Seat No.	

**B.Sc. (E.C.S.) (Semester - II) (New/Old) (CBCS) Examination:
October/November - 2025
English (Comp.)
Communication Skill (ECS1201)**

Day & Date: Thursday, 13-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

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

Q.1   Choose the correct alternatives from the options.   08
   1)   What was the author reading in 'Does Education Do Harm'?
         a)   novels   b)   Autobiography
         c)   Biographies   d)   poetry

   2)   Where in the world has the idea of freedom grown tedious?
         a)   the east   b)   the west
         c)   the entire world   d)   nowhere

   3)   Who has lynched lakes?
         a)   the poet   b)   factories
         c)   vehicles   d)   humans

   4)   How old is Pope believed to be when he wrote "ode on solitude"?
         a)   11   b)   12
         c)   13   d)   14

   5)   What kind of place is the poet going to?
         a)   Loud place   b)   Marketplace
         c)   Silent place   d)   Dull place

   6)   Synonym of abandon is _____.
         a)   leave   b)   depart
         c)   receive   d)   useful

   7)   Antonym of ability is _____.
         a)   Incorrect   b)   inability
         c)   Guilty   d)   lazy

   8)   We _____ (go) to Bhutan last year. (Use past form of a verb)
         a)   go   b)   goes
         c)   went   d)   gone

Q.2 **Answer the following question: (Any Four)** **12**
   a) What kind of men made the age we live in?
   b) What is the true sense of freedom?
   c) Discuss the theme of poem 'Our earth will not die'?
   d) What the poet focuses on in the poem 'Ode on solitude'?
   e) What the subject of the poem 'Remember'?
   f) Why the lakes are lynched?

Q.3 **Answer the following. (Any One)** **10**
   a) Write an application letter for the post of a primary teacher.
   b) What is the theory of multiple of intelligence developed by Gardner?

Q.4 **Answer the following question.** **10**
   What is an interpersonal intelligence?

Seat No.	

B.Sc. (E.C.S.) (Semester - II) (New/Old) (CBCS) Examination: October/November - 2025
Introduction to Web Technology (ECS1202)

Day & Date: Friday, 14-11-2025　　　　　　　　　　Max. Marks: 40
Time: 12:00 PM To 02:00 PM

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

Q.1　Choose the correct alternatives from the options.　　　　　08

1) How can you make a numbering list?
　　a)　<list>　　　　　　　　　　b)　
　　c)　　　　　　　　　　　　d)　<nl>

2) Which CSS property controls the text size?
　　a)　font-size　　　　　　　　　b)　font-style
　　c)　text-style　　　　　　　　　d)　text-size

3) How to insert a background image in HTML?
　　a)　<body background = "img.png">
　　b)　<imgbackground = "img.png">
　　c)　<bg-image = "img.png">
　　d)　none of the above

4) What does vlink attributemean?
　　a)　visitedlink　　　　　　　　　b)　virtuallink
　　c)　very goodlink　　　　　　　　d)　activelink

5) What does CSS stand for?
　　a)　Creative Style Sheets　　　　b)　Colorful Style Sheets
　　c)　Computer Style Sheets　　　　d)　Cascading Style Sheets

6) There are ____ different heading tags in HTML.
　　a)　4　　　　　　　　　　　　　b)　5
　　c)　6　　　　　　　　　　　　　d)　7

7) Who is inventor of HTML?
　　a)　Tim Berners-Lee　　　　　　b)　Hakon lie
　　c)　Tim Thompson　　　　　　　d)　None of these

8) How do you add a background color for all <h1> elements?
　　a)　all.h1 {background-color:#FFFFFF}
　　b)　h1.all {background-color:#FFFFFF}
　　c)　h1 {background-color:#FFFFFF}
　　d)　none of these

Q.2 **Answer the following question: (Any Four)** 08
   a) What is padding?
   b) What is singular and paired tag?
   c) Use of CSS.
   d) What is computer networking?
   e) Explain anchor tag with example.

Q.3 **Write short notes on the following: (Any Two)** 08
   a) Frameset tag
   b) DOM
   c) Form validations

Q.4 **Answer the following question: (Any Two)** 08
   a) Explain user defined function with example in JavaScript.
   b) Explain box model with example.
   c) Write the applications of internet.

Q.5 **Answer the following question: (Any One)** 08
   a) Explain table tag and its attributes with example.
   b) Explain different Math and String built-in functions in JavaScript.

Seat No.

Set **P**

B.Sc. (E.C.S.) (Semester - II) (New/Old) (CBCS) Examination: October/November - 2025
Operating System (ECS1203)

Day & Date: Saturday, 15-11-2025　　　　　　　　　Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
　　　　　　　　2) Draw neat diagrams and give equations wherever necessary.
　　　　　　　　3) Figures to the right indicate full marks.
　　　　　　　　4) Use of logarithmic table and calculator is allowed.

Q.1　Choose the correct alternatives. (MCQ)　　　　　　　　08

1) Which of the following is a condition that causes deadlock?
　　a) Mutual exclusion　　　　　b) Hold and wait
　　c) Circular wait　　　　　　d) All of these

2) When does page fault occur?
　　a) The page is present in memory.
　　b) The deadlock occurs.
　　c) The page does not present in memory.
　　d) The buffering occurs.

3) Which of the following method is used to improve the main memory utilization?
　　a) Swapping　　　　　　　b) Memory stack
　　c) Both (a) and (b)　　　　d) None of these

4) Which of the following statement is correct about fragmentation?
　　a) It is software that connects the OS.
　　b) It is part of the software.
　　c) Loss the memory
　　d) All of these

5) Which of the following statements is correct about virtual memory?
　　a) It is a combination of the logical-memory and physical-memory
　　b) It is a separation of user logical memory and physical memory
　　c) It is a virtual network memory
　　d) None of the these

6) In segmentation, each address is specified by _____
　　a) a segment number & offset　　b) an offset & value
　　c) a value & segment number　　d) a key & value

7) What is the drawback of banker's algorithm?
   a) in advance processes rarely know how much resource they will need
   b) the number of processes changes as time progresses
   c) resource once available can disappear
   d) all of the mentioned

8) Deadlock prevention is a set of methods _____
   a) to ensure that at least one of the necessary conditions cannot hold
   b) to ensure that all of the necessary conditions do not hold
   c) to decide if the requested resources for a process have to be given or not
   d) to recover from a deadlock

Q.2 Answer the following question: (Any Four)   **08**
   a) What is the purpose of paging the page tables?
   b) Define deadlock avoidance.
   c) What is Demand paging?
   d) What are the different accessing methods of a file?
   e) Which are the various disk-scheduling algorithms?
   f) What is the basic approach of page replacement?

Q.3 Write short notes on the following: (Any Two)   **08**
   a) Segmentation.
   b) Logical and physical address space.
   c) File Operation.

Q.4 Answer the following question: (Any Two)   **08**
   a) Differentiate between internal external fragmentations
   b) Define contiguous and non-contiguous memory allocations and compare them
   c) What is virtual memory? How it is implemented.

Q.5 Answer the following question: (Any One)   **08**
   a) Explain all page replacement policies in detail.
   b) What are the conditions for deadlock? Explain deadlock detection and recovery in detail.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - II) (New/Old) (CBCS) Examination: October/November - 2025
Object Oriented Programming using C++ (ECS1204)

Day & Date: Monday, 17-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.
4) Use of logarithmic table and calculator is allowed.

Q.1   Choose the correct alternatives from the options.   08
1) Which one of the following cannot be a friend in C++ languages?
   a) A Class   b)   A Function
   c) An Object   d)   None of the above

2) Which of the following statements is true about the C++ programming language?
   a) C++ is an object-oriented programming language
   b) C++ is a procedural programming language
   c) C++ is a functional programming language
   d) C++ is both procedural and object-oriented language

3) Which of the following is not a type of Constructor in C++?
   a) Default constructor   b)   Parameterized constructor
   c) Copy constructor   d)   Friend constructor

4) Which of the following approach is used by C++?
   a) Left-right   b)   Right-left
   c) Bottom-up   d)   Top-down

5) What is Inheritance in C++?
   a) Deriving new classes from existing classes
   b) Overloading of classes
   c) Classes with same names
   d) Wrapping of data into a single class

6) What is meant by a polymorphism in C++?
   a) class having only single form
   b) class having four forms
   c) class having many forms
   d) class having two forms

7) Which concept allows you to reuse the written code in C++?
   a) Inheritance   b) Polymorphism
   c) Abstraction   d) Encapsulation

8) Which of the following functions must use the reference?
   a) Copy constructor   b) Destructor
   c) Parameterized constructor d) None of the above

Q.2 Answer the following question: (Any Four)   **08**
   a) Define friend function.
   b) What is abstract class in C++?
   c) Differentiate between ifstream and ofstream class.
   d) What is scope resolution operator? Explain its use.
   e) Define copy constructor with example.
   f) What is inheritance?

Q.3 Write short notes on the following: (Any Two)   **08**
   a) Encapsulation.
   b) Dynamic memory allocation.
   c) Differentiate between member function and constructor.

Q.4 Answer the following question: (Any Two)   **08**
   a) What is virtual function? Explain with example.
   b) Write a program to demonstrate the use of inline function.
   c) Explain hybrid inheritance with example.

Q.5 Answer the following question: (Any One)   **08**
   a) What are the various features of object oriented programming?
   b) Explain unary and binary operator overloading with an example for
       each.

Seat No.

B.Sc. (E.C.S.) (Semester - II) (New/Old) (CBCS) Examination: October/November - 2025
Python – II (ECS1205)

Day & Date: Tuesday, 18-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
                2) Figures to the right indicate full marks.
                3) Draw neat diagrams and give equations wherever necessary.
                4) Use of logarithmic table and calculator is allowed.

Q.1 Choose the correct alternatives.   **08**

1) Which keyword is used for function?
    a) Fun   b) Define
    c) def   d) Function

2) Which of these is not a fundamental features of OOP?
    a) Encapsulation   b) Inheritance
    c) Instantiation   d) Polymorphism

3) How many except statements can a try-except block have?
    a) zero   b) one
    c) more than one   d) more than zero

4) Python supports the creation of anonymous functions at runtime, using a construct called _____.
    a) pi   b) anonymous
    c) lambda   d) none of the mentioned

5) The assignment of more than one function to a particular operator is ___.
    a) Operator over-assignment   b) Operator overriding
    c) Operator overloading   d) Operator instance

6) Which of the following is not a type of inheritance?
    a) Double-level   b) Multi-level
    c) Single-level   d) Multiple

7) What will be output for the following code? class test:
    def __init__(self,a):

      self.a=a
    def display(self):
      print(self.a)
   obj=test()
   obj.display()
    a) Runs normally, doesn't display anything

b) Displays 0, which is the automatic default value
c) Error as one argument is required while creating the object
d) Error as display function requires additional argument

8) To read two characters from a file object infile, we use _____.
   a) infile.read(2)   b) infile.read()
   c) infile.readline()   d) infile.readlines()

Q.2 Answer the following question: (Any Four)   08
   a) What is operator overloading?
   b) What is function?
   c) What is lambda function?
   d) What is random module?
   e) Define local and global variables?
   f) What is file? List out types of file used in python

Q.3 Write short notes on the following: (Any Two)   08
   a) Abstract class.
   b) Types of arguments.
   c) Features of OOPs

Q.4 Answer the following question: (Any Two)   08
   a) Write a python program to check given number is prime or not by using function.
   b) What is constructor? Explain types with example.
   c) Explain the modes of files with example.

Q.5 Answer the following question: (Any One)   08
   a) What is inheritance? Explain any four types of inheritance with example.
   b) What is exception handling? Explain in detail with example.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - II) (New/Old) (CBCS) Examination: October/November - 2025
Linear Algebra (ECS1206)

Day & Date: Wednesday, 19-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams and give equations wherever necessary.
4) Use of logarithmic table and calculator is allowed.

Q.1 Multiple choice questions.   **08**

1) Homogenous system of linear equation is _____.
   a) Always consistent   b) Never consistent
   c) Always inconsistent   d) None of these

2) A square matrix is said to be _____ if $A^t = A$.
   a) Symmetric   b) Skew symmetric
   c) Identity   d) Null

3) If $\begin{vmatrix} 4 & 7 \\ x & 0 \end{vmatrix} = 49$ then x =_____.
   a) 7   b) -7
   c) 4   d) 5

4) If any two rows or columns of the determinant are identical then the value of determinant is _____.
   a) 1   b) 0
   c) 2   d) Cannot be determine

5) The product of eigen value of A is same as _____.
   a) Determinant of A   b) Adjoint of A
   c) Trace of A   d) None of these

6) If $Z = i - 1$, then $\bar{z} =$ _____.
   a) $i - 1$ b) $i + 1$
   c) $-i - 1$ d) $-i + 1$

7) Eigen values of A= _____.
   a) Eigen values of its inverse   b) Eigen values of A^t
   c) Trace of A   d) Eigen vector A

8) $z = \bar{z}$, z is _____.
   a) Purely imaginary number   b) Complex number
   c) Purely real number   d) None of these

Q.2 Answer the following question: (Any Four) 08
   a) Define augmented Matrix.
   b) Define eigen vector.
   c) Find the modulus & argument of $1 + 3i$.
   d) Define rank of matrix.
   e) Define system linear equation.
   f) Define characteristic polynomial.

Q.3 Write short notes on the following: (Any Two) 08
   a) Write an algorithm to find solution of system of linear equation by Gauss Jordan method.
   b) Verify Cayley Hamilton theorem for $A = \begin{bmatrix} 2 & -1 & 2 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$
   c) Verify the following:
     1) $z + \bar{z} = 2\text{Re}(z)$
     2) $z - \bar{z} = 2\text{Im}(z)$

Q.4 Answer the following question: (Any Two) 08
   a) Find the eigen values of $\begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$
   b) Find the square root of complex number the $7 + 24i$.
   c) Find the determinant of matrix by cofactor expansion method
   $\begin{bmatrix} 3 & 2 & 1 \\ 1 & 6 & 3 \\ 2 & -4 & 0 \end{bmatrix}$

Q.5 Answer the following question: (Any One) 08
   a) Use Gauss elimination method to solve
   $2x + y + z = 10 \,, 3x + 2y + 3z = 18 \,, x + 4y + 9z = 16.$
   b) Find inverse of matrix by adjoint method $\begin{bmatrix} 1 & 2 & 3 \\ -3 & 2 & -1 \\ 2 & -4 & 3 \end{bmatrix}$

| Seat No. | | Set | P |

B.Sc. (E.C.S.) (Semester - II) (New/Old) (CBCS) Examination: October/November - 2025
Discrete Mathematics (ECS1207)

Day & Date: Thursday, 20-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

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

Q.1 Choose the correct alternatives. (MCQ)   **08**

1) $A = \{1, 2, 3, 4, 5\}, B = \{a, c, x, d, u\}$ then $|A \times B| =$ _____
   a) 11
   b) 20
   c) 25
   d) 14

2) The characteristic equation of recurrence relation
   $a0 - 4ar - 1 + 4ar - 2 = 0$
   a) $m - 4m^2 + 4 = 0$
   b) $m^2 - 4m + 4 = 0$
   c) $m^2 + 4m + 4 = 0$
   d) None of these

3) Let f and g be the function from the set of integers to itself, defined by $f(x) = 2x + 1$ and $g(x) = 3x + 4$. Then the composition of f and g i.e. gof is _____.
   a) $6x + 9$
   b) $6x + 7$
   c) $6x + 6$
   d) $6x + 8$

4) $A = (1, 2, 3, 4, 6)$ then $|A|$ ____.
   a) 4
   b) 5
   c) 6
   d) 7

5) Total solution for the Homogeneous recurrence relation is ____.
   a) Homogeneous solution + Particular solution
   b) Homogenous solution
   c) Non-homogeneous solution + Particular solution
   d) Non-homogenous solution

6) A relation R on a set A is called relation is reflexive, antisymmetric and Transitive ____.
   a) equivalence
   b) partial ordering
   c) transitive
   d) identity

7) x belongs N and x is prime, then x is set ____.
   a) Infinite set
   b) Finite set
   c) Empty set
   d) None of these

8) $f(x) = (2x - 1)(x - 2)(x - 3)$ then $f(-3) =$ _____.
    a) -210   b) 210
    c) -120   d) None of these

Q.2 Answer the following question. (Any Four)   **08**
    a) $f(x) = x^2 - 5x + 7$ find $f(-5)$ and $f(1)$
    b) Define Homogenous recurrence relation.
    c) Define void relation.
    d) Define Set.
    e) Define equivalence relation.
    f) Lit R be the Relation on the Set $A = \{1, 2, 3, 4, 5\}$ given by
        R= $\{(1,3), (1,3), (1,5), (2,4), (1,2), (2,5), (4,5)\}$. Find Diagraph of R.

Q.3 Answer the following. (Any Two)   **08**
    a) State and prove Principle of Inclusion-Exclusion for two set.
    b) Define the following:
        i) relation
        ii) function
        iii) Domain
        iv) Codomain
    c) Define recurrence relation and explain linear recurrence relation with constant coefficient.

Q.4 Answer the following question. (Any Two)   **08**
    a) Check whether the given relations equivalence or not xRy iff $x - y$ is an even integer.
    b) If $f:. R$ to R such that $f(x) = 5x + 11$ for all $x \subset R$, It f is invertible then find f inverse.
    c) Define union and intersection of two sets.

Q.5 Answer the following question. (Any One)   **08**
    a) Solve the recurrence relation $a_r - 7a_{r-1} + 10\, a_{r-2} = 0$ with initial condition $a_0 = 4, a_1 = 17$.
    b) If $R = \{(1,3), (2,1), (2,4), (3,3), (4,1), (4,2)\}$ be a relation on set $A = (1, 2, 3, 4)$ find transitive closure by using Warshall's algorithm.

Seat No.

B.Sc. (E.C.S.) (Semester - II) (New/Old) (CBCS) Examination: October/November - 2025
Digital Electronics and Microprocessor (ECS1208)

Day & Date: Friday, 21-11-2025　　　　　　　　　　Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
　　　　　　　　2) Figures to the right indicate full marks.
　　　　　　　　3) Draw neat diagrams and give equations wherever necessary.
　　　　　　　　4) Use of logarithmic table and calculator is allowed.

Q.1　Multiple choice questions:　　　　　　　　　　　　　　　　08

1) In 8085 pin no 20 is connected to ___.
　　a) Vcc　　　　　　　　　　b) GND
　　c) Positive　　　　　　　　d) Negative

2) 7400 is ____ gate.
　　a) Basic　　　　　　　　　b) universal
　　c) And　　　　　　　　　　d) inverter

3) Multiplexer is ____ circuit.
　　a) universal　　　　　　　b) basic
　　c) combinational　　　　　d) sequential

4) The asynchronous counter uses ____ clock.
　　a) negative　　　　　　　b) positive
　　c) common　　　　　　　d) separate

5) First gate in IC 7402 uses ____ pin for output.
　　a) 1　　　　　　　　　　b) 2
　　c) 3　　　　　　　　　　d) 4

6) PUSH is ____ instruction.
　　a) arithmetic　　　　　　b) logical
　　c) data transfer　　　　　d) branch

7) ____ volt is used as positive supply in 8085.
　　a) +5　　　　　　　　　b) -5
　　c) +10　　　　　　　　　d) -10

8) Shift register uses ____ flip flop.
　　a) RS　　　　　　　　　b) JK
　　c) T　　　　　　　　　　d) D

Q.2 **Answer the following question: (Any Four)** 08
  a) Define logic gate.
  b) Explain interrupt pins of 8085.
  c) Draw logical diagram 4:1 multiplexer.
  d) Draw block diagram of SISO.
  e) Explain ADD. SUB instruction of 8085.
  f) Explain SID and SOD pins of 8085.

