight from the following graph



2) Verify hand shaking lemma by taking suitable example.

3) Define :

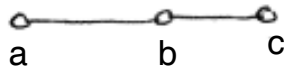
- a) Weighted graph
- b) Spanning sub graph
- c) Isthus.



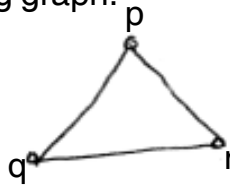
5. Attempt **any two** from the following :

10

1) Find $G_1 \times G_2$ for the following graph.

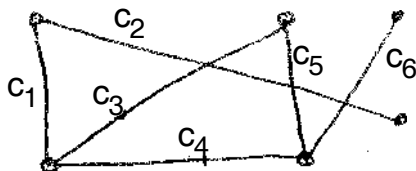


G_1



G_2

2) Find all bridges in the graph G given below



3) Prove that every tree has a centre which consists of either single vertex or two adjacent vertices.



Seat No.	
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B.Sc. (ECS) (Part – I) (Semester – I) Examination, 2015
MATHEMATICS (Paper – VI) (Old)
Numerical Methods

Day and Date : Wednesday, 15-4-2015
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

- N.B. :** 1) *Use of scientific calculator is allowed.*
2) *All questions are compulsory.*
3) *Figures to the **right** indicate **full** marks.*

1. Choose the correct alternative for **each** of the following. **10**
- 1) While doing division of two numbers in normalised floating point form exponents should be
a) added b) subtracted c) divided d) multiplied
- 2) $\nabla f(x - h) =$
a) $f(x + h) - f(x)$ b) $f(x - h) - f(x - 2h)$
c) $f(x) - f(x - h)$ d) $f(x + 2h) - f(x + h)$
- 3) $(\Delta \nabla) f(x) =$
a) $(\Delta - \nabla) f(x)$ b) $(\Delta + \nabla) f(x)$ c) $\Delta f(x)$ d) $\nabla f(x)$
- 4) In iteration method of finding the root of equation $f(x) = 0$ in (a, b) , the condition for selection of the function $\phi(x)$ is $|\phi'(x)|$
a) less than 1 b) equal to 1
c) greater than 1 d) none of these
- 5) In a square matrix if $a_{ij} = 0$ for $i < j$ then the matrix is called as _____ matrix.
a) upper triangular b) lower triangular
c) symmetric d) skew-symmetric



- 6) In Gauss Elimination method, in row echelon form if there are 2 non-leading variables are present then the consistent system possess _____ solutions.
- a) unique b) no c) trivial d) infinitely many
- 7) Trapezoidal rule is obtained by putting $n =$ _____ in general quadrature formula.
- a) 0 b) 1 c) 2 d) 3
- 8) $0.8987 E2 + 0.3421 E3 =$
- a) $0.4319 E2$ b) $4.3190 E3$ c) $0.4319 E3$ d) $0.4319 E5$
- 9) The equation $2.\sin x + e^x = 0$ is of _____ type.
- a) homogeneous b) linear
c) invertible d) transcendental
- 10) By bisection method first approximate value of the root of the equation $x^3 - 4x - 9 = 0$ in the interval (2, 3) is
- a) 2 b) 3.5 c) 2.5 d) 3

2. Attempt **any five** of the following.

10

- 1) Define forward difference operator Δ and backward difference operator ∇ .
- 2) State bisection formula to find root of the equation $f(x) = 0$ in the interval (x_0, x_1)
- 3) State Trapezoidal rule for integration.
- 4) Show that $\Delta f(x) = [\nabla E]f(x)$.
- 5) Evaluate $1.2345 E4 + 0.8341 E5$.
- 6) Write augmented matrix for the following system of linear equations
 $x + 2y - 3z = 4$; $-x + y - z = -2$;
 $2x + 3z = -2$; $-2Y - 4z = 0$.

3. A) Attempt **any two** of the following.

6

- 1) Show that $(\Delta - \nabla)f(x) = (\Delta \nabla)f(x)$.
- 2) Define absolute error, relative error and percentage error.
- 3) Find real root of the equation $x^3 - 18 = 0$ in the interval (2, 3) by Regula Falsi method. Perform only two iterations.



- B) Evaluate the following. 4
- i) $0.8765 E4 \div 0.2624 E2$
 - ii) $0.1321 E - 3 \times 0.8212 E5$
 - iii) $3.4567 E1 + 21.2345 E2$
 - iv) $0.4321 E - 2 - 0.2112 E - 2.$

4. Attempt **any two** of the following. 10

- 1) Use Lagrange's Interpolation Formula to estimate $f(48)$ for the data given below.

x	45	50	55	60
y = f(x)	0.7071	0.7660	0.8192	0.8660

- 2) Solve the following system of linear equations by using Gauss Elimination Method.

$$x_1 + x_2 + 2x_3 = 9;$$

$$2x_1 + 4x_2 - 3x_3 = 1 ;$$

$$3x_1 + 6x_2 - 5x_3 = 0.$$

- 3) By using Runge-Kutta IVth order method find $Y(1.2)$ by taking $h = 0.2$. Given

that $\frac{dy}{dx} = x + y^2$ with $x_0 = 1, y_0 = 2$.

5. Attempt **any two** of the following. 10

- 1) Evaluate $\int_1^2 \left(\frac{1}{x}\right) \cdot dx$ by using Simpson's (1/3)rd rule . Take $h = 0.1$.

- 2) Find approximate value of root of the equation $\log_e x - \cos x = 0$ by using Newton-Raphson method by taking initial approximation $x_0 = 1.5$, correct upto 4 decimal places.

- 3) By using Newton's Backward Difference Interpolation Formula find the value of $f(0.23)$ from the data given below.

x	0.10	0.15	0.20	0.25
y=f(x)	0.1003	0.1511	0.2027	0.2553



Seat No.	
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**B.Sc. (Entire Computer Science) (Part – I) (Semester – I)
Examination 2015
PAPER – VII : DESCRIPTIVE STATISTICS – I (Old)**

Day and Date : Thursday, 16-4-2015
Time : 11.00 a.m. to 1.00 p.m.

Total Marks : 50

- Instructions :** i) **All questions are compulsory.**
ii) **Use of simple or scientific calculator is allowed.**
iii) **Figures to the right indicate full marks.**
iv) **Graph papers will be supplied on request.**

1. Select most correct alternative. **10**
- i) Size of the class interval of the following grouped data is : 10 -19 20 - 29
30 - 39 40 - 49 50 - 59
a) 9 b) 10 c) 14.5 d) 4.5
 - ii) The measure of central tendency that is based on all observations is
a) A.M. b) Median c) Mode d) All of these
 - iii) Quartiles are the values dividing a given set of observations into
a) two equal parts b) four equal parts
c) three equal parts d) five equal parts
 - iv) Which of the following measure of dispersion is a relative measure of dispersion ?
a) Range b) Q.D. c) S.D. d) Coefficient of Q.D.
 - v) The range and coefficient of range of the values 11, 10, 13, 14, 12, 20, 18, 19 are
a) 10 and 2/3 b) 20 and 1/3 c) 10 and 30 d) 10 and 1/3
 - vi) If the value of coefficient of Kurtosis β_2 is equal to three, than the frequency distribution curve is said to be
a) Leptokurtic b) Platykurtic c) Mesokurtic d) Lectokurtic



- vii) If the coefficient of variation and variance of a distribution are 4% and 256 respectively, then the mean of the distribution is _____.
- a) 1024 b) 256×25 c) 16 d) 400
- viii) If the S.D. of X is 10, then the variance of $10 - 5X$ is _____.
- a) -2490 b) -2500 c) 2500 d) 50
- ix) From histogram we can obtain
- a) Mean b) Median
c) Mode d) All of these measures
- x) For a moderately asymmetric frequency distribution, if the values of A.M. and median are 144 and 156 respectively then the modal value is _____.
- a) 80 b) -180 c) 180 d) 280

2. Answer **any five** of the following.

10

- i) Define a variable.
- ii) Define quartiles.
- iii) Define a measure of dispersion.
- iv) State the expression of 3rd central moments in terms first three raw moments.
- v) State the effect of change of origin and change of scale on variance.
- vi) Define Statistics.

3. A) Answer **any two** of the following.

6

- i) Two samples of sizes 30 and 20 have means as 55 and 60 and variances as 16 and 25 respectively. Find the standard deviation of the combined sample of size 50.
- ii) In a certain frequency distribution the sum of upper and lower quartiles is 45 and the difference between them is 15. If the median is 20, find the coefficient of skewness.
- iii) Variance of mesokurtic distribution is 4. Find μ_4 .

B) Write a note on Simple Random Sampling.

4



4. Answer **any two** of the following. 10

- i) Write a note on frequency distribution.
- ii) Write the procedure for drawing less than ogive curve.
- iii) Write a note on Skewness.

5. Answer **any two** of the following. 10

- i) The first three moments of a certain variable about the value 1 are 2, 25 and 80. Find the coefficient of skewness γ_1 and interpret the result.
- ii) Calculate missing frequency if A.M. is 1.46 :

No. of children	0	1	2	3	4	5
No. of families	46	76	38	25	-	5

iii) Draw histogram from the following data :

Marks	0-10	10-20	20-30	30-40	40-50
No. of students	5	8	10	7	4



Seat No.	
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B.Sc. (Entire Computer Science) (Part – I) (Semester – I) (Old)
Examination, 2015
STATISTICS (Paper – VIII)
Probability Theory – I

Day and Date : Friday, 17-4-2015
Time : 11.00 a.m. to 1.00 p.m.

Total Marks : 50

Instructions : i) **All questions are compulsory.**
ii) Use of **simple** or **scientific** calculator is allowed.
iii) Figures to the **right** indicate **full** marks.

1. Select most correct alternative.

10

- i) In ${}^n C_5$, n must be
a) $\neq 5$ b) > 5 c) ≤ 5 d) ≥ 5
- ii) How many two letters words can be formed using the letters of the words SQUARE ?
a) 360 b) 120 c) 30 d) 36
- iii) Two events are said to be independent if
a) One does not affect the occurrence of the other
b) There is no common point in between them
c) Each outcome has equal chance of occurrence
d) Both events has only one point
- iv) $E(10) =$
a) 1 b) 20 c) 10 d) 0
- v) If $B \subset A$, then $P(A/B)$ is equal to
a) Zero b) One c) $P(A)/P(B)$ d) $P(B)/P(A)$
- vi) For a discrete random variable X if $E(X^2) = 52$ and $V(X) = 3$, then $E(X) =$
a) $\sqrt{7}$ b) 7 c) 49 d) 13

P.T.O.



- vii) If a discrete random variable X takes on five values 1, 4, 9, 16, 25 with probabilities 0.2, 0.04, 0.18, k , 0.38 respectively, then the value of k is
a) 0.18 b) 0.2 c) 0.22 d) 0.38
- viii) A family of a parametric distribution in which mean is always greater than variance is
a) Binomial distribution b) Poisson distribution
c) Uniform distribution d) None of these
- xi) A card is drawn at random from a pack of well shuffled cards. What is the probability of drawing a red king card ?
a) $13/52$ b) $1/13$ c) $1/52$ d) $1/26$
- x) Probability of a sure event is
a) 0.25 b) 0.5 c) 0 d) 1

2. Answer **any five** of the following :

10

- i) Find the value of n if ${}^{n+1}C_3 = 7 \cdot {}^nC_2$.
- ii) Give the classical definition of probability.
- iii) Prove that $P(A) = 1 - P(\bar{A})$, where \bar{A} is complementary event of A .
- iv) Define probability mass function of a discrete random variable X .
- v) Define hypergeometric distribution.
- vi) If a discrete r.v. X follows Poisson distribution with parameter $\lambda = 2$, find $P(X = 2)$ and S.D. of the r.v. X .

3. A) Answer **any two** of the following :

6

- i) There are 100 lottery tickets numbered 1 to 100. One ticket is drawn at random. What is the probability that the number on the ticket drawn is 3 or 5 ?
- ii) The mean and the variance of a binomial variate X are 16 and 8 respectively. Find $P(X = 1)$.
- iii) An unbiased coin is tossed and a fair die is rolled. If $A = \{\text{Tail}\}$ and $B = \{6\}$, then verify whether the events A and B are independent.

B) In a certain IT industry, there are 5 men programmers and 10 women programmers. A committee of 5 programmers is to be selected. What is the probability that at least one of the committee member is woman programmer ?

4



4. Answer **any two** of the following :

10

i) Verify whether the following function can be regarded as probability mass function (p.m.f.) of a discrete random variable X and if so find $P(X = 1 \text{ or } 3)$.

$$P(X = x) = \frac{x^2 + 1}{18}, x = 0, 1, 2, 3.$$

ii) If $P(A) = \frac{1}{4}, P(A | B) = \frac{1}{3}$ and $P(B | A) = \frac{1}{2}$, find $P(A | \bar{B})$.

iii) Find how many different words can be formed using all the letters of the word “Monday” and find the probability that such a word formed begins with ‘M’ and ending in ‘y’.

5. Answer **any two** of the following :

10

i) The cumulative distribution function of a random variable X is given by

X	0	1	2	3	4
P(x)	0.1	0.2	0.3	0.2	0.2

Find $E(10 - X)$ and $P(X > 2.7)$.

ii) For any two events A and B, state and prove addition law of probability.

iii) Define binomial distribution. When do we get binomial distribution ?



Seat No.	
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**B.Sc. – I (ECS) (Semester – II) (New) (CGPA Pattern) Examination, 2015
ENGLISH – II (Compulsory) (Paper – I)**

Day and Date : Monday, 20-4-2015
Time : 11.00 a.m. to 2.00 p.m.

Max. Marks : 70

N. B. : 1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**

1. Rewrite the following sentences by choosing the correct alternative given below
each :

14

- 1) Wernher Von Braun is known as the father of _____
 - a) Rocketry
 - b) PSLV
 - c) SLV-3
 - d) V-2 missiles
- 2) To succeed in any mission, says Dr. Kalam, one needs _____
 - a) Single handed victory
 - b) Single man's devotion
 - c) Single attempt success
 - d) Single minded devotion
- 3) On which day was the first session of the Parliament of Religion scheduled to begin ?
 - a) On May 31, 1893
 - b) On September 11, 1893
 - c) On September 21, 1894
 - d) On May 31, 1894
- 4) After discovering 'his purse was nearly empty' what did Vivekananda do ?
 - a) He held on to whatever money was left
 - b) He met with Mr. J. H. Wright and asked him to help him out
 - c) He begged on the roads for money
 - d) He travelled to Boston with what was left
- 5) The Lusaka Zoo presents _____ as the world's most dangerous animal.
 - a) Man
 - b) Woman
 - c) Carnivorous animals
 - d) Reptiles



- 6) To find out if a society is civilized, we have to check _____
- a) Whether there is material progress
 - b) Whether all the people have jobs
 - c) Whether the people have freedom
 - d) Whether the poorest are supported
- 7) Brahma is a Hindu deity who is responsible for _____
- a) The creation of the world
 - b) The maintenance of the world
 - c) The destruction of the world
 - d) The rules of governing the world
- 8) One message of the poem “Brahma” is that _____
- a) Lovers of good deeds are dear to the god
 - b) Lovers with sincere love are dear to the god
 - c) Selfless devotees of the good are dear to the god
 - d) Non-devotees of the evil are dear to the god
- 9) The garden of Gethsemane is famous because _____ here.
- a) Jesus Christ gave advice to his disciples
 - b) Jesus Christ got knowledge under a tree
 - c) Jesus Christ took his last supper
 - d) Jesus Christ said his last prayer
- 10) Today the moon is merely an attraction for _____
- a) The poets
 - b) The children
 - c) The lovers
 - d) The scientists
- 11) The gentleman would not drink _____ tea without your company.
- a) my
 - b) her
 - c) our
 - d) his
- 12) He is the _____ person for us.
- a) Valuabler
 - b) More valuable
 - c) Valuablest
 - d) Most valuable
- 13) He went to the tailor to _____ his trousers which was a bit too long.
- a) altar
 - b) alter
 - c) alert
 - d) allot
- 14) The _____ refused to admit him in the science stream.
- a) principle
 - b) principal
 - c) prince
 - d) princess



2. Answer **any seven** of the following questions in **two** or **three** sentences **each** : **14**

- 1) What happened to the first V-2 Missile when it was first tested ?
- 2) Describe Vivekananda's meeting with J. H. Wright. How did Wright help him out ?
- 3) Why was Vivekananda not prepared for the weather condition in Chicago ?
- 4) What was the motivating slogan behind the American Civil War ?
- 5) Why does the author declare that human rights cannot function in a vacuum ?
- 6) What is the central theme of the poem "Brahma" ?
- 7) What does the end of the poem "Full Moon" suggest ?
- 8) What transition has taken place in our approach to the moon ?

3. A) Write short answers on **any two** of the following : **8**

- 1) How was Vivekananda's speech at the Parliament of Religions different from those of the other Speaker's ? How did it create a magic on the occasion ?
- 2) What kind of personality was Von Braun according to Dr. Kalam ?
- 3) What role do gods and religion have in the poem, in relation to Brahma ?

B) Answer **any two** of the following questions briefly : **6**

- 1) What is a notice ?
- 2) What are the aspects of a good C.V. ?
- 3) What is CC and BCC ?

4. Write a suitable C.V. for the post of a lecturer in English. **14**

OR

You are the principal of the Arya College of Arts and Science, Lucknow. Prepare an agenda for a meeting with the head of English department and the secretary and the treasurer of the College's literary association. The meeting has been called to discuss the venue, date time.

5. Write an e-mail message : **14**

You have to go to work on a mechanical project for your company in Bangalore. Send an e-mail message to Rajdeep Travels (Address : rajdeeptours@rajdeep.com), asking them to make travel arrangements for you to go Singapore by air and return after a week specify airline you would prefer to travel by, the dates, the class by which you want to travel, the mode of payment, the delivery instruction and your food preferences in an attachment called 'Travel details'.



Seat No.	
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B.Sc. (ECS) – I (Semester – II) (CGPA Pattern) Examination, 2015
COMPUTER SCIENCE (Paper – II) (New)
Computer Fundamentals and Programming Using C – II

Day and Date : Tuesday, 21-4-2015
Time : 11.00 a.m. to 2.00 p.m.

Max. Marks : 70

- N.B. :*** 1) ***All questions are compulsory.***
2) ***Figures to the right place indicate full marks.***
3) ***Answer of two Sections should be written in separate answer sheet.***

SECTION – I

(Computer Fundamentals)

1. Choose correct alternatives :

5

- 1) In _____ topology central controller is used to connect the nodes.
a) Bus b) Ring
c) Star d) Mesh
- 2) The bar at the top of a window that appears the name of the window is known as
a) Status bar b) Task bar
c) Menu bar d) Title bar
- 3) Data transmission in which the data flow in only one direction is called _____
a) half-duplex b) full duplex
c) simplex d) none of these
- 4) Default extension of Paint file is _____
a) .txt b) .bmp
c) .jpg d) all of these
- 5) The tag used in HTML to link it with other URL's is _____
a) <L> b) <A>
c) <U> d) none of these



2. Attempt **any five** from following : 10
- 1) List the elements of Windows.
 - 2) Define paired tags with example.
 - 3) Define taskbar.
 - 4) Define word processor.
 - 5) What is image map in HTML ?
 - 6) Short note on GUI.
3. A) Answer **any two** of the following : 10
- 1) What is Multiprogramming ? Explain with diagram.
 - 2) Write the process of mail merge.
 - 3) Write a note on notepad.
- B) Answer **any one** of the following : 10
- 1) Write a note on JAVA script. Explain any five built in functions in JavaScript.
 - 2) What is Computer Network ? Explain types of computer network.

SECTION – II

(Programming Using C – II)

1. Choose correct alternatives : 5
- 1) The default value of register variable is _____
- | | |
|------------|------------------|
| a) zero | b) one |
| c) garbage | d) none of these |
- 2) What is the output :
- ```
define SQR(X) X*X
void main ()
{
print (“\n%d”,SQR(5 + 2));
}
```
- |          |       |
|----------|-------|
| a) error | b) 49 |
| c) 29    | d) 17 |



- 3) We can handle many members at a time using union
  - a) True
  - b) False
- 4) The command line arguments second parameters data type is \_\_\_\_\_
  - a) int
  - b) char
  - c) float
  - d) none of these
- 5) ftell () accepts \_\_\_\_\_ arguments.
  - a) 1
  - b) 2
  - c) 3
  - d) none of these

2. Answer **any five** of the following : **10**

- 1) What is difference between macro and function ?
- 2) Give the advantages of preprocessor.
- 3) What is chain of pointer ?
- 4) What is difference between array and structure ?
- 5) What is difference between scanf() and sscanf() ?
- 6) Why typedef is used ?

3. A) Solve **any two** of the following : **10**

- 1) Explain compiler control directives with example.
- 2) Explain types of functions according to return type and argument accepted.
- 3) Explain command line argument with example.

B) Solve **any one** of the following : **10**

- 1) Explain dynamic memory allocation with example.
  - 2) What is file ? Write a program to implement copy con command in file.
-



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**B.Sc. (E.C.S.) – I (Semester – II) (New) Examination, 2015**  
**Paper – III : LINEAR AND DIGITAL ELECTRONICS – II (CGPA Pattern)**

Day and Date : Thursday, 23-4-2015

Max. Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

- N.B. :** 1) **All questions are compulsory.**  
2) Figures to the **right** place indicate **full** marks.  
3) Answer of **two** Sections should be written in **separate** answer sheet.

SECTION – I  
(Linear)

1. Choose correct alternatives.

5

- 1) The FET has \_\_\_\_\_ number of terminals.  
a) 2                      b) 3                      c) 4                      d) 5
- 2) The frequency of radio frequency oscillator is  
a) 20 KHz to 20 MHz                      b) 20 Hz to 20 KHz  
c) 20 MHz to 20 GHz                      d) None of these
- 3) In CE amplifier I/P and O/P signals are \_\_\_\_\_ degree out of phase to each other.  
a) 90                      b) 180                      c) 270                      d) none of the above
- 4) The MOSFET has \_\_\_\_\_ input impedance.  
a) low                      b) very high  
c) zero                      d) none of these
- 5) The O/P impedance of Op Amp is  
a) low                      b) very high  
c) zero                      d) none of these

P.T.O.



2. Answer **any five** of the followings. **10**
- 1) Give parameters of OP Amp.
  - 2) Draw circuit symbol for N and P channel JFET.
  - 3) Explain class A of amplifier.
  - 4) Explain parameters of JFET.
  - 5) Explain Input terminals of Op Amp.
  - 6) Explain concept of Barckhousen criteria.
  - 7) Give application of JFET.
3. A) Attempt **any two** of the followings. **10**
- 1) Explain different types of amplifier according to frequency range.
  - 2) Explain operation of DE MOSFET.
  - 3) Explain Op Amp as a integrator and differentiator.
- B) Attempt **any one** of the followings. **10**
- 1) Define amplifier. Explain any two types of amplifier according to coupling method.
  - 2) Define Oscillator. Explain any two types of oscillator with suitable diagram.

## SECTION – II

### (Digital Electronics – II)

1. Choose correct alternatives. **5**
- 1) D Flip flop requires \_\_\_\_\_ inputs.  
a) 0                      b) 1                      c) 2                      d) 3
  - 2) A RAM is a \_\_\_\_\_ type memory.  
a) Volatile                      b) Non Volatile  
c) Permanent                      d) None of these





- 3) For 3 bit flash ADC \_\_\_\_\_ comparators are used.  
a) 5                      b) 6                      c) 7                      d) 8
- 4) In binary weighted ladder network register used are of \_\_\_\_\_ values.  
a) same                      b) different                      c) zero                      d) none of these
- 5) The decade counter \_\_\_\_\_ number of states exists.  
a) 5                      b) 10                      c) 7                      d) 9

2. Answer **any five** of the followings. **10**

- 1) Give parameters of memory.
- 2) Explain modulus 10 counter.
- 3) Explain ring counter.
- 4) Explain dynamic RAM.
- 5) Draw dual slope ADC.
- 6) Draw the diagram of 4 bit Johnson counter.
- 7) Give application of DAC.

3. A) Attempt **any two** of the followings. **10**

- 1) Explain working of RS flip flop.
- 2) Explain diode matrix ROM.
- 3) Explain R – 2R ladder network.

B) Attempt **any one** of the followings. **10**

- 1) Define ADC. Explain any two types of ADC.
  - 2) Define counter. Explain 4 bit combined up and down asynchronous counter.
-





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**B.Sc. (ECS) – I (Semester – II) Examination, 2015  
MATHEMATICS (Paper – IV) (New) (CGPA Pattern)  
Algebra and Operations Research**

Day and Date : Saturday, 25-4-2015

Max. Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

- N.B. :** 1) Write answers of Section – I and Section – II on **separate** answer books.  
2) **All** questions are **compulsory**.  
3) **Use** of scientific calculator is **allowed**.  
4) Figures to the **right** indicate **full** marks.  
5) To draw the graphs (if necessary) the graph paper will be **provided** on request.

