



Seat No.	
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Set	P
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**S.Y.M.C.A. (Part – II) (Faculty of Engg.) Examination, 2018
OPERATIONS RESEARCH**

Day and Date : Monday, 7-5-2018
Time : 2.30 p.m. to 5.30 p.m.

Total Marks : 100

Instructions : 1) **All questions are compulsory.**
2) **Use of Scientific calculator allowed.**

1. Choose the correct alternative.

20

- 1) The graphical method of LP problem uses
 - i) Objective function equation
 - ii) Constraint equation
 - iii) Linear equation
 - iv) All of the above
- 2) For maximization problem, the objective function coefficient for an artificial variable is
 - i) + M
 - ii) – M
 - iii) Zero
 - iv) None of the above
- 3) The dual of the primal maximization LP problem having m constraints and n non-negative variables should
 - i) Have n constraints and m non-negative variables
 - ii) Be a minimization LP problem
 - iii) Both i) and ii)
 - iv) None of the above
- 4) The dummy source or destination in a transportation problem is added to
 - i) Satisfy rim conditions
 - ii) Prevent solution from becoming degenerate
 - iii) Ensure that total cost does not exceed a limit
 - iv) None of the above
- 5) The method used for solving an assignment problem is called
 - i) Reduced matrix method
 - ii) MODI method
 - iii) Hungarian method
 - iv) None of the above



- 6) Two person zero sum game means that the
- i) Sum of losses to one player is equal to the sum of gains to other
 - ii) Sum of losses to one player is not equal to the sum of gains to other
 - iii) Both i) and ii)
 - iv) None of the above
- 7) If two constraints do not interest in the positive quadrant of the graph, then
- i) The problem is infeasible
 - ii) The solution is unbounded
 - iii) One of the constraints is redundant
 - iv) None of the above
- 8) Which of the following methods is used to verify the optimality of the current solution of the transportation problem ?
- i) Least cost method
 - ii) Vogel's approximation method
 - iii) Modified distribution method
 - iv) All of the above
- 9) What happens when maxmin and minmax values of the game are same ?
- i) No solutions exists
 - ii) Solution is mixed
 - iii) Saddle point exists
 - iv) None of the above
- 10) A mixed strategy game can be solved by
- i) Algebraic method
 - ii) Matrix method
 - iii) Graphical method
 - iv) All of the above
- 11) EOQ is
- i) Exit of quantity
 - ii) Economic Ordering Quantity
 - iii) Example of quantity
 - iv) None
- 12) Critical Path Method (CPM) was developed by _____
- i) Johnny Lever
 - ii) Johnny Walker
 - iii) Walker
 - iv) E. I. Dupont
- 13) When more than one activity comes and joins an event, such event is known as _____
- i) Merge event
 - ii) Burst event
 - iii) Merge and burst event
 - iv) None
- 14) Inventory may be defined as stock of
- i) Goods
 - ii) Commodities
 - iii) Economic resources
 - iv) All of them



- 15) In a CPM/PERT network the critical path is the
- i) lowest path through the network
 - ii) highest path through the network
 - iii) shortest path through the network
 - iv) longest path through the network
- 16) If small orders are placed frequently, then total inventory cost is
- i) Increased
 - ii) Reduced
 - iii) Either increased or reduced
 - iv) Minimized
- 17) Which cost can vary with order quantity ?
- i) Unit cost only
 - ii) Re-order cost only
 - iii) Holding cost only
 - iv) All of these
- 18) When activity times are uncertain
- i) Assume they are normally distributed
 - ii) Calculate the expected time, using $(t_o + 4t_m + t_p)/6$
 - iii) Use the most likely time
 - iv) Calculate the expected time, using $(t_o + t_m + t_p)/3$
- 19) A dummy activity is used in network diagram when
- i) Two parallel activities have the same tail and head events
 - ii) The chain of activities may have a common event yet be independent by themselves
 - iii) Both i) and ii)
 - iv) None of the above
- 20) Generally, PERT technique deals with the project of
- i) Repetitive nature
 - ii) Non-repetitive nature
 - iii) Deterministic nature
 - iv) None of the above

2. Attempt **any four** :

(4×5=20)

- 1) Find the saddle point (or points) and hence solve the games :
The pay off matrix is given by

		B			
		1	2	3	4
A	1	8	6	2	8
	2	8	9	4	5
	3	7	5	3	5

Determine the saddle point, if exists.

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2) Determine the optimal shipping schedule.

		Warehouse			
Plant		A	B	C	Plant Supply
	W	15	8	18	400
	X	20	10	14	300
	Y	25	14	12	150
Warehouse demand		500	100	300	

3) Maximize $Z = 4X_1 - 3Y$

Subject to the constraints

$$X_1 + Y \geq 5$$

$$2X_1 - Y \geq -1$$

$$X_1 \leq 3$$

$$Y \geq 2$$

4) Write the dual of following LPP :

$$\text{Maximize } Z = 2X_1 + 2X_2$$

$$\text{Subject to } X_1 + 2X_2 \leq 10$$

$$X_1 + X_2 \leq 6$$

$$X_1 - X_2 \leq 2$$

$$X_1 - 2X_2 \leq 1$$

$$X_1, X_2 \geq 0$$

5) Write branch and bound algorithm.

3. Attempt **any one** :

(1×10=10)

1) Solve the assignment problem for maximum sale

		District				
		A	B	C	D	E
Salesman	1	33	38	40	28	40
	2	40	24	28	21	36
	3	41	27	33	30	37
	4	22	38	41	36	36
	5	29	33	40	35	39

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2) Use dominance principle to solve following game :

		Player B		
		1	2	3
Player A	1	2	0	3
	2	3	-1	1
	3	5	2	1

4. Solve the LPP using simplex method :

10

Maximize $Z = 2$

$$X_1 + X_2 + 3X_3$$

$$\text{Subject to } X_1 + X_2 + 2X_3 \leq 4$$

$$2X_1 + 3X_2 + 4X_3 = 10$$

$$X_1, X_2, X_3 \geq 0$$

5. Attempt **any four** :

(4×5=20)

- 1) A television repairman finds that the time spent on his jobs has an exponential distribution with a mean of 30 minutes. If he repairs the sets in the order in which they came in and if the arrival of sets follows Poisson distribution with an approximate average rate of 10 per 8 hour day. What is the repairman's expected idle time each day ? How many jobs are ahead of the average set just brought in ?
- 2) A bookbinder has one printing machine, one binding machine and manuscripts of 7 different books. The time required for performing printing and binding operations for different books are known below :

Book	1	2	3	4	5	6	7
Printing time (hr)	15	85	75	20	120	15	65
Binding time (hr)	25	60	75	30	80	35	50

Determine the sequence table and find the idle time for binding machine, printing machines and total elapsed time.