Q.3 **Write short notes on the following: (Any Two)** 08
  a) Explain 3 bit up counter.
  b) Explain MSJK flip flop.
  c) Explain general purpose registers of 8085.

Q.4 **Answer the following question: (Any Two)** 08
  a) Explain universal gates.
  b) Explain addressing modes 8085.
  c) Explain D and T flip flop.

Q.5 **Answer the following question: (Any One)** 08
  a) Explain shift registers with block diagram.
  b) Explain control unit and flag register of 8085.

| Seat No. | | Set | P |

B.Sc. (E.C.S.) (Semester - II) (New/Old) (CBCS) Examination: October/November - 2025
Introduction to Microcontroller and Embedded System (ECS1209)

Day & Date: Saturday, 22-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams wherever necessary.
4) Non programmable calculators are allowed.

Q.1   Choose the correct alternatives from the options.   08
1)   Speed of 8051 is 12 _____.
a) MHz   b) GHz
c) KHz   d) Hz

2)   Keil compiler of 8051 has _____ file.
a) reg8051.h   b) reg51.h
c) reg80.h   d) reg51c.h

3)   8051 contains _____ no of interrupts.
a) 2   b) 3
c) 4   d) 5

4)   In embedded C _____ used for single line comments.
a) *….*   b) */…../*
c) /*…*/   d) //

5)   RAM used in 8051 is _____ b.
a) 64   b) 128
c) 256   d) 512

6)   Baud rate in flash magic is _____.
a) 2400   b) 4800
c) 90600   d) 9600

7)   8051 has _____ bit address bus.
a) 4   b) 8
c) 16   d) 32

8)   For making LED OFF using embedded C port 1 is initialized by _____.
a) P=0xFF;   b) P=0x00;
c) P=0x0F;   d) P=0xF0;

Q.2 Answer the following question: (Any Four)   **08**
    a) Write application of microcontroller.
    b) Write PSW of microcontroller.
    c) Explain data pointer.
    d) Define embedded system.
    e) Write concept of hardware design.
    f) Write function of accumulator.

Q.3 Write short notes: (Any Two)   **08**
    a) Explain flag register of 8051.
    b) Explain basic concept of designing of embedded system.
    c) Write difference between microprocessor and microcontroller.

Q.4 Answer the following question: (Any Two)   **08**
    a) Explain flash magic.
    b) Explain memory organization of 8051.
    c) Write program to make LED ON and OFF in embedded c program.

Q.5 Answer the following question: (Any One)   **08**
    a) Explain basic structure of embedded C with example.
    b) Explain all SFR's of 8051with byte address.

| Seat No. | | Set | P |

B.Sc. (E.C.S.) (Semester - III) (New) (CBCS) Examination: October/November - 2025
Data Structure using C++-I (ECS1301)

Day & Date: Tuesday, 04-11-2025   Max. Marks: 40
Time: 03:00 PM To 05:00 PM

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

Q.1   Choose the correct alternatives from the options.   08

1)   ____data structure is non-linear.
   a) Stack   b) Queue
   c) Array   d) Tree

2)   Which of the following data structure is used in subroutine call?
   a) Array   b) Stack
   c) Queue   d) Tree

3)   The node of ____ linked list contains two parts.
   a) Singly   b) Doubly Circular
   c) Doubly Linear   d) Both b and c.

4)   In ____ deque, element is inserted from one end and removed from either ends.
   a) Output Restricted   b) Input Restricted
   c) Priority   d) Circular

5)   In array declaration: int x[10]; Last element is stored at index ____.
   a) 0   b) 10
   c) 9   d) 19

6)   Which of the following criteria used to determine efficiency of algorithm?
   a) Space complexity   b) Time complexity
   c) Both a & b   d) None of these.

7)   "Stack underflow" occurs while performing ____ stack operation.
   a) IsEmpty()   b) PUSH()
   c) IsFull()   d) POP()

8)   Which of the following queue is used in time sharing operating system?
   a) Linear   b) Circular
   c) Priority   d) Deque

Q.2 Answer the following question: (Any Four)   08
- **a)** Give the difference between Stack and Queue.
- **b)** List out the applications of queue.
- **c)** What is multi-dimensional array? How it is initialized?
- **d)** Write the postfix expression of infix expression (X+ (Y-(Z*M) +N))/P using stack.
- **e)** Why linked list is called dynamic data structure?
- **f)** What is the precondition for insert() operation of Queue?

Q.3 Write short notes on the following: (Any Two)   08
- **a)** Greedy algorithm.
- **b)** Linked list and its types.
- **c)** Evaluation of postfix expression using stack.

Q.4 Answer the following question: (Any Two)   08
- **a)** Write a program that converts infix expression to prefix expression using stack.
- **b)** Write a program that finds maximum and minimum element of array.
- **c)** Explain ADT for Array.

Q.5 Answer the following question: (Any One)   08
- **a)** What is Doubly linear linked list? Explain its following operations.
    - I) InsertLast()
    - II) RemoveBegin()
    - III) Count()
    - IV) Search()
- **b)** Write a program to implement linear queue with its basic operations.

Seat No.	

B.Sc. (E.C.S.) (Semester - III) (New) (CBCS) Examination: October/November - 2025
Linux OS and Shell Scripting (ECS1302)

Day & Date: Thursday, 06-11-2025   Max. Marks: 40
Time: 03:00 PM To 05:00 PM

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

Q.1 Multiple choice question: **08**

1) Which of the following feature are supports by Linux?
    a) Portability   b) Communication
    c) Security   d) All of these

2) _____ Command is used to change password of your Linux system?
    a) password   b) pass
    c) passwd   d) change-p

3) The Linux Kernel was written by _____.
    a) Brian Kemighan   b) Linus Torvalds
    c) Richard Stallman   d) Dennis Ritchie

4) The command interpreter is also called the _____.
    a) Shell   b) Kernel
    b) Prompt   d) Command

5) The state of the file system is contained in _____.
    a) Boot block   b) Data Block
    c) Super Block   d) None of the above

6) To search one or more files for matching lines _____ command used?
    a) grep   b) egrep
    c) fgrep   d) all of these

7) Fedora Linux uses _____ packages.
    a) deb   b) ebuild
    c) deb_src   d) rpm

8) _____ Command is used to remove a file?
    a) remove   b) rm
    c) mv   d) del

Q.2 Answer the following question: (Any Four) 08
   a) Define Linux Distribution.
   b) Write full forms of KDE and GNOME.
   c) Define Data Block.
   d) State purpose of $tail command.
   e) Define System process.
   f) Define Shell Script.

Q.3 Write short notes on the following: (Any Two) 08
   a) Write short note on Boot Block.
   b) Write short note on background and foreground process.
   c) Write note on Piping.

Q.4 Answer the following question: (Any Two) 08
   a) Explain chmod and chown command with example.
   b) What is Shell? Explain different types of Shell?
   c) Explain the mesg and talk Communication commands with example.

Q.5 Answer the following question: (Any One) 08
   a) Define System Administrator and State roles of System Administrator?
   b) Explain Linux O.S Architecture with different feature?

| Seat No. | | **Set** | **P** |

B.Sc. (E.C.S.) (Semester - III) (New) (CBCS) Examination: October/November - 2025
Software Engineering (ECS1303)

Day & Date: Friday, 07-11-2025　　　　　　　　　　　　Max. Marks: 40
Time: 03:00 PM To 05:00 PM

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

Q.1　Multiple choice question.　　　　　　　　　　　　　　　　　08

1) Which is NOT a software characteristic?
　　a) Software does not wear out　　b) Software is flexible
　　c) Software is not manufactured　d) Software is always correct

2) DFD stands for ____.
　　a) Design Flow Diagram　　　　b) Data Flow Diagram
　　c) Defect Flow Diagram　　　　d) None of these.

3) ____ indicates the appropriate actions that are to be taken, when a condition is satisfied.
　　a) Condition Stubs　　　　　　b) Condition Entries
　　c) Action Stubs　　　　　　　d) Action Entries

4) Which of the following system implementation approach should be used if you want to run the old system and the new system at the same time for a specified period?
　　a) Direct　　　　　　　　　　b) Pilot
　　c) Phased　　　　　　　　　　d) Parallel

5) Which of the following phases of the SDLC is considered as the "ongoing process"?
　　a) System development　　　　b) System analysis
　　c) System design　　　　　　d) System maintenance

6) The most important feature of spiral model is ____.
　　a) Risk management　　　　　b) Quality management
　　c) Performance management　　d) Efficiency management

7) ____ ensures an internal consistency of data, retrieval, maintenance and stability.
　　a) ER-diagram　　　　　　　b) Normalization
　　c) DFD　　　　　　　　　　d) None of these

8) A data dictionary has information about _____.
   a) only important data elements in a data flow
   b) only key data element in a data flow
   c) every data element in a data flow
   d) only numeric data elements in a data flow

Q.2 Answer the following question: (Any Four) 08
   a) What is software?
   b) What is the purpose of DFD?
   c) What is Data Dictionary?
   d) Define the term Risk.
   e) What are the 7 Phases of SDLC?
   f) What are the types of decision table?

Q.3 Write short notes on the following: (Any Two) 08
   a) Explain various roles played by the system analyst.
   b) Fact finding technique -Interview and Questionnaire.
   c) Explain different types of system maintenance.

Q.4 Answer the following question: (Any Two) 08
   a) Explain incremental model in detail
   b) What is Flowchart? Write the principles of flowcharting.
   c) State the advantages and disadvantages of HIPO.

Q.5 Answer the following question: (Any One) 08
   a) What is Normalization? Explain up to 3NF with example.
   b) Explain the various types of system in detail.

Seat No.

B.Sc. (E.C.S.) (Semester - III) (New) (CBCS) Examination: October/November - 2025
Database Management System - I (ECS1304)

Day & Date: Saturday, 08-11-2025   Max. Marks: 40
Time: 03:00 PM To 05:00 PM

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

Q.1 Choose the correct alternatives from the options.   **08**

1) How many Primary keys can have in a table?
   a) More than 1   b) Only 1
   c) Depends on no of Columns   d) Depends on DBA

2) Which clause is used with an "aggregate function"?
   a) Select   b) Group By
   c) Where   d) None of these

3) The E-R model is expressed in term of
   I) Entities   II) The relationship among entities.
   III) The attributes of the entities.   IV) Functional relationship.
   a) I, II   b) I, II, IV
   c) II, II, IV   d) I, II, III

4) What are composite indexes?
   a) Are those which are composed by database for its internal use
   b) A composite index is a combination of index on 2 or more columns
   c) Composite index can never be created
   d) None of the mentioned

5) To combine multiple retrievals, we write several SELECT statements and put the keyword between them. What is the keyword?
   a) Combine   b) Concat
   c) Join   d) Union

6) What is the default value of column?
   a) NULL   b) 0
   c) -1   d) Undefined

7) Which of the following is a top-down approach in which the entity's higher level can be divided into two lower sub-entities?
   a) Aggregation   b) Generalization
   c) Specialization   d) All of the above

8) What type of join is needed when you wish to include rows that do not have matching values?
   a) Equi-join   b) Natural join
   c) Outer join   d) All of the mentioned

Q.2 Answer the following question: (Any Four)   **08**
   a) What is Group Function?
   b) What is Sub query?
   c) Distinguish between ALTER TABLE and UPDATE command.
   d) List database users.
   e) Distinguish between the truncate and delete command.
   f) Define the term: a) Tuple b) Domain

Q.3 Write short notes on the following: (Any Two)   **08**
   a) Explain Mapping cardinality.
   b) Explain Union and Set Difference operations in relational algebra?
   c) Explain the various operator used in SQL.

Q.4 Answer the following question: (Any Two)   **08**
   a) Explain any four Numeric functions with example.
   b) Draw notations for ER-diagram.
   c) What is Attribute? Explain different types of attribute.

Q.5 Answer the following question: (Any One)   **08**
   a) Explain primary key and foreign key constraints with example
   b) What is Join? Explain types of Join with example.

Seat No.	

B.Sc. (E.C.S.) (Semester - III) (New) (CBCS) Examination: October/November - 2025
Probability Theory (ECS1305)

Day & Date: Monday, 10-11-2025   Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
                2) Figures to the right indicate full marks.
                3) Draw neat diagrams and give equations wherever necessary.
                4) Use of logarithmic table and calculator is allowed.

Q.1 Multiple choice questions.   **08**

1) Probability of an impossible event is always ____.
   a) 0   b) 1
   c) 0.5   d) -1

2) If $P(A^c) = 0.8$, then $P(A) =$ ___.
   a) 0.8   b) 0.2
   c) 0.5   d) 1

3) Binomial distribution is a ____ distribution.
   a) Continuous   b) Discrete
   c) Both a) and b)   d) None of these

4) How many 3 letter words can be formed using the letters of the word COMPUTER?
   a) 333   b) 334
   c) 335   d) 336

5) IF $X \sim U(-3,3)$ then mean of X is ____.
   a) 0   b) 1
   c) 0.5   d) 3

6) Variance of a constant is always ____.
   a) 0   b) 1
   c) Constant   d) none of these

7) For____ distribution mean = variance.
   a) Normal   b) Uniform
   c) Poisson   d) Binomial

8) Cumulative distributive function of a continuous random variable is ___.
   a) non-negative   b) non decreasing
   c) both a) and b)   d) none of these

Q.2 Answer the following question: (Any Four)   **08**
    a) Define Binomial Distribution.
    b) Define conditional probability.
    c) Define uniform distribution.
    d) State additive property of Poisson distribution.
    e) Define Probability.
    f) Define cumulative distribution function.

Q.3 Write short notes on the following: (Any Two)   **08**
    a) For a binomial distribution with mean 4 and variance 3, find parameters of binomial distribution.
    b) Consider an experiment of rolling a fair die. Let A be the event that an even number appears. B be the event that number bigger than 3 occurs. Find the probability that appearing on uppermost face is either even or bigger than 3.
    c) State properties of Normal Distribution.

Q.4 Answer the following question: (Any Two)   **08**
    a) Find the constant k for the following pdf,
$$f(x) = k(x-1)^2 \quad 1 \le x \le 3$$
$$\qquad\quad = 0 \qquad\qquad \text{otherwise}$$
    b) Explain types of events.
    c) Explain pairwise and complete independence of three events.

Q.5 Answer the following question: (Any One)   **08**
    a) Obtain mean and variance of X having following p.m.f

X	0	1	2	3	4	5
P(X)	0.05	0.15	0.2	0.5	0.09	0.01

    b) A r.v $X \sim B\ (n = 6, p)$. Find p if, $9\ P(X = 4)\ =\ P(X = 2)$

Seat No.			**Set**	**P**

B.Sc. (E.C.S.) (Semester - III) (New) (CBCS) Examination: October/November - 2025
Data Science with Python (ECS1306)

Day & Date: Tuesday, 11-11-2025   Max. Marks: 40
Time: 03:00 PM To 05:00 PM

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

Q.1 Choose the correct alternatives from the options.   08

1)   A column is a ____ representation of Data.
   a) Diagonal   b) Top
   c) Vertical   d) Horizontal

2)   Choose the correct statement from the following.
   a) Raw data is original source of data
   b) Preprocessed data is original source of data
   c) Raw data is the data obtained after processing steps
   d) None of these

3)   Which of the following library in python is commonly used for data manipulation and analysis.
   a) Matplotlib   b) Pandas
   c) Numpy   d) Scikit-learn

4)   ____ is a primary data structure in pandas used for storing and working with tabular data.
   a) Series   b) Array
   c) DataFrame   d) Dictionary

5)   ___ is a python library widely used for creating data visualization and plots.
   a) Numpy   b) Matplotlib
   c) Scikit-learn   d) PIL

6)   Which of the following arrays is a two dimensional (2-D) array?
   a) [1, 2, 3, 4, 5]   b) [[1, 2, 3], [4, 5, 6]]
   c) [32]   d) None of these

7) What are the sequence of steps to be followed while data pre-processing?
   a) Data cleaning>Data reduction>Data transformation>Data integration
   b) Data cleaning>Data reduction> Data integration>Data transformation
   c) Data reduction> Data cleaning>Data transformation>Data integration
   d) Data cleaning> Data transformation> Data reduction>Data integration

8) The command used to install matplotlib library in python is _____.
   a) install pip matplotlib   b) install matplotlib
   c) pip matplotlib   d) pip install matplotlib

Q.2 Answer the following question: (Any Four)   **08**
   a) Write any two applications of Data Science.
   b) Define the term Data Discretization.
   c) What is Data Integration?
   d) Write a Syntax, to create ndarray and give its example.
   e) Define Python Dictionary. Give its example.
   f) What is Density plot?

Q.3 Write short notes on the following: (Any Two)   **08**
   a) Write a note on different stages in Data Science Project.
   b) Write a note on Residual Plot.
   c) Write a note on pandas DataFrame.

Q.4 Answer the following question: (Any Two)   **08**
   a) Explain Histogram with suitable example.
   b) Explain the different methods used for collecting Primary data.
   c) Write about the Measures in In-sample evaluation.

Q.5 Answer the following question: (Any One)   **08**
   a) What is Data Pre-processing? Explain Data Cleaning steps in data Pre-processing.
   b) Write a program to create a DataFrame from Excel and do the following Operations-
      i) Read the data from excel file.
      ii) Remove the duplicate rows.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - III) (New) (CBCS) Examination: October/November - 2025
Web Development using PHP (SEC-1)

Day & Date: Wednesday, 12-11-2025　　　　　　　　　　Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

Q.1 A) Choose the Correct Alternative: 　　　　　　　　　　**10**

1) Which of the following is used to connect with mysql database?
   a) mysqli_query()　　　　　　　b) mysqli_error()
   c) mysqli_insert()　　　　　　　d) mysqli_connect()

2) Which of the following is used for concatenation in PHP?
   a) +　　　　　　　　　　　　　b) *
   c) .　　　　　　　　　　　　　d) All of these

3) We can use ___ to comment a single line?
   i) /?　　ii) //　　iii) &　　iv) /* */
   a) Only (ii)　　　　　　　　　b) (i), (iii) and (iv)
   c) (ii), (iii) and (iv)　　　　　d) Both (ii) and (iv)

4) PHP's numerically indexed array begins with position ____.
   a) 1　　　　　　　　　　　　　b) 2
   c) 0　　　　　　　　　　　　　d) -1

5) Which of the functions is used to sort an array in descending order?
   a) sort()　　　　　　　　　　b) asort()
   c) rsort()　　　　　　　　　　d) dsort()

6) if $a= 12 what will be returned when ($a == 12)? 5:1 is executed?
   a) 12　　　　　　　　　　　　b) 1
   c) Error　　　　　　　　　　　d) 5

7) Which of the following function is used to unset a variable in PHP?
   a) delete()　　　　　　　　　b) unset()
   c) unlink()　　　　　　　　　d) none of these

8) PHP recognizes constructors by the name.
   a) classname()　　　　　　　b) _construct()
   c) function _construct()　　　d) function _construct

9) Which of the following function converts a string to all uppercase?
   a) upper()　　　　　　　　　b) uppercase()
   c) struppercase()　　　　　　d) strtoupper()

10) The function in PHP that can be used to concatenate array elements to form a single delimited string is _____
   a) implode()
   b) concat()
   c) explode()
   d) concatenate()

B) Fill in the blanks 06
   1) _____ is known as the father of PHP?
   2) Variable name in PHP starts with ____.
   3) The ___ function is used to open files in PHP
   4) The ___ function is used to check whether a variable is set or not.
   5) ____ function is used to set cookie in PHP?
   6) ____ used to end a statement in PHP?