SECTION – I  
(Algebra)

1. Choose the correct alternative :

5

- 1) If there exists an element  $e \in A$  such that  $a * e = e * a = a, \forall a \in A$  then  $e$  is called \_\_\_\_\_ element w.r.t. the binary operation  $*$ .
- a) identity                      b) inverse                      c) binary                      d) none of these
- 2) The converse of  $p \rightarrow q$  is \_\_\_\_\_
- a)  $\sim p \rightarrow \sim q$                       b)  $q \rightarrow p$                       c)  $\sim q \rightarrow \sim p$                       d) None of these
- 3) If  $xRy$  and  $yRx$  then the relation  $R$  is called \_\_\_\_\_ relation.
- a) symmetric                      b) asymmetric  
c) antisymmetric                      d) equivalence
- 4) If  $F(x) = x^3 - x^2 + 2x$  when  $F(3) =$  \_\_\_\_\_
- a) 24                      b) 27                      c) 9                      d) 0
- 5) If  $z = 1 - i$  then modulus of  $z$  is \_\_\_\_\_
- a)  $\sqrt{-2}$                       b)  $\sqrt{2}$                       c) 2                      d) -2

P.T.O.



2. Attempt **any five** from the following : 10

- 1) Define Reflexive and transitive Relation.
- 2) State first principle of Mathematical Induction.
- 3) Write  $M(R)$  and draw Diagraph of Relation  
 $R = \{(1, 4), (4, 1), (4, 4), (5, 4), (1, 5), (5, 5)\}$  defined on  $A$ . Where  $A = \{1, 4, 5\}$ .
- 4) Prepare the truth table for  
 $\sim p \wedge (\sim q \vee p)$
- 5) Let  $*$  be a binary operation on  $z$  defined by  $a * b = a - b$  for all  $a, b \in z$  verify that whether  $*$  is associative or not.
- 6) Find modulus and argument of complex number  $z = \sqrt{3} - i$ .
- 7) Find the value of  $a$  if  $f(x) = ax + 5$  and  $f(1) = 8$ .

3. A) Attempt **any two** from the following : 10

- 1) Let  $A = \{1, 2, 3\}$  and let  
 $R = \{(1, 1), (1, 2), (2, 3), (1, 3), (3, 1), (3, 2)\}$   
 Compute the transitive closure of  $R$  by using Wharshall's Algorithm.
- 2) Prove that  $5^n - 4n - 1$  is divisible by  $16 \forall n \geq 1$  by using Mathematical Induction.
- 3) Let  $*$  be the binary operation defined on  $A = \{a, b, c, d\}$  given by the following multiplication table.

|   |   |   |   |   |
|---|---|---|---|---|
| * | a | b | c | d |
| a | c | d | a | b |
| b | d | a | b | c |
| c | a | b | c | d |
| d | b | c | d | a |

- Find :
- i)  $(a * b) * (b * c), (a * b) * d$
  - ii) Is  $*$  commutative ?
  - iii) Identity element w.r.t.  $*$
  - iv) Inverse of every element w.r.t.  $*$

B) Attempt **any one** of the following : 10

- 1) Prove that  $p \wedge (q \vee r) \equiv (p \wedge q) \vee (p \wedge r)$   
 Also test the validity of following argument by using truth table  
 $p \rightarrow \sim q, \sim r \rightarrow p, p \vdash r$
- 2) Define equivalence relation and let  $\sim$  be an equivalence relation on set  $A$ .  
 Let  $a, b \in A$  then prove that  $b \in [a]$  if and only if  $[a] = [b]$ .



SECTION – II  
(Operations Research)

1. Choose correct alternative :

5

- 1) In Balanced A.P. No. of jobs is \_\_\_\_\_ to No. of facilities.  
a) not equal                      b) less                      c) greater                      d) equal
- 2) In MODI method if all  $d_{ij} \geq 0$  then at that stage the solution is \_\_\_\_\_  
a) optimum                                              b) unbalanced  
c) alternate optimum                                              d) none of these
- 3) The objective of the T.P. is to \_\_\_\_\_ the total transportation cost.  
a) maximize                                              b) minimize  
c) maximize upto infinity                                              d) none of these
- 4) The coefficient of surplus variable in the objective function of maximize type is \_\_\_\_\_  
a) + M                                              b) – M                                              c) zero                                              d) one
- 5) If feasible region does not exist in graphical method of LPP then LPP has \_\_\_\_\_ solution.  
a) unique                                              b) many                                              c) unbounded                                              d) no

2. Attempt **any five** from the following :

10

- 1) Define unbalanced T.P.
- 2) Define decision variable.
- 3) Write the standard form of given LPP

$$\text{Max } Z = 5x_1 + 3x_2$$

Subject to

$$x_1 - 3x_2 \leq 2$$

$$-x_1 + x_2 \leq 1$$

$$\text{with } x_1, x_2 \geq 0$$

- 4) Write tabular form of transportation problem with 3 factories and 4 warehouses.
- 5) Define slack variable.
- 6) Write the names of method to find IBFS of the transportation problem.
- 7) What is the form of objective function in the LPP of canonical form and standard form ?



3. A) Attempt **any two** from the following :

10

1) Solve the following assignment problem for minimum cost

|   |    |    |     |    |
|---|----|----|-----|----|
|   | I  | II | III | IV |
| A | 02 | 10 | 09  | 07 |
| B | 15 | 04 | 14  | 08 |
| C | 13 | 14 | 16  | 11 |
| D | 04 | 15 | 13  | 09 |

2) Write the dual of following LPP

$$\text{Max } Z = 5x_1 + 12x_2 + 4x_3$$

Subject to

$$x_1 + 2x_2 + 4x_3 \leq 10$$

$$2x_1 - x_2 + 3x_3 \leq 8$$

$$3x_1 + x_2 + 4x_3 \leq 5$$

$$4x_1 - 3x_3 \leq 6$$

$$\text{with } x_1, x_2, x_3 \geq 0$$

3) Define unbalanced TP and write note on degeneracy in TP.

B) Attempt **any one** from the following :

10

1) Find IBFS by VAM method and optimal solution by MODI method

|                      |          |           |            |           |                      |
|----------------------|----------|-----------|------------|-----------|----------------------|
|                      | <b>I</b> | <b>II</b> | <b>III</b> | <b>IV</b> | <b>a<sub>i</sub></b> |
| <b>A</b>             | 15       | 10        | 17         | 18        | 2                    |
| <b>B</b>             | 16       | 13        | 12         | 13        | 6                    |
| <b>C</b>             | 12       | 17        | 20         | 11        | 7                    |
| <b>b<sub>j</sub></b> | 3        | 3         | 4          | 5         | 15                   |

2) Solve the following assignment problem to maximize the cost by using Hungarian method

|          |                      |                      |                      |                      |
|----------|----------------------|----------------------|----------------------|----------------------|
|          | <b>P<sub>1</sub></b> | <b>P<sub>2</sub></b> | <b>P<sub>3</sub></b> | <b>P<sub>4</sub></b> |
| <b>1</b> | 20                   | 30                   | 40                   | 50                   |
| <b>2</b> | 40                   | 50                   | 60                   | 70                   |
| <b>3</b> | 70                   | 80                   | 90                   | 80                   |
| <b>4</b> | 30                   | 50                   | 80                   | 40                   |





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**B.Sc. (E.C.S.) (Part – I) (Semester – II) (New) Examination, 2015**  
**STATISTICS (Paper – V)**  
**(CGPA Pattern)**

**Descriptive Statistics and Probability Theory – II**

Day and Date : Tuesday, 28-4-2015

Max. Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

- N.B. :** i) **Use separate** answer book for Section – I and Section – II.  
ii) Figures to the **right** indicate **full** marks.  
iii) **Use of any** type of calculator is **allowed**.

SECTION – I

**(Descriptive Statistics)**

1. Select most correct alternative :

5

i) If  $u = x + 4$ ,  $v = y - 4$ , then \_\_\_\_\_

- a)  $rx_y = ru_v$       b)  $rx_y > ru_v$       c)  $rx_y < ru_v$       d) none of these

ii) If  $b_{xy} = -\frac{4}{5}$ ,  $b_{yx} = -\frac{1}{5}$ , then  $rx_y =$  \_\_\_\_\_

- a)  $-\frac{2}{5}$       b)  $\frac{2}{5}$       c)  $\frac{4}{25}$       d) none of these

iii) The variation in time series due to \_\_\_\_\_ is the seasonal variation.

- a) earthquakes  
b) weekly bazaar  
c) development in medical science  
d) all of these

iv) In multiple regression, the value of dependent variable depends upon

- a) one independent variable  
b) more than one independent variables  
c) more than one dependent variables  
d) none of these



- v) \_\_\_\_\_ is not a problem in construction of index number.
- a) selection of base period                      b) selection of weights  
c) selection of current period                  d) selection of commodities

2. Answer **any five** of the following :

10

- i) Define – Positive correlation.  
ii) Define – Time series.  
iii) State components of time series.  
iv) Given :  $D = 10$ ,  $\sum (X - \bar{X})(Y - \bar{Y}) = -45$ ,  $\sigma_x = 7$ ,  $\sigma_y = 9$ . Find  $r_{xy}$ .  
v) The equation of line of regression Y on X is  $4X - 5Y + 25 = 0$ . Find  $b_{yx}$ .  
vi) Given :  $\sum p_0q_0 = 125$ ,  $\sum p_1q_1 = 230$ ,  $\sum p_1q_0 = 150$ . Find suitable price index number.  
vii) If  $r_{12} = 0.4$ ,  $r_{13} = 0.36$ ,  $r_{23} = 0.51$ . Find  $r_{12.3}$ .

3. A) Attempt **any two** of the following :

10

- i) Explain-secular trend.  
ii) Write short note on multiple correlation.  
iii) Find Price Index No. by  
a) simple aggregate method.  
b) simple average of relatives method.

|                                |          |          |          |          |
|--------------------------------|----------|----------|----------|----------|
| <b>Commodity :</b>             | <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> |
| <b>Price in base year :</b>    | 42       | 55       | 15       | 18       |
| <b>Price in current year :</b> | 40       | 60       | 20       | 21       |

B) Attempt **any one** of the following :

10

- i) Explain scatter diagram method of studying correlation.  
ii) Fit second degree curve  $Y = a + bX + cX^2$  to the following data and hence obtain trend value for year 2016.

|                |      |      |      |      |      |
|----------------|------|------|------|------|------|
| <b>Year :</b>  | 2007 | 2008 | 2009 | 2010 | 2011 |
| <b>Value :</b> | 4    | 20   | 125  | 540  | 1010 |





SECTION – II

(Probability Theory – II)

1. Select most correct alternative :

5

i) If  $X \rightarrow U(a, b)$ . Then variance of  $X$  is \_\_\_\_\_

- a)  $\frac{(b-a)}{2}$       b)  $\frac{a+b}{2}$       c)  $\frac{(b-a)}{12}$       d) none of these

ii) A r.v.  $X$  has exponential distribution with mean 5. Hence variance of the distribution is

- a) 20      b) 25      c) 5      d)  $\sqrt{5}$

iii) For testing  $H_0 : P = P_0$ , the test statistic is

- a)  $Z = \frac{P - P_0}{\sqrt{\frac{P_0 Q_0}{n}}}$       b)  $Z = \frac{X - nP}{\sqrt{npq}}$       c)  $Z = \frac{\bar{X} - \mu_0}{\frac{\sigma}{\sqrt{n}}}$       d) None of these

iv) Normal distribution is symmetric about

- a) A.M      b) Median      c) Mode      d) All of these

v) A Continuous r.v.  $X$  has pdf  $f(X) K(X-1)^2 : 1 \leq X \leq 3$ . Then  $K =$  \_\_\_\_\_

- a)  $\frac{3}{7}$       b)  $\frac{7}{3}$       c) 3      d) none of these

2. Answer **any five** of the following :

10

- i) Define marginal pmf of r.v.  $X$  and  $y$  if  $(X, y)$  is two dimensional discrete r.v.
- ii) Define level of significance.
- iii) Define variance of continuous r.v.
- iv) If  $X \rightarrow U(0, 10)$ , then find  $P(X \leq 3)$ .
- v) Let  $X \rightarrow N(\mu = 3; \sigma^2 = 4)$  and  $P(Z > 1) = 0.15866$ . Calculate  $P(X > 5)$ .
- vi) Define joint pmf.
- vii) Define test statistic for testing equality of two population proportion.



3. A) Answer **any two** :

10

- i) A r.v.  $X$  has normal distribution with mean 5 and S.D.4. Calculate  $P(13 < X < 17)$ . [Given  $P(Z > 1) = 0.1587$  where  $Z$  is S.N.V.].
- ii) Define statistical hypothesis and one sided test.
- iii) The time until next earthquake occurs in a particular region has exponential distribution with mean  $\frac{1}{2}$  per year. Find the probability that the next earthquake occurs within two years.

B) Answer **any one** :

10

- i) Define continuous uniform distribution. Find its mean; variance and distribution function.
- ii) An unbiased coin is tossed 400 times. Using normal approximation find probability of getting \_\_\_\_\_
  - a) Number of heads between 180 and 215.
  - b) Number of heads less than 185.

[Given  $P(Z > 2) = 0.02275$  and  $P(Z > 1.5) = 0.066087$ ].

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**B.Sc. (ECS) – I (Semester – II) (Old) Examination, 2015**  
**COMPUTER FUNDAMENTALS – II (Paper – I)**

Day and Date : Monday, 20-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- N.B. :** 1) **All questions are compulsory.**  
2) **Each questions carries equal marks.**  
3) **Figures to right place indicate full marks.**

1. Choose correct alternatives : 10

1) Windows operating system provide

- a) Graphical user interface                      b) Command line interface  
c) Text line interface                              d) None of these

2) The small graphic or symbol that represents a program file, folder or devices is

- a) Icons                                                      b) Desktop  
c) Monitor                                                  d) Pointer

3) The extension of MS-Excel File is

- a) .xel                                                      b) .cel  
c) .XIS                                                      d) None of these

4) To open a new text file \_\_\_\_\_ short cut key is used.

- a) ctrl+Z                      b) ctrl+N                      c) ctrl+O                      d) ctrl+V

5) Time slice is used in \_\_\_\_\_ system.

- a) multiprogramming                              b) multiprocessing  
c) multitasking                                      d) time sharing



- 6) LAN communication speed ranges from
- a) 100 mbps to 200 mbps
  - b) 10 mbps to 20 mbps
  - c) 10 mbps to 100 mbps
  - d) 10 mbps to 1000 mbps
- 7) \_\_\_\_\_ key should be pressed to start a new paragraph in MS-Word.
- a) Down cursor
  - b) Enter key
  - c) Shift + Enter
  - d) Shift + ctrl
- 8) HREF stands for
- a) Hyper text reference
  - b) Hyper text markup language
  - c) Hyper reference
  - d) All of the above
- 9) \_\_\_\_\_ tag is used to get the table data in individual cell.
- a) <TR>
  - b) <TD>
  - c) <TH>
  - d) <HR>
- 10) Which of the following is use to manage basic system setting and controls ?
- a) control panel
  - b) accessories
  - c) windows explorer
  - d) printer manager

2. Write answer of the following questions (**any five**) : **10**

- i) What do you mean operating system ?
- ii) What is process ?
- iii) Note on Taskbar.
- iv) Explain <a> tag with example.
- v) Explain the term E-mail.
- vi) Explain <frame>tag with example.

3. A) Write answer of the following questions (**any two**) : **6**

- a) What is editor ? List the different types of editors.
- b) Write short note on "Multitasking".
- c) What is windows modulus ? Explain printer manager.

B) Define internet. Explain uses and benefits of internet. **4**



4. Write answer of the following question (**any two**) : **10**
- a) Define networking. Explain different types of networking.
  - b) Explain the process of mail merge.
  - c) Explain the different features of windows operating system.
5. Write the answer of the following questions (**any two**) : **10**
- a) What is word processors ? Write the features of MS-Word.
  - b) Explain the <table> tag with example.
  - c) What is Javascript ? Explain advantages and disadvantages of Javascript.
-





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**B.Sc. (ECS) – I (Semester – I) Examination, 2015**  
**Paper – II (CGPA Pattern)**  
**COMPUTER FUNDAMENTALS AND PROGRAMMING USING C – I**

Day and Date : Monday, 6-4-2015

Max. Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

- N.B. :** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**  
3) **Answer of two Sections should be written in separate answer sheet.**

**SECTION – I**  
**(Computer Fundamentals)**

1. Multiple choice questions. 5
- i) \_\_\_\_\_ are often used in information Kiosks.  
a) Trackball      b) Mouse      c) Touch Screen      d) Joystick
  - ii) IBM 360/370 is representative system of \_\_\_\_\_ generation.  
a) First      b) Second      c) Third      d) Fourth
  - iii) Dot matrix printer is \_\_\_\_\_ type of printer.  
a) Impact      b) Non-impact  
c) Pointing      d) None of these
  - iv) EBCDIC is an \_\_\_\_\_ code.  
a) 6-bit code      b) 7-bit code      c) 8-bit code      d) None
  - v) \_\_\_\_\_ command is used to open the file in a DOS.  
a) Open      b) Type      c) Start      d) New
2. Answer **any five** of the following. 10
- i) Difference between internal and external commands.
  - ii) Is DOS multiuser operating system ? Comment on it.
  - iii) Advantages and disadvantages of assembly languages.



- iv) Difference between interpreter and compiler.
  - v) Explain expansion slots.
  - vi) Give long form of :
    - a) SMPS
    - b) OMR
  - vii) What is software ? Give the list of software.
3. A) Write short notes on **any two** of the following. 10
- i) Explain classification of computer.
  - ii) Explain secondary storage devices.
  - iii) What is DOS ? Explain Batch file with example.
- B) Answer **any one** of the following. 10
- i) Explain the following terms.
    - a) Bar-code reader
    - b) MICR
    - c) SMPS
    - d) EPROM
    - e) ASCII
  - ii) Explain evolution of computer.

SECTION – II  
(Programming Using C-I)

1. Multiple Choice Questions. 5
- i) Which of the following is not a relational operator ?
    - a) !
    - b) !=
    - c) > =
    - d) <
  - ii) \_\_\_\_\_ is a pictorial representation of an algorithm.
    - a) Program
    - b) Flowchart
    - c) Both a) and b)
    - d) None
  - iii) Void main ( )  
{  
int i = 5;  
print f(“%d\t%d”,i,sizeof(i));  
}  
What is the output ?
    - a) 5, 1
    - b) 5, 2
    - c) 5, 3
    - d) 5, 4





- iv) Multiway selection is possible through \_\_\_\_\_ statement.
  - a) conditional
  - b) sequential
  - c) compound
  - d) switch
- v) The address of individual array elements are called as indexes.
  - a) True
  - b) False

2. Answer **any five** of the following. **10**

- i) Define program and programming language.
- ii) Give the list of datatypes used in 'C' language.
- iii) Is 'C' is case-sensitive language ? Comment on it.
- iv) What is the difference between entry-controlled and exit-controlled loop ?
- v) Explain History of 'C' language in brief.
- vi) Why array is used in 'C' language ?
- v) How symbolic constant is defined ?

3. A) Write short notes on **any two** of the following. **10**

- i) Explain program development life cycle.
- ii) Explain structure of 'C' program in detail.
- iii) Write a program to print first 'N' numbers of Fibonacci series.

B) Answer **any one** of the following. **10**

- i) What is string ? Explain any five inbuilt string functions with example.
  - ii) Write a program to find out strong number between 1 to 1000.
-



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**B.Sc. (ECS) (Part – I) (Semester – II) Examination, 2015**  
**COMPUTER SCIENCE (Old)**  
**Programming Using ‘C’ – II (Paper – II)**

Day and Date : Tuesday, 21-4-2015

Total Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**

1. Multiple choice questions : 10

1) What will be the output of following code ?

```
void main ()
{
 struct employee
 {
 int id 8;
 int sex 1;
 int age 7;
 };
 struct employee emp1 = {203, 1, 23};
 clrscr ();
 printf ("%d\t%d\t%d", emp1. id, emp1. sex, emp1. age);
 getch ();
}
```

- a) 8 1 7                      b) 203 1 23                      c) 1 8 7                      d) None



2) Can you combine the following two statements into one ?

```
char *p;
```

```
p = (char*) malloc (100);
```

- a) `char p = *malloc (100);`                      b) `char *p = (char) malloc (100);`  
c) `char *p = (char*) malloc (100)`              d) `char *p = (char*) (malloc*) (100);`

3) The keyword used to transfer control from a function back to the calling function is

- a) switch                      b) goto                      c) go back                      d) return

4) What is the default value of register ?

- a) 0                      b) 1                      c) Garbage                      d) NULL

5) What is the purpose of “rb” in `fopen ()` function used below in the code ?

```
FILE *fp;
```

```
fp = fopen (“source.txt”, “rb”);
```

- a) open “source. txt” in binary mode of reading  
b) open “source. txt” in binary mode of reading and writing  
c) create a new file “source. txt” for reading and writing  
d) None of above

6) How will you free the allocated memory ?

- a) `remove (var-name)`                      b) `free (var-name)`  
c) `delete (var-name)`                      d) `dalloc (var-name)`

7) Does the datatype of all elements in the union will be same.

- a) True                      b) False

8) Which function be used to write entire structure in binary file ?

- a) `fputc ()`                      b) `fputs ()`                      c) `fwrite ()`                      d) `fprintf ()`

9) What does the following declaration mean ?

```
int (*ptr) [10];
```

- a) ptr is array of pointers to 10 integers  
b) ptr is pointer to an array of pointers to 10 integers  
c) ptr is array of 10 integers  
d) ptr is pointer to array

10) What is used to access individual element of an array ?