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- 3) The data on the running costs per year and resale price of equipment A, whose purchase price is Rs. 2,00,000 are as follows :

Year	1	2	3	4	5	6	7
Running Cost (Rs.)	30,000	38,000	46,000	58,000	72,000	90,000	1,10,000
Resale Value (Rs.)	1,00,000	50,000	25,000	12,000	8,000	8,000	8,000

What is the optimum period of replacement ?

- 4) A manufacturer is offered machines A its priced at Rs. 5,000 and running costs are estimated at Rs. 800 for each of the five years. Increasing by Rs. 200 per year in the sixth and subsequence years. If money is worth 10% per year when should machine be replaced ?
- 5) A small project is composed of 9 activities whose time estimate are given below :

Activity Name	Event	1 – 2	1 – 3	1 – 4	2 – 5	2 – 6	3 – 6	4 – 7	5 – 7	6 – 7
Time required in day	t_o	5	18	26	16	15	6	7	7	3
	t_m	8	20	33	18	20	9	10	8	4
	t_p	10	22	40	20	25	12	12	9	5

- i) Draw PERT network.
- ii) Find critical path of expected project and expected project length.

6. Attempt the following :

(2×10=20)

- 1) Find the sequence that minimizes that total time required in performing the following jobs on three machines in the order ABC. Processing time (in hours) is given below :

Job	A	B	C	D	E	F	G
Machine A	3	8	7	4	9	8	7
Machine B	4	3	2	5	1	4	3
Machine C	6	7	5	11	5	6	12

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2) A project is composed of 12 activities whose time estimate are given below :

Activity Name	Event	1 – 2	2 – 3	2 – 4	3 – 5	4 – 5	4 – 6	5 – 7	6 – 7	7 – 8	7 – 9	8 – 10	9 – 10
Time Required in day	t_o	1	1	1	3	2	3	4	6	2	4	1	3
	t_m	2	2	3	4	3	5	5	7	4	6	2	3
	t_p	3	3	5	5	4	7	6	8	6	8	3	7

- Find the expected duration and variance for each activity.
- Draw PERT network.
- Find critical path of expected project and expected project length.
- The earliest and latest time to reach each event.
- Calculate variance and SD of the project length.

OR

2) A computer has a large no. of electronic tubes. They are subject to the following mortality rates :

Period	Age of failure (hrs)	Probability of failure
1	0 – 200	0.10
2	201 – 400	0.26
3	401 – 600	0.35
4	601 – 800	0.22
5	801 – 1000	0.07

If the tubes are group replaced, the cost of replacement is Rs. 15 per tube. Replacement of individual tubes that fail in service, costs Rs. 60 per tube. How frequently should the tube be replaced ?

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Day and Date: Saturday, 19-05-2018
Time: 10.30 A.M. to 1.30 P.M.

Max. Marks: 100

Instructions: All questions are compulsory.

Q.1 Multiple choice questions:

20

- 1) GCD (13, 8) is _____.
a) 1
b) 2
c) 3
d) 4
- 2) 8 queen's problem is solved by _____.
a) Backtracking
b) Branch and Bound
c) Greedy method
d) None of these
- 3) If tree is having m levels then the total node in the tree is _____.
a) 2^{m+1}
b) $2^m - 1$
c) 2^{m*n}
d) 2^{m-1}
- 4) There are _____ steps to solve the problem.
a) Seven
b) Four
c) Six
d) Two
- 5) _____ is the first step in solving the problem.
a) Understanding the Problem
b) Identify the Problem
c) Evaluate the Solution
d) None of these
- 6) _____ is the last step in solving the problem.
a) Understanding the Problem
b) Identify the Problem
c) Evaluate the Solution
d) None of these
- 7) Following is true for understanding of a problem
a) Knowing the knowledgebase
b) Understanding the subject on which the problem is based
c) Communication with the client
d) All of the above
- 8) The six-step solution for the problem can be applied to
I. Problems with Algorithmic Solution
II. Problems with Heuristic Solution
a) Only I
b) Only II
c) Both I and II
d) Neither I nor II
- 9) _____ solution requires reasoning built on knowledge and experience.
a) Algorithmic Solution
b) Heuristic Solution
c) Random solution
d) None of these
- 10) While solving the problem with computer the most difficult step is _____.
a) describing the problem
b) finding out the cost of the software
c) writing the computer instructions
d) testing the solution

- 11) The correctness and appropriateness of _____ solution can be checked very easily.
 - a) algorithmic solution
 - b) heuristic solution
 - c) random solution
 - d) none of these
- 12) The branch of computer that deals with heuristic types of problem is called _____.
 - a) system software
 - b) real time software
 - c) artificial intelligence
 - d) none of the above
- 13) Artificial Intelligence makes use of following prominently _____.
 - a) Database
 - b) Data Warehouse
 - c) Knowledge base
 - d) None of these
- 14) The true and false values represent _____.
 - a) logical data
 - b) numeric data
 - c) character data
 - d) alphanumeric data
- 15) Following operator distinguishes equation from expression _____.
 - a) +, -, *, /
 - b) < or >
 - c) Logical operators
 - d) Assignment operators
- 16) Following are called logical operators _____.
 - a) +, -, *, /
 - b) <, >, <=, >=
 - c) AND, OR, NOT
 - d) \, MOD
- 17) Evaluate $a-2>b$ where $a=6$, $b=8$ _____.
 - a) False
 - b) True
 - c) 6
 - d) 7
- 18) Evaluate for $a = 5$, $b = 4$, $c = 3$, $d = 12$ for the equation $E = a*b+d/c$ _____.
 - a) 40
 - b) 24
 - c) 10
 - d) 10.66
- 19) The PAC stands for _____.
 - a) Program Analysis Chart
 - b) Problem Algorithm Code
 - c) Problem Access Code
 - d) Problem Analysis Chart
- 20) In interactivity chart the darkened circle indicates _____.
 - a) Duplicate module
 - b) Loop
 - c) Decision
 - d) No special meaning