Q.2 Solve the following. (Any Eight) 16
   a) What is basic syntax of PHP?
   b) What is multidimensional array?
   c) What is client?
   d) What is cookie?
   e) What is Control statements in PHP.
   f) What is Session?
   g) Define variable
   h) Define var_dump()
   i) What is data type? list of php data type?

Q.3 A) Attempt the following. (Any Two) 10
   a) Explain comparing and joining strings function.
   b) Explain $_GET and $_POST variable.
   c) Explain Data Types in MySQL

B) Short Notes. 06
   Date and Time function in php.

Q.4 Attempt the following. (Any Two) 16
   a) Explain different sorting techniques of arrays with examples.
   b) Explain operators in php.
   c) Write a PHP code create form using text,button control and retrieving form data using $_GET variable.

Q.5 Attempt the following. (Any Two) 16
   a) Write a PHP code encoding and decoding session variable.
   b) Design a web application to perform following task on employee table
   I) Add New   II) Save   III) Delete   IV) Update   V) Display
   c) What is file? Explain Functions of file in php?

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - III) (CBCS) Examination: October/November - 2025
Probability Theory – I (ECS0305)

Day & Date: Tuesday, 04-11-2025   Max. Marks: 40
Time: 03:00 PM To 05:00 PM

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

Q.1 Choose the correct alternatives from the options.   **08**

1) In the simultaneous tossing of two fair coins, the probability of getting at least two heads is ___.
   a) $1/4$ b) $3/4$
   c) $1/2$ d) $2/3$

2) Probability of any event always lies between ____.
   a) 0   b) 0 to 1
   c) 1   d) none of these

3) The mean of the Binomial distribution is ___.
   a) np   b) npq
   c) n   d) p

4) Variance of constant is always _____.
   a) 1   b) 0
   c) 4   d) 2

5) A caption and vice-captain out of 11 player's team of cricket can be chosen in ___ Ways.
   a) 11P2   b) 11P9
   c) 11C2   d) 11C9

6) For a discrete random variable X if $E(X) = 3$ then $E(2X + 3) =$ __.
   a) 6   b) 9
   c) 8   d) none of these

7) If $X \Longrightarrow H(n = 5, m = 4, N = 100)$ then $E(X) =$ ___.
   a) $2/5$ b) $9/5$
   c) $1/5$ d) none of these

8) In a family of parametric distribution in which mean = variance is ___ distribution.
   a) Binomial   b) Poisson
   c) hyper geometric   d) none of these

Q.2 Answer the following question: (Any Four)   **08**
   a) Define permutation with examples.
   b) $X \to B(6, 0.4)$ Find Variance of X.
   c) Define mathematical Expectation and write its formula.
   d) Define sure event with illustration.
   e) If X is Poisson distribution with parameter $m = 4$ then find $P(X = 0)$.
   d) Define sample space with illustration.

Q.3 Answer the following: (Any Two)   **08**
   a) A and B are independent with $P(A) = 0.5 , P(B) = 0.4$ find
      i) $P(A \cap B)$
      ii) $P(A \cup B)$
   b) If three unbiased coins are tossed find probability of occurrence of
      a) at least two heads   b) at most two heads
   c) State any four properties of cumulative distribution function.

Q.4 Answer the following question: (Any Two)   **08**
   a) How many three digit numbers can be formed using the digits 4,5,6,9 if
      I)   Repetition of digit is not allowed
      II) Repetition of digit is allowed
   b) Define Poisson distribution. State additive property of it.
   c) The p.m.f. of random variable X is given below

X	1	2	3	4	5
P(X)	K	2k	4k	3k	k

      a)   Find the value of k.
      b) $P(x > 5)$

Q.5 Answer the following question: (Any One)   **08**
   a) Find the value of n if $^nC_8 = {}^nC_7$
   b) State Axioms of probability. Prove that probability of an impossible event is 0.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - III) (CBCS) Examination: October/November - 2025
Introduction to Python Programming (ECS0307)

Day & Date: Thursday, 06-11-2025   Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams and give equations wherever necessary.
4) Use of logarithmic table and calculator is allowed.

Q.1   Multiple choice questions: **08**

1) Which of these in not a core data type?
   a) Lists
   b) Dictionary
   c) Tuples
   d) Class

2) What is the return type of function id?
   a) Int
   b) float
   c) Bool
   d) dict

3) What data type is the object below?
   L = [1,23, 'hello', 1]
   a) list
   b) dictionary
   c) array
   d) tuple

4) Which of the following results in a SyntaxError?
   a) '"Once upon a time...", she said.'
   b) "He said, 'Yes!'"
   c) '3\'
   d) '''That's okay'''

5) Which of the following is invalid?
   a) _a = 1
   b) __a = 1
   c) __str__ = 1
   d) none of the mentioned

6) Which of the following statements create a dictionary?
   a) d = {}
   b) d = {"john":40, "peter":45}
   c) d = {40:"john", 45:"peter"}
   d) All of the mentioned

7) Which of the following is not an advantage of using modules?
   a) Provides a means of reuse of program code
   b) Provides a means of dividing up tasks
   c) Provides a means of reducing the size of the program
   d) Provides a means of testing individual parts of the program

8) Which of the following creates a pattern object?
  a) re.create(str)   b) re.regex(str)
  c) re.compile(str)   d) re.assemble(str)

Q.2 Answer the following question: (Any Four)   08
  a) Define syntax for creating List.
  b) What is regular Expression?
  c) What is __init__?
  d) What is slicing in Python?
  e) What are local variables and global variables in Python?
  f) What is the difference between Python Arrays and lists?

Q.3 Write short notes on the following: (Any Two)   08
  a) Random module.
  b) Dictionary.
  c) Operators.

Q.4 Answer the following question: (Any Two)   08
  a) Explain types of regular expression in details.
  b) Write a program to check given no is Armstrong or not.
  c) Explain looping statement with suitable example.

Q.5 Answer the following question: (Any One)   08
  a) What is Exception? Explain its types with suitable example.
  b) Explain function overloading and overriding with suitable example.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - IV) (New) (CBCS) Examination:
October/November - 2025
Data Structure using C++ - II (ECS1401)

Day & Date: Tuesday, 04-11-2025 Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams and give equations wherever necessary.
4) Use of logarithmic table and calculator is allowed.

Q.1 Multiple choice questions. 08

1) The necessary condition for using binary search in an array is _____.
   a) The array should not be too long
   b) The array should of more size
   c) The array should be sorted
   d) None of these

2) If every node u in G adjacent to every other node v in G, A graph is said to be _____.
   a) Isolated b) complete
   c) Finite d) strongly connected

3) Depth first search is equivalent to which of the traversal in the Binary tree?
   a) Pre-order b) Post-order
   c) In-order d) None of these

4) The given array is $arr = \{1.2.4, 3\}$. Bubble sort is used to sort the array elements. How many iterations will be done to sort the array?
   a) 4 b) 2
   c) 1 d) 0

5) Consider a node X in a Binary Tree. Given that X has two children, let Y be In order successor of X. Which of the following is true about Y?
   a) Y has no right child b) Y has no left child
   c) Y has both children d) None of these

6) What is the maximum height of any AVL tree with 7 nodes? Assume that height of tree with single node is 0.
   a) 2 b) 3
   c) 4 d) 5

7) ____ is putting an element in the appropriate place in a sorted list yields a larger sorted order list.
   a) Insertion
   b) Extraction
   c) Selection
   d) Distribution

8) The average case occurs in the Linear Search Algorithm when: ____.
   a) The item to be searched is in some where middle of the Array
   b) The item to be searched is not in the array
   c) The item to be searched is in the last of the array
   d) The item to be searched is either in the last or not in the array

Q.2 Answer the following question: (Any Four)   **08**
   a) How binary search tree differ from binary tree?
   b) List out various types of graphs.
   c) What are the advantages of shell sort?
   d) What is meant by internal and external sorting?
   e) Describe the complexity of bubble sort.
   f) List the applications of trees.

Q.3 Attempt the following. (Any Two)   **08**
   a) Simulate preorder and postorder traversal for the following tree.
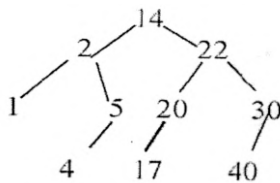
   b) Explain bubble sort. Sort the following numbers using bubble sort.
      35,12,14,9,15,45,32,95,40,5.
   c) Explain AVL Tree with example.

Q.4 Answer the following question: (Any Two)   **08**
   a) What are the rules to be followed to construct a binary search tree? Give one example.
   b) Describe representation of binary tree using array and linked list.
   c) Select the best sorting method out of the following - insertion sort, quick sort and merge sort and give justification.

Q.5 Answer the following question: (Any One)   **08**
   a) Write an algorithm for binary search. Search the element 2 from the sequence 3, 1, 4, 1, 5, 9, 2, 6, 5 using Binary search.
   b) Prepare a quick sort algorithm and explain with suitable example. Give its worst case, average case and best case time complexities.

Seat No.	

B.Sc. (E.C.S.) (Semester - IV) (New) (CBCS) Examination: October/November - 2025
Core Java (ECS1402)

Day & Date: Thursday, 06-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

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

Q.1 Multiple choice questions.   08

1) Who invented Java Programming language?
   a) Guido van Rossum   b) James Gosling
   c) Dennis Ritchie   d) Bjarne Stroustrup

2) _____ is the name of the method used to start a thread execution?
   a) init();   b) run();
   c) start();   d) resume();

3) _____ keyword can be used in subclass to call the constructor of super class?
   a) Super   b) this
   c) Extent   d) extends

4) A Java Class inherits Constants and Methods of an Interface using _____ keyword.
   a) Interface   b) Implements
   c) Extends   d) All the above

5) Java is a _____ programming language.
   a) platform-independent   b) platform-dependent
   c) code dependent   d) sequence-dependent

6) Which component is used to compile, debug and execute the java programs?
   a) JRE   b) JIT
   c) JDK   d) JVM

7) _____ keywords must be used to handle the exception thrown by try block in some rational manner?
   a) Try   b) finally
   c) Throw   d) catch

8) After compilation, an Interface or Abstract-Class is kept in a_____ file in Java Programming.
   a) .java   b) .cls
   c) .class   d) .interface

Q.2 Answer the following question: (Any Four) 08
    a) What is Static and non-static data members in java
    b) Define the term package?
    c) What is Interfaces in java?
    d) What is mean by Inheritance in java?
    e) What are Wrapper Classes?
    f) Define the term Set and list?

Q.3 Attempt the following: (Any Two) 08
    a) Explain Serializable interface with suitable example?
    b) What is Thread? Explain Thread life cycle in java?
    c) Explain JTextBox and JCheckBox with suitable example?

Q.4 Answer the following question: (Any Two) 08
    a) Differentiate between AWT and Swing?
    b) Explain use of final keyword with example?
    c) Explain Event Model in Event handling?

Q.5 Answer the following question: (Any One) 08
    a) Explain JVM architecture with different Features of Java?
    b) Explain Object class and methods with example?

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - IV) (New) (CBCS) Examination: October/November - 2025
Software Testing (ECS1403)

Day & Date: Friday, 07-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
                 2) Figures to the right indicate full marks.
                 3) Draw neat diagrams and give equations wherever necessary.
                 4) Use of logarithmic table and calculator is allowed.

Q.1 Choose the correct alternatives from the options.   **08**

1) Which of the following term describes testing?
    a) Finding broken code
    b) Evaluating deliverable to find errors
    c) A stage of all projects
    d) None of the mentioned

2) Alpha testing is done at _____.
    a) Developer's end   b) User's end
    c) Developer's & User's end   d) None of the mentioned

3) White Box techniques are also classified as _____.
    a) Design based testing   b) Structural testing
    c) Error guessing technique   d) None of the mentioned

4) Software Debugging is a set of activities that can be planned in advance and conducted systematically.
    a) True   b) False

5) Test should be conducted for every possible _____.
    a) data   b) Case
    c) variable   d) all of the mentioned

6) Effective testing will reduce _____ cost.
    a) maintenance   b) design
    c) coding   d) documentation

7) A set of activities that ensure that software correctly implements a specific function.
    a) verification   b) Testing
    c) implementation   d) Validation

8) Which of the following is not a regression test case?
   a) A representative sample of tests that will exercise all software functions
   b) Additional tests that focus on software functions that are likely to be affected by the change
   c) Tests that focus on the software components that have been changed
   d) Low-level components are combined into clusters that perform a specific software sub-function

Q.2 Answer the following question: (Any Four)   **08**
   a) Define automated testing.
   b) Write down advantages of regression testing.
   c) List out types of functional testing.
   d) Write down need of WBT?
   e) Define error and bugs.
   f) What is alpha testing?

Q.3 Attempt the following: (Any Two)   **08**
   a) Explain Equivalence Class Partitioning.
   b) Differentiate static and dynamic testing.
   c) Note on soak testing.

Q.4 Answer the following question: (Any Two)   **08**
   a) Design a test case for to login Gmail account.
   b) Explain integration testing.
   c) Explain Cause Effective Graph.

Q.5 Answer the following question: (Any One)   **08**
   a) Define test case template. Explain it with example.
   b) Explain defect life cycle in detail.

Seat No.	

B.Sc. (E.C.S.) (Semester - IV) (New) (CBCS) Examination: October/November - 2025
Database Management System – II (ECS1404)

Day & Date: Saturday, 08-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

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

Q.1 Multiple choice questions.   **08**

1) states that only valid data will be written to the database
     a) Consistency   b) Atomicity
     c) Durability   d) Isolation

2) If transaction acquires exclusive locks, then it can perform ____ operation.
     a) Read   b) Write
     c) Read and Write   d) Update

3) The deadlock state can be changed back to stable state bv using statement.
     a) Commit   b) Rollback
     c) Savepoint   d) Deadlock

4) Which of the following are the 3 parameter modes for a procedure in PL/SQL?
     a) IN, OUT, IN OUT
     b) LOCAL, GLOBAL, LOCAL GLOBAL
     c) READ, WRITE, APPEND
     d) CUT, COPY, PASTE

5) In PL/SQL, a cursor is a pointer to which of the following area?
     a) Content Area   b) Contest Area
     c) Context Area   d) Contact Area

6) Which of the following is raised when a SELECT INTO statement returns no rows?
     a) CASE_NOT_FOUND   b) NOT_LOGGED_ON
     c) NO_DATA_FOUND   d) ACCESS_INTO_NULL

7) Which of the following operator is used to assign values to a variable in PL/SQL ?
     a) =   b) ==
     c) :=   d) =:

8) The log is a sequence of _____ recording all the update activities in the database.
a) Log records   b) Records
c) Entries   d) Redo

Q.2 Answer the following question: (Any Four)   **08**
a) What is a transaction?
b) List the steps in query processing.
c) What is meant by concurrency control?
d) What is deadlock?
e) Define lock.
f) What is Schedule?

Q.3 Write short notes on the following: (Any Two)   **08**
a) Explain ACID properties of transaction.
b) Describe the PL/SQL block structure with example.
c) Explain trigger in PL/SQL.

Q.4 Answer the following question: (Any Two)   **08**
a) Explain If-Then-Elsif statement with example.
b) Differentiate between PL/SQL Function and Procedure.
c) Explain View Serializability with example.

Q.5 Answer the following question: (Any One)   **08**
a) What is cursor? Explain types of cursor.
b) Explain two-phase locking protocol with example.

Seat No.	

Set **P**

B.Sc. (E.C.S.) (Semester - IV) (New) (CBCS) Examination: October/November - 2025
Descriptive Statistics (ECS1405)

Day & Date: Monday, 10-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
                 2) Figures to the right indicate full marks.
                 3) Use of any type of calculator is allowed.
                 4) Graph papers are supplied on request.

Q.1 Choose the correct alternatives from the options.   **08**

1) From Ogive curve we can determine the measure of central tendency _____.
   a) A.M.   b) Median
   c) Mode   d) All of These

2) Karl Pearson's correlation coefficient always lies between _____.
   a) 0 to 1   b) -1 to 0
   c) -1 to 1   d) None of these

3) A.M. of observations 10, 15, a, 25, 30 is 20 then the value of a = _____.
   a) 20   b) 25
   c) 15   d) None of these

4) Coefficient of range for the observations 15, 18, 17, 20, 25 is _____.
   a) 25   b) 0.25
   c) 15   d) None of these

5) Testing of human blood is an example of_____
   a) SRSWOR   b) SRSWR
   c) SRS   d) None of these

6) If population is heterogeneous, then _____ Sampling method provides most representative sample.
   a) SRS   b) Stratified
   c) Systematic   d) All of these

7) If $5X + 8Y = 15$ is regression equation of X on Y then regression coefficient of it is_____.
   a) 8/5   b) 5/8
   c) -8/5   d) None of these

8) In _____ types of classes, upper limit of class is the lower limit of next class.
   a) inclusive
   b) exclusive
   c) open end
   d) All of these

Q.2 Answer the following question. (Any Four) **08**
   a) Define Statistical population & sample.
   b) State any to merits of A.M.
   c) If regression coefficient of Y on X is 1.3 and X on Y is 0.70, then find correlation coefficient between X and Y.
   d) If X and Y are random variables with cov(X,Y)= -130 and S.D. of X is 10 and S.D. of Y is 9. Find coefficient of regression of X and Y.
   e) Define mode.
   f) Find median of 23, 27, 20, 18, 22, 26, 17.

Q.3 Answer the following question. (Any Two) **08**
   a) Find mode from the following data.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	4	6	12	10	5

   b) Distinguish between absolute & relative measures of dispersion.
   c) Describe Stratified random sampling method.

Q.4 Answer the following question. (Any Two) **08**
   a) Find correlation coefficient between X and Y if
   $n = 10, \Sigma x = 160, \Sigma y = 220, \Sigma y^2 = 6149, \Sigma x^2 = 3126, \Sigma xy = 4237$
   b) For a certain bivariate data, the regression equations are 3X+2Y=26 and 6X+Y=30. Find A.M. of X and Y.
   c) Define the following terms:
      i) Class interval
      ii) Median
      iii) Less than cumulative frequency
      iv) Mid-point of class

Q.5 Answer the following question. (Any One) **08**
   a) Represent the following data by less than Ogive curve and hence find median value.

Class	10-20	20-30	30-40	40-50	50-60	60-70
Freq.	5	10	15	20	14	8

   b) Derive the line of regression of X on Y.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - IV) (New) (CBCS) Examination: October/November - 2025
Data Visualization (ECS1406)

Day & Date: Tuesday, 11-11-2025　　　　　　　　　　Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory
　　　　　　　2) Draw neat diagrams and give equations wherever necessary.
　　　　　　　3) Figures to right indicate full marks.
　　　　　　　4) Use of logarithmic table and calculator is allowed.

Q.1　Choose the correct alternatives from the options.　　　　　　08

1)　The _____ is NOT a component of Power BI.
　　a)　Power Query　　　　　b)　Power Flow
　　c)　Power Pivot　　　　　d)　Power View

2)　The _____ is used for creating custom calculations and measures in Power BI.
　　a)　Python
　　b)　JavaScript
　　c)　DAX (Data Analysis Expressions)
　　d)　SQL

3)　The _____ is cloud-based service provided by Microsoft for sharing and collaborating on Power BI reports and dashboards.
　　a)　Power Share　　　　　b)　Power Access
　　c)　Power Service　　　　d)　Power BI Service

4)　The _____ is a feature in Power BI allows you to create interactive visualizations that respond to user interactions.
　　a)　Slicers　　　　　　　b)　Filters
　　c)　Drillthrough　　　　d)　Bookmarks

5)　The _____ is NOT supported by Power BI for data visualization purpose.
　　a)　Scatter plot　　　　　b)　Heatmap
　　c)　Radar chart　　　　　d)　Stacked area chart

6)　The _____ visualization technique is best suited for comparing proportions or percentages in Power BI.
　　a)　Line chart　　　　　　b)　Pie chart
　　c)　Scatter plot　　　　　d)　Gauge chart

7)　The result of the DAX function DIVIDE(10,0) is _____.
　　a)　Error　　　　　　　　b)　0
　　c)　Infinity　　　　　　d)　BLANK()

8) The _____ function is used to count non-blank rows in DAX.
   a) COUNT()   b) COUNTA()
   c) COUNTBLANK()   d) COUNTROWS()

Q.2 Answer the following question: (Any Four)   **08**
   a) What is data modeling in Power BI?
   b) How can you rename a column in Power BI?
   c) What is Business Intelligence (BI)?
   d) What is the process of changing and detecting data types in Power BI?
   e) What is the difference between a table and a matrix visualization?
   f) What is the purpose of the navigation pane in Power BI.