- a) `[]`                      b) `()`                      c) `{ }`                      d) `->`



2. Answer **any five** of the following : **10**
- i) What is the difference between formal and actual parameter ?
  - ii) Give the syntax of union definition and declaration.
  - iii) Why size of is used ? Give one example.
  - iv) What is difference between & operator and \* operator ?
  - v) How pointer is declared and initialize ?
  - vi) Give the syntax of scanf () and putchar ().
3. A) Write short notes on **any two** of the following : **6**
- i) What is difference between array and structure ?
  - ii) Explain chain of pointers.
  - iii) What is function ? Give the syntax of function declaration and definition .
- B) What is the difference between malloc () and calloc () ? **4**
4. Write short notes on **any two** of the following : **10**
- i) Write a program to illustrate the concept of pointer to structure.
  - ii) Explain storage classes in detail.
  - iii) Explain self referential structure with example.
5. Write short notes on **any two** of the following : **10**
- i) How structure is differ from union ? Explain it with example.
  - ii) Write a program to calculate largest among three numbers using function returning value.
  - iii) Explain the nested function with example.
-



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**B.Sc. (E.C.S.) (Part – I) (Semester – II) Examination, 2015**  
**Paper – III : LINEAR ELECTRONICS – II (Old)**

Day and Date : Wednesday, 22-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

**N.B. :** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**

1. Choose correct alternatives : **10**

- 1) In MMVT (using 555), the time constant is \_\_\_\_\_  
a) 1.6 RC            b) 1.1 RC            c) 0.69 RC            d) 1.36 RC
- 2) In class B amplifier the operating point Q lies on the \_\_\_\_\_ region.  
a) Cut-off            b) Active            c) Saturation            d) None of these
- 3) JFET is a \_\_\_\_\_ device.  
a) Unipolar            b) Bipolar            c) Unpolar            d) None of these
- 4) The feedback ratio in an AMVT is \_\_\_\_\_  
a) Unity            b) Zero            c) High            d) None of these
- 5) The Frequency response of the TC amplifier is \_\_\_\_\_  
a) Poor            b) Good            c) High            d) None of these
- 6) An ideal amplifier has  $\beta$  is \_\_\_\_\_  
a) 0            b) 1            c) 3            d) 4
- 7) The input resistance of MOSFET is \_\_\_\_\_  
a) Low            b) Very High            c) High            d) Zero



- 8) Hartely oscillator uses \_\_\_\_\_ Feedback.  
a) Resistive      b) Capacitive      c) Inductive      d) None of these
- 9) To amplify signal below 10 Hz \_\_\_\_\_ amplifier are used.  
a) CE      b) DC      c) TC      d) None of these
- 10) The theoretical maximum efficiency for Class A amplifier is \_\_\_\_\_  
a) 40%      b) 50%      c) 60%      d) 70%

2. Attempt **any five** of the following : **10**
- 1) Explain virtual ground concept.
  - 2) Give the application of amplifier.
  - 3) State different type of amplifier according to modes of operation.
  - 4) Draw circuit symbol for N and P channel JFET.
  - 5) Draw the circuit diagram for TC amplifier.
  - 6) Explain Input terminals of Op Amp.
3. A) Attempt **any two** of the following : **6**
- 1) State different parameters of ideal Op Amp.
  - 2) Write a note on crystal oscillator.
  - 3) Explain operation of MOSFET in brief.
- B) Explain frequency response curve in CE amplifier. **4**
4. Attempt **any two** of the following : **10**
- 1) Explain feedback concept of oscillator.
  - 2) Explain working of AMVT using IC 555.
  - 3) Explain characteristics of JFET.
5. Attempt **any two** of the following : **10**
- 1) Explain different types of amplifier according to frequency range.
  - 2) Write a note on Phase shift oscillator.
  - 3) Explain Op Amp as Adder and Subtractor.
-



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**B.Sc. (ECS) – I (Semester – II) Examination, 2015**  
**DIGITAL ELECTRONICS – II (Paper – IV) (Old)**

Day and Date : Thursday, 23-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- Instructions :** i) *All questions are compulsory.*  
ii) *All questions carry equal marks.*  
iii) *Draw neat diagram wherever necessary.*

1. Choose the correct alternatives. 10
- 1) With the JK Master Flip Flop the master is clocked when the clock is
    - a) low
    - b) high
    - c) either low or high
    - d) constant
  - 2) \_\_\_\_\_ converter has a binary input.
    - a) A/D
    - b) D/A
    - c) Both
    - d) None
  - 3) \_\_\_\_\_ is a temporary memory.
    - a) RAM
    - b) ROM
    - c) Both
    - d) None
  - 4) IC 7495 is a \_\_\_\_\_ IC.
    - a) Counter
    - b) Shift Register
    - c) Converter
    - d) None
  - 5) For Mod – 10 counter \_\_\_\_\_ F/Fs are used.
    - a) 2
    - b) 3
    - c) 4
    - d) 5
  - 6) In case R – 2R converter the \_\_\_\_\_ register values are used.
    - a) 1
    - b) 2
    - c) 3
    - d) 4
  - 7) The basic memory of dynamic RAM consists of
    - a) A capacitor
    - b) Transistor
    - c) Flip Flop
    - d) A transistor acting as a capacitor
  - 8) IC 7490 has a \_\_\_\_\_ pin IC.
    - a) 14
    - b) 16
    - c) 18
    - d) 20



- 9) For two bit Flash ADC \_\_\_\_\_ capacitors are used.  
a) 2                      b) 3                      c) 4                      d) 5
- 10) PROM are used to store  
a) Bulk information  
b) Sequential information  
c) Information to be accessed rarely  
d) Relatively permanent information
2. Attempt **any five** of the following. **10**
- 1) Explain PIPO Shift Register.
  - 2) Give classification of memory.
  - 3) Explain working of D Flip Flop.
  - 4) Explain parameters of DAC.
  - 5) Explain characteristics of memory.
  - 6) Explain applications of ADC.
3. A) Attempt **any two** of the following. **6**
- 1) Explain Binary Weighted ladder network.
  - 2) Explain modulus 10 counter.
  - 3) Write a note on EEPROM.
- B) Write a note on ring counter. **4**
4. Attempt **any two** of the following. **10**
- 1) Explain tracking type ADC.
  - 2) Define counter. Explain three bit combined asynchronous counter.
  - 3) Write a note on diode matrix ROM.
5. Attempt **any two** of the following. **10**
- 1) Explain RS Flip Flop by using NOR gate.
  - 2) Explain Single Slope ADC.
  - 3) Explain working principle of static memory using MOS.
-





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**B.Sc. (ECS) – I (Semester – II) (Old) Examination, 2015**  
**MATHEMATICS (Paper – V)**  
**Algebra**

Day and Date : Friday, 24-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**  
3) **Use of scientific calculator is allowed.**

1. Choose the correct alternative : 10

1) In the principle of mathematical induction  $P(k)$  is true for all  $k \geq 1$  is called

- a) basis of induction                      b) induction hypothesis  
c) mathematical induction                d) induction principle

2) A relation  $R$  on the set  $A$  is \_\_\_\_\_ if  $(a, b) \in R \Rightarrow (b, a) \in R$ .

- a) symmetric      b) transitive      c) reflexive      d) antisymmetric

3) If  $xRy$  and  $yRz \Rightarrow xRz$  then the relation  $R$  is called \_\_\_\_\_ relation.

- a) symmetric      b) transitive      c) reflexive      d) antisymmetric

4) If  $f(x) = x(x - 2)(x - 4)$  then  $f(4) =$

- a) 7                      b) 20                      c) 0                      d) 15

5) A function  $f$  is invertible iff  $f$  is

- a) only-one – one                      b) only onto  
c) one-one or onto                      d) one-one and onto

6) The imaginary part of the complex number  $(1 + i)(1 - i)$  is

- a)  $i$                       b)  $-i$                       c) 0                      d) 1



- 7) If  $Z = (-1 - i)(2 + i)$  then  $|Z| =$   
 a)  $\sqrt{3}$                       b)  $\sqrt{10}$                       c)  $\sqrt{2}$                       d)  $\sqrt{-1}$
- 8) Disjunction of the statements p and q is false if both the statements are  
 a) true                      b) false                      c) true and false                      d) true or false
- 9) If  $H_1, H_2, H_3 \vdash 9$  then the statement 9 is known as  
 a) hypothesis                      b) conclusion                      c) argument                      d) none of these
- 10) If there exists an element  $e \in A$  such that  $a * e = e * a = a, \forall a \in A$  then e is called \_\_\_\_\_ element.  
 a) inverse                      b) identity                      c) binary                      d) none of these

2. Attempt **any five** from the following.

10

- 1) State the first principle of mathematical induction.
- 2) Define equivalence relation.
- 3) Define injective and surjective function.
- 4) If  $Z = 1 + \sqrt{3}i$  then find the modulus and argument of Z
- 5) Prepare the truth table for  $(p \wedge q) \rightarrow (p \vee q)$ .
- 6) If  $*$  is a binary operation on Z defined by  $a * b = a - b$  for all  $a, b \in Z$  then verify that whether  $*$  is associative or not.

3. A) Attempt **any two** from the following.

6

- 1) Define void relation, reflexive relation and antisymmetric relation.
- 2) If p and q are true statements, r and s are false statements then find the truth value of the statement,  
 $[(q \vee p) \rightarrow (\sim p \wedge q)] \rightarrow [(r \rightarrow \sim s) \wedge (q \rightarrow p)]$ .
- 3) If  $*$  is a binary operation defined on Z by  $a * b = a + b + 5; a, b \in Z$ . Determine whether  $*$  is commutative, associative or not.

B) If  $\sim$  is an equivalence relation on a set A then show that any two equivalence classes are either disjoint or identical.

4



4. Attempt **any two** from the following. 10

- 1) By mathematical induction, prove that  $8^{(n+1)} - 7n + 41$  is divisible by 49, for all  $n \geq 1$ .
- 2) Let  $A = \{a, b, c\}$  and  $R = \{(a, a), (a, b), (b, c), (a, c), (c, a), (c, b)\}$  be a relation on A. Find the transitive closure of R by using Warshall's algorithm.
- 3) If  $f: A \rightarrow B$  and  $g: B \rightarrow C$  are any two bijective functions then show that  $(g \circ f)$  is bijective function.

5. Attempt **any two** from the following. 10

- 1) Find Re (Z) and Im (Z) where  $Z = \left(\frac{2+i}{3-2i}\right)^2$
- 2) Test the validity of the following argument by using truth table  
 $p \rightarrow q, q \rightarrow r \vdash p \rightarrow r$ .
- 3) If  $*$  is a binary operation defined on  $A = \{p, q, r, s, t\}$  given by following multiplicative table.

| X | p | q | r | s | t |
|---|---|---|---|---|---|
| p | s | t | p | q | r |
| q | t | p | q | r | s |
| r | p | q | r | s | t |
| s | q | r | s | t | p |
| t | r | s | t | p | q |

Then find

- i)  $[(p * q) * (s * t)] * r$
  - ii) Find the identify element, if it exists
  - iii) Inverse of each elements of A.
-





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**B.Sc. (ECS) – I (Semester – II) (Old) Examination, 2015**  
**MATHEMATICS (Paper – VI)**  
**Operations Research**

Day and Date : Saturday, 25-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- Instructions :** 1) **All** questions are **compulsory**.  
2) **Use** of calculator is **allowed**.  
3) Figures to the **right** indicate **full** marks

1. Choose the correct alternative. 10
- 1) The coefficient of artificial variable in the objective function of maximisation type is \_\_\_\_\_  
a)  $-M$                       b)  $\perp$                       c)  $O$                       d)  $+M$
  - 2) If the number of jobs is not equal to number of facilities then the assignment problem is called as \_\_\_\_\_ assignment problem.  
a) balanced                      b) unbalanced                      c) restricted                      d) bounded
  - 3) The objective function of the L.P.P. in canonical form is of \_\_\_\_\_ type.  
a) maximise                      b) minimise  
c) maximise and minimise                      d) maximise or minimise
  - 4) In the optimality test of the T. P. if all  $d_{ij} \geq 0$  with atleast one  $d_{ij} = 0$  then the solution under test is \_\_\_\_\_  
a) optimal solution                      b) alternate optimal solution  
c) best solution                      d) not optimal solution
  - 5) If primal of a LPP contains 4-constraints and 3 variables then its dual LPP will contain \_\_\_\_\_ constraints and \_\_\_\_\_ variables respectively.  
a) 3, 3                      b) 4, 4                      c) 3, 4                      d) 4, 3



- 6) The objective of T.P. is to \_\_\_\_\_ the total transportation cost.  
a) maximise      b) optimise      c) minimise      d) stabilize
- 7) If the number of occupied cells is equal to  $m + n - 1$  then the solution of T. P. is \_\_\_\_\_ where 'm' is number of jobs and 'n' is number of facilities.  
a) degenerate      b) non-degenerate  
c) optimum      d) none of these
- 8) The graphical method of solving LPP can be used when the number of variables in the objective function are \_\_\_\_\_  
a) 0      b) 1      c) 3      d) 2
- 9) Hungarian method is the method of solving \_\_\_\_\_  
a) Assignment Problem      b) Transportation Problem  
c) Linear Programming Problem      d) Dual Problem
- 10) \_\_\_\_\_ method is used to find optimum solution of a transportation problem.  
a) Least Cost      b) Vogel's Approximation  
c) North-West Corner      d) Modified Distribution

2. Attempt **any five** of the following.

10

- 1) Define slack variable.
- 2) Define unbalanced T.P.
- 3) Define balanced A.P.
- 4) Write the formula for index number ( $c_{ij}$ ) for occupied cell and the formula for opportunity cost ( $d_{ij}$ ) for the un-occupied cell.
- 5) Define non-degenerate solution of a T.P.
- 6) Write the names of the methods to solve L.P.P.

3. A) Attempt **any two** of the following.

6

- 1) Explain, how an assignment problem of maximisation type is solved.
- 2) Define standard form of L.P.P.
- 3) Write the difference between A. P. and T.P.

B) Define canonical form of a L.P.P. Give any one example.

4



4. Attempt **any two** of the following.

10

1) Solve the following A.P. to minimise the total assignment cost.

|   |    |    |    |    |   |
|---|----|----|----|----|---|
|   | A  | B  | C  | D  | E |
| P | 9  | 3  | 1  | 13 | 1 |
| Q | 1  | 17 | 13 | 20 | 5 |
| R | 0  | 14 | 8  | 11 | 4 |
| S | 19 | 3  | 0  | 5  | 5 |
| T | 12 | 8  | 1  | 6  | 2 |

2) Solve the following L.P.P. by using graphical method.

Minimise  $Z = 4x + 2y$  subject to

$4x + y \geq 20 ;$

$2x + y \geq 14 ;$

$x + 6y \geq 18 ;$

$x, y \geq 0.$

3) Find the optimum solution of following T.P. by using MODI method.

|               | $W_1$ | $W_2$ | $W_3$ | $W_4$ | Capacity |
|---------------|-------|-------|-------|-------|----------|
| $F_1$         | 6     | 5     | 8     | 5     | 30       |
| $F_2$         | 5     | 11    | 9     | 7     | 40       |
| $F_3$         | 8     | 9     | 7     | 13    | 50       |
| <b>Demand</b> | 35    | 28    | 32    | 25    |          |



5. Attempt **any two** of the following.

10

1) Find IBFS of the following T.P. by using Vogel's Approximation method.

|       | $D_1$ | $D_2$ | $D_3$ | $D_4$ | $a_i$ |
|-------|-------|-------|-------|-------|-------|
| $O_1$ | 23    | 27    | 16    | 18    | 30    |
| $O_2$ | 12    | 17    | 20    | 51    | 40    |
| $O_3$ | 22    | 28    | 25    | 41    | 53    |
| $b_j$ | 22    | 35    | 25    | 41    | 123   |

2) Solve the following A.P. to maximise the total assignment cost.

|   | I  | II | III | IV | V  |
|---|----|----|-----|----|----|
| A | 30 | 37 | 40  | 28 | 40 |
| B | 40 | 24 | 27  | 21 | 36 |
| C | 40 | 32 | 33  | 30 | 35 |
| D | 25 | 38 | 40  | 36 | 36 |
| E | 29 | 62 | 41  | 34 | 39 |

3) Solve the following L.P.P. by using simplex method.

$$\text{Maximise } Z = 40x + 35y$$

Subject to

$$2x + 3y \leq 60 ;$$

$$4x + 3y \leq 96 ;$$

$$x, y \geq 0.$$

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**B.Sc. (ECS) (Part – I) (Semester – II) (Old) Examination, 2015**  
**STATISTICS**

**Descriptive Statistics – II (Paper – VII)**

Day and Date : Monday, 27-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- Instructions :**
- 1) *All questions are compulsory.*
  - 2) *All questions carry equal marks.*
  - 3) *Use of any type of calculator is allowed.*
  - 4) *Figures to right indicate full marks.*
  - 5) *Graph paper will be supplied on request.*

1. Choose most correct alternative : 10

1) If the variables X and Y are independent, then correlation between them is

- a) Zero
- b) 1
- c) -1
- d) None of these

2) Scatter diagram method of studying correlation between two variables give

- a) only magnitude of correlation
- b) Only direction of correlation
- c) (a) and (b) both
- d) None of these

3) Let  $Y = 4X + 3$  be the line of regression of X on Y then  $b_{xy} =$

- a) 4
- b) -4
- c)  $-\frac{1}{4}$
- d)  $\frac{1}{4}$

4) If the regression coefficient  $b_{yx} =$  regression coefficient  $b_{xy}$ , then correlation between X and Y is

- a) + ve only
- b) -ve only
- c) Perfect only
- d) None of these

P.T.O.



- 5) Multiple correlation always lies between
- a) 0 and 1
  - b) -1 and 1
  - c) -1 and 0
  - d) None of these
- 6) According to Yule's notation  $b_{12.3}$  is partial regression coefficient in which
- a)  $X_1$  is dependent variable
  - b)  $X_2$  is dependent variable
  - c)  $X_3$  is dependent variable
  - d) None of these
- 7) The time series data is arranged
- a) Geographically
  - b) Qualitatively
  - c) Quantitatively
  - d) Chronologically
- 8) The periodic variation in the time series data, whose period is less than one year is known as
- a) Secular trend
  - b) Seasonal variation
  - c) Cyclical variation
  - d) None of these
- 9) Price Index No. of a certain group of commodities is 135, it means that,
- a) Price increased by 35%
  - b) Price increased by Rs. 35
  - c) Price decreased by 35%
  - d) Price decreased by Rs. 35
- 10) Fisher's Index No. is of type which is obtained by
- a) Simple aggregate method
  - b) Simple average of relative method
  - c) Weighted aggregate method
  - d) Weighted average of relative method



2. Attempt **any five** : 10

- 1) Define correlation
- 2) If correlation coefficient between X and Y is 0.8, find correlation coefficient between
  - i)  $X - 25$  &  $Y + 30$
  - ii)  $\frac{(X - 10)}{13}$  &  $\frac{(11 - Y)}{14}$
- 3) Given :  $n = 8$ ,  $\bar{X} = 4$ ,  $\bar{Y} = 3$ ,  $b_{xy} = -0.3$ ,  $b_{yx} = -0.27$ , estimate Y when  $X = 6$ .
- 4) If  $r_{12} = 0.7$ ,  $r_{23} = r_{13} = 0.6$ , then find  $r_{23.1}$ .
- 5) State demerits of moving average method.
- 6) If  $\sum p_0 q_1 = 1790$ ,  $\sum p_0 q_0 = 1660$ ,  $\sum p_1 q_0 = 2070$ , then find Laspeyre's price index number.

3. A) Attempt **any two** : 6

- 1) Explain the term cause and effect relationship with illustration.
- 2) Find price index number by simple aggregate method.

**Price in Current Year** : 10    25    27    12

**Price in Base Year** : 9    20    30    10

- 3) The equations of lines of regression are  $2Y - X = 22$  and  $4X - Y = 24$ . Find correlation coefficient between X and Y.

B) If  $X_1, X_2, X_3$  are 3 variables measured from their respective means, obtain equation of plane of regression of  $X_1$  on  $X_2$  and  $X_3$  from the following information. 4

$$\sigma_1 = 2.4 \quad \sigma_2 = 2.7 \quad \sigma_3 = 2.7$$

$$r_{12} = 0.28 \quad r_{13} = 0.49 \quad r_{23} = 0.5$$



4. Attempt **any two** :

**10**

- 1) Explain how to select base year in construction of index number.
- 2) Find 3-yearly moving averages for the following data :

**Year :**    1    2    3    4    5    6    7    8

**Sale :**    10    12    16    18    24    30    25    35

- 3) Find Fisher's price index number from the following data :

| Commodity | Price |      | Qty  |      |
|-----------|-------|------|------|------|
|           | 1985  | 1986 | 1985 | 1986 |
| <b>A</b>  | 6     | 10   | 50   | 56   |
| <b>B</b>  | 2     | 2    | 100  | 120  |
| <b>C</b>  | 4     | 6    | 60   | 60   |

5. Attempt **any two** :

**10**

- 1) Find Karl Pearson's coefficient of correlation between X and Y.

**X :**    5    6    7    8    10

**Y :**    4    7    8    6    9

- 2) Write a note on seasonal variation.
- 3) Explain the concept of multiple correlation and state formula for  $R_{1.23}$ .

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**B.Sc. (E.C.S.) (Part – I) (Semester – II) Examination, 2015**  
**Paper – VIII : PROBABILITY THEORY – II (Old)**

Day and Date : Tuesday, 28-4-2015  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

**Instructions :** 1) **All** questions carry **equal** marks.  
2) Use of **any** type of calculator is **allowed**.  
3) Figures to the **right** indicates **full** marks.

1. Choose most correct alternative.

**10**

1) The function  $P(x, y)$  is said to be joint p.m.f. of bivariate discrete r.v.  $(X, Y)$  if

- a)  $P(x, y) \geq 0$  for all  $x$  and  $y$       b)  $\sum_x \sum_y P(x, y) = 1$   
c) a) and b) both                              d) none of these

2) Two random variables  $X$  and  $Y$  are said to be independent, if

- a)  $P(x.y) = P(x).P(y)$ , for all  $x$  and  $y$   
b)  $E(X.Y) = E(X).E(Y)$   
c)  $P(x/y) = P(x)$ , for all  $x$  and  $y$   
d) all of these

3) If the joint p.m.f. of  $(X, Y)$  is  $P(x, y) = \begin{cases} (xy)/9, & \text{if } x = 1, 2 \text{ and } y = 1, 2 \\ 0, & \text{otherwise} \end{cases}$

Then  $P(Y = 3)$  is

- a)  $1/3$                                               b) 1  
c) zero                                              d) none of these

4) If  $X$  is continuous r.v. with p.d.f.  $f(x)$ , then

- a)  $P(X = K) = 0$ , where  $K$  is any constant  
b)  $P(X < 5) = P(X \leq 5)$   
c) a) and b) both  
d) none of these





4) Find k if the p.d.f. of r.v. X is  $f(x) = \begin{cases} k, & \text{if } 0 \leq x \leq 0.5 \\ 0, & \text{otherwise} \end{cases}$ .

5) State mean and variance of X, if  $X \rightarrow u(-4, 4)$ .

6) State additive property of normal distribution.

3. A) Attempt **any two** :

6

1) The joint p.m.f. of a bivariate r.v. (X, Y) is as given below :

$$P(x, y) = \begin{cases} \frac{xy}{36}, & \text{if } x = 1, 2, 3 \text{ and } y = 1, 2, 3 \\ 0, & \text{otherwise} \end{cases}$$

Test whether X and Y are independent ?

2) A random variable X has p.d.f.  $f(x) = \begin{cases} 5x^4, & \text{if } 0 \leq x \leq 1 \\ 0, & \text{o.w.} \end{cases}$

Find variance of X.

3) Define exponential distribution and state its c.d.f.

B) Given :  $n_1 = 1000, n_2 = 800, X_1 = 350, X_2 = 200$ .

4

Test  $H_0 : P_1 = P_2$  against  $H_1 : P_1 \neq P_2$  at 5% level of significance.

4. Attempt **any two** :

10

1) Define c.d.f. of continuous r.v. and state any three properties of it.

2) The life time of a electric bulb has exponential distribution with mean life time 1420 hours. Find number of bulb out of 1000 that will survive upto 700 hours.

3) The p.d.f. of a continuous r.v.X is  $f(x) = \begin{cases} k.x.(2 - x), & \text{if } 0 \leq x \leq 2 \\ 0, & \text{o.w.} \end{cases}$

Obtain value of k and hence find c.d.f. of X.



5. Attempt **any two** :

10

- 1) Explain test for testing population mean.
- 2) The joint p.m.f. of bivariate r.v.  $(X, Y)$  is given below.

| $X \downarrow \ Y \rightarrow$ | 1  | 2  | 3  |
|--------------------------------|----|----|----|
| 1                              | k  | 2k | 3k |
| 2                              | 2k | 4k | 6k |
| 3                              | 3k | 5k | 7k |

Find :

- i) value of k
  - ii)  $E(X.Y)$
- 3) There are 1000 students in a college of certain age group and it is known that their weights are normally distributed with mean 55 kg. and s.d. 7 kg. Find number of students having weight between 48 kg. and 62 kg.  
(Given : area under standard normal curve from 1 to  $\infty$  is 0.1587).
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**B.Sc. (ECS – II) (Semester – III) (New) Examination, 2015  
OPERATING SYSTEM – I (Paper – I)**

Day and Date : Wednesday, 29-4-2015

Max. Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

**Instructions:** 1) Figures to the **right** indicate **full** marks.  
2) **All** questions are **compulsory**.

1. Multiple choice questions.

10

- 1) In design goals the requirements can however divided into two basic groups as user and \_\_\_\_\_ goals.
  - a) Implementation
  - b) Management
  - c) System
  - d) None of these
- 2) When the processes enters the system, they are put into a \_\_\_\_\_ queue, which consist of all processes in the system.
  - a) Ready queue
  - b) Job queue
  - c) Device queue
  - d) None of these
- 3) Which is not the part of PCB ?
  - a) Program counter
  - b) Process state
  - c) Accounting information
  - d) Flag registers
- 4) RR scheduling is
  - a) Preemptive scheduling
  - b) Non-preemptive scheduling
  - c) Deadlock scheduling
  - d) None of these
- 5) The \_\_\_\_\_ queue contains all the process that are ready to execute and are waiting for the CPU.
  - a) Device queue
  - b) Job queue
  - c) Ready queue
  - d) Waiting queue

P.T.O.



- 6) A uniprocessor system can have \_\_\_\_\_ processes.
- a) 2                      b) any number      c) 1                      d) none of these
- 7) The simplest algorithm is
- a) SJF                      b) FCFS  
c) Preemptive SJF                      d) None of these
- 8) When the CPU becomes idle, the operating system must select one of the processes in \_\_\_\_\_ queue to be executed.
- a) waiting queue                      b) ready queue  
c) device queue                      d) none of these
- 9) A process execution begins and ends with
- a) I/O burst                      b) CPU burst  
c) Any one of a) and b)                      d) None of these
- 10) A process can be defined as
- a) any user program                      b) any OS program  
c) any program in execution                      d) none of these

2. Answer **any five** of the following.

**10**

- 1) What is multiprogramming ?
- 2) Explain process termination.
- 3) What is PCB ?
- 4) What is Interprocess communication ?
- 5) Explain scheduling queues.
- 6) Explain difference between process and threads.

3. A) Answer **any two** of the following.

**6**

- 1) Explain distributed operating system.
- 2) Write a note on semaphores.
- 3) Explain priority scheduling.



- B) Consider the following five work loads. 4  
Time Slot = 2  
Calculate the following using RR scheduling.

| Jobs           | Burst Time |
|----------------|------------|
| J <sub>1</sub> | 9          |
| J <sub>2</sub> | 6          |
| J <sub>3</sub> | 10         |
| J <sub>4</sub> | 3          |
| J <sub>5</sub> | 5          |

- i) Compute average waiting time and turn around time.
- ii) Also prepare Gantt chart for it.

4. Answer **any two** of the following. 10

- 1) Explain different scheduling criterias in detail.
- 2) Explain dining-philosophers problem.
- 3) Explain virtual machine.