SECTION - I

- | | | |
|------------|---|----------------------------|
| Q.2 | Write short note on following. (Any Four) | 20 |
| | <ol style="list-style-type: none"> a) Randomized algorithm b) Algorithm for finding maximum and minimum of two numbers c) Optimal merge pattern d) Flow shop scheduling e) Recursive algorithm | |
| Q.3 | <ol style="list-style-type: none"> a) Define and explain asymptotic notations (O, Ω, Θ) to measure complexity of an algorithm. b) Write an algorithm for merge sort. Explain it with an example. | 10

10 |
| | OR | |
| | Explain multistage graph for finding minimum cost path with an example. | 10 |

SECTION - II

- Q.4 Write short note on the following. (Any Four)** **20**
- a)** Algorithm for Greatest common divisor
 - b)** Depth first search
 - c)** Branch and Bound techniques
 - d)** Even Faster evolution and interpolation
 - e)** Bi-connected components
- Q.5 a)** Write an algorithm for Graph colouring problem. **10**
- b)** Explain algorithm for 8 queen's problem using backtracking. **10**
- OR**
- Write and explain Fast Fourier transformation with recursion. **10**



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**S.Y.M.C.A. (Part – II) (Under Faculty of Engg.) Examination, 2018
PROGRAMMING IN JAVA**

Day and Date : Monday, 14-5-2018
Time : 2.30 p.m. to 5.30 p.m.

Total Marks : 100

Instructions : 1) Figures to the **right** indicate marks.
2) Write a program **if necessary**.

1. Multiple Choice Question :

20

- 1) _____ is the process of converting typed code to machine code ?
a) Compilation b) Interpretation c) Parsing d) Coding
- 2) _____ consist a data and methods ?
a) Variable b) Class c) Vectors d) None of these
- 3) _____ and _____ classes are derived from Throwable class ?
a) Error and Exception b) AWT and Thread
c) Paint and Awt d) Action and Border
- 4) _____ is one of the features of object oriented programming that allows the creation of hierarchical classifications ?
a) Inheritance b) Polymorphism
c) Abstract class d) Data hiding
- 5) _____ exception will be thrown if you try to access the array element beyond its index value ?
a) ArrayIndexOutOfBoundsException b) Arithmetic Exception
c) ClassNotFoundException d) Interrupted Exception
- 6) When the ejbRemove method encounters a system problem, it should throw _____
a) javax.ejb.NoSuchEntityException
b) java.ejb.EJBException
c) java.ejb.RemoveException
d) javax.ejb.DuplicateKeyException



- 7) _____ is a block of java code in JSP that is used define class-wide variables and methods in the generated class file.
a) scriptlets b) declarations c) element d) expression
- 8) Which of the following is not an implicit object ?
a) date b) request c) out d) pagecontext
- 9) An Enterprise JavaBeans can be deployed in _____
a) J2EE server b) Weblogic
c) Web sphere d) All of the above
- 10) Consider the following HTML page code
`<html>
 <body>
 POST
 </body>
</html>`
Which method of HelloServlet will be invoked when the hyperlink is clicked ?
a) doGet b) doPost
c) doHref d) servicePost
- 11) To determine the behaviour of the beans in an application, we make use of
a) Java.beans.SimpleBeanInfo b) Java.beans.Introspector
c) Java.awt.* d) None of the above
- 12) Which of the following of beans would survive a server crash ?
a) Entity beans b) Stateless session beans
c) Stateful session beans d) Message-driven beans
- 13) What are valid methods for HttpSession Listener interface ?
a) sessionRemoved b) sessionDestroyed
c) sessionReCreated d) sessionReplaced
- 14) In the JMS, message producers and message consumers are created by which of the following objects ?
a) Connection Factories b) Message Listeners
c) Connections d) Sessions



- 15) Which of the following statement is false regarding the exceptions in JDBC ?
- a) SQLWarning objects are a subclass of SQLException that deal with database access warnings
 - b) Warnings stop the execution of an application, as exceptions do; they simply alert the user that something did not happen as planned
 - c) Connection object has a getWarning () method in it
 - d) Statement and ResultSet objects have getWarning () methods in it
- 16) The EJB timer service is used for timing notifications. It can be used with
- a) CMP entity beans
 - b) both BMP and CMP entity beans
 - c) message-driven beans
 - d) b and c
- 17) Stub is a _____ proxy for the remote object.
- a) Server side
 - b) Client side
 - c) Both side
 - d) None of the above
- 18) _____ the first web browser developed in Java ?
- a) Internet Explorer
 - b) Netscape Navigator
 - c) Operano
 - d) HotJava
- 19) _____ is the ability of an Java application to perform multiple tasks at the same time ?
- a) Multiprogramming
 - b) Multithreading
 - c) Multiprocessing
 - d) Multitasking
- 20) _____ exception will be thrown when you divide be zero ?
- a) ArrayIndexOutOfBoundsException
 - b) Arithmetic Exception
 - c) ClassNotFoundException
 - d) InterruptedException
2. Write short note on (**any four**) : (4×5=20)
- a) Layout Managers
 - b) Inheritance in Java
 - c) Serialization
 - d) Delegation Event Model in Java
 - e) List Box and Combo Box.



3. a) Describe an applet life cycle. Write a program to explain use of an applet. **10**
b) Write a GUI based program to enter the roll no in the textbox and view all the details like name, address, contact no. data_of_birth on the other text boxes. (Retrieve values from database using JDBC) **10**

OR

- b) Write a java program that display Text field where user can type file name. When file name is entered, the program should check whether file exists. If it does not, an error message should be flashed on the screen. And if it is, then it should splay contents of the file in the text area. **10**
4. Write short note on (**any four**) : **(4×5=20)**
a) Swing JMenu control
b) Socket and ServerSocket
c) Thread Life Cycle
d) DatagramSocket and DatagramPacket
e) Native-API driver.
5. a) Explain in detail different JDBC drivers. **10**
b) What is Scroll Pane in swing ? Explain the use of JScrollPane with program example. **10**

OR

- b) Explain steps of creating RMI application. Write RMI application to do addition to two numbers. **10**
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T.Y. M.C.A. (Part – I) (Under Faculty of Engg.) Examination, 2018
MOBILE COMMUNICATION

Day and Date : Thursday, 3-5-2018
Time : 10.30 a.m. to 1.30 p.m.