Q.3 Attempt the following questions: (Any Two)   **08**
   a) Explain Features of Power BI in detail.
   b) What is measure? Explain how to add measures in data. Explain with example.
   c) What is DAX, and why is it essential for data analysis in Power BI?

Q.4 Answer the following questions: (Any Two)   **08**
   a) List four different data sources supported by Power BI. Explain how to upload data.
   b) Describe how to create relationships manually in Power BI.
   c) Explain the different types of joins available in Power BI. What factors influence the choice of join type?

Q.5 Answer the following question: (Any One)   **08**
   a) What are the primary components of Power BI? Explain each in detail.
   b) Discuss different types of DAX functions, providing, examples for aggregate, date, logical, math, and string functions.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - IV) (CBCS) Examination: October/November - 2025
Operating System (ECS0403)

Day & Date: Tuesday, 04-11-2025　　　　　　　　　　　　　Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
　　　　　　　　2) Draw neat diagrams and give equations wherever necessary.
　　　　　　　　3) Figures to the right indicate full marks.

Q.1　Multiple choice questions.　　　　　　　　　　　　　　　　08

1)　Which of the following is not a type of operating system?
　　a)　Batch OS　　　　　　　　　　b)　Time-Sharing OS
　　c)　Distributed OS　　　　　　　　d)　Compiler OS

2)　The Process Control Block (PCB) contains information about _____.
　　a)　The next instruction to execute
　　b)　Process state, program counter, CPU registers
　　c)　Scheduling information
　　d)　All of the above

3)　In Round Robin Scheduling, each process is assigned _____.
　　a)　A variable time quantum　　　b)　A fixed time quantum
　　c)　Priority level　　　　　　　　d)　A semaphore value

4)　Which of the following is not a condition for deadlock?
　　a)　Mutual exclusion　　　　　　b)　Hold and wait
　　c)　Preemption　　　　　　　　　d)　Circular wait

5)　Resource Allocation Graph (RAG) is used to represent _____.
　　a)　Scheduling policies　　　　　b)　Deadlocks
　　c)　File structures　　　　　　　d)　Memory allocation

6)　In paging, the address generated by CPU is called:
　　a)　Physical address　　　　　　b)　Logical address
　　c)　Virtual address　　　　　　　d)　None of these

7)　Which of these is not part of process state?
　　a)　Running　　　　　　　　　　b)　Waiting
　　c)　New　　　　　　　　　　　　d)　Compiled

8)　Which disk scheduling algorithm may cause starvation?
　　a)　FCFS　　　　　　　　　　　b)　SSTF
　　c)　SCAN　　　　　　　　　　　d)　C-SCAN

Q.2 Answer the following question. (Any Four)   08
    a) Define Swapping.
    b) What is Paging?
    c) Define Operating System.
    d) What is Disk Scheduling?
    e) What is a Race Condition?

Q.3 Write short notes on the following. (Any Two)   08
    a) Explain the concept of Threads and their types.
    b) Describe the Producer-Consumer Problem in process synchronization.
    c) Describe fragmentation and compaction in memory management.

Q.4 Answer the following question: (Any Two)   08
    a) Explain in detail the various types of Operating Systems and their features.
    b) Describe Process scheduling criteria and explain FCFS and SJF scheduling algorithms.
    c) Explain the File System Structure and various File Allocation Methods.

Q.5 Answer the following question. (Any One)   08
    a) Explain the methods of handling Deadlocks: Prevention, Avoidance, Detection, and Recovery.
    b) Explain Paging and Segmentation in details.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - IV) (CBCS) Examination: October/November - 2025
Optimization techniques (ECS0406)

Day & Date: Thursday, 06-11-2025　　　　　　　　　　Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
　　　　　　　2) Draw neat diagrams and give equations wherever necessary.
　　　　　　　3) Figures to the right indicate full mark.
　　　　　　　4) Use of logarithmic table and calculator is allowed.

Q.1　Choose the correct alternative.　　　　　　　　　　　　　　08

1) For solving an assignment problem which method is used _____.
   - a) Hungarian
   - b) Simplex
   - c) American
   - d) MODI

2) A feasible solution is called a basic feasible solution if the no. of non-negative allocation is equal to _____.
   - a) $M - n + 1$
   - b) $m - n - 1$
   - c) $m + n - 1$
   - d) $m + n + 1$

3) One can find the initial basic feasible solution by using _____.
   - a) VAM
   - b) MODI
   - c) Optimal test
   - d) None

4) A given T.P is said to be unbalance if the total supply is not equal to total _____.
   - a) Optimization
   - b) Demand
   - c) Row
   - d) Column

5) The cost associated with slack or surplus variable in objective function is _____.
   - a) One
   - b) Positive
   - c) Negative
   - d) Zero

6) A given A.P is said to be balance if the number of rows and columns are _____.
   - a) equal
   - b) not equal
   - c) same
   - d) a&c

7) In _____ problem no. of rows equal to number of columns.
   - a) Transportation
   - b) Assignment
   - c) Linear Programming
   - d) None

8) A feasible solution to an LPP which is also the basic solution is called
   _____ solution.
   a) Feasible
   b) Optimal
   c) Basic Feasible
   d) Alternate

Q.2 Answer the following. (Any Four)   08
   a) Define surplus variables in L.P.P.
   b) Define term Decision variable.
   c) Define Transportation problem.
   d) Define non-generate solution of a $m \times n$ T.P.
   e) Write the standard form of the given L.P.P.
      $Max. z = 15x + 23y$
      subject to the constraints, $2x + 4y \leq 6$
      $$x + 3y \leq 9$$
      $$x, y \geq 0$$
   d) Define term Operation research.

Q.3 Answer the following. (Any One)   08
   a) Explain North-West corner Method.
   b) Write a note on unbalanced T.P.
   c) Write down the limitations of O.R.

Q.4 Answer the following. (Any Two)   08
   a) Find I.B.F.S. by Least Cost Method:

	W_1	W_2	W_3	W_4	Capacity
F_1	19	30	50	10	7
F_2	70	30	40	60	9
F_3	40	8	70	20	18
Demand	5	8	7	14	34

   b) Write the dual of following L.P.P.
      Minimize: $z = 5x - 3y + 4z$
      Subject to: $4x + 3y \geq 6$
      $$2x + 3y - 5z \geq 6$$
      $$x - y \geq 6$$
      $$x, y, z \geq 0$$
   c) Write a note on degeneracy in T.P.

Q.5 Answer the following. (Any One)   08
   a) Write down the scope of Operation Research.
   b) Solve the LPP by using simplex method:
      Maximize: $z = 3x + 2y$
      Subject to: $x + y \leq 4$
      $$x - y \leq 2$$
      and $x, y \geq 0$

Seat No.	

Set **P**

B.Sc. (E.C.S.) (Semester - V) (New) (CBCS) Examination: October/November - 2025
English (Compulsory)
Business English (ECS1501)

Day & Date: Tuesday, 28-10-2025   Max. Marks: 40
Time: 09:00 AM To 12:00 PM

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

Q.1   Choose the correct alternatives from the options.   08
    1) Where did Dr. kalam deliver this famous speech?
        a) IIT, Kharagpur   b)   IIT, Hyderabad
        c) IIM, Lucknow   d)   IIM, Kolkata

    2) The school master live in_____
        a) mansion   b)   bungalow
        c) cottage   d)   apartment

    3) Who snatched the queen's mirror?
        a) Her daughter   b)   The new bride
        c) The king   d)   None of the above

    4) What, according to the poet is the first stage of human life?
        a) old age   b)   infancy
        c) being a student   d)   death

    5) According to the poet, money is our vast _____ madness.
        a) insanity   b)   collective
        c) collection   d)   None of the above

    6) Who came to visit Phatik's mother?
        a) Their grandfather   b)   Their uncle
        c) Their aunt   d)   Cousin

    7) Wait for the computer to _____.
        a) shut down   b)   boot up
        c) sing up   d)   log in

    8) The mason is building the wall. (Change into Passive Voice)
        a) The wall is being built by the mason.
        b) The wall was being built by the mason.
        c) The wall were being built by the mason.
        d) None of the above

Q.2 **Answer the following question in brief. (Any Four)** **12**
  a) Why did Phatik's mother readily agree to the uncle's offer?
  b) Why is queen unsatisfied and seek a rival?
  c) Describe the character of the village schoolmaster?
  d) What according to Lawrence, should be provided free of cost?
  e) What are the three vision Dr. kalam had for India?
  f) Why do men and women have exits and entrance in the play of life?

Q.3 **Answer the following. (Any One)** **10**
  a) Explain the 21st century skills in details.
                      OR
  b) Explain the types of 21st Century skills.

Q.4 **Answer the following question.** **10**
  What is learning skill? Explain four types of learning skills.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - V) (New) (CBCS) Examination: October/November - 2025
Data Communication and Networking (ECS1502)

Day & Date: Wednesday, 29-10-2025   Max. Marks: 80
Time: 09:00 AM To 12:00 PM

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

Q.1 A)   Multiple choice questions.   10

1) The OSI model consists of _____layers.
    a) Five   b) Seven
    c) Eight   d) Nine

2) Which one of the following is not a network topology?
    a) Star   b) Ring
    c) Bus   d) Peer to Peer

3) DNS is the abbreviation of _____
    a) Dynamic Name System   b) Dynamic Network System
    c) Domain Name System   d) Domain Network Service

4) Network layer is responsible for _____
    a) Logical addressing   b) Physical addressing
    c) Port addressing   d) MAC addressing

5) Which of the following is an error correcting code?
    a) Checksum   b) Parity
    c) Cyclic redundancy check   d) Hamming codes

6) In TDM, slots are further divided into _____
    a) Seconds   b) Frames
    c) Packets   d) Bits

7) Bluetooth is an example of _____
    a) Personal area network   b) Local area network
    c) Virtual private network   d) Wide area network

8) Wireless transmission of signals can be done via
    a) Radio waves   b) Microwaves
    c) Infrared   d) All of the mentioned

9) Which network topology requires a central controller or hub?
    a) Star   b) Ring
    c) Bus   d) None of these

    10) Data communication system within a building or campus is
        a) LAN   b) MAN
        c) WAN   d) PAN

B) Fill in the blank.   **06**
    1) URL stands for_____
    2) Network components are connected to the same cable in the _____ topology.
    3) _____is the transmission of data between two or more computer over communication links.
    4) The ____ layer is the layer closest to the transmission medium.
    5) A device that converts digital signals into analog signals is_____
    6) _____is a group of two or more computers that are linked in order to share resources such as printers, files, and other resource.

Q.2 Solve any Eight of the following.   **16**
    a) What are the benefits of the networks?
    b) Define Analog and Digital signal.
    c) Define the term data communication.
    d) What is WWW?
    e) What is Hub?
    f) Which are the key elements of protocol?
    g) Define WAN.
    h) What is flow control?
    i) What is frequency?
    j) What is Transmission Media?

Q.3 A) Attempt any Two of the following.   **10**
    1) Explain the connection oriented and connection less services in data communication.
    2) Explain Parallel and Serial Transmission.
    3) What is network? Explain uses of computer network.

    B) Explain Error Recovery Protocol in detail.   **06**

Q.4 A) Attempt any Two of the following.   **08**
    1) Explain pulse code modulation in detail with diagram.
    2) Explain the Data link layer Design issues in detail.
    3) What is topology? Explain Star topology in detail.

    B) Explain ISO-OSI reference model in detail with diagram.   **08**

Q.5 Attempt any Two of the following.   **16**
    a) Explain types of Network with advantages and disadvantages in detail.
    b) Explain Transmission Guided Media and Unguided Media in detail.
    c) What is Routing? Explain Link State Routing Algorithms.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - V) (New) (CBCS) Examination: October/November – 2025
Advanced Java (ECS1503)

Day & Date: Thursday, 30-10-2025   Max. Marks: 80
Time: 09:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
                          2) Each question should only one correct option.

Q.1 A) Multiple choice questions.   **10**
  1) The Hibernate XML configuration file name is _____.
      a) hibernate.config.xml   b) hibernate.cfg.xml
      c) hibenate.cg.xml   d) None of These

  2) Which of the following is not an advantage of using Hibernate Query Language?
      a) Data Independent   b) Easy to write query
      c) No need to learn SQL   d) Difficult to implement

  3) The life cycle of a servlet is managed by _____ .
      a) Servlet Container   b) Servlet Context
      c) Supporting Protocol   d) All of these

  4) Dependency Injection is a_____.
      a) Framework   b) UML
      c) Design Pattern   d) Pluggin

  5) Hibernate is an _____.
      a) Open Source   b) Lightweight
      c) ORM   d) All of These

  6) _____ interface is used to call the stored procedure.
      a) CallableStatement   b) PreparedStatement
      c) CallStatement   d) Statement

  7) The ServerSocket class used to create socket for_____
      a) TCP   b) IP
      c) UDP   d) All of These

  8) _____ driver if known as thin driver in JDBC.
      a) Type 1 driver   b) Type 2 driver
      c) Type 3 driver   d) Type 4 driver

9) _____ is required less resources.
   a) Thread   b) Process
   c) Both a and b   d) None of above

10) _____ is not a directive.
    a) Page   b) Include
    c) Tag   d) Export

B) One sentence answer.   **06**
   1) CGI stands for _____.
   2) JSTL stands for _____.
   3) <% %> this syntax in JSP is called as _____.
   4) _____ package is used for network programming.
   5) _____ invoked only once when first request comes for the servlet.
   6) _____ is the PrintWriter implicit object used to send output to the client.

Q.2 Solve the following. (Any Eight)   **16**
   a) Why use TCP?
   b) Define Socket.
   c) Write a two difference between CGI and Servlet.
   d) What is Hibernate?
   e) What is the use of Hidden Form Field?
   f) Define Session and Cookies.
   g) Give advantages of session in Servlet.
   h) What is Bean?
   i) Why use JSP?
   j) Write a four features of Servlet.

Q.3 A) Attempt the following. (Any Two)   **10**
   1) What is InetAddress class? Explain with example.
   2) Explain life cycle of servlet.
   3) Explain Statement interface with Example.

   B) Write a note on types of JDBC driver.   **06**

Q.4 A) Attempt the following. (Any Two)   **08**
   1) What is Cookie? Write a program to create and add cookie.
   2) Explain request and response implicit objects with methods and example in JSP.
   3) Write a program to demonstrate Socket and ServerSocket class.

   B) Explain declarative, expression elements of JSP in details. **08**

Q.5 Answer the following. (Any Two)   **16**
   a) Explain inheritance mapping in hibernate.
   b) Explain JSTL SQL tags.
   c) Explain RequestDispacher interface with example.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - V) (New) (CBCS) Examination: October/November– 2025
Dot NET Core (ECS1504)

Day & Date: Friday, 31-10-2025   Max. Marks: 80
Time: 09:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
    2) Draw neat labeled diagrams wherever necessary.
    3) Figures to right indicate full marks.

Q.1 A) Choose and write correct answer from given alternatives: **10**
1) Which keyword is used to declare an enumeration in C#?
    a) Enum   b)   var
    c) class   d)   struct

2) _____are the correct statement about delegate.
    a) Delegates can be used to implement callback notification
    b) Delegates permit execution of a method on a secondary thread in an asynchronous manner
    c) Delegate is a user defined type
    d) All of the mentioned

3) Select the correct statement about an Exception?
    a) It occurs during loading of program
    b) It occurs at run time
    c) It occurs during Just-In-Time compilation
    d) All of these

4) Destructor will be called by_____
    a) Monitor   b)   garbage collector
    c) dispose()   d)   object

5) Which keyword is used to inherit from a base class in C#?
    a) Extends   b)   super
    c) base   d)   :

6) What interface should a class implement to release unmanaged resources manually?
    a) ICleanup   b)   IDisposable
    c) IRelease   d)   ICollector

7) A type of class which does not have its own objects but acts as a base class for its subclass is known as_____.
    a) Static class   b)   Sealed class
    c) Abstract class   d)   None of the above

8) Which access modifier allows a class member to be accessed only within the same class?
   a) public
   b) protected
   c) private
   d) internal

9) Indexer is declared using _____ keyword.
   a) new
   b) base
   c) get
   d) This

10) Which of these keywords is not a part of exception handling?
    a) try
    b) finally
    c) thrown
    d) catch

B) Fill in the Blank.   **06**
1) _____ is used to access members of class before the object of that class is created.
2) A _____ is an identifier assigned to memory location where data is stored.
3) A _____ lambda contains a single expression and returns the result of that expression.
4) In LINQ, the where, select, and from keywords are part of _____ syntax.
5) Windows Forms applications are built on the _____ class from the System.Windows.Forms namespace.
6) _____ namespace supports for multithreading programming.

Q.2 Solve the following. (Any Eight)   **16**
   a) What is Local variable?
   b) List out Access Specifiers.
   c) Define Properties.
   d) What is Collection Classes?
   e) Define Virtual Method.
   f) What is the use of using statement in C#?
   g) Define Abstract class.
   h) What is Thread Pool Thread?
   i) Give the use of try keyword.
   j) What is difference between ListBox & ComboBox?

Q.3 A) Attempt the following. (Any Two)   **10**
   a) Explain Indexer with suitable example.
   b) What is LINQ? Write a LINQ query to select even numbers from a list of integers.
   c) Describe any three controls with example in windows application.

   B) Write short note on Lambda expression.   **06**

Q.4 A) Answer of the following: (Any Two) **08**
1) Write a program to demonstrate the difference between boxing and unboxing.
2) What is Thread? Explain Thread priorities and give an example of Thread Priorities.
3) What is interface? Give one example of interface.

B) What is Inheritance? Explain types of Inheritance. **08**

Q.5 Answer of the following. (Any Two) **16**
a) Write a program to handle custom exception.
b) Explain .Net framework with suitable block diagram in detail.
c) What is Delegate? Write a program to demonstrate the types of delegate.

<table>
<tr><td>**Seat No.**</td><td></td></tr>
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Set **P**

B.Sc. (E.C.S.) (Semester - V) (New) (CBCS) Examination: October/November – 2025
Advanced Python Programming (ECS1505 - A)

Day & Date: Saturday, 01-11-2025　　　　　　　　Max. Marks: 80
Time: 09:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
　　　　　　　2) Draw neat labelled diagrams wherever necessary.
　　　　　　　2) Figures to the right indicate full marks.
　　　　　　　4) Use of log table and calculators is allowed.