5. Answer **any two** of the following. 10

- 1) Explain different types of operating system.
  - 2) Explain different types of schedulers in detail.
  - 3) What are the services provided by operating system ?
-





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**B.Sc. (ECS) – II (Semester – III) (New) Examination, 2015  
OBJECT ORIENTED PROGRAMMING USING C++ – I (Paper – II)**

Day and Date : Thursday, 30-4-2015  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

**N. B. :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternative : **10**

- 1) When unary operator overloads it takes \_\_\_\_\_ arguments, while binary operator overloads it takes \_\_\_\_\_ arguments.  
a) 1, 1                      b) 2, 2                      c) 0, 1                      d) 1, 0
- 2) Constructor name and class name must be same.  
a) true                      b) false
- 3) If we define function outside the class body then compiler treats it is \_\_\_\_\_  
a) friend                      b) inline                      c) constructor                      d) none of above
- 4) \_\_\_\_\_ is insertion operator.  
a) >                      b) <                      c) >>                      d) <<
- 5) Which of the following operator can be overloaded ?  
a) ?                      b) #                      c) @                      d) ++
- 6) \_\_\_\_\_ is special member function whenever object created it executes automatically.  
a) constructor                      b) destructor                      c) friend                      d) all
- 7) Constructor should be declared only in private section only.  
a) true                      b) false
- 8) Return type of destructor is \_\_\_\_\_  
a) int                      b) float                      c) void                      d) nothing



- 9) Static variable should be defined \_\_\_\_\_
- a) outside the class                      b) inside the class  
c) both a) and b)                      d) none of these
- 10) The member function declared in private access specifier called \_\_\_\_\_
- a) friend                      b) private member function  
c) inline member function                      d) none of these

2. Answer **any five** of the following : **10**

- 1) Write advantages of inline member function.
- 2) Write rule's for declaring constructor.
- 3) List out relational operators used in C++.
- 4) Write syntax of class definition.
- 5) State any four binary operators.
- 6) Define friend function.

3. A) Answer **any two** of the following : **6**

- 1) Explain the term nested member function.
- 2) Explain multiple constructor in a class.
- 3) What are the rules of operator overloading ?

B) Write a program in C++ to test the given number is Armstrong or not by using default constructor. **4**

4. Answer **any two** of the following : **10**

- 1) Explain copy constructor with e.g.
- 2) What is difference between structure and class ?
- 3) Write a program in C++ to implement any one binary operator overloading.

5. Answer **any two** of the following : **10**

- 1) What is the meaning of private and public access specifier ?
  - 2) Explain nested class with e.g.
  - 3) Write a program that shows static data member and static member functions.
-



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**B.Sc. (ECS) – II (Semester – III) (New) Examination, 2015**  
**COMPUTER SCIENCE**  
**Data Structures and Algorithms – I (Paper – III)**

Day and Date : Saturday, 2-5-2015  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

***N.B. : 1) All questions are compulsory.***  
***2) Figures to the right place indicate full marks.***

1. Choose correct alternatives. 10
- 1) front = rear, state that Queue is empty.  
a) True                      b) False
  - 2) To delete a node in between two nodes of doubly linked list, \_\_\_\_\_ links we have to set.  
a) One                      b) Two                      c) Three                      d) Four
  - 3) \_\_\_\_\_ data structure allows us to insert and remove elements in both ends.  
a) Array                      b) Stack                      c) Deque                      d) Circular queue
  - 4) ADT is programming language.  
a) True                      b) False
  - 5) In sequence of operations of stack push (5), push (7), pop, push (7), push (5) pop, pop, push (5), pop, pop. The sequence of popped out values are  
a) 7, 5, 5, 5, 7      b) 7, 5, 7, 5, 5      c) 5, 5, 7, 7, 5      d) 7, 5, 7, 5, 7
  - 6) 'Front' end of queue is used for \_\_\_\_\_ of element.  
a) Insertion                      b) Removing                      c) Both a and b                      d) None
  - 7) 'next' part of last node of circular linked list replaced by \_\_\_\_\_ node.  
a) Second                      b) Middle                      c) Header                      d) None of these



- 8) Stack underflow condition occurs while performing \_\_\_\_\_ operation.  
a) create( )      b) push( )      c) pop( )      d) display( )
- 9) \_\_\_\_\_ data structure is used to manipulate polynomial expression.  
a) Array      b) Stack      c) Queue      d) Linked list
- 10) Traversing in both direction is possible in singly linked list.  
a) True      b) False

2. Attempt **any five** questions from the followings : **10**

- 1) What is Singly Linked list ? Write its node structure.
- 2) Differentiate between Stack and Queue.
- 3) Define “Time and Space Complexity”.
- 4) What is Algorithm ? List out its characteristics.
- 5) List out applications of queue.
- 6) List out advantages of linked list over array.

3. A) Attempt **any two** questions from the followings : **6**

- 1) Implement PUSH( ) and POP( ) operations of stack.
- 2) Write a program to find largest number in two dimensional array.
- 3) Explain following operations of singly circular linked list.  
I) Insert End    II) Count.

B) Explain “Greedy algorithm” in detail. **4**

4. Attempt **any two** questions from the followings : **10**

- 1) Explain the concept of Circular queue with its basic operations.
- 2) How will you check expression is valid or not by using stack ?
- 3) What is array ? Explain all types of array in details.

5. Attempt **any two** questions from the followings : **10**

- 1) Explain algorithm with example for conversion of infix expression to prefix.
  - 2) What is IRD ? Explain its two cases of remove operations.
  - 3) What is Doubly linear linked list ? Explain its following operations :  
I) Insert First    II) Remove End    III) Search.
-





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**B.Sc. (ECS) – I (Semester – I) Examination, 2015  
ELECTRONICS (Paper – III) (CGPA Pattern)  
Linear & Digital Electronics – I**

Day and Date : Wednesday, 8-4-2015

Max. Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

- Instructions:** 1) **All** questions are **compulsory**.  
2) Figures to the **right** indicate **full** marks.  
3) Draw circuit diagram **wherever** necessary.

SECTION – I

(Linear)

1. Multiple choice questions.

5

- i) In case of linear resistor current and applied voltage are related as  
a) directly proportional                      b) inversely proportional  
c) not directly proportional                  d) none
- ii) In case of electrolytic capacitor for its polarity long lead is  
a) negative                      b) positive                      c) neutral                      d) none
- iii) In an intrinsic semiconductor the number of free electrons is \_\_\_\_\_ the number of holes.  
a) equal to                      b) less than                      c) more than                      d) both a and b
- iv) \_\_\_\_\_ diode is used to convert incoming light into an electrical quantity.  
a) p – n junction                      b) zener                      c) photo                      d) LED
- v) Transistor is a  
a) current controlled device                      b) voltage controlled device  
c) temperature controlled device                      d) both a and b

2. Answer **any** of the following.

10

- i) What is resistor ? What is resistance ?  
ii) Give examples of active and passive components.



- iii) State and explain in short maximum power transfer theorem.
- iv) Draw atomic structure of silicon and Germanium atom.
- v) Draw step down transformer and step up transformer.
- vi) What is Light emitting diode ?
- vii) What is operating point ?

3. A) Write short notes on **any two** of the following. 10

- i) Explain P-N junction diode.
- ii) What is biasing ? Explain voltage divider biasing.
- iii) What is rectifier ? Explain bridge rectifier.

B) Answer **any one** of the following. 10

- i) Explain forward and reverse biasing of diode.
- ii) Explain types of capacitor and also explain charging and discharging of capacitor.

## SECTION – II

### (Digital Electronics – I)

1. Multiple choice questions. 5

i) \_\_\_\_\_ code is error detection and correction code.

- a) Hamming      b) ASCII      c) EBCDIC      d) None

ii) A \_\_\_\_\_ is a circuit with several i/p and one o/p.

- a) Data selector      b) Demultiplexer  
c) Encoder      d) Decoder

iii) A full adder has

- a) two i/p and two o/p      b) two inputs and one o/p  
c) three i/p's and one o/p      d) three i/p's and two o/p's

iv) A decimal number 6 in Excess – 3 code is written as

- a) 0110      b) 0010      c) 1101      d) 1001

v) A priority encoder produces a binary o/p, corresponding to the \_\_\_\_\_ order octal digit appearing on the inputs.

- a) lowest      b) highest      c) first      d) none



2. Answer **any five** of the following. 10

i) Draw k – map and simplify following equation.

$$Y = \overline{A}B\overline{C} + \overline{A}\overline{B}C + A\overline{C}D + A\overline{C}\overline{D}.$$

ii) Prove  $\overline{A \oplus B} = A.B + \overline{A}.\overline{B}$  .

iii) Construct hamming code for 1001 using even parity.

iv) Explain universal gate and draw AND gate from NOR gate.

v) Write Excess – 3 code for 22.

vi) Convert 1111 gray into binary and 1111 binary into gray.

vii) Draw 1 : 4 Demultiplexer.

3. A) Write short note on **any two** of the following. 10

i) Explain full adder.

ii) Execute the following conversion.

a)  $(3711)_8$  –  $(?)_{10}$

b)  $(1993)_{10}$  –  $(?)_{16}$

c)  $(100)_{16}$  –  $(?)_{10}$

d)  $(125)_{10}$  –  $(?)_2$

e)  $(E8)_{16}$  –  $(?)_2$

iii) Minimise the following using K – map and draw simplified diagram using basic gates

$$F(A, B, C, D) = \sum m(1, 2, 3, 4, 5, 6, 7, 9, 13, 15)$$

B) Answer **any one** of the following. 10

i) Explain demultiplexing tree and draw 1 : 32 demultiplexer using 1 : 8 demultiplexer.

ii) Explain universal gate and draw.

- a) AND                      b) OR                      c) NOR  
d) NOT                      e) EX-OR using NOR gate
-



SLR-O – 30

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**B.Sc. (ECS) – II (Semester – III) (New) Examination, 2015**  
**COMPUTER SCIENCE**  
**Software Engineering – I (Paper – IV)**

Day and Date : Tuesday, 5-5-2015

Total Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternative : 10

- 1) \_\_\_\_\_ is method is related with finding and investigating more features of system.
  - a) Requirement investigation
  - b) Requirement anticipation
  - c) Both a and b
  - d) None of these
- 2) Computer Run Chart can be regarded as master plan of computer sub system
  - a) True
  - b) False
- 3) Which fact-finding technique is adopted when the field of investigation is very vast and the respondents are spread over a wide geographical area ?
  - a) Interview
  - b) Questionnaire
  - c) Record review
  - d) Observations
- 4) \_\_\_\_\_ gives just idea about system it does not contains all features of system.
  - a) Spiral
  - b) Prototyping
  - c) Both a and b
  - d) None of these
- 5) Which of the following is not a characteristic of a software ?
  - a) Probabilistic
  - b) Deterministic
  - c) Versions are possible
  - d) Customized

P.T.O.



- 6) Which of the following feasibility is related to human organizational and political aspects ?  
a) Economical    b) Technical    c) Operational    d) None of these
- 7) Decision table is tool for programmer and system analyst.  
a) True    b) False
- 8) MIS mean  
a) More Infinity System    b) Most Information System  
c) Major Information System    d) Management Information System
- 9) Spiral model is useful to guide risks in the project.  
a) True    b) False
- 10) \_\_\_\_\_ is a system which interacts with environment.  
a) Open    b) Close  
c) Both a and b    d) None of these

2. Answer **any five** of the following :

**10**

- 1) What is flowchart ?
- 2) What is Feedback ?
- 3) What do you mean by requirement specification ?
- 4) Write advantages of Decision table.
- 5) Differentiate between Deterministic and Probabilistic system.
- 6) What is need of prototyping ?

3. A) Answer **any two** of the following.

**6**

- 1) Write a note on observation and record review.
- 2) Differentiate between structured and unstructured interview techniques.
- 3) What is Requirement Anticipation.

B) Write note on HIPO chart.

**4**



4. Answer **any two** of the following. **10**
- 1) Explain characteristics of software.
  - 2) Distinguish between system analysis and system design.
  - 3) What are the various fact finding techniques ? Discuss the advantages of interview and questionnaires.
5. Answer **any two** of the following. **10**
- 1) Explain decision table with its type.
  - 2) Explain in detail waterfall model.
  - 3) Explain role of System Analyst.
-





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**B.Sc. (E.C.S.) (Part – II) (Semester – III) (New) Examination, 2015  
ELECTRONICS  
Organization of PC – I (Paper – V)**

Day and Date : Wednesday, 6-5-2015  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

***N.B. :*** 1) ***All questions are compulsory.***  
2) ***Figures to the right place indicate full marks.***

1. Choose correct alternatives :

**10**

- 1) \_\_\_\_\_ is a soft magnetic disk.
  - a) CD
  - b) Floppy
  - c) HDD
  - d) None of these
- 2) The system configuration used \_\_\_\_\_ RAM.
  - a) Static
  - b) Dynamic
  - c) CMOS
  - d) None of these
- 3) \_\_\_\_\_ means that signals can be passed in one direction.
  - a) Simplex
  - b) Half duplex
  - c) Full duplex
  - d) None of these
- 4) The POST is stored in \_\_\_\_\_ memory.
  - a) RAM
  - b) ROM
  - c) HDD
  - d) None of these
- 5) \_\_\_\_\_ interrupt can not be ignored or masked at 8088.
  - a) Maskable
  - b) NMI
  - c) HOLD
  - d) None of these
- 6) The \_\_\_\_\_ is organized into locations.
  - a) CPU
  - b) K/B
  - c) Memory
  - d) Printer
- 7) \_\_\_\_\_ IC is used for bus controller.
  - a) 8284
  - b) 8259
  - c) 8288
  - d) None of these

**P.T.O.**





- 8) \_\_\_\_\_ Scanner uses a photo multiplier tube.
- a) Drum
  - b) Hand held
  - c) Sheet Fed
  - d) None of these
- 9) \_\_\_\_\_ is a signal which contains the electronic signal.
- a) Set
  - b) Clock
  - c) Switch
  - d) None of these
- 10) The CDROM is a drive which reads \_\_\_\_\_ coated round plastic disc.
- a) Gold
  - b) Aluminum
  - c) Magnetic
  - d) None of these

2. Attempt **any five** of the following : **10**
- 1) Explain modem in brief.
  - 2) State different types of interrupt used in IBM PC.
  - 3) Explain types of signal.
  - 4) Give different types of monitor.
  - 5) Draw block diagram of ALU.
  - 6) Explain capacitive switch.
3. A) Attempt **any two** of the following : **6**
- 1) Explain different types of bus.
  - 2) Explain CRC.
  - 3) Explain SMPS.
- B) Write a note on key board. **4**
4. Attempt **any two** of the following : **10**
- 1) Explain control unit with suitable block diagram.
  - 2) Explain magnetic disk drive.
  - 3) Explain functional block diagram of PC.
5. Attempt **any two** of the following : **10**
- 1) What is Interrupt ? Explain different types of interrupt.
  - 2) Explain different DMA channels of PC.
  - 3) Explain different types of Scanner.
-



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**B.Sc. (ECS) (Part – II) (Semester – III) Examination, 2015  
MICROPROCESSOR – I (Paper – VI) (New)**

Day and Date : Thursday, 7-5-2015  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

- N.B. :** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*  
3) *Neat diagrams must be drawn wherever necessary.*

1. Choose correct alternatives : 10
- 1) In I/O mapped I/O control signals are \_\_\_\_\_  
a) common                      b) separate                      c) multiplex                      d) none of these
  - 2) Handshaking is \_\_\_\_\_ data transfer.  
a) synchronous                      b) parallel                      c) direct                      d) asynchronous
  - 3) Associative memory is \_\_\_\_\_  
a) DAM                      b) CAM                      c) DMA                      d) AAM
  - 4) Polling is \_\_\_\_\_ used for identifying the priority of interrupt.  
a) hardware                      b) I/O device                      c) software                      d) controller
  - 5) Static RAM consist of \_\_\_\_\_ to store information.  
a) capacitor                      b) flip flop                      c) inductor                      d) resister
  - 6) ADDX R1, R2 is \_\_\_\_\_ address instruction  
a) three                      b) two                      c) one                      d) zero
  - 7) Data stored on magnetic tape in \_\_\_\_\_ track.  
a) longitudinal                      b) circular                      c) semicircular                      d) spiral
  - 8) PC stores address of \_\_\_\_\_ instruction.  
a) last                      b) next                      c) current                      d) TOS
  - 9) \_\_\_\_\_ fetches the instruction from memory.  
a) PCU                      b) user                      c) ALU                      d) input
  - 10) CD ROM is \_\_\_\_\_ type memory.  
a) mechanical                      b) electrical                      c) magnetic                      d) optical

P.T.O.



2. Attempt **any five** of the following : 10
- a) Explain synchronous serial communication.
  - b) Explain polish notation.
  - c) Write non volatile memory.
  - d) Explain daisy chaining.
  - e) Explain register stack.
  - f) Explain function of CS, RD, WR, VSS pins.
3. A) Attempt **any two** of the following : 6
- 1) Explain logical instruction.
  - 2) Explain handshake method of data transfer.
  - 3) Explain memory hierarchy.
- B) Explain instruction format. 4
4. Attempt **any two** of the following : 10
- 1) Explain general register organization.
  - 2) Explain I/O mapped I/O.
  - 3) Explain cache memory.
5. Attempt **any two** of the following : 10
- 1) Explain addressing modes.
  - 2) Explain DMA mode of data transfer.
  - 3) Explain associative memory.
-



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**B.Sc. (ECS) – II (Semester – III) (New) Examination, 2015**  
**ENGLISH – I (Paper – VII)**

Day and Date : Friday, 8-5-2015

Max. Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to *right* indicate *full* marks.**

1. a) Fill in the blanks in the following sentences by choosing the correct alternatives :

6

- 1) \_\_\_\_\_ are the written record of the decisions taken in the meeting.  
a) Notice                      b) Agenda                      c) Minutes                      d) None of above
- 2) The following points are included in the notice  
a) Day, date and time                      b) Place of meeting  
c) Name of the organisation                      d) All of the above
- 3) Instrumental and terminal are the types of  
a) Personality                      b) Attitude  
c) Values                      d) Paper
- 4) FIR stands for  
a) First Investigation Report                      b) First Interview Report  
c) First Information Report                      d) First Invented Report
- 5) Any documents sent together with a letter are indicated by  
a) Index                      b) Enclosures  
c) Xerox copy                      d) None of above
- 6) Meetings conducted by a temporary committee are called  
a) Statutory                      b) Formal  
c) Ad-hoc                      d) Informal



b) Match the pair.

4

**A**

**B**

- |             |                                             |
|-------------|---------------------------------------------|
| 1) Value    | a) Mental ability                           |
| 2) Agenda   | b) Written in past tense                    |
| 3) Report   | c) List of items to be discussed in meeting |
| 4) Attitude | d) Love                                     |
|             | e) Social ability                           |

2. Gives brief answers to the following questions (**any five**) :

10

- 1) Which are five universal values ?
- 2) What is attitude ?
- 3) What do you mean by values ?
- 4) Mention the components in Job application letter.
- 5) Mention the major types of report.
- 6) What do you mean by space and indention in writing mechanism ?

3. A) Write short notes on **any two** of the following :

6

- 1) What is meeting and states various types of meeting.
- 2) What are the functions of attitude ?
- 3) Site the examples of tree diagram and bar diagram.

B) Attempt **any two** of the following :

4

- 1) Formation of attitudes
- 2) The layout of business letter
- 3) Steps in writing reports.

4. Attempt **any one** of following :

10

- 1) Explain the common features of report.
- 2) Define meeting and explain various types of meeting with suitable examples.

5. Write a letter of application in response to the following advertisement with bio-data wanted software engineer, graduate in computer science with master degree fluency in English preferred.

10

Write to : Manager, Infosys Pvt. Ltd. Wakad, Pune Main street, Pune-411011.

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**B.Sc. (ECS) – II (Semester – III) (Old) Examination, 2015  
OPERATING SYSTEM – I (Paper – I)**

Day and Date : Wednesday, 29-4-2015  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

**Instructions :** 1) Figures to the **right** indicate **full** marks.  
2) **All** questions are **compulsory**.

1. Multiple choice questions :

10

- 1) FIFO scheduling is
  - a) Preemptive scheduling
  - b) Non-preemptive scheduling
  - c) Deadlock scheduling
  - d) None of these
- 2) \_\_\_\_\_ is the solution to critical section problem.
  - a) Mutual exclusion
  - b) Race condition
  - c) System calls
  - d) None of these
- 3) \_\_\_\_\_ is a program that acts as an intermediary between computer user and computer hardware.
  - a) Process management
  - b) Storage management
  - c) Operating system
  - d) All the above
- 4) \_\_\_\_\_ provides interface to services made available by operating system.
  - a) Programming execution
  - b) I/O operation
  - c) Accounting
  - d) System calls
- 5) The RR algorithm is designed specially for \_\_\_\_\_ system.
  - a) Time sharing
  - b) Distributed
  - c) Real time
  - d) Multiprogramming
- 6) A process can be defined as
  - a) Any user program
  - b) Any program in execution
  - c) Any OS program
  - d) None of these



- 7) The dining philosophers problem is an example of
- a) Critical section problem
  - b) Memory management problem
  - c) Free space allocation problem
  - d) None of these
- 8) The short term scheduler selects
- a) The process which is ready to execute and allocate CPU
  - b) The jobs are admitted to the system for processing
  - c) The process loads them into memory
  - d) None of these
- 9) A major problem with priority scheduling algorithm is
- a) Saturation
  - b) Starvation
  - c) Deadlock
  - d) None of these
- 10) PCB means
- a) Program Control Block
  - b) Process Communication
  - c) Process Control Block
  - d) None of these

2. Answer **any five** of the following :

10

- 1) Define process and threads.
- 2) Define throughput and turnaround time.
- 3) System calls.
- 4) Write a short note on time sharing operating system.
- 5) Ready queues.
- 6) Write a short note on batch system.

3. A) Answer **any two** of the following :

6

- 1) Explain design goals of operating system.
- 2) Explain structure of PCB.
- 3) Write a note on semaphores.



B) Consider the following four jobs. Calculate the following using FCFs algorithm. **4**

| Job            | Burst time |
|----------------|------------|
| J <sub>1</sub> | 7          |
| J <sub>2</sub> | 5          |
| J <sub>3</sub> | 5          |
| J <sub>4</sub> | 10         |

- i) Prepare a Gantt chart.
- ii) Calculate average turn around time.
- iii) Calculate average waiting time.

4. Answer **any two** of the following : **10**

- 1) What are the services provided by operating system ?
- 2) Write a note on process state with neat diagram.
- 3) Explain layered architecture of operating system.

5. Answer **any two** of the following : **10**

- 1) Explain reader writer problem in detail.
  - 2) What is operating system ? Explain components of operating system.
  - 3) Explain FCFs and SJF.
-







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**B.Sc. (ECS) – II (Semester – III) (Old) Examination, 2015**  
**OBJECT ORIENTED PROGRAMMING USING C++ – I (Paper – II)**

Day and Date : Thursday, 30-4-2015  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

**N.B. :** 1) *All questions are compulsory.*  
2) *Figures to the **right** indicate **full** marks.*

1. Choose the correct alternative : **10**
- 1) Which of the following feature is used to implement data abstraction ?  
a) Delegation                                          b) Encapsulation  
c) Inheritance                                          d) Polymorphism
  - 2) Procedure oriented programming approach focus on  
a) function                          b) data                          c) both                          d) none of above
  - 3) A goto statement transfer control to  
a) variable                          b) function                          c) label                          d) operator
  - 4) \_\_\_\_\_ variable is initialized to zero.  
a) Auto                          b) Static                          c) Register                          d) All
  - 5) << is called \_\_\_\_\_  
a) insertion operator                                          b) external operator  
c) extraction operator                                          d) object
  - 6) Which of the following is not passed to function ?  
a) Header file                                          b) Array  
c) Object                                          d) Reference variable
  - 7) Destructor may be \_\_\_\_\_  
a) parameterized                          b) virtual                          c) over loaded                          d) friend
  - 8) \_\_\_\_\_ is cannot overloaded.  
a) .\*                                          b) New                                          c) > =                                          d) +



9) Conversion from basic data type to class type is done by using \_\_\_\_\_

- a) constructor                                  b) destructor  
c) operator                                         d) friend function

10) By default all members of a class are \_\_\_\_\_

- a) public                                  b) private                                  c) protected                                  d) all

2. Answer **any five** of the following : 10

- 1) What is friend function ?
- 2) Explain copy constructor.
- 3) Explain memory management operators used in C++.
- 4) How do-while control work ?
- 5) Differentiate structure and union.
- 6) Explain different storage classes for variables.

3. A) Answer **any two** of the following : 6

- 1) What is function ? List different component of function.
- 2) Explain break, continue and goto statements.
- 3) Explain nesting of classes.

B) Write a program to implement friend function. 4

4. Answer **any two** : 10

- 1) What is operator overloading ? List rules used for operator overload.
- 2) Write a program to implement passing object to member function by using pass by reference.
- 3) Explain static member function with e.g.

5. Answer **any two** : 10

- 1) What is destructor ? Explain use of destructor with e.g.
- 2) Write a program to overload addition operator (+).
- 3) Differentiate object oriented programming and procedure oriented programming.