Max. Marks : 100

- Instructions :** 1) Figures to the **right** indicate marks.
2) Q. **3A.** and Q. **5A** are **compulsory**.
3) Write an example **if necessary**.

1. Multiple Choice Questions :

20

- 1) The intensity of radiation is not same in all directions from the antenna is known as
 - a) Omni directional effect
 - b) Directive effect
 - c) Macroni effect
 - d) Negative effect
- 2) CDMA stands for
 - a) Carrier Division Multiple Access
 - b) Constant Division Multiple Access
 - c) Condition Division Multiple Access
 - d) Code Division Multiple Access
- 3) Disadvantage of FDMA is
 - a) Antennas typically fixed
 - b) Guard space needed
 - c) Synchronization difficult
 - d) Inflexible
- 4) The physical layer of GSM handles _____ functions.
 - a) radio-specific
 - b) television-specific
 - c) data-specific
 - d) call-specific
- 5) Submarine communication or AM radio uses _____ waves.
 - a) Sky
 - b) Ground
 - c) Line of sight
 - d) Micro
- 6) Receivers are complex in case of
 - a) CDMA
 - b) FDMA
 - c) TDMA
 - d) SDMA
- 7) 3G W-CDMA is also known as
 - a) UMTS
 - b) DECT
 - c) DCS-1800
 - d) ETACS
- 8) FDMA is used mainly for transmission
 - a) Digital
 - b) Analog
 - c) Both a) and b)
 - d) Neither a), b) and c)
- 9) In _____ Frequency Spectrum is divided into smaller spectra and is allocated to each user.
 - a) TDMA
 - b) CDMA
 - c) FDMA
 - d) FGMA



- 10) Alexander Graham Bell invented telephone in
a) 1876 b) 1854 c) 1916 d) 1910
- 11) _____ reducing the cell size to increase capacity is called as
a) Intelligentcell approach b) Microcell approach
c) Top down approach d) Bottom up approach
- 12) What is the maximum distance running the lowest data rate for 802.11b ?
a) About 100 feet b) About 175 feet c) About 300 feet d) About 350 feet
- 13) The _____ mainly focuses on voice oriented tele services.
a) GPRS b) DECT c) FOMA d) GSM
- 14) WAP stands as
a) Wireless Application Protocol b) Wire-line Application Protocol
c) Wireless Access Protocol d) None of these
- 15) LIR stands for
a) Least Interference Routing b) Lost Interference Routing
c) Lossless Interference Routing d) Less Interference Routing
- 16) Roaming is
a) Moving between AP b) Changing AP
c) Scanning for AP d) None of the above
- 17) GSM allows a reuse factor of
a) 1 b) 3 c) 5 d) 7
- 18) Which multiple access technique is used by IEEE 802.11 standard for wireless LAN ?
a) CDMA b) CSMA/CA
c) ALOHA d) None of the mentioned
- 19) Data is transmitted in small portions, called
a) Explores b) Bursts c) Bounces d) Destroys
- 20) _____ is a process of converting plaintext into cipher text.
a) Authentication b) Decryption c) Compression d) Encryption

SECTION – I

2. Write short note on **(any 4)** :

20

- a) TETRA.
- b) Mobile and wireless devices.
- c) Advantages of Wireless Communication.
- d) Wireless data technologies.
- e) Different types of antennas.

Set P



3. A) Explain simplified reference model of wireless communication. **10**
B) What is cellular system ? Explain advantages of cellular system. **10**

OR

- B) Explain handover in UMTS. **10**

SECTION – II

4. Write a short note on **(any 4)** : **20**
a) HIPERLAN2.
b) Dynamic host configuration protocol.
c) WLAN advantages.
d) WAP architecture.
e) Mobile IP.

5. A) What is Bluetooth ? Explain Bluetooth architecture in detail. **10**
B) What is IEEE 802.11 ? Explain its two basic architectures. **10**

OR

- B) What is WAP ? Explain WAP architecture. **10**
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Day and Date : Saturday, 5-5-2018
Time : 10.30 a.m. to 1.30 p.m.

Total Marks : 100

1. Multiple choice questions :

20

- P.T.O.



- 7) Capability of data mining is to build _____ models.
 - a) Retrospective
 - b) Interrogative
 - c) Predictive
 - d) Imperative
- 8) The first International Conference on KDD was held in the year _____.
 - a) 1996
 - b) 1997
 - c) 1995
 - d) 1994
- 9) Removing duplicate records is a process called _____.
 - a) Recovery
 - b) Data cleaning
 - c) Data cleansing
 - d) Data pruning
- 10) Data marts that incorporate data mining tools to extract sets of data are called _____.
 - a) Independent data mart
 - b) Dependent data marts
 - c) Intra-entry data mart
 - d) Inter-entry data mart
- 11) _____ clustering technique start with as many clusters as there are records, with each cluster having only one record.
 - a) Agglomerative
 - b) Divisive
 - c) Partition
 - d) Numeric
- 12) Which of the following is the data mining tool ?
 - a) C
 - b) Weka
 - c) C++
 - d) VB
- 13) In _____ algorithm, each cluster is represented by the centre of gravity of the cluster.
 - a) K-medoid
 - b) k-means
 - c) STIRR
 - d) ROCK
- 14) A _____ acts a bridge between data warehouse and database application.
 - a) Data mart
 - b) Operational data
 - c) Meta data
 - d) Data cube
- 15) In web mining, _____ is used to know which URLs tend to be requested together.
 - a) Clustering
 - b) Associations
 - c) Sequential analysis
 - d) Classification
- 16) The complexity of data mining algorithm is represented by _____.
 - a) $\log n$
 - b) $2n \log n$
 - c) $n \log n$
 - d) $2 \log n$
- 17) The basic idea of the apriori algorithm is to generate _____ item sets of a particular size and scans the database.
 - a) Candidate
 - b) Primary
 - c) Secondary
 - d) Super key