Q.1 A) Multiple choice questions.　　　　　　　　　　　　　10

1) Which of these is NOT a valid method in threading.Thread?
   a) start()　　　　　　　　b) run()
   c) stop()　　　　　　　　d) join()

2) _____ method is used to start the execution of a thread.
   a) run()　　　　　　　　b) start()
   c) execute()　　　　　　d) begin()

3) In Python, the default family used in socket. socket() for IPv4 is _____.
   a) AF_INET6　　　　　　b) AF_INET
   c) AF_UNIX　　　　　　d) AF_LOCAL

4) Which Python module is commonly used for working with URLs and HTTP requests?
   a) socket　　　　　　　b) Xmlrpc
   c) threading　　　　　　d) urllib

5) In Tkinter, _____ class is used to create a root window.
   a) Tk()　　　　　　　　b) Frame()
   c) Canvas()　　　　　　d) Window()

6) In Tkinter, _____ geometry manager uses row and column indexing.
   a) pack()　　　　　　　b) grid()
   c) place()　　　　　　　d) manager()

7) After establishing a connection, _____ object is used to execute SQL queries.
   a) Connection　　　　　b) Cursor
   c) Statement　　　　　　d) Query

8) _____ parameter is not required while connecting to a MySQL database using mysql.connector.connect()?
   a) Host
   b) User
   c) Password
   d) Driver

9) _____ command is used to start a new Django project?
   a) django-admin startproject projectname
   b) django startproject projectname
   c) python startproject projectname
   d) create-django projectname

10) In Django ORM, _____ method is used to retrieve all objects from a model.
    a) Model.objects.filter()
    b) Model.objects.all()
    c) Model.objects.get()
    d) Model.objects.query()

B) Fill in the blanks. **06**
   1) _____ module is used to implement threads.
   2) The default port for running Django development server is _____.
   3) _____ method is used to establish a connection to a MySQL database in Python.
   4) _____ method is used by a server socket to wait for incoming client connections.
   5) _____ method is used to Waits for a thread to finish execution.
   6) The thread synchronization can be done using _____ and _____ techniques.

Q.2 Solve the following. (Any Eight) **16**
   a) Define deadlock of Threads.
   b) Define Sockets Programming.
   c) List out the Advantages of GUI.
   d) Define Stored Procedure. What is the use of Stored Procedure?
   e) Define Django Serialization and Deserialization.
   f) Define Django Middleware?
   g) Define Django Authentication and Authorization.
   h) What is the use of fetchone() and fetchall() methods?
   i) Define Container. List out the types of containers.
   j) Write the difference between Class and thread

Q.3 A) Attempt of the following. (Any Two) **10**
   1) Explain Thread Life cycle.
   2) Create a Django Model for Student information having attributes like stud_name, stud_addr,stud_dob, stud_class and stud email.
   3) Explain Entry and Listbox widget with suitable example.

B) Write a note on Django Project and App life cycle. **06**

Q.4 A) Attempt the following. (Any Two)   **08**
   1) Explain Django Views with example.
   2) Write a note on Events and Bindings on Button widget with an example.
   3) Write a python program to know the IP Address of website.

B) Explain the different steps for connecting Python Application to MySQL Database.   **08**

Q.5 Attempt the following. (Any Two)   **16**
   a) Explain the different steps to create TCP/IP Client and Server.
   b) Explain the different ways of Creation of Threads.
   c) Write a program to draw different shapes like line, oval, polygon, rectangle and Text using Canvas.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - V) (New) (CBCS) Examination: October/November – 2025
Theory of Computation (ECS1505-B)

Day & Date: Saturday, 01-11-2025
Time: 09:00 AM To 12:00 PM

Max. Marks: 80

Instructions: 1) All questions are compulsory.
2) Draw neat labeled diagrams wherever necessary.
3) Figures to right indicate full marks.

Q.1 A) Multiple choice questions. 10

1) TM is more powerful than PDA.
   a) True   b) False

2) The proper prefix of the string abcis _____.
   a) {Ɛ,c, bc,abc}   b) {Ɛ,c,bc}
   c) {Ɛ,a,ab,abc}   d) {Ɛ,a,ab}

3) The ordered pair of elements is known as _____.
   a) set   b) alphabet
   c) relation   d) String

4) The symbol which can't be replaced by any other symbol is called ____.
   a) terminal   b) Variable
   c) production   d) Both a & b

5) The Mealy machine has final states.
   a) True   b) False

6) NFA is more powerful than DFA.
   a) True   b) False

7) In PDA one situation has only one transition then which is known as _____.
   a) TM   b) DPDA
   c) NPDA   d) Stack

8) In _____ machine, the transition is associated with the transaction.
   a) Moore   b) Mealy
   c) both a and b   d) None of these

9) If L(r)={a, aa, aaa, aaaa, aaaaa,……. } then r =_____
   a) a^* b) a^+
   c) a^5 d) a^4

10) A pumping lemma is used to prove a given language is_____
   a) irregular   b) context-sensitive
   c) restricted   d) none of these

B) Fill in the blank.   **06**
   1) If the rightmost and leftmost productions are single non-terminals, then it is known as a _____ production.
   2) The_____ machine has tape infinite on both sides.
   3) The context-free language is not closed under _____ properties.
   4) The function that maps one-to-one from input to output function is known as a _____ function.
   5) The _____ is accepted context-free grammar.
   6) Type 1 grammar is also known as _____.

Q.2 Solve the following. (Any Eight)   **16**
   a) Let R = {(1,2),(2,2),(2,3)} be a relation in {1,2,3,4}. Find R*
   b) What is meant by instantaneous description?
   c) Why do we require an NFA with e-moves?
   d) What are the applications of FA?
   e) How many ways does PDA accept-language? Give names.
   f) Show that $(a+b)^* = (a+b)^* + (a+b)^*$.
   g) What is the context-free grammar for $(a+b)^*.ab.(a+b)^*$.
   h) Explain notations used in CFG.
   i) State difference between the DFA and NFA machine.
   j) Define:
      i) Alphabet.
      ii) Symbol.

Q.3 A) Attempt the following. (Any Two)   **10**
   1) Convert the following NFA to its equivalent DFA

Δ	a	b
q_0	q_0, q_1	q_2
q_1	q_0	q_1
q_2	-	q_0, q_1

   2) Construct a DFA to determine out given number is divisible by 2.
   3) Construct RE for the following DFA
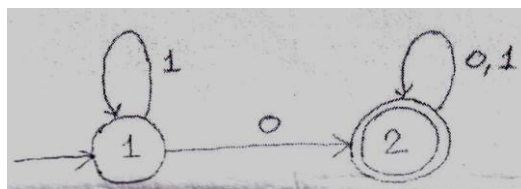
B) Construct F.A. equivalent to R.E.   **06**
   (a / b)* (ab + ba)* (a / b)*

Q.4 A) Attempt the following. (Any Two) 08
1) Explain how to convert Mealy into a Moore machine with an example.
2) Find CNF for the following grammar:
$$A \rightarrow A + A|A^*A|(A)|a$$
3) Construct a PDA that accepts the language generated by the CFG
$$S \rightarrow S + S|S^*S|4|2$$
Give the acceptance of the string "2 + 2 * 4" by a PDA.

B) What is the pumping lemma? Using the pumping lemma, check 08
$\{a^n b^{n+1}|n >= 1\}$ is regular or not.

Q.5 Attempt the following. (Any Two) 16
a) Design a DFA that accepts a string with abc as a sub-string over $\Sigma = \{a, b, c\}$.
b) Explain the simplification of grammar.
c) Design TM for $L = \{a^n b^n c^n|n >= 1\}$.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - V) (New) (CBCS) Examination: October/November – 2025
Mobile Application and Development (ECS1505-C)

Day & Date: Saturday, 01-11-2025   Max. Marks: 80
Time: 09:00 AM To 12:00 PM

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

Q.1 A) Choose correct alternatives.   **10**

1) What does AVD stand for?
    a) Android Virtual device   b) Android Virtual display
    c) Active Virtual display   d) Active Virtual device

2) Android is based on Linux for the following reason.
    a) Security   b) Portability
    c) Networking   d) All of these

3) If you need to pass data back from an acitivty which method you should use?
    a) startActivity()   b) activityForResult()
    b) startActivityForResult()   d) none of the above

4) APK stands for _____
    a) Android Phone kit   b) Android Page Kit
    c) Android Package kit   d) None of the above

5) Which of the following is contained in the src folder?
    a) XML   b) Java source code
    c) Manifest   d) None of the above

6) Component represents the single screen with the user interface.
    a) Activity   b) Service
    c) Broadcast receiver   d) Content provider

7) The _____ arranges widgets in positions relative to each other.
    a) LinearLayout   b) ConstraintLayout
    c) RelativeLayout   d) None of these

8) Which element is used to display Google map in your UI?
    a) View   b) Map
    c) Map View   d) None of the above

9) All layout classes are the subclass of_____.
   a) android.view.ViewGroup   b) Layout
   c) android.view.View   d) none of these

10) For which of the following Android is mainly developed?
    a) Servers   b) Desktops
    c) Laptops   d) Mobile devices

B) Fill in the blank.   06
1) DVM stands for _____.
2) The Top most layer of android is _____.
3) _____ is the built-in database of Android.
4) In Linear layout by default orientation is _____
5) In_____ Open Handset Alliance was announced.
6) _____ Virtual machine is used by android operation system.

Q.2 Solve the following. (Any Eight)   16
   a) What is Datepicker view in Android?
   b) What is use of Geocoding?
   c) What is Android emulator?
   d) Write usage of image switcher view.
   e) What is intent filter?
   f) What is OnPause() doing in Activity Lifecycle?
   g) List out Layouts in android.
   h) What is the use of Toggle Button?
   i) What is use of String.xml?
   j) Write types of menus in android?

Q.3 A) Answer the following. (Any Two)   10
   a) Explain Gallery and Image View views?
   b) Explain directory Structure of Android application.
   c) Write a List of android versions.

B) What is intent? Explain type of Intent.   06

Q.4 A) Attempt of the following. (Any Two)   08
   a) Explain Linear Layout in detail.
   b) Explain Activity Life cycle.
   c) What is Android SDK?

B) Explain Android architecture in detail.   08

Q.5 Attempt of the following. (Any Two)   16
   a) What is the res (resource) folder content in the android framework?
   b) Explain AndroidMainfest.xml.
   c) Explain Content provider in detail.

| Seat No. | | Set | P |

B.Sc. (E.C.S.) (Semester - V) (New) (CBCS) Examination: October/November – 2025
Artificial Intelligence (Special Paper-XI) (ECS1506)

Day & Date: Monday, 03-11-2025   Max. Marks: 80
Time: 09:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Draw neat labelled diagrams wherever necessary.
3) Figures to the right indicate full marks.
4) Use of log table and calculators is allowed

Q.1 A) Multiple choice questions. 10

1) Consider a scenario where a student has a set of queries to be resolved. Among the staff members available in the college, he approaches specific staff members who can solve and assist him. In such a case, the staff member selection would more appropriately be mapped to _____.
   a) Simple reflex agents   b) Utility agents
   c) Goal-based agents   d) Table-driven agents

2) When does Alpha pruning occur in Alpha-Beta pruning?
   a) When a Beta value is greater than an Alpha value
   b) When an Alpha value is greater than a Beta value
   c) When Alpha equals Beta
   d) When Min and Max nodes have the same value

3) Which search strategy uses the FIFO principle?
   a) Depth First Search   b) Breadth First Search
   c) A* Algorithm   d) Hill Climbing

4) Predicate logic is useful for representing _____.
   a) Probabilistic reasoning
   b) Logical relationships between objects
   c) Learning from examples
   d) Constraint optimization

5) Semantic networks represent knowledge in the form of _____.
   a) Rules
   b) Probability functions
   c) Graphs with nodes and links
   d) Frames only

6) Dempster-Shafer theory deals with _____.
   a) Constraint propagation
   b) Logic programming
   c) Reasoning under uncertainty
   d) Forward chaining

7) Rule-based deduction systems are an example of _____.
   a) Procedural knowledge representation
   b) Declarative knowledge representation
   c) Inductive reasoning
   d) Statistical learning

8) Resolution is a method used in _____.
   a) Semantic nets   b) Predicate logic inference
   c) Game playing   d) Probabilistic reasoning

9) The main human element in expert systems is _____.
   a) Rational agent   b) Knowledge engineer
   c) Rule compiler   d) Learning agent

10) Tic-tac-toe is an example of _____.
    a) Dynamic & Partially Observable
    b) Stochastic & Sequential
    c) Deterministic & Sequential
    d) Episodic & Partially Observable

B) Fill in the blanks.   **06**
   1) An _____ is an entity that perceives its environment and acts upon it.
   2) Depth First Search (DFS) uses the _____ data structure for node expansion.
   3) The statement " PAQ→R" is equivalent to: _____.
   4) Knowledge representation using interconnected nodes and links is called _____.
   5) _____ Learning is based on feedback in the form of rewards and punishments.
   6) The person responsible for transferring expert knowledge into an expert system is called a _____.

Q.2 Solve the following. (Any Eight)   **16**
   a) What is heuristic search?
   b) Define Stochastic & Dynamic.
   c) Find whether the given set is unifiable or not? S(x, Ram), S(y, Sita)
   d) What is the role of the knowledge engineer in expert systems?
   e) What are steps in problem solving process in AI?
   f) What are the advantages of AI?
   g) State difference between frames and semantic nets.
   h) Define types AI.
   i) Define supervised learning with example.
   j) Translate the first-order-logic statement into English. ∀x: student (x) —> smart (x).

Q.3 A) **Attempt the following. (Any Two)** **10**
  1) Given Statements: "If the alarm rings, then there is a fire. There is no fire." Represent the statements using propositional variables and logical connectives and use appropriate inference rules to determine whether the alarm rang or not. Justify with logical reasoning or a truth table.
  2) What are the differences between forward chaining and backward chaining?
  3) Explain AO* Algorithm with example.

B) In a class, 70% children were fall sick due to Viral fever and 30% cue to Bacienal fever Toe probability of observing temperature for Viral is 0.78 and for Bacterial is 0.31. If a child develops high temperature, find the child's probability of having viral infection using Baye's probabilistic interferences. **06**

Q.4 A) **Attempt the following. (Any Two)** **08**
  1) Apply the A* search algorithm to find the optimal solution path from A to Z. A heuristics value are with nodes, and cost is with edges.
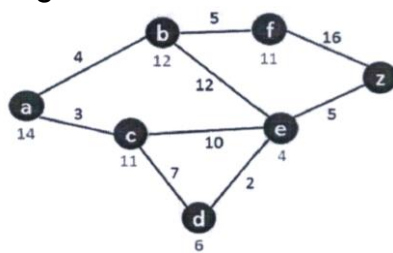
  2) Explain dempster Shafer theory.
  3) Translate the following sentences into first order logic
      I) All birds fly.
      II) Every man respects his parents.
      III) Some boys play cricket.
      IV) Not all students like both Mathematics and Science.

B) Explain types of Hill Climbing Algorithm with its advantages and disadvantages. **08**

Q.5 **Attempt the following. (Any Two)** **16**
  a) Discuss the role of knowledge engineering in expert systems. What are the difficulties in knowledge acquisition?
  b) Consider the following statement and apply resolution graph to prove that goal.
      a) The humidity is high or the sky is cloudy.
      b) If the sky is cloudy, then it will rain.
      c) If the humidity is high, then it is rain.
      d) It is not hot.
     Goal: It will rain.
  c) Explain inductive learning with a decision tree example.

Seat No.	

B.Sc. (E.C.S.) (Semester - V) (New) (CBCS) Examination: October/November - 2025
Web Technology and E-Commerce – I (2013505)

Day & Date: Tuesday, 28-10-2025　　　　　　　　　　　　Max. Marks: 70
Time: 09:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
　　　　　　　　2) Draw neat labelled diagrams wherever necessary.
　　　　　　　　3) Figures to right indicate full marks.

Q.1　Select the correct alternative.　　　　　　　　　　　　　　　14

　　1)　What class does the ASP.NET Web Form class inherit by default?
　　　　a)　System.Web.UI.Page　　　b)　System.Web.UI.Form
　　　　c)　System.Web.GUI.Page　　　d)　System.Web.Form

　　2)　The _____ objects maintains data across users.
　　　　a)　Server　　　　　　　　　b)　Session
　　　　c)　Response　　　　　　　　d)　Application

　　3)　By default, ASP.NET stores SessionIDs in _____
　　　　a)　Cache　　　　　　　　　b)　Cookies
　　　　c)　Database　　　　　　　　d)　Global Variable

　　4)　The _____ validation control is not supported by Asp.Net.
　　　　a)　RequiredFieldValidator
　　　　b)　RegularExpressionValidator
　　　　c)　TextValidator
　　　　d)　CustomValidator

　　5)　A _____ is a request sent from a client to server from the same page user is already working with.
　　　　a)　AutopostBack　　　　　　b)　PostBack
　　　　c)　PostRequest　　　　　　　d)　ViewBack

　　6)　The _____ directives' Duration attribute determines how long the page is cached.
　　　　a)　@Cache　　　　　　　　b)　@OutCache
　　　　c)　@PageCache　　　　　　d)　@OutputCache

　　7)　The _____ provides set of types that are used by all .NET languages and ensures .NET language type compatibility.
　　　　a)　Common Type System
　　　　b)　Common Language Type
　　　　c)　Common Type Language
　　　　d)　Common System Type

8) The _____ layout of the Data List control presents the list items in a format like a word processing document.
   a) Horizontal   b) Flow
   c) Column   d) Text

9) The _____ method do you invoke on the DataAdapter control to load your generated dataset with data.
   a) Fill()   b) Get()
   c) DataFill()   d) Load()

10) The _____ control allows to easily displaying two-dimensional data.
    a) radiobutton   b) dropdownlist
    c) listbox   d) datagrid

11) What does the term 'Electronic Commerce' (e-Commerce) refer to?
    a) Online education
    b) Buying and selling of goods & services over the internet
    c) Watching movies online
    d) Digital currency exchange

12) The _____ namespace contains fundamental classes with the core ADO.NET functionality.
    a) System.Data.common   b) System.Data.Types
    c) System.Data   d) System.Data.SqlTypes

13) The _____ is event which is not related to a Master Page event.
    a) Init   b) Load
    c) PreRender   d) Click

14) The _____ is a key component of electronic commerce.
    a) Face-to-face transactions
    b) Offline marketing
    c) Electronic Data Interchange (EDI)
    d) Traditional banking

Q.2 A) Answer the following. (Any Four)   **08**
   a) Explain Web Architecture Model with net diagram.
   b) Explain Application locations available in Asp.Net.
   c) Explain need of Master pages.
   d) Explain EDI.
   e) Explain custom validator control with example.

B) Write Notes on. (Any Two)   **06**
   1) Write any 6 differences between ASP & ASP.Net.
   2) Explain definition of E commerce
   3) Explain nesting master pages.

Q.3 A) Answer the following. (Any Two)   **08**
1) Explain RegularExpressionValidator control with example.
2) List out all master page events.
3) Explain internet commerce in detail.

B) Answer the following. (Any One)   **06**
1) What is server-side state management? Explain any one server-side state management in detail.
2) What is page directive? Explain all in details.

Q.4 A) Answer the following. (Any Two)   **08**
1) Explain Asp.Net compilation technique in detail.
2) Explain DataReader with example.
3) Explain cross page posting with example.

B) Answer the following. (Any One)   **06**
1) Explain cookies in detail.
2) Create web page contains calendar control which display your exam schedule.