\_\_\_\_\_



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**B.Sc. (E.C.S.) – II (Semester – III) (Old) Examination, 2015**  
**COMPUTER SCIENCE (Paper – III)**  
**Data Structure and Algorithms – I**

Day and Date : Saturday, 2-5-2015  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

**Instructions:** 1) *All questions are compulsory.*  
2) *Figures to the right indicates full marks.*

1. Choose correct alternatives. 10
- 1) \_\_\_\_\_ queue gives statement 'Queue is Full' as well as 'Queue is Empty' at one time.  
a) Circular                      b) Priority                      c) Deque                      d) Linear
  - 2) Stack is primitive data Structure.  
a) True                      b) False
  - 3) Linked list is flexible than stack and queue.  
a) True                      b) False
  - 4) If an array having size 'n' then its last element is stored at index  
a)  $n + 1$                       b)  $n - 1$                       c)  $n$                       d)  $n \% 1$
  - 5) 'Stack underflow' condition occurs while performing \_\_\_\_\_ operation.  
a) Create( )                      b) Push( )                      c) Pop( )                      d) status( )
  - 6) Node of doubly linked list has \_\_\_\_\_ ports.  
a) One                      b) Two                      c) Three                      d) Four
  - 7) \_\_\_\_\_ is the postfix form of infix expression  $(A + B)/C * D - E$ .  
a)  $AB + CDE * / -$                       b)  $AB + CDE * - /$   
c)  $AB + CDE - * /$                       d)  $AB + CED - * /$
  - 8) To insert new node in between two nodes of doubly linked list, we have to set \_\_\_\_\_ pointer.  
a) One                      b) Two                      c) Three                      d) Four

P.T.O.



- 9) \_\_\_\_\_ is non-linear data structure.  
a) Stack                      b) Queue                      c) Linked List                      d) None of these
- 10) \_\_\_\_\_ deque allows us to remove elements from both ends but add element from only one end.  
a) IRD                      b) ORD                      c) Both a & b                      d) None of these

2. Answer **any five** of the following. **10**

- 1) Explain 'Stack Underflow' and 'Stack Overflow' conditions.
- 2) What is Linked list ? Write node structure for singly and doubly linked list.
- 3) What is algorithm ? List out its characteristics.
- 4) In which manner stack works ? Why ?
- 5) Implement 'status' operation of linear queue.
- 6) What is 'Multi-dimensional' array ? How it is declared and initialized ?

3. A) Answer **any two** of the following. **6**

- 1) What is deque ? List out its type with definition.
- 2) What is ADT ? Explain ADT for stack.
- 3) Explain 'Divide and conquer algorithm' in detail.

B) Write an algorithm to check expression is valid or not using stack. **4**

4. Answer **any two** of the following. **10**

- 1) Write an algorithm to convert infix expression into postfix expression.
- 2) What is stack ? Implement its 'Push and Pop' operations.
- 3) What is doubly linear linked list ? Implement its following operations :  
a) Insert\_between                      b) Count( )                      c) Search( )

5. Answer **any two** of the following. **10**

- 1) How stack is useful in 'Recursion' ?
  - 2) Write a program that finds maximum number in two dimensional array.
  - 3) Implement following operations of ORD :  
a) Insert\_left( )                      b) Insert\_right( )
-



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**B.Sc. (ECS) – II (Semester – III) (Old) Examination, 2015**  
**COMPUTER SCIENCE**  
**Software Engineering – I (Paper – IV)**

Day and Date : Tuesday, 5-5-2015  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

**Instructions:** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternative : 10

1) Which of the following is not the characteristic of software ?

- a) Software does not wear out
- b) Software is flexible
- c) Software is not manufactured
- d) Software is always correct

2) MIS means

- a) More Infinity System
- b) Most Information System
- c) Major Information System
- d) Management Information System

3) \_\_\_\_\_ symbol is used to represent any data stored offline.

- a)       b)       c)       d) 

4) In risk analysis of spiral model, which of the following risk includes ?

- a) Technical
- b) Management
- c) Both a and b
- d) None of these



- 5) Which of the following feasibility is related to human organizational and political aspects ?
- a) Economical
  - b) Technical
  - c) Operational
  - d) None of these
- 6) \_\_\_\_\_ technique is used to collect information from individuals or from groups.
- a) Record review
  - b) Interview
  - c) Questionnaire
  - d) None of these
- 7) \_\_\_\_\_ is a system which is self contained.
- a) Open system
  - b) Closed system
  - c) Probabilistic system
  - d) None of these
- 8) \_\_\_\_\_ refers software can easily continue to operate correctly though there will be invalid inputs.
- a) Robustness
  - b) Performance
  - c) Reusability
  - d) Reliability
- 9) \_\_\_\_\_ method is related with finding and investigating more features of system.
- a) Requirement anticipation
  - b) Requirement investigation
  - c) Requirement specification
  - d) None of these
- 10) In \_\_\_\_\_ technique, analyst collect data from records, document.
- a) Record review
  - b) Observation
  - c) Interview
  - d) None of these

2. Answer **any five** of the following :

**10**

- 1) Differentiate between deterministic and probabilistic system.
- 2) What is flowchart ?
- 3) Define software engineering.
- 4) What are advantages of problem identification in system development life cycle ?
- 5) What is requirement investigation ?
- 6) Give some important points to be considered while designing a questionnaire.



3. A) Answer **any two** of the following : **6**
- 1) Explain Spiral Model.
  - 2) Define feedback with example.
  - 3) Give the advantages of decision table.
- B) Explain technical feasibility. **4**
4. Attempt **any two** of the following : **10**
- 1) Explain the role of system analyst.
  - 2) Explain the qualities of software.
  - 3) Explain the advantages of observation and questionnaire as a fact gathering technique.
5. Answer **any two** of the following : **10**
- 1) Explain in detail waterfall model.
  - 2) Explain three activities of requirement determination.
  - 3) State the advantages and disadvantages of HIPO.
-







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**B.Sc. (ECS) – II (Semester – III) (Old) Examination, 2015**  
**ELECTRONICS**  
**Organization of PC – I (Paper – V)**

Day and Date : Wednesday, 6-5-2015  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

- Instructions :** 1) *All questions are compulsory.*  
2) *Figures to right indicate full marks.*  
3) *Neat diagram draw wherever necessary.*

1. Fill in the blanks. 10

- 1) LSI stands for \_\_\_\_\_
- a) Large Scale Integration                      b) Large Scale Integral  
c) Large Scale Infinity                         d) None of these
- 2) Cache memory acts between \_\_\_\_\_
- a) CPU and RAM                                 b) RAM and ROM  
c) CPU and HDD                                 d) None of these
- 3) The fetching of instruction is done by \_\_\_\_\_ unit.
- a) ALU                                              b) Control                      c) Memory                      d) None of these
- 4) Static RAM is made up of \_\_\_\_\_
- a) Counter                                        b) Multiplexer                      c) Flip-flop                      d) Resistor
- 5) \_\_\_\_\_ use interrupt mode of data transfer.
- a) Keyboard                                      b) Monitor                      c) Scanner                      d) None of these



- 6) In \_\_\_\_\_ signals can passed in one direction only.  
a) half duplex                                        b) full duplex  
c) simplex                                            d) none of these
  
- 7) The \_\_\_\_\_ supports uniprogramming systems.  
a) PC-AT                b) PC-XT                c) PC-NT                d) None of these
  
- 8) In CD/DVD information can store in the form of  
a) Pits and lands                b) Charging                c) 0 and 1                d) None of these
  
- 9) \_\_\_\_\_ printer require heat sensitive paper.  
a) Thermal                b) Dot-matrix                c) Laser                d) Inkjet
  
- 10) \_\_\_\_\_ motor is used to move the position of head.  
a) Spindle                                            b) Stepper  
c) Index sloper                                            d) None of these

2. Answer **any five** of the following. **(5×2=10)**

- 1) What is non-maskable interrupt ? Give one example.
- 2) Which is best method in error detection and error correction ? Why ?
- 3) Write types of interrupt signal.
- 4) Write types of memory.
- 5) Draw diagram of matrix keyboard organization.
- 6) What is impact and non-impact printer ?



3. A) Answer **any two** of the following. **(2×3=6)**
- 1) Explain types of scanner.
  - 2) What are advantages of virtual memory ?
  - 3) Draw diagram of CD-ROM drive operation.
- B) Explain DMA mode for I/P and O/P data transfer. **4**
4. Attempt **any two** of the following. **(2×5=10)**
- 1) Explain how interrupt servicing are done.
  - 2) Explain different types of keyswitches.
  - 3) Write short note on latest mother-board.
5. Attempt **any two** of the following. **(2×5=10)**
- 1) Explain parity check method.
  - 2) Explain control bus signals.
  - 3) Compare features of PC and PC/AT.
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**B.Sc. (ECS) – II (Semester – III) (Old) Examination, 2015**  
**ELECTRONICS**  
**Microprocessor – I (Paper – VI)**

Day and Date : Thursday, 7-5-2015

Total Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

**Instructions:** 1) **All questions are compulsory.**  
2) **Figures to the right indicate get full marks.**

1. Choose the correct alternatives. 10

- 1) Static RAM consists of \_\_\_\_\_ to store information.  
a) capacitor      b) flip flop      c) inductor      d) resistor
- 2) Polling is a \_\_\_\_\_ used in priority of interrupt.  
a) input      b) I/O device      c) hardware      d) software
- 3) PUSHA is \_\_\_\_\_ instruction.  
a) Data transfer      b) Arithmetic      c) Processor      d) Logical
- 4) In synchronous transmission clock is  
a) separate      b) common      c) serial      d) parallel
- 5) \_\_\_\_\_ fetches the instruction from memory.  
a) user      b) ALU      c) PCU      d) input
- 6) Intel 8089 IOP is \_\_\_\_\_ pin IC.  
a) 40      b) 20      c) 24      d) 14
- 7) To access 128 byte memory it requires \_\_\_\_\_ address lines.  
a) 8      b) 7      c) 16      d) 20
- 8) Program counter stores address of \_\_\_\_\_ instruction.  
a) next      b) last      c) current      d) none of these



9) In I/O mapped I/O control signals are  
a) common      b) separate      c) multiplex      d) none of these

10) Data stored on magnetic tape in \_\_\_\_\_ track.  
a) longitudinal      b) circular      c) semicircular      d) spiral

2. Attempt **any five** of the following. **10**

- 1) What is meant by polling ?
- 2) Explain processor control instruction.
- 3) Give parameters of memory.
- 4) Explain concept of interfacing.
- 5) Explain register stack.
- 6) Explain types of memory.

3. A) Attempt **any two** of the following. **6**

- 1) Explain arithmetic instructions.
- 2) Explain memory address map.
- 3) Explain I/O interface module.

B) Explain general register organization. **4**

4. Attempt **any two** of the following. **10**

- 1) Explain optical memory.
- 2) Explain asynchronous data transfer.
- 3) Explain communication between CPU and IOP.

5. Attempt **any two** of the following. **10**

- 1) Explain virtual memory management concept.
  - 2) Explain parallel priority interrupt.
  - 3) Explain instruction format.
-



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**B.Sc. (ECS) – I (Semester – I) (CGPA Pattern) Examination, 2015**  
**MATHEMATICS (Paper – IV)**  
**Graph Theory and Numerical Methods**

Day and Date : Wednesday, 15-4-2015

Max. Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

- N.B. :** 1) Write answers of Section – I and Section – II on **separate** answer books.  
2) **All** questions are **compulsory**.  
3) **Use** of scientific calculators are **allowed**.  
4) Figures to the **right** indicate **full** marks.

SECTION – I  
(Graph Theory)

1. Choose the correct alternative :

5

- 1) A tree whose centre is a single vertex is called \_\_\_\_\_  
a) unicentral          b) bicentral          c) tricentral          d) none of these
- 2) A complete bipartite graph  $K_{m,n}$  is \_\_\_\_\_ iff  $m = n$ .  
a) Complete          b) Hamiltonian          c) Eulerian          d) None of these
- 3) A single vertex together with loop is a cycle of length \_\_\_\_\_  
a) one          b) two          c) zero          d) three
- 4) For any graph  $G$ ,  $G \oplus G$  is \_\_\_\_\_  
a)  $G$                                   b) Null graph  
c) complete graph                  d) none of these
- 5) A vertex of degree one is called \_\_\_\_\_ vertex.  
a) one          b) pendent          c) isolated          d) none of these





2. Attempt **any five** from the following :

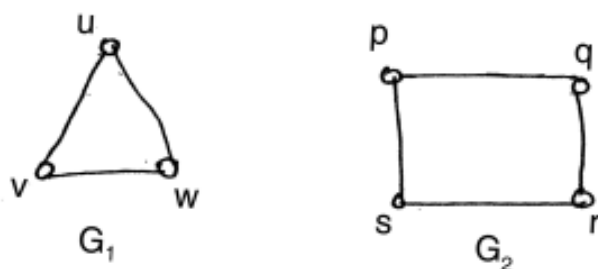
10

- i) Define union and intersection of two graphs.
- ii) Define self complementary graph.
- iii) Define edge connectivity with suitable example.
- iv) Define spanning tree with suitable example.
- v) Draw a graph which is Hamiltonian but not Eulerian.
- vi) Find the number of edges in a complete graph with seven vertices.
- vii) Draw the graphs  $K_{3,2}$  and  $K_{2,4}$ .

3. A) Attempt **any two** from the following :

10

i) Find and draw  $G_1 \times G_2$  for the following pairs of graphs.



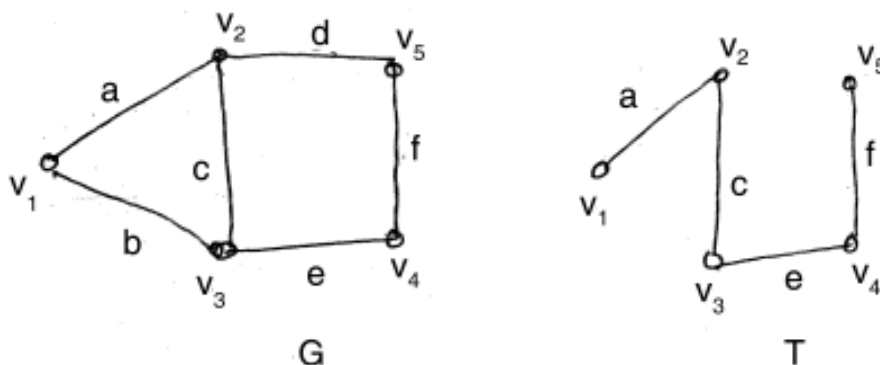
- ii) Write a note on Koningsberg's seven bridges problem.
- iii) Define incidence matrix and adjacency matrix with suitable example.

B) Attempt **any one** from the following :

10

- i) Define : a) Fundamental circuit
- b) Fundamental cutset

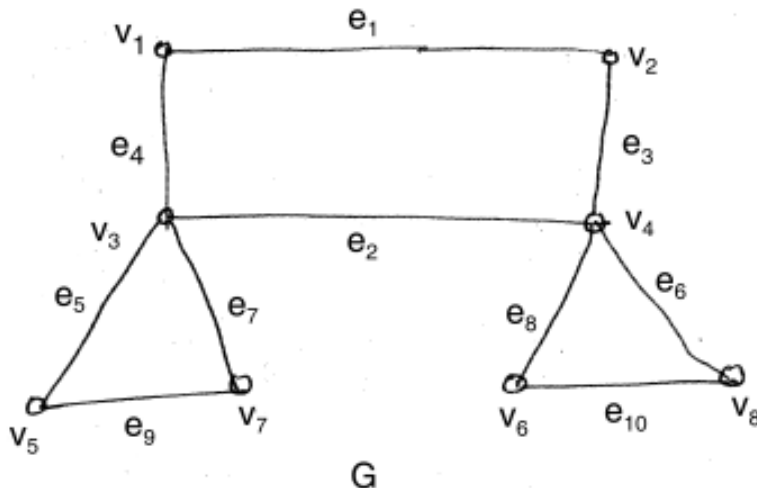
Find all fundamental circuits and fundamental cutsets of  $G$  w.r.t. spanning tree  $T$  given below :





- ii) Define : a) Eulerian circuit
- b) Euler graph

Use Fleury's algorithm to trace an Eulerian circuit for the following graph.



**SECTION – II**  
(Numerical Methods)

1. Choose the correct alternative :

5

- 1) Trapezoidal rule is obtained by putting  $n =$  \_\_\_\_\_ in general quadrature formula.  
a) 1                      b) 2                      c) 3                      d) 4
- 2)  $\bar{E}^{-1}[f(x)] =$  \_\_\_\_\_  
a)  $f(x)$                       b)  $f(x + h)$                       c)  $f(x - h)$                       d) none of these
- 3) The relation between  $E$  &  $\Delta$  is \_\_\_\_\_  
a)  $E = 1 + \Delta$                       b)  $E = 1 - \Delta$                       c)  $E = 1 + \nabla$                       d) none of these
- 4)  $0.4399 E10 \times 0.5789E - 12 =$  \_\_\_\_\_  
a)  $0.2547E-2$                       b)  $0.2547E2$                       c)  $0.2547E22$                       d)  $0.2547E3$
- 5) The equation  $x \log x + \sin x = 0$  is called as \_\_\_\_\_ equation.  
a) polynomial                      b) transcendental  
c) algebraic                      d) differential



2. Attempt **any five** from the following :

10

- i) Find the interval in which the root of the equation  $x^3 - 2x - 5 = 0$  lies.
- ii) Write augmented matrix for following system of linear equations  
 $u + 2v + 3w = 3; -2v + 3w = 7; 2u + v = 6.$
- iii) Write the Simpson's  $\left(\frac{3}{8}\right)^{\text{th}}$  rule for integration.
- iv) Show that  $Ef(x) = (1 + \Delta) f(x).$
- v) State the formula for  $K_1, K_2$  and  $K$  in Runge-Kutta 2<sup>nd</sup> order method.
- vi) Write Regula Falsi method formula to find the root of the equation  $f(x) = 0$  in the interval  $(a, b).$
- vii) Find the value of  $(0.4596E_3 + 4.6982E_4).$  Write your answer in normalised floating point form.

3. A) Attempt **any two** from the following :

10

- i) Find the real root of the equation  $x^3 - 2x - 5 = 0$  correct upto 4-decimal places by using Newton's Raphson method.

ii) Obtain  $A^{-1}$ , it exist by using adjoint method,  $A = \begin{bmatrix} 1 & 0 & 2 \\ 2 & -1 & 3 \\ 4 & 1 & 8 \end{bmatrix}.$

iii) Show that  $\Delta \left[ \frac{f(x)}{g(x)} \right] = \frac{g(x)\Delta f(x) - f(x)\Delta g(x)}{g(x+h).g(x)}$

B) Attempt **any one** from the following :

10

- i) Write the general quadrature formula. State and derive Trapezoidal rule for integration.
- ii) Write the Newton's Forward difference interpolation formula.  
 From the following data estimate  $f(1995)$  and  $f(1997).$

| x          | 1994 | 1996 | 1998 | 2000 |
|------------|------|------|------|------|
| $y = f(x)$ | 43   | 48   | 52   | 57   |



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**B.Sc. (ECS) II (Semester – III) (Old) Examination, 2015  
ENGLISH – I (Paper – VII)**

Day and Date : Friday, 8-5-2015

Max. Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

**Instructions:** i) *All questions are compulsory.*  
ii) *Figures to the **right** indicate **full** marks.*

1. A) Fill in the blanks in the following sentences by choosing the correct alternative :

6

- 1) The birds migrate to \_\_\_\_\_
  - a) Fly in the sky
  - b) Enjoy and see the world
  - c) Reproduce and find food for their young
  - d) See the fields
- 2) Mr. Ellsworth got the first prize to his painting because \_\_\_\_\_
  - a) The committee members of the gallery were his friends
  - b) Dr. Caswell recommended his painting
  - c) The painting was really classic
  - d) He had bought the gallery a month ago
- 3) Gerrard was stolen by \_\_\_\_\_
  - a) Terrorists
  - b) Gypsies
  - c) Fruit vendor
  - d) None of the above
- 4) The word 'throwaway culture' suggests a society which likes \_\_\_\_\_
  - a) to waste things
  - b) to save things
  - c) to buy things
  - d) to accumulate things



- 5) Researchers agree that the developments on the Arctic and the Antarctic are due to the global warming. But they differ on \_\_\_\_\_
- its exact effect
  - the issue of carbon dioxide
  - relating it to the dryness of regions
  - rise in the water level of the seas
- 6) What is the intruder's intention ?
- to be Vincent Charles
  - to be a big smuggler
  - to be a murderer
  - to be a good human being

B) Match the words from **A** with their meaning in **B** :

4

**A**

**B**

- |             |                |
|-------------|----------------|
| 1) chunk    | a) undamaged   |
| 2) intact   | b) concession  |
| 3) discount | c) reality     |
| 4) evident  | d) a big piece |

2. Give brief answers to the following questions (attempt **any five**) :

10

- What is the effect of the global warming in the cold arctic ?
- Who is Yashwant Rao ?
- In the poem 'I am Insensitive to Tragedies'. What does the poet seek ?
- What interested Mr. Ellsworth in the art galleries ?
- What is the relationship between consumerism and plastic bag ?
- What is the special advantage for the birds in migrating north-ward in spring ?

3. A) Write short notes on **any two** of the following :

6

- The title 'Art for Heart', State'
- Ellsworth
- Gerrard as melodramatic character.

B) Attempt **any two** of the following :

4

- Write about your successful or unsuccessful experiences in the government office of Maharashtra.
- Write a description of Taj Mahal: Your description should have the following main points :
  - Category
  - Characteristics
  - Function/use



3) Read the following paragraph about wards in the hospital and make Pie diagram or bar diagram :

There are four wards in the hospital. The biggest ward is the General ward where there are 38% patients. In the children’s ward there are 25% patients and there are 12% accident cases in the accident ward. There are also 25% maternity cases in the maternity ward.

4. Attempt **any one** of the following :

10

1) Represent the information given below in the bar diagram and make statements of comparison and generalization about the data.

| Percentages of Admissions to the three faculties in a College |         |         |         |         |
|---------------------------------------------------------------|---------|---------|---------|---------|
|                                                               | 1990/91 | 1991/92 | 1992/93 | 1993/94 |
| Arts                                                          | 48%     | 52%     | 56%     | 58%     |
| Commerce                                                      | 32%     | 27%     | 24%     | 21%     |
| Science                                                       | 20%     | 21%     | 20%     | 21%     |

2) Write a small paragraph with a proper sequence of events :

- the first to show that an atom has a regular structure
- studied radioactivity-life long research in it
- big discoveries in this field before 1932
- Ernest Rutherford: b. 1871  
d. 1937
- New Zealand physicist
- Radioactivity: how one chemical element changes or is changed into another
- the first man to split the atom, show its importance.

5. Narrate your first experience at the time of voting and state the importance of voting.

10

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**B.Sc. (ECS) – II (Semester – IV) Examination, 2015**  
**COMPUTER SCIENCE (Paper – I)**  
**Operating Systems – II (New)**

Day and Date : Saturday,, 9-5-2015  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

**Instructions :** 1) *Figures to the right indicate full marks.*  
2) **All questions are compulsory.**

1. Multiple choice questions :

10

- 1) Writing to a file has to be done via \_\_\_\_\_
  - a) User defined function
  - b) System call
  - c) Any one of a) and b)
  - d) None of these
- 2) Paging suffers from \_\_\_\_\_
  - a) Internal fragmentation
  - b) External Fragmentation
  - c) Both
  - d) None of these
- 3) \_\_\_\_\_ directory can have cycles.
  - a) Tree structure
  - b) Single level
  - c) Two level
  - d) General graph
- 4) A buffer consist of two parts-memory array that contains data from disk and \_\_\_\_\_ that identifies the buffer.
  - a) Buffer pool
  - b) Buffer data
  - c) Buffer header
  - d) None of these
- 5) The relocatable code is generated at \_\_\_\_\_
  - a) Compile time
  - b) Load time
  - c) Execution time
  - d) Run time





- 6) When a page must be replaced, \_\_\_\_\_ chooses the page that has not been used for the longest period of time.
- a) FIFO                                  b) Optimal  
c) LRU                                    d) None of these
- 7) Compaction is a solution for \_\_\_\_\_
- a) Internal fragmentation            b) Segmentation  
c) Both                                    d) External fragmentation
- 8) \_\_\_\_\_ allocation method does not support direct access.
- a) Index                                  b) Contiguous  
c) Linked                                d) All the above
- 9) Demand paging is a \_\_\_\_\_ system.
- a) Virtual memory                      b) Job Scheduling  
c) CPU Scheduling                    d) None of these
- 10) In contiguous memory allocation, the memory is usually divided into two partitions, one for the resident operating system and one for \_\_\_\_\_
- a) System processes                  b) User processes  
c) Ready processes                    d) None of these

2. Answer **any five** of the following :

**10**

- 1) Explain file types.
- 2) Explain the necessary conditions from which deadlock can be occurred.
- 3) What is virtual memory ?
- 4) Explain features and UNIX OS.
- 5) What are the different methods for accessing file ?
- 6) What is demand paging ?