- 18) Rule based classification algorithms generate _____ rule to perform the classification.
a) If-then b) While c) Do while d) Switch
- 19) Market-basket problem was formulated by _____
a) Agrawal et al b) Steve et al c) Toda et al d) Simon et al
- 20) After the pruning of a priori algorithm, _____ will remain.
a) Only candidate set b) No candidate set
c) Only border set d) No border set

SECTION – I

2. Write short note on (**any 4**) : **20**
a) Picklist prompts
b) Meta data
c) Data warehouse multiple data types
d) Catalogs
e) Need of data warehouse.
3. A) What is data warehouse ? Explain the architecture of data warehouse. **10**
B) What is OLAP ? Explain need and categories of OLAP. **10**
OR
B) Differentiate ROLAP, MOLAP and HOLAP. **10**

SECTION – II

4. Write a short note on (**any 4**) : **20**
a) Web mining
b) Divisive hierarchical clustering
c) Outlier
d) PAM algorithm
e) DBMS vs DM.
5. A) What is Data Mining ? Explain data mining challenges and issue. **10**
B) Explain nearest neighbor method with example. **10**
OR
B) Explain web structure and web usage mining. **10**
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Set

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Day and Date : Tuesday, 8-5-2018
Time : 10.30 a.m. to 1.30 p.m.

Total Marks : 100

Instructions : 1) Figures to the **right** indicate marks.
2) Q.3 A and Q.5 A are **compulsory**.
3) Write a program if **necessary**.

20

- 1) _____ are software programs that hide their true nature and reveal their designed behavior only when activated.
 - a) Viruses
 - b) Worms
 - c) Trojan horses
 - d) All of the above
- 2) National security is a multilayered system that protects the sovereignty of a state, its _____.
 - a) Assets
 - b) Resources
 - c) People
 - d) All of the above
- 3) Once the organizational assets have been identified, a threat assessment process _____ the risks facing each asset.
 - a) Identifies
 - b) Quantifies
 - c) Both a and b
 - d) None of the above
- 4) A _____ is an identified weakness in a controlled system, where controls are not present or are no longer effective.
 - a) Vulnerability
 - b) Defect
 - c) Both a and b
 - d) None of the above
- 5) _____ can continue replicating themselves until they completely fill available resources, such as memory, hard drive space and network bandwidth.
 - a) Virus
 - b) Worms
 - c) Trojan Horse
 - d) All of the above

P.T.O.



- 6) _____ is an attempt to gain personal or financial information from an individual, usually by posing as a legitimate entity.
 - a) Sniffers
 - b) Social engineering
 - c) Phishing
 - d) None of the above
- 7) Internet protocol is vulnerable to denial of service is
 - a) Sabotage
 - b) Software attacks
 - c) Both a and b
 - d) None of the above
- 8) Management must define _____ type of security policy, according to the National Institute of Standards.
 - a) EISP
 - b) ISSP
 - c) SysSP
 - d) All of the above
- 9) A _____ is a plan or course of action that conveys instructions from an organization's senior management to those who make decisions, take actions and perform other duties.
 - a) Policy
 - b) Standards
 - c) Practices
 - d) All of the above
- 10) The typical information classification scheme has _____ category or categories.
 - a) Confidential
 - b) Internal
 - c) External
 - d) All of the above
- 11) Cyber crimes are unlawful acts where the computer is used as a
 - a) Tool
 - b) Target
 - c) Both a and b
 - d) None of the above
- 12) The sender and receiver of a message had assurance that the message not been altered during transmission is
 - a) Authentication
 - b) Integrity
 - c) Non Repudiation
 - d) All of the above
- 13) Violation of cyber laws rules of conduct lead to Govt. action as
 - a) imprisonment
 - b) fine
 - c) both a or b
 - d) none of the above
- 14) _____ is the registering of sites with famous names in the hope or selling them at a profit.
 - a) Cyber Squatting
 - b) Reverse Hacking
 - c) Meta Tags
 - d) None of the above
- 15) The _____ may, by notification in the Official Gazette, appoint a CCA.
 - a) Central Government
 - b) State Government
 - c) Both a and b
 - d) None of the above



- 16) _____ may make an application to the Certifying Authority for the issue of a DS Certificate.
- a) Company authority
 - b) Company owner
 - c) Any person
 - d) None of the above
- 17) The Certifying Authorities issue digital signature certificates for electronic authentication to
- a) Peoples
 - b) Users
 - c) Authority
 - d) None of the above
- 18) A Certifying Authority is a trusted body whose central responsibility is to _____ and provide directories of Digital Certificates.
- a) Issue
 - b) Revoke
 - c) Renew
 - d) All of the above
- 19) The _____ issue digital signature certificates for electronic authentication of users.
- a) CA
 - b) CCA
 - c) Both a and b
 - d) None of the above
- 20) The applicant holds the _____, which is capable of creating a digital signature.
- a) Private key
 - b) Public key
 - c) Both a and b
 - d) None of the above

SECTION – I

2. Write short note on **(any 4)** : **20**
- a) Components of Information System.
 - b) Critical characteristics of Information System.
 - c) Threats to information of an organisation.
 - d) Information Security Standards.
 - e) Planning for continuity.
3. A) Explain in brief Security Technologies as firewall and VPNs. **10**
- B) Describe in detail different stages of risk assessment. **10**
- OR
- B) On which security models standards are based ? Explain each in brief. **10**



SECTION – II

4. Write a short note on **(any 4)**. **20**
- a) Digital Signature.
 - b) Need of Certifying Authority.
 - c) Concept of domain names.
 - d) Qualifications for Presiding Officer of the Cyber Appellate Tribunal.
 - e) Appeal to Cyber Appellate Tribunal.
5. A) Describe different functions of the Controller. **10**
- B) What do you mean by Trademark Jurisprudence as Meta Tags and cyber squatting ? **10**
- OR
- B) Explain the role of Cyber Regulation of Appellate Tribunal. **10**
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Seat No.	
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**TYMCA (Part – I) (Under Faculty of Engg.) Examination, 2018
ADVANCED INTERNET TECHNOLOGY**

Day and Date : Saturday, 12-5-2018

Max. Marks : 100

Time : 10.30 a.m. to 1.30 p.m.

