Total No. of Questions : 12]

SEAT No. :

PA-2709

[Total No. of Pages : 4

[5929]-1001
F.Y. M.C.A. (Engineering)
DISCRETE MATHEMATICS
(2019 Pattern) (310901) (Semester - I)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Out of a total of 130 students, 60 are wearing hats, 51 are wearing scarves and 30 are wearing both hats and scarves. **[6]**

Out of 54 students who are wearing sweaters, 26 are wearing hats, 21 are wearing scarves and 12 are wearing both hats and scarves. Everyone wearing neither a hat nor a scarf is wearing gloves.

i) How many students are wearing gloves?

ii) How many students not wearing a sweater are wearing hats but not scarves?

iii) How many students not wearing a sweater are wearing neither hat nor a scarf?

b) Prove the following statement by mathematical induction **[6]**

$P(n) : 1^3 + 2^3 + \ldots\ldots\ldots\ldots\ldots + n^3 = n^2 (n+1)^2 / 4$

OR

Q2) a) 100 sportsmen were asked whether they play which game : cricket, Hockey, Football. The results are :

45 play cricket, 38 play Hockey, 21 play Football, 18 play Cricket and Hockey, 9 play Cricket and Football, 4 play Football and Hockey and 23 play none of these.

Draw a venn diagram that will show the results of the survey and determine the number of sportsmen who play: **[6]**

i) Exactly one of the games

ii) Exactly two of the games

P.T.O.

b) Prove the following expressions using venn diagram **[6]**

i) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

ii) $(A \cap B)' = A' \cup B'$

Q3) a) Explain the following Terms with Example. **[6]**

i) Injective Function

ii) Bijective Function

iii) Surjective Function.

b) Given a relation R = {(1, 2), (2, 3), (3, 4), (2, 1)} on A = { 1, 2, 3, 4}. Find the transitive closure of R by Warshall's algorithm **[6]**

OR

Q4) a) If x = {l, 2, 3, ..., 7} and R={(x,y) | x-y is divisible by 3}. Show that R is an equivalence relation. Draw the digraph of R. **[6]**

b) Let f(x) = 2*x*+3, g(*x*) = 3*x*+4, h(*x*) = 4x for x € R, where R= set of all real numbers. Find gof, fog, foh, hof, goh, hog **[6]**

Q5) a) Two dice are rolled. What is the probability that the sum of the faces will not exceed 7? Given that at least one face shows a 4. **[5]**

b) A box contains 6 white balls. Find the number of ways, 4 balls can be drawn from the box if

i) two must be white ii) all of them must have the same colour **[6]**

OR

Q6) a) How many arrangements of the word INSTRUCTOR are there in which there are exactly two consonants between successive pairs of vowels?**[6]**

b) i) Suppose repetitions are not permitted, then how many 4 digit numbers can be formed from the six digits 1, 2, 3,5,7,8? **[5]**

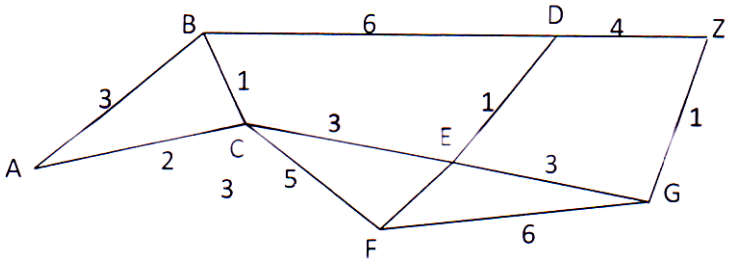
ii) How many such a numbers are less than 4000?

iii) How many numbers in (i) are even?

iv) How many numbers in (ii) are odd?

v) How many of the numbers in (i) contain both the digits 3 and 5?

Q7) a) Find shortest path between A-Z for the given graph; using Dijkstra's algorithm : **[6]**



b) Define the following terms : **[6]**

i) Edge connectivity

ii) Isomorphic Graph

iii) Complete Graph

OR

Q8) a) Define Directed Graph with suitable example. **[6]**

b) Determine the number of regions defined by a connected graph with 6 nodes and 10 edges. Draw the graph. **[6]**

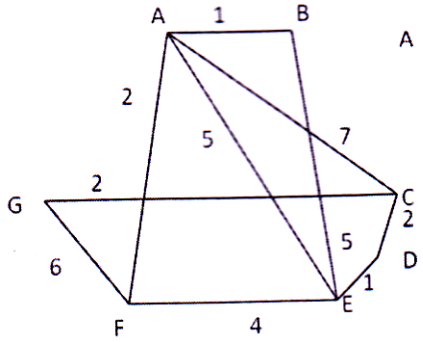
Q9) a) A tree has 2n vertices of degree 1, 3n vertices of degree 2 and n vertices of degree 3. Determine the number of vertices and edges in the tree. **[6]**

b) Explain Prim's Algorithm with example. **[6]**

OR

Q10)a) Define i) Full Binary Tree ii) Rooted Tree iii) center of tree iv) Fundamental Cut set **[6]**

b) Give the stepwise construction of minimum spanning tree for the following graph using Kruskal's algorithm. **[6]**