Q.5 Answer the following. (Any Two)   **14**
a) Create web page which able to insert, update and delete record.
b) What is application folder? Explain in detail.
c) Explain DropDownList control with example.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - V) (New) (CBCS) Examination:
October/November – 2025
Advanced Python Programming (Special paper - XI) (ECS0506)

Day & Date: Saturday, 01-11-2025   Max. Marks: 80
Time: 09:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
         2) Draw neat, labelled diagrams wherever necessary.
         3) Figures to the right indicate full marks.
         4) Use of log table and calculators is allowed

Q.1 A) Multiple choice questions.   **10**

1) Which module is used for threading in Python?
   a) multiprocessing   b) thread
   c) threading   d) concurrent

2) What does the join() method of a thread do?
   a) Starts the thread
   b) Stops the thread
   c) Waits for the thread to finish
   d) Kills the thread

3) Which protocol is used to transfer files over the Internet?
   a) HTTP   b) FTP
   c) SMTP   d) SNMP

4) What does socket.AF_INET indicate?
   a) Using IPv4 addresses   b) Using IPv6 addresses
   c) Using Unix sockets   d) Using FTP protocol

5) What does socket.gethostbyname('www.example.com') return?
   a) Hostname   b) IP address of the host
   c) MAC address of host   d) Port number

6) Which geometry manager places widgets in a table-like structure?
   a) pack()   b) place()
   c) grid()   d) align()

7) Which Python module is commonly used to connect MySQL databases?
   a) sqlite3   b) mysql. connector
   c) pymongo   d) sqlalchemy

8) Which of the following is a required argument to connect to a MySQL database?
   a) host
   b) user
   c) password
   d) All of the above

9) Which Tkinter widget is used to take single-line input from the user?
   a) Label
   b) Entry
   c) Text
   d) Button

10) What is the default state of a thread when it is created?
   a) Running
   b) Waiting
   c) New (not started)
   d) Terminated

B) Fill in the blanks. 06
1) _____ method is used to check if a thread is still alive.
2) _____ is the default port number for HTTP.
3) _____ is used to create a cursor object in MySQL Python connector.
4) CGI stands for _____.
5) Series in pandas is _____ dimensional data Structure.
6) _____ widget is used to for slider in tkinter.

Q.2 Solve the following. (Any Eight) 16
a) Write the difference between process and thread.
b) Define deadlock in thread.
c) Define Socket programming.
d) Define IP address and URL.
e) What is container? What are the types of Container used in tkinter?
f) Define Stored procedure.
g) Define cookies.
h) What is XML?
i) How to install and import pandas module?
j) What is Univariate data analysis?

Q.3 A) Attempt the following. (Any Two) 10
1) Write a program to create a thread subclass by inheriting Thread class.
2) Explain the different methods used in Server socket.
3) Explain Entry and Label widget with an example.

B) Write a note on Layout management methods in GUI. 06

Q.4 A) Attempt the following. (Any Two) 08
1) What is Histogram? Write a program to demonstrate Histogram.
2) Explain Lock in threading module with example.
3) Explain the steps for creation of TCP/IP Client Socket.

B) What is Canvas? Explain how to draw different shapes like line, oval, polygon, rectangle, arc using Canvas. 08

Q.5 Attempt the following. (Any Two)   **16**

    a)   What is CGI? Explain the architecture of CGI?

    b)   What is DataFrame? Write a program to do following operation on DataFrame.

        1) Create DataFrame from dict.

        2) Inserting New Column.

        3) Adding New row.

    c)   Explain the different steps used for connecting python application to MySQL Database.

Seat No.	

**B.Sc. (E.C.S.) (Semester - VI) (New) (CBCS) Examination:
October/November - 2025
English (Compulsory)
Business English (ECS1601)**

Day & Date: Tuesday, 28-10-2025   Max. Marks: 40
Time: 03:00 PM To 05:00 PM

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

Q.1   Choose the correct alternatives.   08
1)   A good citizen is one who _____.
a)   obeys law   b)   breaks law
c)   believes law   d)   knows law

2)   Akshino was going to _____ fair.
a)   Czar   b)   Nizhny
c)   Vladimir   d)   Rayzan

3)   Rabindranath Tagore got noble prize in _____.
a)   1925   b)   1905
c)   1913   d)   1918

4)   What is the purpose of emissary's visit?
a)   To investigate duchess's death
b)   To arrest the duke
c)   To negotiate a marriage with duke
d)   To negotiate a marriage with duchess

5)   What are the things read or heard by us?
a)   Plays   b)   Novels
c)   Poems   d)   Lovely tales

6)   What time is used in the poem Tree at my window?
a)   Morning   b)   Afternoon
c)   Night   d)   Dawn

7)   What is the adverbial in the following?
a)   happy   b)   happily
c)   unhappy   d)   happy-happy

8)   She said, "I have my dinner in this restaurant."
a)   She said that she has dinner in that restaurant.
b)   She told that she had her dinner in that restaurant.
c)   She said that she has had her dinner in that restaurant.
d)   She said that would have dinner in that restaurant.

Q.2 Answer the following question in brief. (Any Four)   **12**
   a) What are the dangers of separatism?
   b) What is the significance of Akshino's wife's dream?
   c) What is the theme of the poem Endless Love?
   d) Describe the nature of duke.
   e) Describe the nature in the poem ode to beauty.
   f) What is the theme of Tree at my window?

Q.3 Write short notes on the following. (Any One)   **10**
   a) What are the literacy (IMT) skills?
   b) What are global awareness and civic literacy?

Q.4 What are life skills (FLIPS)?   **10**

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - VI) (New) (CBCS) Examination:
October/November - 2025
Network Security (ECS1602)

Day & Date: Wednesday, 29-10-2025   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to right indicate full marks.

Q.1 A) Multiple choice questions.   **10**
1) Caesar Cipher is an example of _____.
   a) Poly-alphabetic Cipher   b) Mono-alphabetic Cipher
   c) Multi-alphabetic Cipher   d) Bi-alphabetic Cipher

2) A digital signature needs a _____.
   a) Private-key system   b) Shared-key system
   c) Public-key system   d) All of them

3) Which protocol is used to convey SSL related alerts to the peer entity?
   a) Alert Protocol
   b) Handshake Protocol
   c) Upper-Layer Protocol
   d) Change Cipher Spec Protocol

4) Which one of the following modes of operation in DES is used for operating short data?
   a) Cipher Feedback Mode (CFB)
   b) Cipher Block Chaining (CBC)
   c) Electronic Code Book (ECB)
   d) Output Feedback Modes (OFB)

5) Message authentication is a service beyond _____.
   a) Message Confidentiality   b) Message Integrity
   c) Message Splashing   d) Message Sending

6) MAC stands for
   a) Message authentication code
   b) Message arbitrary connection
   c) Message authentication control
   d) Message authentication cipher

7) What is the PGP stand for?
   a) Permuted Gap Permission
   b) Permuted Great Privacy
   c) Pretty Good Permission
   d) None of the mentioned

8) Digital signature cannot provide _____ for the message.
   a) Authentication
   b) Nonrepudiation
   c) Confidentiality
   d) Integrity

9) In Message Confidentiality, transmitted message must make sense to only intended
   a) Receiver   b) Sender
   c) Modulator   d) Translator

10) ElGamal encryption system is _____
    a) symmetric key encryption algorithm
    b) asymmetric key encryption algorithm
    c) not an encryption algorithm
    d) block cipher method

B) Fill in the blank.   **06**
   1) The _____ algorithm takes the ciphertext and the secret key and produces the original plaintext.
   2) The _____ is a pair of keys that have been selected so that if one is used for encryption, the other is used for decryption.
   3) The 4x4 byte matrices in the AES algorithm are called _____.
   4) In SHA-512, the message is divided into blocks of size _____ bits for the hash computation.
   5) The DES Algorithm Cipher System consists of _____rounds (iterations) each with a round key.
   6) In asymmetric key cryptography, the private key is kept by_____

Q.2 Solve any Eight of the following.   **16**
   a) Define S/MIME.
   b) What is Cryptography?
   c) What is message authentication?
   d) Define Kerberos.
   e) What is a digital signature?
   f) What is brute-force attack?
   g) What is traffic padding?
   h) What is the need of security?
   i) What is mean by Message Digest?
   j) What you meant by hash function?

Q.3 A) **Attempt any Two of the following.** **10**
    1) Write a note on E-mail Security.
    2) Explain Asymmetric Key Cryptography.
    3) Explain Polyalphabetic Substitution cipher with example.

  B) Explain Types of Security attacks in detail. **06**

Q.4 A) **Attempt any Two of the following.** **08**
    1) Explain Security Services in Detail.
    2) Explain RSA Cryptosystem.
    3) Write the use of smart card and Biometrics.

  B) What is Firewall and explain types of Firewall. **08**

Q.5 Attempt any Two of the following. **16**
  a) Explain the AES algorithm in detail.
  b) What is mean by SSL? Explain SSL Architecture in network security.
  c) Explain IDEA in detail.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - VI) (New) (CBCS) Examination: October/November – 2025
Data Warehousing and Data Mining (ECS1603)

Day & Date: Thursday, 30-10-2025   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

Q.1 A) Multiple choice questions.   **10**

1) _____ is not a data pre-processing methods.
   a) Data Visualization   b) Data Discretization
   c) Data Cleaning   d) Data Reduction

2) The type of relationships in Star Schema_____.
   a) One to many   b) Many to many
   c) Many to one   d) One to one

3) _____ is the collection of data objects that are similar to one another within the same group.
   a) Partitioning   b) Grid
   c) Cluster   d) Table

4) _____ clustering technique requires a merging approach.
   a) Partitional   b) Hierarchical
   c) Naive Bayes   d) None of the mentioned

5) The important aspect of the data warehouse environment is that data found within the data warehouse is_____
   a) subject-oriented   b) time-variant
   c) integrated   d) All of the above

6) An outlier is a ____.
   a) Description of records in the data
   b) Data point which is considered different from other data points
   c) Record with missing attributes
   d) Duplicate record

7) _____ is used to day to day operations.
   a) OLTP   b) OLAP
   c) OLAM   d) None of these

8) Small logical units where data warehouse hold large amounts of data is known as _____.
   a) Data Layers   b) Data Marts
   c) Data Storages   d) Data Miners

9) In the example predicting the number of newborns, the final number of total newborns can be considered as the_____.
   a) Features   b) Observation
   c) Attribute   d) Outcome

10) Apriori algorithm operates in_____ method.
   a) Bottom-up search method
   b) Breadth-first search method
   c) None of the above
   d) Both a & b

B) Fill in the blank. **06**
   1) _____method of analysis does not classify variables as dependent or Independent.
   2) _____ is the purpose of data preprocessing in the context of data Warehousing.
   3) _____component of data warehousing architecture is responsible for querying and analyzing data stored in the data warehouse.
   4) _____phase of the data warehousing process involves combining data from various sources into a single, coherent format.
   5) _____ is not a basic data mining task.
   6) Converting data from different sources into a common format for processing is called as _____.

Q.2 Solve the following. (Any Eight) **16**
   a) What is data reduction?
   b) What is a medoid in clustering?
   c) What is Operational Database?
   d) Define multimedia data mining.
   e) What is data characterization?
   f) Define web mining.
   g) What is data mining?
   h) Define Classifier.
   i) What is mean by Clustering?
   j) Define Dimension table.

Q.3 A) Attempt the following. (Any Two) **10**
   1) Explain closed frequent item sets.
   2) Explain K-means clustering algorithms.
   3) Apply all binning methods for the following sorted data with 3 bins:3,7,8,13,22,22,24,26,28,28,30,37

B) Explain Snowflake Schema and Fact Constellation Schema with example. **06**

Q.4 A) Attempt the following. (Any Two) **08**
   1) Explain Naive Bayes Classifier.
   2) Explain APRIORI Algorithm with example.
   3) Explain KDD with suitable diagram.

    B) Explain Types of Clustering in Details. **08**

Q.5 Attempt the following. (Any Two) **16**
    a) Explain Data preprocessing in details.
    b) Explain Data warehouse Architecture and its Components.
    c) Explain classification by Decision tree induction Algorithm.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - VI) (New) (CBCS) Examination: October/ November – 2025
ASP.Net Core MVC(ECS1604)

Day & Date: Friday, 31-10-2025   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
                     2) Draw neat diagrams and give equations wherever necessary.
                     3) Figures to right indicate full marks.

Q.1 A)   Multiple choice questions.   10

1) The main role of the Program.cs file in ASP.NET Core is_____.
    a) Define database structure
    b) Configure services and middleware
    c) Store models
    d) Host SQL Server

2) The _____ service lifetime creates a new instance for every HTTP request, ensuring consistency during a request.
    a) Scoped   b)   Singleton
    c) Transient   d)   Global

3) The services.AddControllersWithViews() method in Program.cs is useful to add _____
    a) controller services only   b)   Razor pages only
    c) model binding services   d)   MVC controller and view services

4) In a Razor View, you want to generate a <label> for the Email property of the model then _____ is the correct tag helper.
    a) <label for="Email">
    b) <label asp-label="Email">
    c) <label asp-for="Email">
    d) <label model="Email">

5) The _____ approaches is most commonly used for projects that start with a database schema and then build the model from that schema.
    a) Code First   b)   Database First
    c) Model First   d)   Entity First

6) To set a session value in ASP.NET Core, _____ is used.
    a) Session.Set("key", value)
    b) HttpContext.Session.Add("key", value)
    c) HttpContext.Cookies.Set("key", value)
    d) HttpContext.Session.SetString("key", value)

7) When setting up a database provider in an EF Core project, _____ class is used to configure the connection string.
   a) DbContextOptionsBuilder
   b) DbContext
   c) DatabaseOptionsBuilder
   d) DbSet

8) The_____ objects can be used to pass data between two consecutive requests in ASP.NET Core MVC.
   a) ViewData   b)   ViewBag
   c) TempData   d)   Model

9) The _____ navigation property setup would best represent a one-to-one relationship between Person and Passport.
   a) public ICollection<Passport> Passports { get; set; }
   b) public Passport Passport { get; set; }
   c) public List<Passport> Passports { get; set;]
   d) public ICollection<Person> People { get; set;}

10) The_____ feature in Entity Framework Core enables the insertion of initial data into the database.
    a) Data Seeding   b)   Migration
    c) Fluent API   d)   Model Binding

B)   Fill in the blank.   **06**
   1) When a record is retrieved from the database using DbContext, its default entity state is_____.
   2) The _____ method is used to register services where a single instance is maintained throughout the application's lifetime
   3) When creating a model where a Student can enroll in multiple Courses, and each Course can have multiple Students, the relationship is in _____ form.
   4) The_____ tag helper is used to show validation messages for a specific model property.
   5) _____is a dictionary object that allows passing data from a controller to a view and can hold data for a single request.
   6) The_____ attribute is used to prevent a property from being mapped to the database.

Q.2 Solve the following. (Any Eight)   **16**
   a)   Explain [Table] and [Column] attribute with example.
   b)   What is use of Shared folder? Explain in detail.
   c)   What are limitations of [HttpPost] route over [Route] attribute.
   d)   What is Collection Navigation Property? Give example.
   e)   Explain View Component Tag Helper with example.
   f)   What is Detached entity state?
   g)   Explain Solution File in detail.
   h)   Explain Validation HTML Helpers with example.
   i)   What is Attribute Routing using Tokens? Give example.
   j)   How to Enable InProcess Hosting? Give example.

Q.3 A) **Attempt the following. (Any Two)** **10**
    1) What are the different lifespans in Dependency Injection? Explain each with an example.
    2) Write steps to create ASP.NET Core Empty Application and convert it to MVC Application.
    3) Explain FileResult and ContentResult with example.

B) What is data annotation? Explain with example how to create **06** custom annotation?

Q.4 A) **Attempt the following. (Any Two)** **08**
    1) What are different types of Models in ASP.NET Core MVC.
    2) What is partial view? Explain with example.
    3) Create web application which demonstrate TempData for Data Persistence Between Requests

B) What is session? Explain different techniques to store session with **08** example.

Q.5 Solve the following. (Any Two) **16**
    a) Explain features of .Net Core in detail.
    b) Create CRUD application for student model using any Database.
    c) What is ORM in EF core? Explain in detail DB providers used in EF Core.

Seat No.

B.Sc. (E.C.S.) (Semester - VI) (New) (CBCS) Examination: October/November – 2025
React JS (ECS1605-A)

Day & Date: Saturday, 01-11-2025   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Draw neat labelled diagrams wherever necessary.
3) Figures to right indicate full marks.
4) Use of log table and calculators is allowed.

Q.1 A) Multiple choice questions.   **10**

1) What is ReactJS primarily used for?
   a) Backend development   b) Machine learning
   c) Building user interfaces d) Database management

2) JSX stands for: _____
   a) JavaScript XML   b) Java Syntax Extension
   c) Java Server Extension   d) Java Standard Execution

3) Which method is used to update state in a React component?
   a) changeState()   b) setState()
   c) updateState()   d) modifyState()

4) What is the primary purpose of props in React?
   a) To store local component data
   b) To pass data between components
   c) To handle events
   d) To modify the DOM

5) React components can be classified into: _____
   a) Functional components   b) Class components
   c) Both a & b   d) None of the above

6) Which hook is used for side effects in a functional component?
   a) useState   b) useEffect
   c) useReducer   d) useContext

7) What does the Virtual DOM do?
   a) Directly updates the real DOM
   b) Improves performance by reducing DOM manipulations
   c) Slows down the UI updates
   d) None of the above

8) Which package is required to use React Router?
   a) react-redux
   b) react-router-dom
   c) react-dom
   d) react-navigation

9) The default package manager for React applications is: _____
   a) Bower
   b) Yam
   c) Npm
   d) Pip

10) Which file contains the dependencies of a React project?
   a) package.lock
   b) package.json
   c) index.js
   d) config.js

B) Fill in the blank/Definition/ One-word answer.   **06**
   1) The full form of JSX is _____.
   2) React applications are built using a structure called _____.
   3) The function used to render components in React is _____.
   4) _____ allows you to pass data from a parent component to a child component.
   5) The method used to bind events in React is _____.
   6) The command to create a new React project using Create React App is _____.

Q.2 Solve the following. (Any Eight)   **16**
   a) Explain the workflow of ReactJS.
   b) What are the key differences between JavaScript and JSX?
   c) Describe the scope of ReactJS in modern web development.
   d) Explain Child Components with an example.
   e) What are Props in React? How are they used?
   f) Explain the purpose and implementation of JSX.
   g) Differentiate between functional components and class components.
   h) What are the different types of event binding methods in React?
   i) Explain how to create and access refs in React.
   j) Describe the purpose of package.json in a React project.

Q.3 A) Attempt the following. (Any Two)   **10**
   1) Explain Conditional Rendering in React with an example.
   2) What are the advantages of using JSX in React?
   3) Describe how State and Props are used to manage data in React components.

B) Short note/Solve.   **06**
   Explain the use of map() function in iterating lists in React.

Q.4 A) Attempt the following. (Any Two)   **08**
   1) Explain React Router and its importance in building SPAs.
   2) What is Redux? Explain its architecture.
   3) Explain how context API is used for state management in React.

B) Short Note/ Solve.   **08**
   Describe the use of useState and useEffect hooks in React.

Q.5 **Attempt the following. (Any Two)** **16**
    a) What are Controlled and Uncontrolled components in React? Explain with examples.
    b) Explain how forms are validated in React applications.
    c) What are React component lifecycle methods? Explain with an example.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - VI) (New) (CBCS) Examination: October/November – 2025
Compiler Construction (ECS1605-B)

Day & Date: Saturday, 01-11-2025   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
                          2) All questions carry equal marks.