MCQ/Objective Type Questions

1. MCQ : **(20×1=20)**

- 1) Which segment do flipkart belong ?
a) B2B b) B2C c) C2B d) None of these
- 2) Which is a function of E-commerce ?
a) Marketing b) Advertising c) Both a and b d) None of these
- 3) In PHP we can use _____ to comment a single line.
a) // b) #
c) /**/ d) All of the above
- 4) What are Servlets ?
a) Java Servlets are programs that run on a Web or Application server
b) Java Servlets act as a middle layer between a requests coming from a Web browser or other HTTP client and databases or applications on the HTTP server
c) Both a and b
d) None of these
- 5) Which of the following code is used to get names of the headers in servlet ?
a) response.getHeaderNames() b) request.getHeaderNames()
c) Header.getHeaderNames() d) None of these



- 6) Which of the following is true about init() method of servlet ?
- a) The init() method simply creates or loads some data that will be used throughout the life of the servlet
 - b) The init() method is not called again and again for each user request
 - c) Both a and b
 - d) None of these
- 7) When the servlet is first created ?
- a) Destroy b) Service c) Init d) None of these
- 8) Each time the server receives a request for a servlet, the server spawns a new thread and calls
- a) Service b) Destroy c) Init d) None of these
- 9) _____ called when server deletes servlet instance.
- a) Delete b) Init c) Destroy d) None of these
- 10) To join the internet, the computer has to be connected to a
- a) Internet architecture board b) Internet society
 - c) Internet service provider d) None of the mentioned
- 11) A function in PHP which starts with ____ (double underscore) is called
- a) Default function b) Inbuilt function
 - c) Magic function d) None of these
- 12) Which of the following is/are a PHP code editor ?
- a) Notepad b) Notepad++
 - c) PDT d) All of these
- 13) Which of the following must be installed on your computer so as to run PHP script ?
- a) IIS b) Apache c) PHP d) All of these
- 14) Which of the following is not related to security mechanism ?
- a) Encryption b) Decryption c) e-cash d) None of these



15) What will be the output of the following php code

```
<?php
```

```
$num="1"
```

```
$num1="2"
```

```
print$num+$num1;?>
```

- a) 3 b) 12 c) 1+2 d) None of these
- 16) You can test the type of any variable with the ____ function.
a) Whattype() b) Showtype() c) Gettype() d) None of these
- 17) PHP sessions are created using the
a) session_start() b) sessions_start()
c) session_starts() d) none of these
- 18) Which of the following are JSP objects ?
a) Request b) Response c) Both a and b d) None of these
- 19) Which of the following are/is directives in JSP ?
a) <jsp:include> b) <jsp:forward> c) <jsp:plugin> d) none of these
- 20) URL stands for
a) Uniform Resource Locator b) Uniform Resource Location
c) Uniform Resources Locator d) None of these

SECTION – I

2. Write short note on (**any 4**) :

(4×5=20)

- 1) Uniform Resource Locator.
- 2) HTTP protocol basics.
- 3) Internet Payment Systems.
- 4) HTTP Servlet.
- 5) SETprotocol for Credit card payment.

Set P



3. Answer the following :

1) What is E-commerce ? Explain its types and Internet Payment Systems in detail. **10**

2) What is servlet ? Explain Get and Post methods of servlet with an example. **10**

OR

2) Explain how to secure e-commerce with the help of various techniques. **10**

SECTION – II

2. Write short note on (**any 4**) : **(4×5=20)**

1) custom tags.

2) include directive of JSP.

3) loops in PHP.

4) Installing and Configuring PHP.

5) Difference between JSP and Servlet.

3. Answer the following :

1) Explain error handling in PHP with the help of example. **10**

2) Explain PHP web server architecture in detail. **10**

OR

2) Write a program to insert a new record in to the table. (Use PHP and MySQL). **10**



Seat No.	
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T.Y. M.C.A. (Part – I) (Under Faculty of Engg.) Examination, 2018
Elective – II : CLOUD COMPUTING

Day and Date : Tuesday, 15-5-2018
Time : 10.30 a.m. to 1.30 p.m.

Total Marks : 100

- Instructions :**
- 1) Figures to the **right** indicate **marks**.
 - 2) Q. 3.A) and Q. 5. A) are **compulsory**.
 - 3) Write a program **if necessary**.

1. Choose the correct answer :

20

- 1) _____ cloud allow system and service to access group of information.
a) Public b) Private c) hybrid d) Community
- 2) Which cloud operates only one single organization own facility ?
a) Public b) Private c) Hybrid d) Community
- 3) _____ provide the runtime environment for application development and deployment tools.
a) PaaS b) SaaS c) IaaS d) All of the above
- 4) Which service model allows and provide application to end user ?
a) PaaS b) SaaS c) IaaS d) All of the above
- 5) _____ cloud computing allow multiple tenant share of pool of resources.
a) Rapid elasticity b) Broadband network
c) Resource pool d) None of the above
- 6) _____ is environment allow one computer run software that allow another computer simultaneously.
a) Traditional b) Service model
c) Cloud d) Virtualization
- 7) _____ virtualization is a method of partition a physical server into multiple servers.
a) Virtual network b) Client
c) Server d) All of the above
- 8) _____ layer allows application to work with remote client device without changes.
a) Physical layer b) Application layer
c) Virtualization layer d) Both b) and c)



- 9) _____ web service is not platform in traditional sense.
a) Google
b) Microsoft AZURE
c) RACKSPACE
d) AMAZON
- 10) _____ cloud is more suitable for processing and storing non-sensitive data.
a) Private
b) Public
c) Hybrid
d) All of the above
- 11) Which security is mention to secure the computer facility and equipment ?
a) Logical
b) Behavioral
c) Physical
d) None of the above
- 12) How many security levels are done in cloud computing ?
a) 1
b) 2
c) 3
d) 4
- 13) Which service verifies genuineness of communication entity ?
a) Encryption
b) Authorization
c) Authentication
d) All of the above
- 14) _____ is branch of mathematics as well as cryptography.
a) Encryption
b) Cryptography
c) Authentication
d) All of the above
- 15) Network and internet security field consist of _____
a) Deter
b) Prevent
c) Detection
d) All of the above
- 16) Which cloud computing strategy are manage the multiple deployment model ?
a) Multi-Cloud
b) Single Cloud
c) Both a) and b)
d) None of the above
- 17) _____ specification provides multiple cloud vendor like cloud Bees, RackSpace
a) CAMP
b) RAMP
c) Private RAMP
d) Both a) and b)
- 18) _____ service is flexible to capture dynamic, context or attribute and credit base requirement.
a) Trust management
b) Privacy
c) Assess control
d) All of the above
- 19) _____ is pure cloud computing service with all storage found online.
a) Apple drive
b) Google drive
c) Amazon drive
d) Both a) and b)
- 20) Which service provides the application delivery through web browser to end user ?
a) SaaS
b) PaaS
c) IaaS
d) None of the above