3. A) Answer **any two** of the following : **6**
- 1) Describe various directory structures.
  - 2) Why is safe and unsafe state of a system ? It is possible that a system is in unsafe state but not deadlocked ?
  - 3) Explain layout of system memory.
- B) Write a note on segmentation. **4**
4. Answer **any two** of the following : **10**
- 1) Explain optimal page replacement.
  - 2) Explain process states and transitions in detail.
  - 3) Explain deadlock prevention techniques.
5. Answer **any two** of the following ; **10**
- 1) Explain structure of buffer header and buffer pool.
  - 2) Explain the sleep and wake up algorithms.
  - 3) Explain segmentation in detail.
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**B.Sc. (ECS) – II (Sem. – IV) Examination, 2015**  
**COMPUTER SCIENCE (New) (Paper – II)**  
**Object Oriented Programming Using C++ – II**

Day and Date : Monday, 11-5-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- N. B. :** 1) **All questions are compulsory.**  
2) Figures to the **right** indicate **full marks.**

1. Choose correct alternatives.

10

- 1) Which of the following function to close the file in C++ ?
  - a) FcloseFile ( )
  - b) remove ( )
  - c) close ( )
  - d) none of these
- 2) \_\_\_\_\_ is the process to creating only one derived class from many base classes.
  - a) Multiple inheritance
  - b) Hierarchical
  - c) Single
  - d) All of above
- 3) \_\_\_\_\_ is member function to read the character from file.
  - a) get ( )
  - b) put ( )
  - c) char ( )
  - d) none of these
- 4) In inheritance, we have to create object of derived class.
  - a) True
  - b) False
- 5) \_\_\_\_\_ mode is used to seek the end of files at opening.
  - a) ios :: in
  - b) ios :: app
  - c) ios :: ape
  - d) ios :: out
- 6) \_\_\_\_\_ class can not be instantiated.
  - a) Friend
  - b) Abstract
  - c) Inherited
  - d) Both b), c)
- 7) \_\_\_\_\_ function does not have any defination.
  - a) inline
  - b) Friend
  - c) Virtual
  - d) Pure Virtual
- 8) \_\_\_\_\_ base class means it contain pure virtual function.
  - a) Virtual
  - b) inline
  - c) Abstract
  - d) None of these



9) File allows temporary storage of data.

- a) True                      b) False

10) \_\_\_\_\_ is extraction operator.

- a) >>                      b) <<                      c) +                      d) none of these

2. Answer **any five** of the following : **10**

- 1) Define derived class.
- 2) State any four stream state member function.
- 3) Write use of 'this' keyword.
- 4) Define runtime binding.
- 5) Define hierarchical inheritance.
- 6) Write the use of seek ( ) function.

3. A) Answer **any two** of the following : **6**

- 1) Explain virtual base class.
- 2) What are the types of polymorphism ?
- 3) Explain pointer object with example.

B) Write a program in C++ to copy one file into another. **4**

4. Answer **any two** of the following : **10**

- 1) Explain exception handling in C++.
- 2) Explain different types of stream classes used in C++.
- 3) Write a program in C++ to implement hierarchical inheritance.

5. Answer **any two** of the following : **10**

- 1) Explain virtual, pure virtual functions with e.g.
  - 2) Write a program in C++ to read a file and to count the no. of blank spaces, lines, character from that file.
  - 3) Write a short note on 'inheritance'.
-



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**B.Sc. (ECS) – II (Semester – IV) (New) Examination, 2015**  
**COMPUTER SCIENCE**  
**Paper – III : Data Structures and Algorithms – II**

Day and Date : Tuesday, 12-5-2015  
 Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

**Instructions :** 1) **All questions are compulsory.**  
 2) **Figures to the right place indicate full marks.**

1. Choose the correct alternatives :

**10**

- 1) In a complete binary tree the number of nodes in level 0 is  
 a) 0                      b) 1                      c) 2                      d) 3
- 2) In AVL Tree, the Balance Factor of each node is either  
 a) 1, 2, 3                b) -1, 1, 2              c) -1, 0, 1              d) 2, 0, -2
- 3) In which type of BST traversal we get the sorted data ?  
 a) Preorder              b) Inorder                c) Postorder             d) DFS
- 4) For Graph Traversal which method is used ?  
 a) BFS                      b) DFS                      c) Both a and b        d) None of these
- 5) Number of nodes in a full binary tree of height h is calculated as  
 a)  $2 * h - 1$             b)  $2 + h - 1$             c)  $2^h - 1$                 d)  $2^3 - h$
- 6) A directed graph is \_\_\_\_\_ if it has no cycle.  
 a) Cyclic                    b) Acyclic                c) Both a and b        d) None of these
- 7) Which of the following sorting technique applied on two sorted lists ?  
 a) Insertion Sort        b) Radix Sort            c) Quick Sort            d) Merge Sort
- 8) The complexity of linear search algorithm is  
 a)  $O(n)$                     b)  $O(\log n)$             c)  $O(n^2)$                 d)  $O(n \log n)$

P.T.O.



9) \_\_\_\_\_ Algorithm searches a given value or element in an already sorted array by repeatedly dividing the search interval into half.

- a) Hashing                      b) Binary Search    c) Quick Sort        d) Radix Sort

10) When two keys hash to the same slot, we call the situation as

- a) Hashing                      b) Collision            c) Slotting            d) Inserting

2. Answer **any five** of the following : **10**

- 1) Define the term predecessor and successor of a node.
- 2) Define siblings with example.
- 3) What is sorting ? What are the types of sorting ?
- 4) What are the advantages of binary search over the linear search ?
- 5) Explain folding method of hashing.
- 6) What are the applications of graph ?

3. A) Answer **any two** of the following : **6**

- 1) Construct a Binary Search Tree for the following data  
30, 24, 45, 67, 82, 12, 19, 37, 20, 56, 72.
- 2) Explain the method of searching the element using Binary search technique.
- 3) Explain B+ tree with example.

B) Explain the different types of AVL rotations. **4**

4. Answer **any two** of the following : **10**

- 1) Write a function to insert a node in binary search tree.
- 2) Write a program to sort a list of elements using Quick sort.
- 3) Explain the adjacency matrix representation of a Graph with example.

5. Answer **any two** of the following : **10**

- 1) Write an algorithm for Preorder tree traversal and give its example.
  - 2) Write an Algorithm for simple insertion sort.
  - 3) Explain the BFS traversal with example.
-



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**B.Sc. (ECS) – II (Semester – IV) (New) Examination, 2015  
COMPUTER SCIENCE (Paper – IV)  
Software Engineering – II**

Day and Date : Wednesday, 13-5-2015  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

**Instructions:** 1) Figures to the **right** indicate **full** marks.  
2) **All** questions are **compulsory**.

1. Choose the correct alternative. 10
- 1) High cohesion-low coupling relationship is
    - a) Best
    - b) Worst
    - c) Controlled
    - d) Balanced
  - 2) \_\_\_\_\_ file contains data which retained permanently within the system.
    - a) Open
    - b) Master
    - c) Transaction
    - d) Library
  - 3) The additional names given to data items are called as
    - a) Data
    - b) Structure
    - c) Alias
    - d) None
  - 4) \_\_\_\_\_ symbol is used to store source or destination of data.
    - a) Data store
    - b) Entity
    - c) Process
    - d) Dataflow
  - 5) \_\_\_\_\_ is related with i/p and o/p only of the program.
    - a) WBT
    - b) BBT
    - c) Alpha testing
    - d) Beta testing
  - 6) \_\_\_\_\_ form is achieved when all repeating groups are removed.
    - a) 1 NF
    - b) 2 NF
    - c) 3 NF
    - d) None







4. Answer **any two** of the following. **10**
- 1) Explain the Integrated CASE environments.
  - 2) Explain Normalization in detail.
  - 3) Explain the steps in implementation.
5. Answer **any two** of the following. **10**
- 1) Explain incremental approach to system implementation and give some benefits of it.
  - 2) Compare Black box testing with White box testing.
  - 3) What is system maintenance ? Explain three categories of maintenance.
-





- 9) \_\_\_\_\_ is a guided media.
  - a) Air
  - b) Twisted pair cable
  - c) Radio wave
  - d) Microwave
- 10) The \_\_\_\_\_ is the first intel microprocessor with internal cache memory.
  - a) 80186
  - b) 80286
  - c) 80386
  - d) 80486

2. Answer **any five** of the following : 10

- 1) What is RISC ?
- 2) Draw diagram of mesh topology.
- 3) Write four characteristics of TTL logic family.
- 4) Give features of 80286 processor.
- 5) Write seven layer of OSI Reference Model.
- 6) Draw diagram of any two SMD devices.

3. A) Answer **any two** of the following : 6

- 1) Write short note on SMT.
- 2) Explain CPLD.
- 3) Write note on CISC.

B) Explain two network topologies. 4

4. Attempt **any two** of the following : 10

- 1) Explain instruction and execution unit of 80286 processor.
- 2) Explain basic concept of PLA.
- 3) Explain Network Interface Card.

5. Attempt **any two** of the following : 10

- 1) What is guided media ? Explain one guided media.
  - 2) Write functions of following media :
    - 1) Repeater
    - 2) Hub
    - 3) Switch
    - 4) Router
    - 5) Bridge.
  - 3) Give features of 80486 and Pentium processor.
-



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**B.Sc. (ECS) (Part – II) (Semester – IV) Examination, 2015  
MICROPROCESSOR – II (Paper – VI) (New)**

Day and Date : Friday, 15-5-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- N.B :** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*  
3) *Neat diagrams must be drawn wherever necessary.*

1. Choose correct alternatives :

10

- 1) 80486 is \_\_\_\_\_ bit processor.  
a) 8                      b) 32                      c) 16                      d) 20
- 2) 8253 has \_\_\_\_\_ no. of modes.  
a) 4                      b) 3                      c) 6                      d) 8
- 3) 8257 has \_\_\_\_\_ no. of channels.  
a) 3                      b) 16                      c) 8                      d) 4
- 4) XCHG is \_\_\_\_\_ instruction.  
a) logical              b) data transfer      c) arithmetic              d) program
- 5) 8086 has \_\_\_\_\_ flags.  
a) 9                      b) 5                      c) 17                      d) 21
- 6) 8255 consist of \_\_\_\_\_ ports.  
a) 2                      b) 3                      c) 8                      d) 6
- 7) \_\_\_\_\_ processor control instruction.  
a) CLI                      b) RCL                      c) RET                      d) JZ
- 8) 8086 has \_\_\_\_\_ byte instruction queue.  
a) 3                      b) pipelined              c) 6                      d) 32



- 9) Pin on \_\_\_\_\_ is used to control mode of 8086.  
a) 31                      b) 33                      c) 32                      d) 30
- 10) REPENZ is \_\_\_\_\_ instruction.  
a) logical                      b) arithmetic                      c) processor                      d) string

2. Attempt **any five** of the following : **10**

- a) Explain interfacing.
- b) Explain instruction queue of 8086.
- c) Explain STC, CLD instruction.
- d) Write program for addition of two numbers.
- e) Explain function of pin INTR, HOLD, ALE, DEN of 8086.
- f) Explain segment registers of 8086.

3. A) Attempt **any two** of the following : **6**

- 1) Explain flag register of 32 bit microprocessor.
- 2) Explain arithmetic instruction.
- 3) Explain modes of 8253.

B) Explain maximum mode of 8086. **4**

4. Attempt **any two** of the following : **10**

- 1) Explain control word of 8253.
- 2) Explain flag register of 8086.
- 3) Explain 8255 with block diagram.

5. Attempt **any two** of the following : **10**

- 1) Explain 8086 with block diagram.
  - 2) Compare 80486 and Pentium processor.
  - 3) Explain program control instruction.
-



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**B.Sc. (ECS) – II (Semester – IV) (New) Examination, 2015**  
**ENGLISH – II (Paper – VII)**

Day and Date : Saturday, 16-5-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

**N.B. :** i) **All questions are compulsory.**  
ii) **Figures to the right indicate full marks.**

1. A) Fill in the blanks in the following sentences by choosing the correct alternatives :

6

- 1) Self-esteem as a \_\_\_\_\_
  - a) self image
  - b) self character
  - c) a confidence and satisfaction in oneself
  - d) self-motivation
- 2) Creativity is the ability to \_\_\_\_\_
  - a) to discover something which is already discovered
  - b) to imagine or invent something new
  - c) to write and think in positive manner
  - d) to have power of writing
- 3) Building self-confidence is an art of \_\_\_\_\_
  - a) Positive thinking
  - b) Practical thinking
  - c) Theoretical thinking
  - d) Philosophical thinking
- 4) Intrapersonal means \_\_\_\_\_
  - a) the ability to understand oneself
  - b) the ability to understand others
  - c) the ability to understand society
  - d) the ability to understand friends



- 5) Interview is a form of \_\_\_\_\_ communication.  
 a) Oral                      b) Written                      c) Small                      d) Mass
- 6) \_\_\_\_\_ is a function of brain.  
 a) values                      b) learning                      c) memory                      d) ability

B) Match the pair. 4

**A**

- 1) Extempore speech
- 2) Spearman's theory of intelligence
- 3) Emotional intelligence
- 4) Audience awareness

**B**

- a) To know the spectators
- b) Speech without preparation
- c) Missing element in explanation
- d) Two factor theory
- e) Primary mental abilities

2. Give brief answers to the following questions (attempt **any five**) : 10

- 1) What is learning ?
- 2) What is memory ?
- 3) What is thinking process ?
- 4) What is decision making and problem solving ?
- 5) What is etiquette ?
- 6) What is group dynamics ?

3. A) Write short notes on **any two** of the following : 6

- 1) Describe group development process.
- 2) State the importance of computing skill.
- 3) Describe stress management skills.

B) Attempt **any one** of the following : 4

- 1) Discuss leadership skills.
- 2) How you will build self confidence ?

4. Attempt **any one** of the following : 10

- 1) What is the importance of writing skills in organization ?
- 2) What are the team roles ?

5. Write an imaginary interview between you and Sachin Tendulkar about his childhood, cricket and his personal interest in society and politics. 10





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**B.Sc. (ECS) – II (Semester – IV) (Old) Examination, 2015**  
**COMPUTER SCIENCE (Paper – I)**  
**Operating Systems – II**

Day and Date : Saturday, 9-5-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternative. **10**
- 1) Virtual memory is commonly implemented by  
a) Segmentation    b) Swapping    c) Demand paging    d) None of these
  - 2) Unix operating system is written in a  
a) High level language    b) Low level language  
c) Assembly language    d) BASIC language
  - 3) Shared sub-directories and files are example of  
a) A cyclic graph directory    b) Tree structured directory  
c) One level directory    d) Two level directory
  - 4) Where does the swap space reside ?  
a) RAM    b) Disk    c) ROM    d) On-chip Cache
  - 5) An address in main memory is called  
a) Physical address    b) Logical address  
c) Virtual address    d) Secret address
  - 6) The buffer header contains a \_\_\_\_\_ field.  
a) Device number    b) Block number  
c) Both a and b    d) None of these



- 7) The minimum number of process involved in any deadlock can be  
a) one                      b) two                      c) more than two      d) any number
- 8) Which of the following is characteristic of the Unix file system ?  
a) Hierarchical structure                      b) Dynamic growth of files  
c) Protection of file data                      d) All of these
- 9) Banker's algorithm is a  
a) Dead lock prevention algorithm      b) Dead lock direction algorithm  
c) Dead lock avoidance algorithm      d) None of these
- 10) Files can have  
a) Read access    b) Copy access    c) Write access      d) All of these
2. Answer **any five** of the following. **10**  
a) Give the disadvantages of buffer cache.  
b) What is safe and unsafe state of a system ?  
c) Give the difference between swap in and swap out.  
d) What is shell ?  
e) Give the operations of a file.  
f) What is fragmentation ?
3. A) Answer **any two** of the following. **6**  
1) Explain single level directory structure.  
2) What is deadlock ? Give one example.  
3) What are advantages of linked file allocation over contiguous file allocation.
- B) Explain unix file system. **4**
4. Answer **any two** of the following. **10**  
1) Discuss deadlock prevention strategies.  
2) Write note on segmentation.  
3) Explain different file types.
5. Answer **any one** of the following. **10**  
1) Explain process states and transitions in unix environment.  
2) What are page faults ? When do they occur ? Explain the concept of page replacement in brief.
-



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**B.Sc. (ECS) – II (Semester – IV) (Old) Examination, 2015  
OBJECT ORIENTED PROGRAMMING USING C++ – II (Paper – II)**

Day and Date :Monday, 11-5-2015

Total Marks : 50

Time :11.00 a.m. to 1.00 p.m.

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternatives. 10
- 1) Which of the following ways are legal to access a class data member using 'this' pointer ?  
a) this → x                      b) this . x                      c) \* this x                      d) \*\* this – x
  - 2) Which of the following is a mechanism of static polymorphism ?  
a) operator overloading                      b) function overloading  
c) function overriding                      d) both a and b
  - 3) What happens if the base and derived class contains definition of a function with same prototype ?  
a) Compiler reports an error on compilation  
b) Only base class function will get called irrespective of object.  
c) Only derived class function will get called irrespective of object.  
d) Base class object will call base class function and derived class object will call derived class function.
  - 4) Which of the following is not type of inheritance ?  
a) Multiple                      b) Multilevel                      c) Distributive                      d) Hierarchical
  - 5) Which of the following are available only in the class hierarchy chain ?  
a) Public data members                      b) Private data members  
c) Protected data members                      d) Member functions.
  - 6) The function whose prototype is void getData (Item \* things) ; it receives  
a) a pointer to an object                      b) an object to reference  
c) a copy of a structure                      d) nothing

P.T.O.



- 7) To hide data member from outside members you must declare the data members in the \_\_\_\_\_ section of the class.
- a) restricted                      b) confidential    c) hidden                      d) private
- 8) ios : : in mode is used for
- a) open for reading                      b) open for writing  
c) open as a binary file                      d) open for truncate a file
- 9) Which one of the following is incorrect about catch statement ?
- a) The exception handler is indicated by the catch keyword  
b) Catch must be used immediately after the statements marked by the try keyword  
c) The catch can also occur immediately after another catch  
d) Catch can be used to generate the exception
- 10) Manipulator setw ( ) is used to perform following action.
- a) Sets the field width  
b) Sets the format flag  
c) Sets the floating point  
d) None of these

2. Answer **any five** of the following :

**(5× 2=10)**

- 1) What does inheritance mean in C++ ?
- 2) What is virtual function ?
- 3) What is file ?
- 4) List out the C++ predefined console stream classes.
- 5) What is meant by pointer to object ?
- 6) What is meant by exception ?



3. A) Answer **any two** of the following. (2× 3=6)
- 1) What are file pointers ? Describe get-pointers and put pointers.
  - 2) What is an abstract class ?
  - 3) List out C++ predefined parameterized manipulators in C++.
- B) Write a program which copies the contents of one file to new file. 4
4. Answer **any two** of the following. (2×5=10)
- 1) What is meant by inheritance ? Explain each type of inheritance with example.
  - 2) Explain in detail different methods of opening a file.
  - 3) Draw file stream class hierarchy diagram and explain its members.
5. Answer **any two** of the following. (2×5=10)
- 1) Explain in detail polymorphism in C++ and give an example of dynamic binding.
  - 2) Explain different file modes used in C++.
  - 3) Explain following terms in detail :
    - a) try
    - b) catch
    - c) throw
-





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**B.Sc. (E.C.S.) I (Semester – I) Examination, 2015  
STATISTICS (Paper – V) (CGPA Pattern)  
Theory – I : Descriptive Statistics and Probability**

Day and Date : Friday, 17-4-2015  
Time : 11.00 a.m. to 2.00 p.m.

Max. Marks : 70

- N.B. :** i) Use **separate** answer books for Section – I and Section – II.  
ii) Figures to **right** indicate **full** marks.  
iii) Use of **any** type of calculator is **allowed**.  
iv) Graph paper will be supplied on request.

SECTION – I

**(Descriptive Statistics)**

1. Select most correct answer :

5

- i) If population is heterogeneous, then \_\_\_\_\_ sampling method provides most representative sample.  
a) SRS  
b) Systematic  
c) Stratified  
d) All of these
- ii) \_\_\_\_\_ of the following has adjacent rectangles.  
a) Histogram  
b) Simple bar diagram  
c) Sub-divided bar diagram  
d) All of these
- iii) Measures of central tendency that affected by extreme observations is  
a) Median  
b) Mode  
c) A.M.  
d) All of these
- iv) The range of 20 observations is 30, if each observation is increased by 5 then range =  
a) 15  
b) 35  
c) 20  
d) 30
- v) If third order central moment is –ve, then the frequency distribution is  
a) mesokurtic  
b) symmetric  
c) skewed  
d) none of these

P.T.O.



2. Attempt **any five** : **10**

- i) Define – Continuous variable.
- ii) State any two requirements of good measures of central tendency.
- iii) Define – Class frequency.
- iv) Given –  $n = 20$ ,  $\bar{X} = 10$ , C.V. = 49. Find variance.
- v) The  $r^{\text{th}}$  order moment about point 4 is 6. Find  $\bar{X}$ .
- vi) Given –  $\mu_2 = 4$ ,  $\mu_4 = 48$ , comment on Kurtosis of frequency distribution.
- vii) Given – A.M. = 40, Median = 25, find mode (use empirical relation).

3. A) Attempt **any two** : **10**

- i) Write a short note on weighted A.M.
- ii) Explain Simple Random Sampling method.
- iii) Given :  $n = 15$ ,  $\sum (X - \bar{X})^2 = 120$ ,  $\sum (X - \bar{X})^3 = -60$ ,  $\sum (X - \bar{X})^4 = 225$ .  
Comment on Skewness of the frequency distribution.

B) Attempt **any one** : **10**

- i) Explain construction of histogram. How mode is determined by using histogram ?
- ii) Find Range, coefficient of range, S.D. C.V. for the following data :

| Class   | Frequency |
|---------|-----------|
| 6 – 10  | 4         |
| 10 – 14 | 9         |
| 14 – 18 | 12        |
| 18 – 22 | 10        |
| 22 – 26 | 6         |
| 26 – 30 | 3         |





SECTION – II  
(Probability Theory – I)

1. Select most correct answer : 5

- i) In  ${}^n p_r$ , the restriction is  
a)  $n > r$                       b)  $n \leq r$                       c)  $r \leq n$                       d)  $n = r$
- ii) Number of ways by which a Chairman can be selected out of 4 doctors, 3 teachers and 5 engineers is  
a) 12                                  b) 7                                  c) 8                                  d) 9
- iii) If A is a subset of B, then  $P(A/B)$  is equal to  
a) zero                              b) one                              c)  $\frac{P(A)}{P(B)}$                       d)  $\frac{P(B)}{P(A)}$
- iv) If  $V(X) = 9$  then  $V(2X + 3) =$   
a) 9                                  b) 21                                  c) 39                                  d) 36
- v) A discrete r.v. X takes its all possible values equally likely, then X has \_\_\_\_\_ distribution.  
a) Binomial                              b) Discrete uniform  
c) Hypergeometric                      d) Poisson

2. Answer **any five** of the following : 10

- i) Define sample space and event.
- ii) Define expectation and variance of a discrete random variable.
- iii) Define discrete uniform distribution.
- iv) Give axiomatic definition of probability.
- v) In how many ways all the letters of the word LION be arranged if repetition is not allowed ?
- vi) If  $P(B) = 0.4$   $P(A \cup B) = 0.5$  then find  $P(\bar{A}/\bar{B})$ .
- vii) Four cards are drawn from a pack of 52 playing cards. What is the probability of getting 2 king and 2 queen cards ?



3. A) Answer **any two** of the following :

10

i) Define binomial distribution. State its mean and variance.

If  $X \sim B (n = 10, p = 0.4)$ , find  $P (X \leq 1)$ .

ii) Define c.d.f. and state its properties.

iii) The probability distribution of a discrete r.v.  $X$  is given by :

|           |               |               |                |   |
|-----------|---------------|---------------|----------------|---|
| X         | 0             | 1             | 2              | 3 |
| P (X = x) | $\frac{1}{6}$ | $\frac{1}{2}$ | $\frac{3}{10}$ | K |

Find the value of K.

Also find the cumulative distribution function and  $P (X \leq 2.5)$ .

B) Answer **any one** of the following :

10

i) State and prove addition law of probability.

ii) Prove that

a)  $P (\bar{A}) = 1 - P (A)$

b) If  $A \subset B$  the  $P (A) \leq P (B)$ .