Q.1 A) Choose correct alternatives.   10
1) The _____ determines the semantic meaning of the source string
   a) Lexical analyzer   b) Syntax Analyzer
   c) Semantic analyzer   d) None of these

2) Once an intermediate-code program is partitioned into _____, we represent the flow of control between them by a _____.
   a) basic blocks & flow graphs
   b) flow graphs & basic blocks
   c) directed acyclic graph
   d) none of these

3) The attributes that can be computed from the values of the attributes at the parents of that node in the parse tree is called as _____.
   a) inherited   b) synthesized
   c) both a & b   d) none of these

4) _____ will try different productions, backing up when a parse fails.
   a) backtracking   b) predictive
   c) intermediate code   d) backpatching

5) In _____ anode in a flow graph dominates another if every path to the latter must go through the former.
   a) inner loops   b) reducible
   c) pre-header   d) dominators

6) In _____ , however, the position of an activation record for a procedure is not known until run time
   a) stack allocation   b) heap allocation
   c) static allocation   d) both b and c

7) This parser uses _____ derivation process
   a) Top-down parser   b) Bottom-up Parser
   c) Either a or b   d) Both a and b

8) _____ parsers begin at the source string and try to apply reductions to arrive at the start symbol.
   a) LL parser
   b) LR parser
   c) None of these
   d) All of above

9) _____ is a compiler which performs the recompilation of only modified source rather than compiling the whole source program.
   a) Cross compiler
   b) Boot strapping compiler
   c) One pass compiler
   d) Incremental compiler

10) _____ is a translation scheme in which the type of each expression is obtained from the types of subexpressions.
   a) Type checking
   b) Type analysis
   c) Both a & b
   d) None of these

B) Fill in the blank/Definition/One sentence answer/ One-word answer/ Give the name/Predict the product etc.   **06**
1) The LR-parsing method is the most general _____ shift-reduce parsing method.
2) _____ engines that produce collections of routines for walking a parse tree and generating intermediate code.
3) Shift reduce parsers are _____.
4) The _____ is a flow graph in which there are two types of edges forward edges and backward edges.
5) _____ allocation is for all the data objects at compile time.
6) _____ is a data structure used by compiler to keep track of semantics of variable.

Q.2 Solve the following. (Any Eight)   **16**
   a) Define Cross compilers.
   b) Convert the following grammar in left factored form.
   $S \rightarrow aAb|aBC|aAbG$
   c) Role of lexical analyzer.
   d) Define Regular Definition.
   e) Construct the DAG for the following string.
   $x: = -a^*b + -a^*b$
   f) Define the terms:
   a) Dominators.
   b) Natural loops.
   g) Explain Backtracking with example.
   h) Design the dependency graph for the following grammar.

   $E \rightarrow E1 + E2$

   $E \rightarrow E1 * E2$
   i) What is Global Register Allocation?
   j) What is Handle? Explain Handle Pruning with example.

Q.3 A) Attempt the following. (Any Two)   **10**

    1) Annotate the parse tree for the computation of inherited attributes for the given string.

        int a,b,c;

        $S \rightarrow TL$
        $T \rightarrow int$
        $T \rightarrow float$
        $T \rightarrow char$
        $T \rightarrow double$
        $L \rightarrow L1, id$
        $L \rightarrow id$

    2) What is runtime storage? Explain the runtime storage allocation in detail.

    3) Explain compiler construction tools.

B) Write the Intermediate Representation like postfix notation, syntax tree and three address code for the following expression   **06**

(a-b)*(c+d)-(a+b)

Q.4 A) Attempt the following. (Any Two)   **08**

    1) Check whether following grammar is LR (1) grammar or not.
        S →AaAb|BbBa, A→ε, B→ε

    2) Define SDD. Explain the terms Synthesized attribute and Inherited attribute with example.

    3) Write a note on Peephole Optimization.

B) Write the following expression in syntax tree, postfix notation and Three address code of intermediate representations.   **08**

(a-b)*(c+d)-(a+b)

Q.5 Attempt the following. (Any Two)   **16**

    a) Construct LL (1) parse table for following grammar:

        S→aBDh   B→cC   C→bC|ε   D→EF   E→ g|ε   F→ f|ε

    b) Define Code optimization. Explain principle sources of code optimization.

    c) Explain Activation Record. Draw the Activation Record for the factorial program.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - VI) (New) (CBCS) Examination: October/November – 2025
Internet of things (ECS1605-C)

Day & Date: Saturday, 01-11-2025   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Each question should only one correct option.
3) Figures to right indicate full marks.

Q.1 A) Multiple choice questions.   **10**

1) Which of the following is a common application area of IoT in healthcare?
   a) Smart irrigation systems
   b) Wearable health monitors
   c) Automated checkout systems
   d) Smart traffic lights

2) One of the biggest security challenges IoT is: _____
   a) Reducing data collection
   b) Weak or default device passwords
   c) Lack of Bluetooth support
   d) High download speeds

3) What is the main purpose of sensor interfacing in embedded systems?
   a) To increase the clock speed of the processor
   b) To allow the sensor to communicate data to a microcontroller or processor.
   c) To provide internet access to the sensor
   d) To store sensor data in a hard drive

4) Which of the following protocols is most commonly used in Wireless Sensor Networks (WSNs)?
   a) HTTP   b) Zigbee
   c) FTP   d) SMTP

5) What is Fog Computing?
   a) A method of securing Wi-Fi networks
   b) A programming language for IoT
   c) A decentralized computing infrastructure located closer to the data source
   d) A way to back up data to the cloud

6) A major challenge in Brownfield IoT implementation is:
   a) Too much available bandwidth
   b) Integrating IoT with legacy systems
   c) Lack of Wireless protocols
   d) Systems being too new to modify

7) Google Cloud IoT Core allows:
   a) Only image storage
   b) Devices to connect and Ingest data into Google Cloud services
   c) Free smartphone distribution
   d) Custom hardware development

8) Which programming language is most commonly associated with Raspberry Pi?
   a) Java   b) Python
   c) COBOL   d) Swift

9) What is the primary goal of cybersecurity?
   a) To increase device speed
   b) To enhance UI design
   c) To protect systems, networks, and data from digital attacks
   d) To monitor employees' behaviour

10) Which type of algorithm is commonly used in IoT for predictive maintenance?
   a) Sorting algorithm   b) Decision tree
   c) Bubble sort   d) Binary search

B) Fill in the blank.   **06**
   1) _____ Learning algorithms help IoT systems to learn from sensor data and improve performance over time
   2) _____ Networks are often targeted for security vulnerabilities in IoT systems, especially when devices are connected without sufficient safeguards.
   3) In IoT systems, the _____ layer of middleware is responsible for ensuring device-to-device and device-to-cloud communication by handling the message routing and communication protocols.
   4) A _____ city uses IoT technologies to enhance the quality of life for residents through systems like smart lighting, waste management, and traffic monitoring.
   5) The _____ in RFID systems is responsible for receiving the data sent by the RFID tag and transmitting it to the backend system for processing.
   6) The _____ architecture is one of the most widely used ARM processor architectures, commonly found in smartphones, tablets, and embedded devices

Q.2 **Solve the following. (Any Eight)** **16**
  a) Define IOT.
  b) Draw Architecture of IOT.
  c) What are microcontrollers?
  d) Define smart objects.
  e) What is mean by SCADA?
  f) List the advantages of Modbus.
  g) What are the different components used in IOT?
  h) What is Raspberry Pi?
  i) List Advantages of PWM used in IOT?
  j) What is cloud computing?

Q.3 **A)** **Attempt the following. (Any Two)** **10**
  1) What are the different elements of an IOT ecosystem? Explain it.
  2) Explain SCADA protocol in detail.
  3) Explain the Modbus protocol and its applications

  B) **Short note/Solve.** **06**
  Write a note on challenges in IOT

Q.4 **A)** **Attempt the following. (Any Two)** **08**
  1) Describe various types of sensors Used in IoT.
  2) Write a note on Microcontroller.
  3) Explain the IoT Stack in detail with an appropriate diagram.

  B) Explain cloud computing in detail. **08**

Q.5 **Attempt the following. (Any Two)** **16**
  a) Explain IOT architecture in detail.
  b) Describe the architecture and applications of Raspberry Pi.
  c) Explain health care and water quality application of IOT.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - VI) (New) (CBCS) Examination: October/November – 2025
Mobile Application Development (ECS0606)

Day & Date: Monday, 03-11-2025   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Draw neat labelled diagrams wherever necessary.
3) Figures to right indicate full marks.
4) Use of log table and calculators is allowed.

Q.1 A) Multiple choice questions.   **10**

1) What is Android?
   a) A Programming Language
   b) A Web Browser
   c) An Operating System
   d) A Graphics Editor

2) What is an Intent in Android development?
   a) A graphical element
   b) A variable
   c) A message object to communicate between components
   d) A database connection

3) Which of the following is an important component of an Android app?
   a) Broadcast Receiver
   b) Activity
   c) Service
   d) All of the above

4) What is the purpose of the Android Manifest file (AndroidManifest.xml)?
   a) Stores user preferences
   b) Contains the app's source code
   c) Defines the app's structure and permissions
   d) Stores the app's resources

5) What is a Fragment in Android?
   a) A part of a user interface that can be reused in multiple activities
   b) A type of background service
   c) A component that handles data storage
   d) A class for managing permissions

6) Which method is used to start an activity in Android?
   a) createActivity()   b) launchActivity()
   c) openActivity()   d) startActivity()

7) What is the role of a Content Provider in Android?
   a) To share data between different apps
   b) To manage network connections
   c) To display UI elements
   d) To handle app permissions

8) Which method is used to display a Toast message in Android?
   a) makeText()   b) showToast()
   c) displayToast()   d) createToast()

9) Which layout is most commonly used to align views in a single row or column in Android?
   a) RelativeLayout   b) LinearLayout
   c) FrameLayout   d) ConstraintLayout

10) By default in android studio during app development, the directory made for XML files is _____.
   a) res/layout   b) res/values
   c) AndroidManifest.xml   d) Build.gradle

B) Fill in the blank.   **06**
   1) APK stands for _____.
   2) Android is based on _____ Kernel.
   3) ADB stands for _____.
   4) _____ Converts Java byte code into Dalvik Byte code.
   5) The method is called when the service was created first-time using on StartCommand() or onBind() is _____
   6) The method that is used to produce log message in android is _____.

Q.2 Solve the following. (Any Eight)   **16**
   a) Define context.
   b) What id Broadcast receiver.
   c) Define Fragment.
   d) What is the difference between RelativeLayout and LinearLayout?
   e) Write any two advantages of Android.
   f) Define Adapter.
   g) What is Toast? Write its syntax.
   h) List the languages used to build Android.
   i) What is the use of Bundle in Android?
   j) What is the role of Dalvik Virtual Machine in Android development?

Q.3 A) Attempt the following. (Any Two)   **10**
   a) What is Intent? Explain the different types of Intent.
   b) Explain the different features of Android.
   c) What is the difference between activity and services in Android.

B) Write note on Service life cycle of an android application. **06**

Q.4 A) Attempt the following. (Any Two) **08**
  1) Explain the Alert and Date Picker dialog box in Android.
  2) What is AndroidManifest.xml file and why do you need this?
  3) Explain how to identify the View with suitable example.

B) What is content provider? How it is implemented in Android **08**
application.

Q.5 Attempt the following. (Any Two) **16**
  a) Explain the life cycle of an Activity in Android application.
  b) Explain Android Architecture?
  c) What is Android SDK? Explain the components of Android SDK.

Seat No.	

B.Sc. (E.C.S.) (Semester - VI) (New/Old) (CBCS) Examination: October/November - 2025
English (Compulsory)
Business English (ECS0601)

Day & Date: Tuesday, 28-10-2025   Max. Marks: 40
Time: 03:00 PM To 05:00 PM

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

Q.1 Choose the correct alternatives from the options.   **08**

1) What is the name of dog in the story Growing Up?
   a) Sport   b) Sort
   c) Snort   d) Snore

2) How much money was Aksionov accused of stealing?
   a) 8000 rubbles   b) 20000 rubbles
   c) 4000 rubbles   d) 50000 rubbles

3) How many children are listening to the story?
   a) Five   b) Two
   c) Three   d) One

4) What glides on the lake?
   a) Deer   b) Peacock
   c) Duck   d) Swans

5) Who is narrator of the poem My Last Duchess?
   a) The poet   b) The emissary
   c) The duchess   d) The duke

6) What makes for itself a cooling covert against the hot season?
   a) Daffodils   b) Beauty
   c) Clear rills   d) Animals

7) She was walking slowly. (Identify the adverb)
   a) Was   b) Walking
   c) Slowly   d) None of the above

8) She said, "She must leave all the bad habits." (Change into reported speech)
   a) She said she has to leave all the bad habits.
   b) She said that she must have leave all the bad habits.
   c) She said that she had to leave all the bad habits.
   d) She said that she could leave all the bad habits.

Q.2 **Answer the following question. (Any Four)** **12**
   a) How was Robert and the dog attacked?
   b) What is the significance of the wife's dream in the story God Sees the Truth but Waits?
   c) What is tragic story told by narrator in the poem My Last Duchess?
   d) Describe the use of memory and tradition in the poem "Sita"?
   e) Why 'Ode to Beauty' considered to be a romantic poem?
   f) Who do you think are 'our best' that the poet refers to in the poem Life?

Q.3 **Write short notes on the following. (Any One)** **10**
   a) Write detail note on Life skill.
   b) What is Initiative? Give an example of a situation in which you took initiative.

Q.4 **Answer the following question.** **10**
   a) What are the Health literacy and Civic literacy?

Seat No.		Set	P

**B.Sc. (E.C.S.) (Semester - VI) (New/Old) (CBCS) Examination:
October/November - 2025
System Security (ECS0602)**

Day & Date: Wednesday, 29-10-2025   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

Q.1 A) Multiple choice questions.   10
   1) The full form of Malware is _____
      a) Malfunctioned Software   b) Multipurpose Software
      c) Malicious Software   d) Malfunctioning of Security

   2) Which of this is an example of physical hacking?
      a) Remote Unauthorized access
      b) Inserting malware loaded USB to a system
      c) SQL Injection on SQL vulnerable site
      d) Distributed Denial of Service attack

   3) In cryptography, cipher is _____
      a) algorithm for performing encryption and decryption
      b) encrypted message
      c) decrypted message
      d) none of these

   4) _____ are the special type of programs used for recording and
      tracking user's keystroke.
      a) Keylogger   b) Trojans
      c) Virus   d) Worms

   5) _____ are a collective term for malicious spying programs used
      for secretly monitoring Someone's activity and actions over a
      digital medium.
      a) Malware   b) Remote Access Trojans
      c) Keyloggers   d) Spyware

   6) _____ is a small program that changes the way a computer operates.
      a) Worm   b) Trojan
      c) Bomb   d) Virus

7) An attack in which the site is not capable of answering valid request.
   a) Smurfing
   b) Denial of service
   c) E-mail bombing
   d) Ping storm

8) _____ is least secure method of authentication?
   a) Key card
   b) Fingerprint
   c) Retina pattern
   d) Password

9) Which of the following are forms of malicious attack?
   a) Theft of information
   b) Modification of data
   c) Wiping of information
   d) All of the above

10) Which of the following is an authentication method?
   a) SMS code
   b) Biometric
   c) Password
   d) All of the above

B) Fill in the blank/ One-word answer/ Give the name.   **06**
   1) In _____ each user is assigned one or more roles, and the roles determine which parts of the system the user is allowed to access.
   2) DES Stands for _____.
   3) _____ can store but not process data.
   4) The basic building block of a relational database is a table of data, consisting of _____ and _____.
   5) Keyloggers are a form of _____.
   6) A backdoor, also known as a_____.

Q.2 Solve Any Eight of the following.   **16**
   a) What is System Security?
   b) What is digital signature?
   c) What is a message authentication code?
   d) What are two common techniques used to protect a password file?
   e) What is an access right?
   f) What is a protection domain?
   g) What is Database Security?
   h) Define the term Viruses.
   i) What is mean by Attacks?
   j) Define the term Spyware.

Q.3 A) Attempt Any Two of the following.   **10**
   1) What is Confidentiality? Explain Confidentiality with Symmetric Encryption.
   2) What is Authentication? Explain Password-Based Authentication.
   3) Explain the Need for Database Security.

B) Short notes on.   **06**
   i) Public-Key Encryption   ii) Denial-of-Service Attacks

Q.4 **A)** **Attempt Any Two of the following.** **08**
1) In the context of access control, explain a subject and an object?
2) List and explain four common techniques for selecting or assigning passwords?
3) Explain the difference between a simple memory card and a smart card.

B) What is biometric authentication? Explain Physical characteristics **08**
used in Biometric Applications and Operation of a Biometric Authentication System.

Q.5 **Attempt Any Two of the following.** **16**
a) Explain DBMS Architecture with suitable diagram.
b) Explain Reflector and Amplifier Attacks in details.
c) What is Malicious Software? Explain Types of Malicious Software.

Seat No.		**Set**	**P**

B.Sc. (E.C.S.) (Semester - VI) (New/Old) (CBCS) Examination: October/November – 2025
Compiler Construction (ECS0603)

Day & Date: Thursday, 30-10-2025   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
               2) Draw neat labelled diagrams wherever necessary.
               3) Figures to right indicate full marks.

Q.1 A) Multiple choice questions.   **10**

1) The compiler process can be considered as a series of sub-process is called _____
   a) Series   b) subprocess
   c) phases   d) none of these

2) _____ is the process where the stream of characters making up the source program is read from left to right and grouped into tokens.
   a) Lexical analysis   b) Diversion
   c) Modelling   d) None of the above

3) In _____ the parser discards enough tokens to reach a decent state on the declaration of errors.
   a) Panic mode recovery   b) parser level recovery
   c) both a and b   d) None of these

4) A rightmost derivation in reverse is obtained by _____.
   a) Handle   b) handle pruning
   c) grammar   d) none of these

5) Which of the following feature is related to bottom-up parsing?
   a) Shift   b) Reduce
   c) Precedence relation   d) All of the above

6) An important component of semantic analysis is _____.
   a) code checking   b) type checking
   c) flush checking   d) all of the above

7) The _____ is a technique in the compiler used to determine if storage location may be accessed more than one way.
   a) Symbol table   b) Alias analysis
   c) Syntax analysis   d) Semantic analysis

8) In the run time environment, each node represents _____ of a procedure.
   a) definition   b) declaration
   c) activation   d) all of the above

9) The attributes that can be computed from the values of the attributes at the siblings and parent of that node is called a _____.
   a) synthesized   b) inherited
   c) both a & b   d) none of these

10) Which of the following is not an intermediate code form?
    a) Postfix notation   b) Syntax trees
    c) Three address codes d) Quad

B) Fill in the blank.   **06**
   1) The graph that shows basic blocks and their successor relationship is called _____.
   2) A computer uses a _____ to keep track of scope and binding information about names.
   3) An intermediate code form is _____.
   4) A _____ compiler is also called a residential compiler.
   5) A compiler that runs on one machine and produces code for a different machine is called _____
   6) The ____ should be able to catch syntactic errors.

Q.2 Solve the following. (Any Eight)   **16**
   a) Define:
       i) Natural loop.
       ii) Pattern.
   b) Write a short note on input buffering.
   c) What are the issues in code generation?
   d) What are the actions available in the shift-reduce parser?
   e) What is left recursion? How it is eliminated?
   f) What is the difference between CLR and LALR?
   g) Construct DAG for Expression? i:=i+10.
   h) Why there is a need of intermediate code?
   i) Why there is a need of code optimization?
   j) What is back patching?

Q.3 A) Attempt the following. (Any Two)   **10**
   1) Construct DAG for Expression? (a+b) * a * a(a+b).
   2) What is compiler? What are the types of compiler?
   3) What is parameter? Explain the parameter passing techniques.