SECTION – I

2. Write short note on **(any 4)** : **20**
- a) Benefits and disadvantages of Private Cloud Model.
 - b) Virtualisation Technologies.
 - c) VMware Vcloud Suite Private Cloud.
 - d) Software as service offerings.
 - e) Microsoft private cloud.
3. A) Explain in detail Hybrid Cloud with its advantages and disadvantages. **10**
- B) What are the top five PaaS vendors ? Explain their products in brief. **10**
- OR
- B) Describe in brief Platform as Service offerings. **10**

SECTION – II

4. Write a short note on **(any 4)** : **20**
- a) Security consideration for E commerce.
 - b) Network security in cloud computing.
 - c) Challenges in Cloud Computing related to application security.
 - d) Malicious insiders in cloud computing environment.
 - e) Account or service hijacking.
5. A) Explain in detail shared technology and data loss or leakage issues. **10**
- B) Describe special security considerations for E commerce. **10**
- OR
- B) Explain different future trends of cloud computing. **10**
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Seat No.	
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Set

P

T.Y. M.C.A. (Part – I) (Under Faculty of Engg.) Examination, 2018
Elective : 1) ARTIFICIAL TECHNOLOGY

Day and Date : Thursday, 3-5-2018
Time : 2.30 p.m. to 5.30 p.m.

Max. Marks : 100

Instructions : 1) *Figures to the **right** indicates marks.*
2) *Q. 3 A) and Q. 5 A) are **compulsory**.*
3) *Write a program if **necessary**.*

1. Multiple Choice Questions :

20

- 1) The process of removing detail from a given state representation is called
 - a) Extraction
 - b) Abstraction
 - c) Information Retrieval
 - d) Mining of data
- 2) Breadth-first search always expands the _____ node in the current fringe of the search tree.
 - a) Shallowest
 - b) Child node
 - c) Deepest
 - d) Minimum cost
- 3) A problem solving approach works well for
 - a) 8-puzzle problem
 - b) 8-queen problem
 - c) Finding a optimal path from a given source to a destination
 - d) Mars Hover (Robot Navigation)
- 4) Which function will select the lowest expansion node at first for evaluation ?
 - a) Greedy best-first search
 - b) Best-first search
 - c) Both a) and b)
 - d) None of the above
- 5) The time and space complexity of BFS is (For time and space complexity problems consider b as branching factor and d as depth of the search tree)
 - a) $O(bd + 1)$ and $O(bd + 1)$
 - b) $O(b^2)$ and $O(d^2)$
 - c) $O(d^2)$ and $O(b^2)$
 - d) $O(d^2)$ and $O(d^2)$
- 6) One of the main cons of hill-climbing search is
 - a) Terminates at local optimum
 - b) Terminates at global optimum
 - c) Fail to find a solution
 - d) None of the above



- 7) Which data structure conveniently used to implement BFS ?
 - a) Stacks
 - b) Queues
 - c) Priority Queues
 - d) All of the above
- 8) _____ algorithm keeps track of k states rather than just one.
 - a) Hill-Climbing search
 - b) Local Beam search
 - c) Stochastic hill-climbing search
 - d) Random restart hill-climbing search
- 9) The set of actions for a problem in a state space is formulated by a
 - a) Intermediate states
 - b) Initial state
 - c) Successor function, which takes current action and returns next immediate state
 - d) None of the above
- 10) Which search uses only the linear space for searching ?
 - a) Best-first search
 - b) Recursive best-first search
 - c) Depth-first search
 - d) None of the mentioned
- 11) Which is created by using single propositional symbol ?
 - a) Complex sentences
 - b) Atomic sentences
 - c) Composition sentences
 - d) None of the above
- 12) How many proposition symbols are there in artificial intelligence ?
 - a) 1
 - b) 2
 - c) 3
 - d) 4
- 13) The truth values of traditional set theory is _____ and that of fuzzy set is _____.
 - a) Either 0 or 1, between 0 and 1
 - b) Between 0 and 1, either 0 or 1
 - c) Between 0 and 1, between 0 and 1
 - d) Either 0 or 1, either 0 or 1
- 14) Which are needed to compute the logical inference algorithm ?
 - a) Logical equivalence
 - b) Validity
 - c) Satisfiability
 - d) All of the above
- 15) The major tasks of NLP includes
 - a) Automatic summarization
 - b) Discourse analysis
 - c) Machine translation
 - d) Semantic analysis



- 16) Fuzzy logic is a form of
 - a) Two valued logic
 - b) Crisp set logic
 - c) Many-valued logic
 - d) Binary set logic
- 17) Which is the best way to go for Game playing problem ?
 - a) Linear approach
 - b) Heuristic approach (Some knowledge is stored)
 - c) Random approach
 - d) An optimal approach
- 18) The values of the set membership is represented by
 - a) Discrete set
 - b) Degree of truth
 - c) Probabilities
 - d) Both b) and c)
- 19) Which of the following is an advantage of using an expert system development tool ?
 - a) Imposed structure
 - b) Knowledge engineering assistance
 - c) Rapid prototyping
 - d) All of the above
- 20) Input segments of AI programming contain(s)
 - a) Sound
 - b) Smell
 - c) Touch
 - d) All of the above

SECTION – I

2. Write short note on **(any 4)** : **20**
 - a) Heuristic search technique.
 - b) The AI problems
 - c) Issues in design of search program
 - d) Best First search
 - e) AND-OR Graphs.
3. A) Describe AI problem of constraint satisfaction with example. **10**
B) Is AI problem solution steps being ignored ? Explain this with the 8-puzzle problem. **10**