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**B.Sc. (ECS) – II (Semester – IV) (Old) Examination, 2015**  
**COMPUTER SCIENCE (Paper – III)**  
**Data Structures and Algorithms – II**

Day and Date : Tuesday, 12-5-2015  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose correct alternatives. 10

- 1) A tree contains \_\_\_\_\_  
a) no loops                      b) no cycles                      c) both a & b                      d) none of these.
- 2) In AVL tree the balance factor of each node must be in the range of \_\_\_\_\_  
a) 0, 1, 2                      b) 1, 0, 1                      c) -2, 1, 2                      d) -1, 0, 1
- 3) Which of the traversal technique lists the nodes of a binary search tree in ascending order ?  
a) Post-order                      b) In-order                      c) Pre-order                      d) None of these
- 4) Sorting is useful for \_\_\_\_\_  
a) report generation  
b) responding to queries only  
c) making searching easier and efficient  
d) minimizing the storage needed
- 5) Which of the following algorithm solves all-pair shortest path problem ?  
a) Prim's algorithm                      b) Warshall's algorithm  
c) Dijkstra's algorithm                      d) Floyd's algorithm



- 6) \_\_\_\_\_ allowed in a binary search tree.
- a) duplicate items are not                      b) duplicate items are  
c) single item is not                              d) none of these
- 7) Finding the location of the element with a given value is \_\_\_\_\_
- a) Traversal                      b) Search                      c) Sort                      d) None of these
- 8) To represent hierarchical relationship between elements, which data structure is suitable ?
- a) Deque                      b) Priority                      c) Tree                      d) All of these
- 9) In a binary tree, certain null entries are replaced by special pointers which point to nodes higher in the tree for efficiency. These special pointers are called \_\_\_\_\_
- a) Leaf                      b) branch                      c) path                      d) thread
- 10) A connected graph without any cycle is called \_\_\_\_\_
- a) a tree graph                      b) a tree                      c) free tree                      d) all of these

2. Answer **any five** of the following.

**10**

- 1) What is strictly binary tree ? Give one example.
- 2) What is graph ? Explain undirected graph.
- 3) Construct a binary search tree for these numbers.
- 85, 32, 57, 92, 33, 90, 13, 89, 26, 98, 38, 59, 99
- 4) What is insertion sort ?
- 5) Define tree and root.
- 6) Explain indegree and outdegree of node with example.



3. A) Answer **any two** of the following. **6**
- 1) Write a function for post-order tree traversal.
  - 2) Explain BFS.
  - 3) Explain Hash function.
- B) Write note on Radix Sort. **4**
4. Answer **any two** of the following. **10**
- 1) Explain height balance tree with example.
  - 2) Write a function to search node from Binary search tree.
  - 3) Explain the procedure for Dijkstra's algorithm.
5. Answer **any two** of the following. **10**
- 1) Explain different tree traversal methods.
  - 2) Write a program for Quick sort.
  - 3) Explain AOE network with suitable example.
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**B.Sc. (ECS) – II (Semester – IV) (Old) Examination, 2015**  
**COMPUTER SCIENCE (Paper – IV)**  
**Software Engineering – II**

Day and Date : Wednesday, 13-5-2015  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose correct alternative : 10

- 1) \_\_\_\_\_ is example of language processing tools.
  - a) Compilers
  - b) Interpreters
  - c) Both a and b
  - d) None of these
- 2) Black Box Testing attempts to find errors such as \_\_\_\_\_
  - a) interface errors
  - b) incorrect or missing functions
  - c) performance errors
  - d) all of these
- 3) Perfective maintenance involves changing software to improve some of its qualities.
  - a) True
  - b) False
- 4) Rate of read, update, addition and deletion statistical are related with which of the following ?
  - a) External entities
  - b) Data stores
  - c) Data elements
  - d) Processes
- 5) Attribute is represented by \_\_\_\_\_
  - a) Diamond box
  - b) Rectangle
  - c) Ellipse
  - d) None of these



- 6) Various objectives of input design should focus on \_\_\_\_\_
- a) Avoiding delay
  - b) Avoiding errors in data
  - c) Controlling amount of input
  - d) All of above
- 7) Maintenance is necessary to eliminate errors in the working system during its working life.
- a) True
  - b) False
- 8) Which of the following is not a component of a Data Dictionary ?
- a) Version
  - b) Length
  - c) Range
  - d) Aliases
- 9) \_\_\_\_\_ is decomposition of complex data structures into flat file called relations.
- a) normalization
  - b) association
  - c) both a and b
  - d) none of these
- 10) On line system is usually interactive and menu driven.
- a) True
  - b) False

2. Answer **any five** of the following :

**10**

- 1) Write types of output.
- 2) What are advantages of Data Dictionary ?
- 3) Define Entity.
- 4) Define Workbench.
- 5) What is meant by change over ?
- 6) Define Relationship.





3. A) Answer **any two** of the following : **6**
- 1) Write note on incremental approach.
  - 2) Explain need of testing.
  - 3) Explain basic steps in Data Capture.
- B) Explain components of Data Dictionary. **4**
4. Answer **any two** of the following : **10**
- 1) Explain bottom up implementation.
  - 2) Explain the different methods of conversion from old system to new system.
  - 3) Draw a CLD for inventory control system.
5. Answer **any two** of the following : **10**
- 1) Explain benefits and weaknesses of CASE tool.
  - 2) Explain First Normal Form (1 NF), Second Normal Form (2 NF) and Third Normal Form (3 NF).
  - 3) Explain Black Box Testing.
-





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**B.Sc. (ECS) – II (Semester – IV) (Old) Examination, 2015  
ELECTRONICS (Paper – V)  
Organization of PC – II**

Day and Date : Thursday, 14-5-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m

**Instructions:** i) **All questions are compulsory and carry equal marks.**  
ii) **Draw neat diagram wherever necessary.**

1. Fill in the blanks with correct alternative and rewrite : **10**

- 1) Fan out of TTL logic is \_\_\_\_\_  
a) 2                      b) 5                      c) 08                      d) 10
- 2) In a \_\_\_\_\_ there are set of AND gates.  
a) PLA                      b) CPLD                      c) FPGA                      d) none of these
- 3) In \_\_\_\_\_ method components are plated through holes which establish a connection between two sides of PCB.  
a) PTM                      b) SMT                      c) SMC                      d) both b and c
- 4) Inter 80286 has \_\_\_\_\_ operating mode.  
a) minimum and maximum                      b) low and high  
c) real and protected                      d) none
- 5) The \_\_\_\_\_ is the 1<sup>st</sup> intel up with internal cache memory.  
a) 80186                      b) 80286                      c) 80386                      d) 80486
- 6) \_\_\_\_\_ waves are unidirectional.  
a) Microwave                      b) Radiowaves  
c) both a and b                      d) none

P.T.O.



- 7) \_\_\_\_\_ is a multiport repeater.  
a) HUB                      b) Repeater              c) Router                  d) Switches
- 8) \_\_\_\_\_ is a guided media.  
a) Air                                      b) Co-axial cable  
c) Microwave                              d) Radiowaves
- 9) The inner core of an optical fibre is of \_\_\_\_\_ composition.  
a) copper                                      b) glass or plastic  
c) bimetallic                                      d) rubber
- 10) In a \_\_\_\_\_ topology a common cable connects all the nodes.  
a) Ring                      b) Bus                      c) Star                      d) Mesh

2. Answer **any five** of the following : **10**
- a) Draw diagram of PLA.
  - b) Write seven layer of OSI Reference model.
  - c) Write four advantages of star topology.
  - d) What is peer-to-peer network ?
  - e) What is SSI and MSI in IC ? Give brief idea.
  - f) What is an embedded system ?
3. A) Answer **any two** of the following : **6**
- 1) Give features of 80486.
  - 2) Explain TTL characteristics briefly.
  - 3) Explain briefly LAN, MAN and WAN.
- B) Explain Ethernet Technology. **4**
4. Attempt **any two** of the following : **10**
- 1) Explain FPGA in detail.
  - 2) Explain unguided media in detail.
  - 3) Explain router and brouter.
5. Attempt **any two** of the following : **10**
- 1) Explain SMD and SMT.
  - 2) Explain internal structure of 80286.
  - 3) Compare CISC and RISC.
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**B.Sc. (ECS) II (Semester – IV) Examination, 2015  
MICROPROCESSOR – II (Paper – VI) (Old)**

Day and Date : Friday, 15-5-2015

Total Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

**N.B. :** 1) **All questions are compulsory.**  
2) Figures to **right** indicate get **full** marks.

1. Choose correct alternatives : 10

- 1) Clock speed of 80286 is
  - a) 10 to 20 MHz
  - b) 6 to 20 MHz
  - c) 6 to 10 MHz
  - d) 5 MHz
- 2) Virtual memory of 80386 is
  - a) 4 Gb
  - b) 64 Gb
  - c) 64 Tb
  - d) 64 Kb
- 3) ROL is \_\_\_\_\_ instruction.
  - a) Rotate
  - b) Shift
  - c) Processor
  - d) Arithmetic
- 4) 80386 is introduced in
  - a) 1984
  - b) 1985
  - c) 1983
  - d) 1986
- 5) 8255 is \_\_\_\_\_ device.
  - a) PIC
  - b) PTC
  - c) PPI
  - d) PCI
- 6) CBW is \_\_\_\_\_ instruction.
  - a) String
  - b) Arithmetic
  - c) Program control
  - d) Data transfer
- 7) \_\_\_\_\_ is quad processor.
  - a) 80486
  - b) 80386
  - c) 80286
  - d) 80186
- 8) REPEZ is \_\_\_\_\_ instruction
  - a) arithmetic
  - b) bit manipulation
  - c) processor
  - d) string



- 9) 8253 has \_\_\_\_\_ modes.  
a) 8                      b) 6                      c) 4                      d) 3
- 10) \_\_\_\_\_ is used to drive seven segment display.  
a) 7447                  b) 7474                  c) 7414                  d) 7400

2. Attempt **any five** of the following. **10**

- 1) Explain features of pentium – II.
- 2) Explain shift instructions.
- 3) Explain count register of 8257.
- 4) Explain features of 80186.
- 5) Explain multiplication instructions.
- 6) Explain modes of 8255.

3. A) Attempt **any two** of the following. **6**

- 1) Explain data transfer instruction.
- 2) Explain concept of interfacing.
- 3) Explain features of P – III.

B) Explain control word of 8255. **4**

4. Attempt **any two** of the following. **10**

- 1) Explain features of 80286 and 80386.
- 2) Explain bit manipulation instruction of 8086.
- 3) Explain 8253 with block diagram.

5. Attempt **any two** of the following. **10**

- 1) Explain features of 80486 and P – IV.
  - 2) Explain program control instructions.
  - 3) Explain linear select decoding.
-



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**B.Sc. (E.C.S.) – II (Semester – IV) (Old) Examination, 2015**  
**ENGLISH – II (Paper – VII)**

Day and Date : Saturday, 16-5-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicates full marks.**

1. A) Fill in the blanks in the following sentences by choosing the correct alternatives : **6**
- 1) In \_\_\_\_\_ sanskrit book describes different flying vehicles and methods of constructing them.
- a) Vedang Jyotisha                      b) Sushruta Samhitas  
c) Brihad Vimanashastra              d) Vedic Richas
- 2) Cliff suggested to Bill that they should disconnect junior \_\_\_\_\_
- a) because Cliff wanted to go and see the show  
b) because Bill was in a hurry to get married  
c) because Bill and Cliff were afraid of Junior  
d) because Junior was listening to what they were saying at that time
- 3) The wife of the talkative man lost her temper as \_\_\_\_\_
- a) the talkative man demanded her jewellery for pawning  
b) her neighbours teased her for winning the road engine  
c) her father had not come to take her away  
d) she feared her husband would ask for her ornaments to pay the rent of the Gymkhana ground



4) New medical technologies can be improved upon in such a way that

\_\_\_\_\_

- a) all families get employment
- b) there are no side effects
- c) they are provided free of cost
- d) all women have access to them

5) \_\_\_\_\_ watches the sunrise.

- a) A grey baboon
- b) A statue
- c) A tiny-spring of baboon
- d) A Kokila

6) The poet's eyes are blinded with tears because of the \_\_\_\_\_

- a) memory of the tree only
- b) memory of the tree and of companions
- c) memory of the motherland
- d) none of these

B) State whether the following statements are **true** or **false** :

**4**

- 1) The bird was very afraid of the angry bull.
- 2) The talkative man brought the gaiety land to the town.
- 3) Junior said 'Will you Marry Me, Marry Ann' ?
- 4) New technological process itself harms womens health.

2. Give brief answers to the following questions. (Attempt **any five**) :

**10**

- 1) Which industries are having a negative impact on womens health ?
- 2) Which prize did the talkative man get ?
- 3) Where was the narrator when he talked to Cliff Anderson ?
- 4) Who noticed the wagtail and where ?
- 5) Who is unforeseen camp follower ?
- 6) Why is the tree always clear to the poet ?





3. A) Write short notes on **any two** of the following : **6**
- 1) The character of Bill Billing.
  - 2) Write the theme of poem 'The Casualties' in your own words.
  - 3) Give instances of industries where negative impact of technology is observed on women.
- B) Attempt **any one** of the following : **4**
- 1) Express your agreement and disagreement statements on the following statement.
    - 1) Computers will create unemployment in our country.
    - 2) Write a short piece of dialogue between two friends on following topic.
      - 1) Today's youth and their responsibility.
4. Attempt **any one** of the following : **10**
- 1) Write a letter of application in response to the following advertisement.

Wanted Office Assistant, graduate with experience of office correspondence, able to handle computer, fluency in English preferred. Write to : The Manager, M.B.Traders, Moti Building, Main Street, Pune-4.
  - 2) Report a seminar held in your class on the following topic.
    - 1) Vision 2020.
5. Write an imaginary interview with famous sports personality. **10**
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**B.Sc. (E.C.S. – III) (Semester – V) Examination, 2015  
DATA COMMUNICATION AND NETWORKING – I (Paper – I)**

Day and Date : Wednesday, 1-4-2015

Max. Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

**Instructions :** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternative : 10
- 1) A central computer is surrounded by one or more satellite computer is called a  
a) Bus N/w                      b) Ring N/w                      c) Star N/w                      d) All
  - 2) \_\_\_\_\_ OSI layer incorporates the MAC address.  
a) Data Link                      b) Network                      c) Physical                      d) Application
  - 3) Only one protocol is used in  
a) LAN                      b) MAN                      c) WAN                      d) ALL
  - 4) Breaking bit streams is known as  
a) Windowing                      b) Framing                      c) Splitting                      d) None
  - 5) TCP/IP is a set of \_\_\_\_\_ that enable communication between computers.  
a) Services                      b) Protocols                      c) Primitives                      d) Methods
  - 6) Many low speed channels are interwoven into one high-speed transmission by  
a) TDM                      b) FDM                      c) CDM                      d) None
  - 7) The transport layer does  
a) Multiplexing                      b) Segmentation  
c) Splitting                      d) All
  - 8) If channel is busy then station backs off a fixed interval time to send the frame in \_\_\_\_\_ CSMA.  
a) P-persistent                      b) 1 Persistent  
c) none persistent                      d) All



- 9) \_\_\_\_\_ device introduces maximum delay into the network.  
a) modem                      b) gateway              c) switch              d) all
- 10) \_\_\_\_\_ transmission methods is suitable for five T.V. transmissions.  
a) Synchronous                      b) Isochronous  
c) Asynchronous                      d) None

2. Answer **any five** of the following : **10**
- 1) What is noise ?
  - 2) List the applications of Internet.
  - 3) What is virtual circuit ?
  - 4) What is FDMA ?
  - 5) What is Packet ?
  - 6) Define Bandwidth.
3. A) Answer **any two** of the following : **6**
- 1) Explain the advantages of packet switching.
  - 2) Explain shortest path routing and broadcast routing.
  - 3) Explain service primitives of network model.
- B) Explain sources of errors. **4**
4. Answer **any two** of the following : **10**
- 1) Explain guided media used for network.
  - 2) Discuss various congestion control policies.
  - 3) Write a note on CSMA/CD.
5. Answer **any two** of the following : **10**
- 1) Explain how hamming code is useful in error correcting codes.
  - 2) Write a note on network topology.
  - 3) Explain different layers of ISO-OSI reference model.
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**B.Sc. (ECS) – III (Semester – V) Examination, 2015  
Paper – II : DATABASE MANAGEMENT SYSTEM – I**

Day and Date : Monday, 6-4-2015

Max. Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

1. Choose correct alternative.

**10**

- 1) A top to bottom relationship among the items in a database is established by  
a) Hierarchical    b) Network    c) Relational    d) All of above
- 2) The process of normalization was proposed by \_\_\_\_\_  
a) Dr. Berry    b) Dr. E. F.Codd    c) Jacobson    d) None of these
- 3) MVD stands for  
a) Many value dependency    b) Many – volumn dependency  
c) Multi – value dependency    d) None of these
- 4) 5<sup>th</sup> normal form is also known as  
a) PJNF    b) DKNF    c) DCNF    d) None of the above
- 5) Which of the following group function ignore null value ?  
a) max    b) count    c) sum    d) count (\*)
- 6) The number of column in the table is \_\_\_\_\_  
a) degree    b) sum    c) cardinality    d) None of the above
- 7) \_\_\_\_\_ is known as virtual relation.  
a) view    b) table    c) snapshot    d) None of the above
- 8) The overall discription of database is called \_\_\_\_\_  
a) instance    b) schema    c) data    d) table
- 9) Insert, delete, update are  
a) Data control language    b) Data definition language  
c) Data manipulation language    d) None of the above



10) Select LPAD ('aaaa', 10, \*) from dual.

a) \* \* \* \* \* a a a a

b) a a \* \* \* \* \* a a

c) a a a a \* \* \* \* \*

d) \* \* \* a a a a \* \* \*

2. Answer **any five** of the following.

10

- a) Strong and weak entity set.
- b) Explain generalization.
- c) Explain logical data independency.
- d) Define candidate key.
- e) Write union operation in relational algebra.
- f) List data control language statements.

3. A) Answer **any two** of the following.

6

- 1) Explain the method for converting E – R diagram containing specialization into table.
- 2) What is work of transaction manager and query processor of database.
- 3) Define relation, tuple, cardinality.

B) Explain different types of attributes.

4

4. Answer **any two**.

10

- 1) List and explain functions used in SQL for numbers.
- 2) What is Hierarchical data model ? What are disadvantages of it ?
- 3) Explain types of ordered indexing.

5. Answer **any two**.

10

- 1) Explain group by and having clause.
- 2) What is use of normalization ? Explain first two normal form.
- 3) Explain any five rules for relational database of Dr. Codd.

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**B.Sc. (ECS) – III (Semester – V) Examination, 2015**  
**COMPUTER SCIENCE**  
**Core Java (Paper – III)**

Day and Date : Tuesday, 7-4-2015  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

**N.B. :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. A) Choose the correct alternatives.

7

- 1) Java supports \_\_\_\_\_ access specifiers.  
a) Private                      b) Protected                      c) Default                      d) All of these
- 2) Programmer can reuse the super class code without rewriting it by using  
a) Interface                      b) Inheritance                      c) Both a and b                      d) None of these
- 3) Writing two or more methods in super and sub classes such that methods have same name and same signatures is called  
a) method overloading                      b) method overriding  
c) method implementation                      d) none of these
- 4) Which of the following method is not related with objects ?  
a) equals ( )                      b) toString ( )                      c) notify ( )                      d) noticeAll ( )
- 5) Which of the following having all the methods as public and abstract ?  
a) interface                      b) abstract class  
c) both a and b                      d) none of these
- 6) Exceptions checked by Java compiler at compile time known as  
a) unchecked exception                      b) checked exception  
c) both a and b                      d) none of these
- 7) When programmer does not want to handle exception then he/she has to use  
a) throw clause                      b) throws clause  
c) try clause                      d) all of these

P.T.O.



- B) State **true** or **false**. **3**
- 1) It is possible to override private methods.
  - 2) Object is super class for all other class.
  - 3) Is it possible to write a class within the interface.
2. Solve **any 5**. **10**
- a) Platform Independency.
  - b) This reference.
  - c) Final keyword.
  - d) Example of one wrapper class.
  - e) Define synchronization.
  - f) Vector.
3. A) Solve **any two**. **6**
- 1) Access specifiers of Java.
  - 2) Difference between abstract class and interface.
  - 3) Describe array list class with example.
- B) Write a program to overload constructors. **4**
4. Solve **any two**. **10**
- 1) Write a program demonstrate need of synchronization.
  - 2) Explain properties of static data members and static methods.
  - 3) Explain object serialization technique with example.
5. Solve **any two**. **10**
- 1) Write a program implement DOS command 'Copycon' using streams available in Java.
  - 2) What is exception ? Why does it needs ? Explain with example.
  - 3) Explain parameter passing technique available in Java.
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**B.Sc. (ECS) – III (Semester – V) Examination, 2015**  
**COMPUTER SCIENCE (Paper – IV)**  
**Theory of Computer Science**

Day and Date : Wednesday, 8-4-2015

Max. Marks : 50

Time :3.00 p.m. to 5.00 p.m.

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternative : **10**

- 1) Turing machines output accept if they enter an accept state. When do turing machine output reject ?
  - a) When they are not in an accept state and holts
  - b) When they never end
  - c) When they enter a reject state
  - d) Never
  
- 2) Which of the following classes of turing machine is not equivalent to the class of standard TM ?
  - a) TM with stay option
  - b) TM with semi-infinite tapes
  - c) Non-deterministic TM
  - d) All of these
  
- 3) Which of the following is accepted by an NPDA and not DPDA ?
  - a) All strings in which a given symbol is present atleast twice
  - b) Even palindromes
  - c) String ending with a particular alphabet
  - d) None



- 4) A PDA  $A$  is deterministic if ;
- $\delta(q, \lambda, z) \neq \phi$  implies  $\delta(q, a, z) = \phi \forall a \in z$
  - $\delta(q, a, z)$  is \_\_\_\_\_
- empty
  - singleton
  - either a) or b)
  - none
- 5) A grammar  $G$  has productions of type  $A \rightarrow aB, A \rightarrow Ba, A \rightarrow a$ , then  $G$  is
- regular
  - CF
  - both
  - none
- 6)  $L = \{ww^R \text{ where } w \text{ belongs to } \{0,1\}^* \}$  is
- case sensitive
  - context free
  - both
  - none
- 7) Which of the following is true for the language generated by  
 $S \rightarrow AB, A \rightarrow BB \mid a, B \rightarrow AB \mid b$
- aabbb does not belongs to this language
  - aabb belongs to this language
  - ab does not belongs to this language
  - aab belongs to this language
- 8) Which of the following grammars can generate  $w = aabbb$  ?
- $S \rightarrow AB, A \rightarrow aA \mid a, B \rightarrow bB \mid b$
  - $S \rightarrow AB, A \rightarrow BB \mid a, B \rightarrow AB \mid b$
  - Both
  - None
- 9) The language generated by the regular expression  $(aa)^* (bb)^* b$  is
- $(ab)^{2n} b$
  - $a^{2n} b^{2n+1}$
  - $a^2 b^2 b^1$
  - none of these
- 10)  $(L^*)^*$  equal to
- $L^*$
  - $L^{**}$
  - $(L^{**})$
  - none



2. Solve the following (**any five**) : 10

- 1) Verify the property  $(A')' = A$ , by considering the universal set  $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$  and  $A = \{1, 3, 5, 7\}$ .
- 2) Give CFG to generate a string containing a, b in any sequence.
- 3) Construct Melay machine to convert each occurrence of substring 101 by 100 over alphabet  $\{0, 1\}$ .
- 4) Construct a DFA to accept the following language

$$\{x \in \{0,1\}^* \mid |x| \text{ is a multiple of 2 or 3}\}.$$

- 5) Give the regular expression for the language
  - a) exactly one a
  - b) first character a or c followed by any string in b
- 6) Eliminate  $\epsilon$  – productions from grammar G given as

$$S \rightarrow X_a$$

$$X \rightarrow aX \mid bX \mid \epsilon$$

3. A) Solve the following (**any two**) : 6

- 1) Define DPDA and NPDA.
- 2) Find the CFL associated with the CFG given below :

$$S \rightarrow aB \mid bA$$

$$A \rightarrow a \mid aS \mid bAA$$

$$B \rightarrow b \mid bS \mid aBB$$

- 3) Give the typical notations used for grammar.

B) Construct a NPDA , M for the language. 4

$$L = \{ww^R \mid w \in \{a, b\}^*\} \text{ such that } L = L(M).$$



4. Solve the following (**any two**) : 10

1) Let R be the relation on  $\{a, b\}^*$  defined by  $(x, y) \in R$  iff  $|x| - |y|$  is a multiple of 2 or 3 such that R is not a right congruence.

2) Construct FA for the following regular expression :

$$a(a + b)^* b + b(a + b)^* a.$$

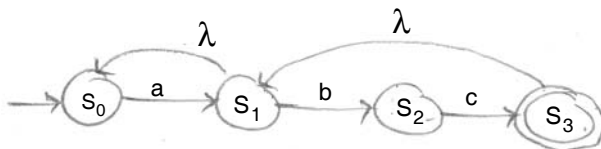
3) Explain various ways of describing the set with example.

5. Solve the following (**any two**) : 10

1) Convert the following grammar to GNF–  $S \rightarrow Bs \mid Aa$   $A \rightarrow bc$   $B \rightarrow Ac$ .