B) Find out a triple, quadruple, and indirect triple for the following.   **06**
   P = Q+R*S /T+-U *-V

Q.4 A) Attempt the following. (Any Two)   **08**
1) What is handle? Explain the handle pruning with the help of example.
2) Explain peephole optimization in detail.
3) Check whether the following grammar is LL (1) or not.
$S \rightarrow AaAb \mid BbBa, A \rightarrow \varepsilon, B \rightarrow \varepsilon$

B) Construct annotated parse tree for 3*5+4n using the following   **08**
grammar rules:

PRODUCTION	SEMANTIC RULES
1) $L \rightarrow E$ n	$L.val = E.val$
2) $E \rightarrow E_1 + T$	$E.val = E_1.val + T.val$
3) $E \rightarrow T$	$E.val = T.val$
4) $T \rightarrow T_1 * F$	$T.val = T_1.val \times F.val$
5) $T \rightarrow F$	$T.val = F.val$
6) $F \rightarrow (E)$	$F.val = E.val$
7) $F \rightarrow$ digit	$F.val = $ digit. lexval

Q.5 Attempt the following. (Any Two)   **16**
a) What is compiler? Explain phases of compiler.
b) Construct SLR(1) parsing table for the following grammar:
$E \rightarrow E + T|T, T \rightarrow TF|F, F \rightarrow a|b$
c) Why there is need of storage allocation? Explain storage allocation
strategies.

| Seat No. | | Set | P |

B.Sc. (E.C.S.) (Semester - VI) (New/Old) (CBCS) Examination: October/November – 2025
Internet Programming using ASP.Net (ECS0604)

Day & Date: Friday, 31-10-2025   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

Q.1 A) Multiple choice questions.   **10**

1) ASP stands for?
   a) Active Server Pages
   b) Access Server Pages
   c) Active Server Platform
   d) Active Server Programming

2) Attribute must be set on a validator control for the validation to work ____.
   a) Control To Validate
   b) Control To Bind
   c) Validate Control
   d) Validate

3) We can manage states in asp.net application using ____.
   a) Session Objects
   b) Application Objects
   c) View state
   d) All of the above

4) What is used to validate complex string patterns like an e-mail address?
   a) Extended expressions
   b) Basic expressions
   c) Regular expressions
   d) Irregular expressions

5) An alternative way of displaying text on web page using ____.
   a) asp:label
   b) asp:listitem
   c) asp:button
   d) asp:hidden

6) Which of the following controls is used to validate that two fields are equal?
   a) Regular Expression Validator
   b) Compare Validator
   c) equals() method
   d) Required Field Validator

7) Which of the following is not the way to maintain state?
   a) View state
   b) Cookies
   c) Hidden fields
   d) Request object

8) You can have only one Global. asax file per protect.
   a) True
   b) False

9) WSDL stands for _____?
   a) Web Server Description Language
   b) Web Server Descriptor Language
   c) Web Services Description Language
   d) Web Services Descriptor Language

10) Which method do you invoke on the Data Adapter control to load your generated dataset with data?
   a) Load ()   b) Fill ()
   c) Data List   d) Data Bind

B) **Fill in the blank/Definition/One sentence answer/ One-word answer/ Give the 06 name/Predict the product etc.**   **06**
   1) SOAP Stands for _____.
   2) AJAX stands for _____.
   3) How to display validation messages in one control?
   4) Write Default Event of Text Box Control.
   5) What is the file extension of a web service?
   6) List out button control.

Q.2 **Solve the following. (Any Eight)**   **16**
   a) What is a Dataset?
   b) What are the advantages of ASP.NET?
   c) Explain Post Back.
   d) What is a Master Page?
   e) What is ASP.NET?
   f) What are the types of List Controls?
   g) Explain @ Page Directive.
   h) Explain menu control.
   i) Explain Hidden Field.
   j) What is View State?

Q.3 **A)** **Attempt the following. (Any Two)**   **10**
   a) Explain Tree view Control.
   b) Explain Self-page & Cross Page Posting.
   c) Define Architecture of ASP.NET

   B) **Short notes/Solve.**   **06**
   Explain File Upload Control with an example.

Q.4 **A)** **Attempt the following. (Any Two)**   **08**
   1) What is Web Service?
   2) What is Master Page define its uses.
   3) What is the difference between Server. Transfer and Response. Redirect?

   B) **Describe/Explain/Solve:**   **08**
   Explain Validation Controls in ASP.Net

Q.5 **Attempt the following. (Any Two)** **16**
   a) What is State Management explain with types of state management techniques.
   b) Explain Site Navigation Techniques.
   c) Explain Page Directives.

Seat No.		Set	P

B.Sc. (E.C.S.) (Semester - VI) (New/Old) (CBCS)
Examination: October/November – 2025
Angular JS (ECS0605)

Day & Date: Saturday, 01-11-2025 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

Q.1 A) Multiple choice questions. 10

1) AngularJS is perfect for _____
   a) Create Single Page Applications
   b) Creating a Desktop Application
   c) Create Web Services
   d) None of these

2) AngularJS is distributed as a _____
   a) XML file   b) PHP file
   c) JavaScript file   d) ASP file

3) Who developed AngularJS?
   a) Jesse James Garrett   b) Douglas Crockford
   c) Miško Hevery   d) Brendan Eich

4) AngularJS expressions are written inside _____
   a) {expression}   b) [{ expression }]
   c) _ expression   d) {{ expression }}

5) Which directive can be used to write AngularJS expressions?
   a) ng-expression   b) ng-bind
   c) ng-statement   d) ng-bindexpression

6) Which of the following is an advantage of AngularJS?
   a) AngularJS code is unit testable.
   b) AngularJS provides reusable components.
   c) AngularJS uses dependency injection and makes use of separation of concerns.
   d) All of the above

7) AngularJS is a _____ Framework
   a) HTML Framework   b) .Net Framework
   c) JavaScript framework   d) Oracle Framework

8) An AngularJS module defines an _____.
   a) Expression
   b) application
   c) element
   d) none of the above

9) _____ function is used to create a module in AngularJS.
   a) Module
   b) ng-bind
   c) angular.create
   d) angular.module

10) _____directive defines the application controller?
    a) ng-control
    b) ng-controller
    c) ng-NewController
    d) None of the above

B) Fill in the blank. 06
1) Filters can be added to expressions by using the _____, followed by a filter.
2) _____ is not a valid method of $location service?
3) _____ AngularJS service is used to make the request to the server?
4) _____ AngularJS service is the version of the window.setInterval function?
5) AngularJS is a JavaScript-based open-source front-end web framework that belongs to_____ community.
6) _____ directive initializes application data in AngularJS?

Q.2 Solve the following. (Any Eight) 16
   a) What is AngularJS?
   b) What is scope in AngularJS?
   c) What are the Modules in AngularJS?
   d) What are the services in AngularJS?
   e) What are the filters in AngularJS?
   f) Explain directives in AngularJS.
   g) Explain Control flow statements in java Scripts
   h) What is data binding in AngularJS?
   i) What is Scope Inheritance in AngularJS?
   j) Define Comments used in JavaScript?

Q.3 A) Attempt the following. (Any Two) 10
   a) Explain the different of the features of Angular JS?
   b) Explain the AngularJS Modules
   c) Explain the Controller Methods

B) Short notes on. 06
   i) lowercase filters
   ii) Core Directives

Q.4 A) Attempt the following. (Any Two) 08
1) What is Controller? Explain Attaching properties and functions to scope.
2) Write a Simple "hello world" program using Angular JS.
3) Explain Conditional Directives in detail.

B) Describe/Explain/Solve: **08**

What is scope? Explain Scope Lifecycle in details.

Q.5 Attempt the following. (Any Two) **16**
a) What is Ajax? Explain Implementation of Ajax using $http and $qService?
b) What is Form? Explain Angular Forms with Example?
c) Explain MVC Architecture in Angular JS?

Seat No.		**Set**	**P**

B.Sc. (E.C.S.) (Semester - VI) (New/Old) (CBCS) Examination: October/November – 2025
Mobile Application Development (Special Paper-XI) (ECS0606)

Day & Date: Monday, 03-11-2025   Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Draw neat labelled diagrams wherever necessary.
3) Figures to right indicate full marks.

Q.1 A) Multiple choice questions.   **10**

1) For which of the following Android is mainly developed?
   a) Servers   b) Desktops
   c) Laptops   d) Mobile devices

2) What is Manifest.xml in android?
   a) It has information about layout in an application
   b) It has the information about activities in an application
   c) It has all the information about an application
   d) None of the above

3) What is the use of content provider in android?
   a) To send the data from an application to another application
   b) To store the data in a database
   c) To share the data between applications
   d) None of the above

4) Android is _____.
   a) An operating system   b) A web browser
   c) A web server   d) A and B

5) What is APK?
   a) Android Programming Kernel
   b) Android Package Kit
   c) Android Programming Kit
   d) Application Package Kit

6) OHA in android stands for _____.
   a) Open Health Academy
   b) Open Handset Alliance
   c) Open Handset Application
   d) Open Handset Association

7) Which of the following is the name of the Android version 5.0?
   a) Cupcake   b) Eclair
   c) KitKat   d) Lollipop

8) Which of the following is the topmost layer of android architecture?
   a) System Libraries and Android Runtime
   b) Linux Kernel
   c) Applications
   d) Applications Framework

9) All layout classes are the subclasses of _____
   a) android.view.View   b) android.view.ViewGroup
   c) android, widget   d) None of the above

10) Which of the following virtual machine is used by the Android operating system?
   a) JVM   b) Dalvik virtual machine
   c) Simple virtual machine   d) None of the above

B) Fill in the blank.   **06**
1) _____ is aopensource SQL database that stores data to a text file on a device.
2) A _____ is a small gadget or control of your android application placed on the home screen.
3) _____ contains a number of XML Illes like strings, dimensions, colors, and style definitions
4) An android _____ is simply a piece of code that has a well defined life cycle e.g. Activity, Receiver, Service etc
5) _____contains AndroidManifest.xml for creating our android application.
6) _____ can be used to display information for the short period of time.

Q.2 Solve the following. (Any Eight)   **16**
  a) What is android Emulator?
  b) What is Alert Dialog widget?
  c) Explain Java folder.
  d) Explain Spinner widget.
  e) What is Intent Objects?
  f) What is Android Layout?
  g) What is API level?
  h) Explain Features of Android.
  i) What is Android View?
  j) What is OHA?

Q.3 A) Attempt the following. (Any Two)   **10**
1) Explain History of Android.
2) Explain CheckBox widget with Example.
3) Explain following points -
   a) AndroidManifest.xml file
   b) Dalvik Virtual Machine

B) Short notes on.   **06**
Explain categories of android applications in the market.

Q.4 A) Attempt the following. (Any Two)   **08**
1) Explain Android Core Building Blocks.
2) Explain Android - Content Providers,
3) Explain Auto Complete Text View widget with Example.

B) Describe/Explain/Solve: **08**
Explain Types of Layouts in Android with example

Q.5 Attempt the following. (Any Two)   **16**
a) Explain Android Architecture in detail with parts.
b) Explain The Directory Structure of an Android Project.
c) Explain Android Toast widget with Example.

| Seat No. | | | **Set** | **P** |

B.Sc. (E.C.S.) (Semester - I) (CBCS) Examination:
October/November - 2025
Graph Theory (ECS1107)

Day & Date: Monday, 24-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
                2) Figures to the right indicate full marks.
                3) Draw neat diagrams and give equations wherever necessary.
                4) Use of logarithmic table and calculator is allowed.

Q.1 Multiple choice questions.   **08**

  1) If the edge set of a graph G is empty then the graph is called _____ graph.
     a) Null   b) regular
     c) simple   d) none of these

  2) A graph having parallel edges and loop is called _____ graph.
     a) multigraph   b) simple
     c) pseudo   d) none of these

  3) The order of adjacency matrix is _____.
     a) m b) $n \times q$
     c) $n \times n$ d) none of these

  4) A graph having only one component is called _____ graph.
     a) disconnected   b) connected
     c) void   d) none of these

  5) A walk in which there is no repetition of any edges is called _____.
     a) trail   b) path
     c) circuit   d) none of these

  6) A graph having Hamiltonian path is called _____ graph.
     a) eulerian   b) hamiltonian
     c) disconnected   d) none of these

  7) A connected circuit free graph is called _____ graph.
     a) tree   b) complete
     c) regular   d) none of these

  8) By solving traveling salesmen problem to find _____.
     a) trail   b) eulerian circuit
     c) hamiltonian path   d) none of these
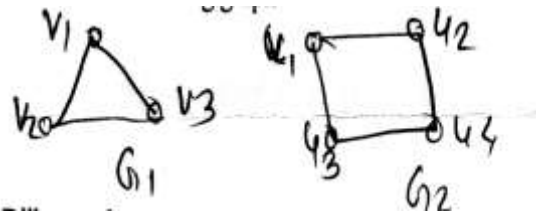
Q.2 **Answer the following question: (Any Four)** 08
  a) Define Weighted graph.
  b) Define Regular graph.
  c) Draw a graph K.4,2.
  d) Define trail.
  e) Define Binary tree.
  f) Define spanning graph.

Q.3 **Write short notes on the following: (Any Two)** 08
  a) State and prove Hand-shaking lemma with suitable example.
  b) Find $G1 \times G2$ of the following graph.

  c) By using Dijkstras shortest path algorithm to find shortest path from a to all vertices.

Q.4 **Answer the following question: (Any Two)** 08
  a) Write note on matrix representations of graph.
  b) Find union and intersection of the following two graphs.
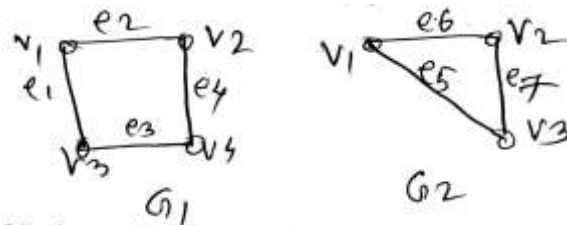
  c) Solve the following traveling salesman problem by starting to v.
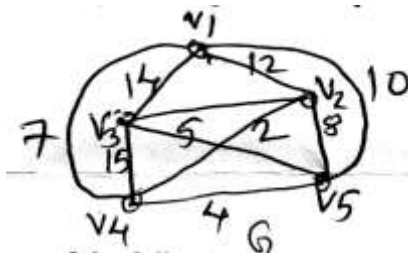
Q.5 Answer the following question: (Any One) 08

a) Find union, intersection and ring sum of two graphs.

b) By using kruskals algorithm to find shortest spanning tree of the given graph G.

Seat No.	

B.Sc. (E.C.S.) (Semester - I) (CBCS) Examination: October/November - 2025
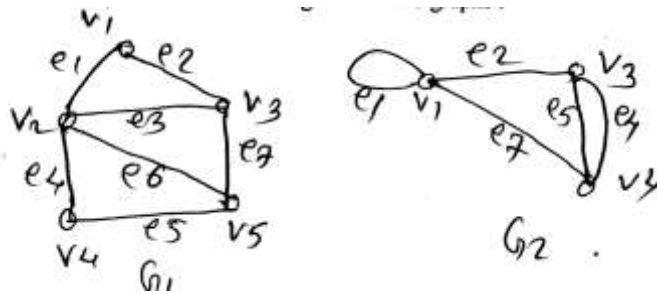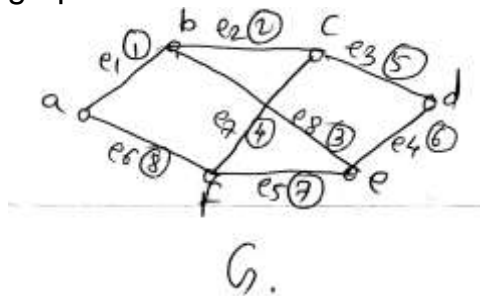## Advanced Electronics Paper – II (ECS1109)

Day & Date: Tuesday, 25-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw necessary diagrams wherever necessary.
4) Non programmable calculators are allowed.

Q.1 Choose the correct alternatives from the options.   08

1) _____ material used for yellow or red color LED.
a) GaAs   b) GaP
c) GaN   d) GaAsP

2) _____ no of components are fabricated in VLSI IC.
a) 500 to 50000   b) 100 to 1 lakh
c) 30 to 100   d) more than 1 lakh

3) _____ is used as insulation layer in IC.
a) FeO_2 b) SiO_2
c) GeO_2 d) CO_2

4) Washer thermistor has _____ mm diameter.
a) 12.5   b) 12.55
c) 12.25   d) 12.75

5) Photodiode converts _____ into _____.
a) mechanical, electrical   b) electrical, light
c) light, electrical   d) None of these

6) In LSI IC components fabricated up to _____.
a) 100 to 5000   b) 100 to 2 lakh
c) 100 to 1 lakh   d) None of these

7) LCD use _____ and _____ material.
a) IN_2O_3, SnO_3 b) IN_2O_2, SnO_3
c) INO_3, SnO_3 d) INO, SnO_3

8) LDR uses _____ material.
a) CdS_2 b) CdS_3
c) CdS_4 d) CdS

Q.2 Answer the following question: (Any Four) 08
    a) Explain linear IC.
    b) Write use of photodiode.
    c) Draw diagram of common cathode display.
    d) Define sensor.
    e) Write subfamilies of TTL IC.
    f) Write use of single layer PCB.

Q.3 Write short notes on the following: (Any Two) 08
    a) Explain construction of LCD.
    b) Explain fabrication of diode.
    c) Explain SMT.

Q.4 Answer the following question: (Any Two) 08
    a) Explain TTL logic gates AND, NOT.
    b) Explain multilayer PCB.
    c) Explain fabrication of capacitor.

Q.5 Answer the following question: (Any One) 08
    a) Explain IC fabrication steps - wafer formation, epitaxial growth, insulation layer, masking and etching.
    b) Explain construction and working of thermistor, LDR.

Seat No.	

B.Sc. (E.C.S.) (Semester - I) (CBCS) Examination: October/November - 2025
Programming using 'C (ECS1104)

Day & Date: Wednesday, 26-11-2025   Max. Marks: 40
Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.
                2) Figures to the right indicate full marks.
                3) Draw neat diagrams and give equations wherever necessary.
                4) Use of logarithmic table and calculator is allowed.

Q.1 Multiple Choose Questions.   **08**

1) _____ is a keyword that used for a storage class.
   a) Printf()   b) external
   c) Auto   d) scanf()

2) The default perimeter passing mechanism is _____.
   a) call by value   b) call by reference
   c) call by value result   d) none of these

3) By default a function returns a value of type _____.
   a) Int   b) char
   c) Void   d) None of these

4) int **x; _____.
   a) x is a pointer to pointer   b) x is not pointer
   c) x is long   d) None of these

5) The keyword 'break' cannot be simply used within _____.
   a) do-while   b) if-else
   c) for   d) while

6) A declaration float a, b; occupies _____ of memory.
   a) 1 byte   b) 4 bytes
   c) 8 bytes   d) 16 bytes

7) Array subscripts in C always start at _____.
   a) -1   b) 1
   c) 0   d) Value provided by user

8) The variable declared inside the function is known as the ____ variable.
   a) loop   b) local
   c) global   d) none of these

Q.2 Answer the following question: (Any Four) 08
  a) What is header file?
  b) How pointer is declared and initialized?
  c) Write the syntax of printf () function.
  d) List out rules to declare variable.
  e) Syntax of do-while loop.

Q.3 Write short notes on the following: (Any Two) 08
  a) Explain advantages & disadvantages of algorithms. Write algorithm of minimum of two numbers.
  b) Write a program that check entered number is Prime or not using function.
  c) What is data type? Explain Primitive data types in details.

Q.4 Answer the following question: (Any Two) 08
  a) What is operator? Explain its types.
  b) What is-pointer? List out rules for pointer operations.
  c) Explain "pointer to function" concept with example.

Q.5 Answer the following question: (Any One) 08
  a) What is Array? Explain two Dimension of array in details.
  b) What is function? Explain inbuilt and user defined function with example.