OR

- B) Explain in detail issues in knowledge representation. 10**



SECTION – II

4. Write a short note on **(any 4)** : **20**
- a) Statistical and probabilistic reasoning.
 - b) Representation of facts in logic.
 - c) Frames.
 - d) Natural language processing.
 - e) Waiting for quiescence.
5. A) How statements are converted in clause form and propositional logic form ? **10**
- B) Explain in detail discourse and pragmatic processing of natural language. **10**
- OR
- B) Describe with an algorithm the MINIMAX search procedure. **10**
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Seat No.	
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Set

P

M.C.A. (Engg.) Direct 2nd Year Students (Bridge Course)
Examination, 2018
DISCRETE MATHEMATICAL STRUCTURE (Paper – I)

Day and Date : Thursday, 17-05-2018
Time : 10.30 a.m. to 1.30 p.m.

Total Marks : 100

Instructions : 1) Draw diagram **wherever** necessary.
2) Figures to the **right** indicate **full** marks.

1. Choose the **correct** alternative :

20

- 1) A _____ is an ordered collection of objects.
 - a) Relation
 - b) Function
 - c) Set
 - d) Proposition
- 2) A matrix having many rows and one column is known as
 - a) Row matrix
 - b) Column matrix
 - c) Diagonal matrix
 - d) None of the mentioned
- 3) The set O of odd positive integers less than 10 can be expressed by _____
 - a) { 1, 2, 3}
 - b) {1, 3, 5, 7, 9}
 - c) {1, 2, 5, 9}
 - d) {1, 5, 7, 9, 11}
- 4) In how many ways can 5 balls be chosen so that 2 are red and 3 are black
 - a) 910
 - b) 990
 - c) 980
 - d) 970
- 5) If ${}^nC_{12} = {}^nC_6$ value of n is
 - a) 12
 - b) 14
 - c) 16
 - d) 18



- 6) 6P_1 is equal to
- a) 18
 - b) 12
 - c) 6
 - d) 0
- 7) A symmetric matrix is a one in which
- a) All diagonal elements are zero
 - b) All diagonal elements are 1
 - c) $A = A^T$
 - d) $A = -A^T$
- 8) A matrix having one row and many columns is known as
- a) Row matrix
 - b) Column matrix
 - c) Diagonal matrix
 - d) None of the mentioned
- 9) Power set of empty set has exactly _____ subset.
- a) One
 - b) Two
 - c) Zero
 - d) Three
- 10) What is the cardinality of the set of odd positive integers less than 10 ?
- a) 10
 - b) 5
 - c) 3
 - d) 20
- 11) Which of the following two sets are equal ?
- a) $A = \{1, 2\}$ and $B = \{1\}$
 - b) $A = \{1, 2\}$ and $B = \{1, 2, 3\}$
 - c) $A = \{1, 2, 3\}$ and $B = \{2, 1, 3\}$
 - d) $A = \{1, 2, 4\}$ and $B = \{1, 2, 3\}$
- 12) The set of positive integers is _____
- a) Infinite
 - b) Finite
 - c) Subset
 - d) Empty
- 13) What is the Cardinality of the Power set of the set $\{0, 1, 2\}$?
- a) 8
 - b) 6
 - c) 7
 - d) 9



- 14) The members of the set $S = \{x|x \text{ is the square of an integer and } x < 100\}$ is _____
- a) $\{0, 2, 4, 5, 9, 58, 49, 56, 99, 12\}$
 - b) $\{0, 1, 4, 9, 16, 25, 36, 49, 64, 81\}$
 - c) $\{1, 4, 9, 16, 25, 36, 64, 81, 85, 99\}$
 - d) $\{0, 1, 4, 9, 16, 25, 36, 49, 64, 121\}$
- 15) 6P_4 is equal to
- a) 36
 - b) 360
 - c) 6
 - d) 4
- 16) Which of the following statement is true ?
- a) Every graph is not its own sub graph
 - b) The terminal vertex of a graph are of degree two
 - c) A tree with n vertices has n edges
 - d) A single vertex in graph G is a sub graph of G
- 17) An arrangement of finite numbers of objects taken some or all at a time is called their
- a) A.P.
 - b) Combination
 - c) Sequence
 - d) Permutation
- 18) The trace of the matrix is defined as
- a) Sum of all the elements of the matrix
 - b) Sum of all the elements of leading diagonal of matrix
 - c) Sum of all non-zero elements of matrix
 - d) None of the mentioned
- 19) If matrix A and B are symmetric and $AB = BA$ iff
- a) AB is symmetric matrix
 - b) AB is an anti-symmetric matrix
 - c) AB is a null matrix
 - d) None of the mentioned
- 20) Trace of the matrix of odd ordered anti-symmetric matrix is
- a) 0
 - b) 1
 - c) 2
 - d) All of the mentioned



SECTION – I

2. Write short note on (**any 4**) : 20
- A) Explain inverse function.
 - B) Explain regular and bipartite graph
 - C) Explain bounded lattice
 - D) Explain rooted and spanning tree
 - E) Explain Euler and Hamilton graph
3. A) Explain set with its four operations. 10
- B) What is graph ? Explain adjacency and incidence matrix. 10

OR

- B) What is relation ? Explain reflexive, irreflexive and transitive relation with an example. 10

SECTION – II

4. Write short note on (**any 4**) : 20
- A) Write in brief about Regular Expression.
 - B) Explain in detail the characteristics of Automaton.
 - C) Draw a state table for a NDFA given by the regular expression $(a + b)^* abb$.
 - D) Write short note on Applications of Pumping Lemma for Regular Sets.
 - E) Explain in detail Moore machine with a neat diagram.
5. A) Write long answer on Regular Sets and Regular Grammar with example. 10
- B) Construct a Mealy machine which is equivalent to the Moore machine defined below : 10

Present State	Next State		Output
	a = 0	a = 1	
$\rightarrow q_0$	q_1	q_2	1
q_1	q_3	q_2	0
q_2	q_2	q_1	1
q_3	q_0	q_3	1

OR

- B) Explain the conversion of Nondeterministic Systems to Deterministic Systems. 10