2) Construct a TM that recognizes the language,  $L = \{ a^n b^n c^n \mid n \geq 0 \}$ .

3) Obtain equivalent DFA for the following NFA's




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**B.Sc. (ECS) – III (Semester – V) Examination, 2015**  
**COMPUTER SCIENCE**  
**Web Technology and E-Commerce – I (Paper – V)**

Day and Date : Monday, 13-4-2015

Max. Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

**Instructions :** 1) **All questions are compulsory.**  
2) **All questions carry equal marks.**

1. Choose the correct alternative. **10**
- 1) \_\_\_\_\_ attribute of check boxes specifies on which side the text will be appears.  
a) Text align      b) Align      c) Textside      d) None of these
  - 2) \_\_\_\_\_ property of image map specify how to interact when specific area is clicked.  
a) Area      b) Click      c) Hotspot mode      d) None of these
  - 3) Server side script are executed than client side script.  
a) True      b) False
  - 4) \_\_\_\_\_ property of checkbox is used to get or set check box status.  
a) Status      b) Check box status  
c) Checked      d) None of these
  - 5) \_\_\_\_\_ property of RadioButton control about how to lay out the items bound to the control on web page.  
a) Repeat Direction      b) Repeat layout  
c) Repeat Column      d) None of these
  - 6) \_\_\_\_\_ file contains web application settings.  
a) app. config      b) machine. config  
c) assembly. config      d) web. config
  - 7) HTML controls are run on client side whereas ASP.Net controls run on server side.  
a) True      b) False





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**B.Sc. (ECS) – I (Semester – I) (Old) Examination, 2015**  
**COMPUTER FUNDAMENTALS – I (Paper – I)**

Day and Date : Wednesday, 1-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- N.B. :** 1) **All** questions are **compulsory**.  
2) **Each** questions carries **equal** marks.  
3) Figures to the **right** place indicate **full** marks.

1. Choose the correct alternatives :

10

- 1) In \_\_\_\_\_ generation transistors were used.  
a) first                      b) third                      c) second                      d) fourth
- 2) \_\_\_\_\_ converts single instruction of program into object code.  
a) Compiler                      b) Loader                      c) Linker                      d) Interpreter
- 3) \_\_\_\_\_ printer is page printer.  
a) Dot matrix                      b) Line                      c) Drum                      d) Laser
- 4) \_\_\_\_\_ DOS command is used to remove empty directory.  
a) del                      b) rd                      c) delete                      d) none
- 5) 1GB (Gigabyte) means \_\_\_\_\_  
a) 1024 bytes                      b) 1024 MB                      c) 1024 KB                      d) 1024 GB
- 6) \_\_\_\_\_ software manages computer Hardware.  
a) System                      b) Application                      c) MS. word                      d) None
- 7) Number of the pixels on the screen is its \_\_\_\_\_  
a) Dot pitch                      b) Resolution                      c) Depth                      d) None



- 8) ASCII value of 'F' is \_\_\_\_\_  
a) 25                      b) 70                      c) 68                      d) 69
- 9) \_\_\_\_\_ is one of the scanning device.  
a) OMR                      b) Key board                      c) Mouse                      d) None
- 10) Dynamic RAM is made up from \_\_\_\_\_  
a) Flip-Flop                      b) Diode                      c) MOS                      d) None

2. Write the answer of the following (**any five**) : **10**
- 1) Covert  $(652)_8$  into binary.
  - 2)  $(10111)_2 * (111)_2 = (?)_2$ .
  - 3) Convert  $(1010101)_2$  into hexadecimal.
  - 4) Binary subtraction.
  - 5) Define Bit and Byte.
  - 6) MD command with example.
3. A) Answer **any two** of the following : **6**
- 1) Write the uses of batch file.
  - 2) Write short note on Gray code.
  - 3) Explain the Light pen.
- B) Explain LCD monitor with suitable diagram. **4**
4. Answer **any two** of the following : **10**
- 1) What are the characteristics of computer ?
  - 2) Explain first and second generations of computer.
  - 3) Explain dot matrix printer.
5. Answer **any two** of the following : **10**
- 1) Explain functions of Operating System.
  - 2) Define Computer Languages. Explain high level language with its features.
  - 3) Write a short note on floppy disk.
-







- 9) An interface can inherit from another interface.  
a) True                      b) False
- 10) Defining two methods with the same name but with different parameters is called \_\_\_\_\_  
a) Multiplexing      b) Overriding      c) Duplexing      d) Overloading
2. Answer **any five** of the following : **10**
- 1) What is the use of CTS ?
  - 2) Give the list of classes contains in the system namespace.
  - 3) How to remove the fifth element from Array List class.
  - 4) What is the use of Hashtable class ?
  - 5) Differentiate between properties and indexers.
  - 6) Give the advantages of generic classes.
3. A) Answers **any two** of the following : **6**
- 1) Give the list of a new features added to C#.
  - 2) What is Enumeration ? Give one example.
  - 3) Explain the concept of constructor in multilevel inheritance.
- B) Write note on multithreading. **4**
4. Answer **any two** of the following : **10**
- 1) Write a program to overload indexer.
  - 2) Explain the concept of multiple catch blocks with suitable example.
  - 3) How to pass arguments to Main() method ? Explain with one suitable example.
5. Answer **any two** of the following : **10**
- 1) Write a program for overloading any two binary operators.
  - 2) Explain the StreamReader and StreamWriter classes.
  - 3) What is synchronization ? Explain the concept of synchronization.
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**B.Sc. (E.C.S.) – III (Semester – VI) Examination, 2015**  
**COMPUTER SCIENCE (Paper – I)**  
**Data Communications and Networking – II**

Day and Date: Monday, 20-4-2015

Max. Marks : 50

Time: 11.00 a.m. to 1.00 p.m.

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose correct alternatives : **10**
- 1) Bridges can divide a large \_\_\_\_\_ into smaller segments.  
a) Packet                      b) Frame                      c) Network                      d) Address
  - 2) Basic unit of a Bluetooth system is a  
a) Scatternet                      b) Nanonet  
c) Piconet                      d) None of the above
  - 3) Class \_\_\_\_\_ has the greatest number of hosts per given network address.  
a) A                      b) B                      c) C                      d) D
  - 4) \_\_\_\_\_ provides email services.  
a) DNS server                      b) File server  
c) Mail server                      d) Application server
  - 5) \_\_\_\_\_ reorders symbols in a block of symbols.  
a) Substitution cipher                      b) Transposition cipher  
c) Caesar cipher                      d) None of the above
  - 6) \_\_\_\_\_ will not compile, execute, or serve files with dynamic extensions in windows server 2003.  
a) IIS                      b) NTFs                      c) Tux                      d) Squid
  - 7) \_\_\_\_\_ server allows windows to access Linux System.  
a) Apache                      b) Samba                      c) CUPS                      d) TUX
  - 8) TCP uses the mechanism of  
a) Physical connections                      b) Virtual circuits  
c) Circuit switching                      d) Virtual connections

**P.T.O.**





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**B.Sc. (ECS) – III (Semester – VI) Examination, 2015**  
**COMPUTER SCIENCE (Paper – II)**  
**Database Management System – II**

Day and Date : Tuesday, 21-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

**Instructions:** 1) *All questions are compulsory.*  
2) *Figures to the right indicates full marks.*

1. Choose correct alternative : 10

- 1) An initial state of transaction is \_\_\_\_\_
  - a) active
  - b) Final
  - c) partial commeted
  - d) aborted
- 2) Which of the following is not a property of transaction.
  - a) Automicity
  - b) Isolation
  - c) Durability
  - d) Concurrency
- 3) The concept of locking can be used to solve problem of \_\_\_\_\_
  - a) Lost update
  - b) Uncommitted dependency
  - c) Inconsistent data
  - d) All of above
- 4) A transaction cannot proceed for an infinite period of time while other transactions in the system continue normally is \_\_\_\_\_
  - a) dead lock
  - b) starvation
  - c) transaction break
  - d) all of above
- 5) \_\_\_\_\_ is assignment operator in PL/SQL
  - a) = =
  - b) =
  - c) :=
  - d) None of above
- 6) Lable in PL /SQL is defined as
  - a) < lable >
  - b) lable
  - c) << lable >>
  - d) None of above



- 7) Disk is example of \_\_\_\_\_
  - a) volatile
  - b) non-volatile storage
  - c) huge
  - d) none of above
- 8) In 2-phase locking protocol all locks are released in \_\_\_\_\_ phase.
  - a) growing
  - b) shrinking
  - c) transaction
  - d) all of the above
- 9) Two actions on same data object are conflict if one of them.
  - a) read
  - b) write
  - c) reader write
  - d) none of above
- 10) recovery techniques are
  - a) serializability
  - b) shadow paging
  - c) write ahead laggin
  - d) ARIES

2. Answer **any five** : 10

- 1) Define starvation.
- 2) What is use of % type and % rowtype ?
- 3) What are the states of transaction ?
- 4) Write advantages of stored procedure's.
- 5) Shadow paging.
- 6) List data types in PL /SQL.

3. A) Answer **any two** : 6

- 1) Discuss any four predefined oracle Exceptions.
- 2) Explain binary lock.
- 3) Write structure of PL /SQL block.

B) Explain log base recovery. 4

4. Answer **any two** : 10

- 1) Explain properties of transaction.
- 2) Write PL /SQL function for check the number is palindrow or not.
- 3) Explain types of parameters used in function.

5. Answer **any two** : 10

- 1) Explain conflict serializability.
- 2) Write a trigger which not allow's to insert negative marks.
- 3) Explain cursor with e.g. \_\_\_\_\_



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**B.Sc. (ECS) – III (Semester – VI) Examination, 2015**  
**COMPUTER SCIENCE (Paper – III)**  
**Advanced Java**

Day and Date : Wednesday, 22-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

***N.B :*** 1) ***All questions are compulsory.***  
2) ***Figures to the right indicate full marks.***

1. Choose the correct alternatives. **10**

- 1) In URL query string, the parameter name and value are associated using \_\_\_\_\_ symbol.  
a) ?                      b) =                      c) &                      d) all of these
- 2) The \_\_\_\_\_ method ensures that a new web page is generated.  
a) GET                      b) POST                      c) DELETE                      d) UPDATE
- 3) A servlet is an example of the \_\_\_\_\_ class.  
a) Object                      b) Applet                      c) HTTP Servlet                      d) None of these
- 4) The \_\_\_\_\_ method is called when the servlet is firstly created.  
a) init ( )                      b) service ( )                      c) destroy ( )                      d) load ( )
- 5) \_\_\_\_\_ can be created by extending the Applet class.  
a) Servlet                      b) JSP program  
c) Applet                      d) All of these
- 6) \_\_\_\_\_ are used to get small amount of state information associated with a user's web browsing.  
a) XML file                      b) Hibernate                      c) Servlet                      d) Cookies







4. Answer **any two** of the following. **10**

- 1) Write a simple JSP program that will displays Hello message.
- 2) Write a program to create simple JApplet that will demonstrate simple arithmetic calculator.
- 3) Explain any two swing controls.

5. Answer **any two** of the following. **10**

- 1) Write a program that will demonstrates use of Type – 4 drivers used to connect Oracle database.
  - 2) Explain JSP life cycle.
  - 3) What is adapter class ? Explain any three adapter classes with the help of example.
-





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**B.Sc. (ECS) – III (Semester – VI) Examination, 2015**  
**COMPUTER SCIENCE (Paper – IV)**  
**Compiler Construction**

Day and Date : Thursday, 23-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

**Instructions :** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternatives : 10

- 1) The task of collecting the source program is sometimes entrusted to a separate program, called a
    - a) linker
    - b) loader
    - c) compiler
    - d) pre-processor
  - 2) \_\_\_\_\_, in which the look ahead symbol unambiguously determines the flow of control through the procedure body for each non-terminal.
    - a) Predictive
    - b) Recursive-descent
    - c) Operator-precedence
    - d) None
  - 3) A set of non-terminals, sometimes called
    - a) Semantic variables
    - b) Syntactic variable
    - c) Static variable
    - d) All above
  - 4) Many loops have \_\_\_\_\_ variables, variables that take on a linear sequence of values each time around the loop.
    - a) induction
    - b) static
    - c) syntactic
    - d) semantic
  - 5) A \_\_\_\_\_ machine is an interpreter for a byte code intermediate language produced by languages such as Java and C#.ol style="list-style-type: none;">  - a) Server
  - b) Client
  - c) Virtual
  - d) All above
- 6) Back patching is a technique for generating code for \_\_\_\_\_ expressions and statements in one pass.
  - a) boolean
  - b) arithmetic
  - c) logical
  - d) none



- 7) \_\_\_\_\_ finds spaces within the heap that are no longer in use and can therefore be reallocated to house other data items.
- a) Garbage collection                      b) Back patching  
c) Mark-and-sweep collectors            d) Control stack
- 8) In an \_\_\_\_\_, attributes may be inherited or synthesized.
- a) S-attributed SDD                      b) L-attributed SDD  
c) Both (a) and (b)                      d) None
- 9) \_\_\_\_\_ errors include misplaced semicolons or extra or missing braces; that is, “(” or “)”.
- a) Semantic                      b) Syntactic                      c) Lexical                      d) Logical
- 10) A \_\_\_\_\_ is a sequence of characters in the source program that matches the pattern for a token.
- a) token                      b) pattern                      c) lexeme                      d) all above

2. Answer **any five** of the following :

10

- 1) List out the some useful compiler construction tools.
- 2) What is the difference between panic mode recovery and phrase-level recovery ?
- 3) Give several methods for evaluating semantic rules.
- 4) What is control stack ?
- 5) What is the role of lexical analyzer ?
- 6) Define :
  - a) Basic block                      b) Flow graph

3. A) Answer **any two** of the following :

6

- 1) Explain dominator and immediate dominator with example.
- 2) Define the following with example
  - 1) Token
  - 2) Pattern
  - 3) Lexeme
- 3) Explain Boolean expression.

B) What is three address code ?

4

Consider, the expression

$a := b * - c + b * - c$

Give the code for syntax tree and code for dag of expression.



4. Answer **any two** of the following : 10

1) What is dag ? Construct the dag for the expression

$$x - x * (y + z) - (y + z) * w$$

Also give the instructions for the same.

2) Define compiler. Explain the different types of compiler.

3) Consider the expression,

$$E \rightarrow E + E / E * E / id$$

check whether the above grammar is ambiguous or not; if found ambiguous, remove the ambiguity and write an equivalent unambiguous grammar.

5. Answer **any two** of the following : 10

1) Explain structure-preserving transformation basic block.

2) Give the different storage-allocation strategies. Explain any two.

3) Explain the notational conventions with regard to grammar.

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**B.Sc. (ECS) III (Semester – VI) Examination, 2015**  
**COMPUTER SCIENCE (Paper – V)**  
**Web Technology and E-Commerce – II**

Day and Date :Friday, 24-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to *right* indicate *full* marks.**

1. Choose the correct alternative : **10**

- 1) \_\_\_\_\_ activity of trade cycle concerned with customer inquiry and negotiate.  
a) exception      b) settlement      c) order      d) presale
- 2) EDI requires co-operation and active participation of trading partners.  
a) True      b) False
- 3) Loginview control is used to display login (user) name.  
a) True      b) False
- 4) \_\_\_\_\_ control is used to sort data row and allow paging.  
a) Gridview      b) Datalist  
c) Repeater      d) None of these
- 5) Default value for pagesize is 10 in Gridview control.  
a) True      b) False
- 6) \_\_\_\_\_ data control does not exist in asp.net.  
a) Gridview      b) Datalist  
c) Repeater      d) Tableview
- 7) Order and delivery are included in \_\_\_\_\_ phase of trade cycle.  
a) presales      b) execution      c) settlement      d) after sales



- 8) \_\_\_\_\_ is a process to converting cipher text to plain text.  
a) Encryption      b) Decryption      c) EDI      d) None of these
- 9) EDI transactions required printed orders.  
a) True      b) False
- 10) Default value for parameter direction properly is  
a) Input output      b) Input      c) Output      d) None

- 2. Answer the following **(any 5)** : **10**
    - a) Login status control.
    - b) Sql Datasource control.
    - c) Dataset.
    - d) Concept of four P's.
    - e) Threat of substitution.
    - f) Software supplies and support.
  
  - 3. a) Answer the following **(any 2)** : **6**
    - 1) Create user Wizard control.
    - 2) Explain Electronic market.
    - 3) Explain definition of EDI.
  
  - b) Explain oracle client namespace. **4**
  
  - 4. Answer the following **(any 2)** : **10**
    - a) Explain internet e-commerce security in detail.
    - b) Design web page for master detail form.
    - c) Explain inter organisational value chain in detail.
  
  - 5. Answer the following **(any 2)** : **10**
    - a) Explain user management are role management in detail.
    - b) Explain e shop in detail.
    - c) Explain :
      - i) e-book shop
      - ii) e-newspaper
      - iii) online share dealing.
-





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**B.Sc. (ECS) – III (Semester –VI) Examination, 2015**  
**COMPUTER SCIENCE (Paper – VI)**  
**Visual Programming & Application S/W – II**

Day and Date : Saturday, 25-4-2015  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

***N.B. :*** 1) ***All questions are compulsory.***  
2) ***Figures to the right indicate full marks.***

1. Choose the correct alternative :

10

- 1) A \_\_\_\_\_ is a control that contains other controls.
  - a) List Box
  - b) Timer
  - c) Image List
  - d) Panel
- 2) The Load event occurs after the form becomes visible.
  - a) True
  - b) False
- 3) All delegate types are \_\_\_\_\_ and derived from the \_\_\_\_\_ class.
  - a) Virtual, Event
  - b) Virtual, Delegate
  - c) Sealed, Delegate
  - d) Sealed, Event
- 4) The default value of Window State property is
  - a) Maximized
  - b) Minimized
  - c) Normal
  - d) None of these
- 5) Mouse events generated by supplying the input through a mouse.
  - a) True
  - b) False
- 6) The data source in a LINQ query can be a
  - a) Data structure
  - b) File system
  - c) Data base
  - d) All of these
- 7) A \_\_\_\_\_ is used by a single .Net application.
  - a) Private assembly
  - b) Shared assembly
  - c) Both a and b
  - d) None of these



8) The \_\_\_\_\_ control is used to display data in a drop-down list.

- a) Check Box
- b) Group Box
- c) Combo Box
- d) List Box

9) The assemblies can contain several name spaces.

- a) True
- b) False

10) LINQ to SQL supports to

- a) transactions
- b) views
- c) stored procedures
- d) all of these

2. Answer **any five** of the following :

10

- 1) Which are the different features of Forms ?
- 2) Give the difference between assemblies and name spaces.
- 3) What is the advantage of shared assembly ?
- 4) What is the use of List Box control ?
- 5) What is delegate ?
- 6) Which are the steps to use event ?

3. A) Answer **any two** of the following :

6

- 1) Explain various components in crystal reports.
- 2) Explain overview of the deployment options are available in .Net technology.
- 3) Explain Button control with suitable example.

B) Explain the concept of custom control.

4

4. Answer **any two** of the following :

10

- 1) What is MDI ? Explain in detail.
- 2) What is LINQ ? Explain sorting operator in LINQ.
- 3) Write a program to implement a delegate.

5. Answer **any one** of the following :

10

- 1) What is assembly ? Explain the procedure for creating a private and shared assembly.
  - 2) What is event ? Explain different keyboard and mouse events available in C #.
-



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**B.Sc. (ECS) (Part – I) (Semester – I) Examination, 2015**  
**COMPUTER SCIENCE (Old)**  
**Programming Using ‘C’ – I (Paper – II)**

Day and Date : Monday, 6-4-2015

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

**Instructions:** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose correct alternatives : 10

1) C is a

- a) Middle level language
- b) High level language
- c) Low level language
- d) None

2) A variable name can not start with

- a) an alphabet
- b) a number
- c) a special symbol
- d) both b and c

3) What will be the output of following program ?

```
int main()
{
 int K, num = 30;
 K = (num < 10) ? 100 : 200;
 printf("\n%d", num);
 return 0;
}
```

4) # define directives are end with semicolon.

- a) True
- b) False

5) Char data type requires \_\_\_\_\_ bytes for storing one character.

- a) 8
- b) 4
- c) 2
- d) 1



- 6) \_\_\_\_\_ is derived data type.  
a) float                      b) int                      c) array                      d) none
- 7) \_\_\_\_\_ string function accept only one parameter.  
a) strlen()                      b) strepy()                      c) streat()                      d) stremp()
- 8) The \_\_\_\_\_ operator returns how many bytes required for an operand.  
a) bitwise                      b) logical                      c) sizeof                      d) arithmetic
- 9) An \_\_\_\_\_ is a set of instructions for accomplishing a task.  
a) flowchart                      b) algorithm                      c) both a and b                      d) none
- 10) The continue statement can be used in loop constructes.  
a) True                      b) False

2. Answer **any five** of the following :

10

- 1) Give list of steps involving in problem solving.
- 2) What is the work of interpreter ?
- 3) List the types of constant.
- 4) Define the identifier and keyword.
- 5) There is no difference between 'A' and "A". Comment.
- 6) Find the errors if any and justify

```
main()
{
 int a [10], i;
 for (i = 1; i <= 10; i ++)
 {
 scanf ("%d", a [i]);
 printf ("%d", a [i]);
 }
}
```



3. A) Answer **any two** of the following : **6**
- 1) Difference between if-else and switch-case.
  - 2) What is flow chart ? Give symbols used in flowchart.
  - 3) What is difference between scanf (“% s”) and gets() function ?
- B) Write a program to print given number is even or odd. **4**
4. Answer **any two** of the following : **10**
- 1) What is string ? Explain following string functions.
    - a) streat()                      b) stremp()
  - 2) Write a program to sort n positive integers.
  - 3) Explain unconditional control statements.
5. Answer **any two** of the following : **10**
- 1) Write a program to find out given number is perfect or not.
  - 2) Explain program development life cycle.
  - 3) Write a program to calculate diagonal sum of an array elements.
-





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**B.Sc (ECS) – I (Semester – I) Examination, 2015**  
**ELECTRONICS (PAPER – IV) (Old)**  
**Digital Electronics – I**

Day and Date : Wednesday, 8-4-2015

Total Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- Instructions :** i) *All questions are compulsory and carry equal marks.*  
ii) *Draw neat diagram wherever necessary.*  
iii) *Any type of calculator allowed.*

1. Fill in the blanks with correct alternative and rewrite : **10**
- 1) The radix of the binary number is \_\_\_\_\_  
a) 3                      b) 1                      c) 2                      d) 10
  - 2) The binary code of  $(73)_{10}$  is \_\_\_\_\_  
a) 1010001              b) 1000100              c) 1100101              d) 1001001
  - 3) The following is the unweighted code \_\_\_\_\_  
a) 8421 code              b) 2421 code              c) 5211 code              d) excess-3 code
  - 4) The gray code equivalent of binary  $(1000001)_2$  is \_\_\_\_\_  
a) 1100001              b) 1000011              c) 1100010              d) 1010001
  - 5)  $\bar{A} + \bar{B} + \bar{C} = D$  represents a \_\_\_\_\_  
a) NAND gate              b) NOR gate              c) EX-OR gate              d) AND gate
  - 6) The O/P of the following gate is 0 only if at least one of its input is 0 \_\_\_\_\_  
a) AND gate              b) OR gate              c) EX-OR gate              d) NOR gate
  - 7) A half – adder is also known as \_\_\_\_\_  
a) AND ckt              b) NAND ckt              c) NOR ckt              d) EX–OR ckt



- 8) The O/P of combinational ckt depends upon
- a) Present input only
  - b) Past input only
  - c) Both present and past inputs
  - d) None of the above

- 9) A multiplexer is also known as \_\_\_\_\_
- a) Counter
  - b) Decoder
  - c) Data Selector
  - d) None of these

- 10) A circuit used for parallel to serial conversion of data is known as \_\_\_\_\_
- a) decoder
  - b) demultiplexer
  - c) multivibrator
  - d) multiplexer

2. Answer **any five** of the following : **(5×2=10)**

- a) What is digital signal ? Draw it.
- b) Draw symbol and truth table of X-OR gate.
- c) What is encoder and decoder ?
- d) Draw diagram of Half adder and full adder.
- e) What is ASCII code ? Give details.
- f) Write one example of hex to octal conversion.

3. A) Answer **any two** of the following : **(2×3=6)**

- i) Draw any two diagrams of Interconversion of gates using NAND.
- ii) Explain nibble multiplexing.
- iii) What is gray code ? Explain with one example.

B) Construct hamming code for the data 1010 with odd parity. **4**

4. Attempt **any two** of the following : **(2×5=10)**

- i) What is demultiplexer ? Explain 1 : 8 demultiplexer.
- ii) Explain K. map with one example.
- iii) Explain parallel adder.

5. Attempt **any two** of the following : **(2×5=10)**

- i) Explain MOS logic family.
  - ii) Explain Interconversion of gates using NOR.
  - iii) Explain IC 74148.
-