Q11)a) Explain the following terms with examples (i) Ring (ii) Integral Domain (iii) Field. **[6]**

b) Let R = {0, 60, 120, 180, 240, 300} and * = binary operation so that for a and b in R, a * b is overall angular rotation corresponding to successive rotation by a and by b. Show (R, *) is a group **[5]**

OR

Q12)a) Explain the following terms: (i) Monoids (ii) Sub-group (iii) Group codes. **[6]**

b) Consider the set A = { 1, 3 5, 7, 9 .....} i.e. a set of odd positive integers. Determine whether A is closed under : (i) Addition (ii) Multiplication. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2710

[Total No. of Pages : 3

[5929]-1002
F.Y. M.C.A. (Engineering)
DATA STRUCTURES
(2019 Pattern) (Semester - I) (310902)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Consider the integer array arr[30] [40] declared in C ,base address of array is 700, find the address of element arr[12][20] using row major and column major address implementation. **[6]**

b) What is ADT? Write an ADT for Array. **[6]**

OR

Q2) a) Explain types of Data structures with example. **[6]**

b) Write a pseudo C algorithm for fast transpose of sparse matrix. Also mention the time complexity. **[6]**

Q3) a) Write a function in C/C++ to insert node in circular linked list at any position. **[6]**

b) What are the relative advantages and disadvantages of contiguous allocation vs. linked allocation? **[6]**

OR

Q4) a) Write pseudo c code to add two polynomials using linked list. **[6]**

b) Compare singly linked list and doubly linked list with suitable example. **[6]**

Q5) a) Explain Push and POP operation on linked stack. **[6]**

b) What is backtracking? Explain use of stack in backtracking. **[5]**

OR

P.T.O.

Q6) a) Convert the following expression from infix to Postfix. Make use of appropriate data structure which can be used for conversion

2*3 / (2 – 1) + 5*3 **[6]**

b) Explain application of stack in recursion. **[5]**

Q7) a) Define the following with example : **[6]**

(i) Multi-queue (ii) Degueue (iii) Circular queue

b) Explain priority queue. Write ADT for priority queue and state its applications. **[6]**

OR

Q8) a) Write pseudo C/C++ code to perform insert and delete operation on linear queue. **[6]**

b) Explain circular queue using linked list. Write pseudo C code for enqueue operation. **[6]**

Q9) a) Draw any directed graph with minimum 6 nodes and represent graph using adjacency matrix. **[6]**

b) Write an algorithm for Preorder, Postorder traversal of binary tree and give suitable example. **[6]**

OR

Q10)a) Consider the graph represented by the following adjacency matrix : **[6]**

vertex	**1**	**2**	**3**	**4**	**5**	**6**
1	0	3	1	6	0	0
2	3	0	5	0	3	0
3	1	5	0	5	6	4
4	6	0	5	0	0	2
5	0	3	6	0	0	6
6	0	0	2	2	6	0

And find minimum spanning tree of this graph using Prim's algorithm

b) Explain expression tree. **[6]**

Q11)a) What is heap? Explain heap sort with suitable example. State its complexity. **[6]**

b) Explain linear search with example. State its time complexity and compare it with binary search. **[5]**

OR

Q12)a) Sort the following numbers using quick sort :

25, 82, 17, 23, 38, 7, 64, 86, 21

State its time complexity **[6]**

b) Define : **[5]**

i) sort order,

ii) sort efficiency,

iii) sort passes,

iv) Internal sorting

v) External sorting

Total No. of Questions : 12] **SEAT No. :**

PA-2711 **[Total No. of Pages : 2**

[5929]-1003
F.Y. M.C.A. (Engineering)
OBJECT ORIENTED PROGRAMMING
(2019 Pattern) (Semester - I) (310903)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) a) Explain - Need of Object Oriented Programming. **[6]**

b) Explain the structure of Bottom up approach. **[6]**

OR

Q2) a) Compare C & C++ platforms. **[6]**

b) Write and explain the pillars of OOP. [6]

Q3) a) Write the various operators with example used in C++. **[5]**

b) Write a C++ program to explain Constructor and destructor. **[6]**

OR

Q4) a) Describe with examples Inline function and static data member. **[5]**

b) Write a C++ program to explain the term Array of objects. **[6]**

Q5) a) Explain the term class in inherited Publicly, Privately and Protectedly. **[6]**

b) Write a note on overloading and overriding with example. **[6]**

OR

Q6) a) Differentiate between multiple and multilevel inheritance in C++? **[6]**

b) Write a program to overload increment and decrement operator. **[6]**

Q7) a) Explain the use of Friend Function with example. **[6]**

b) What is Dynamic Binding? **[5]**

OR

P.T.O.

Q8) a) What is the use of this pointer. **[5]**

b) Explain the concept of Virtual Function. **[6]**

Q9) a) Why templates are used in C++? How many types of templates are there in C++? **[6]**

b) Write a Program to find Largest among two numbers using function template. **[6]**

OR

Q10)a) Explain how exception handling mechanism can be used for debugging a program. **[6]**

b) Write a structure of template in C++. **[6]**

Q11)a) Discuss the various forms of get() function supported by the input stream. How are they used? **[6]**

b) What is a file mode? Describe the various file mode options available. **[6]**

OR

Q12)a) Write a note on - seekg(), tellg(), seekp(), tellp(). **[6]**

b) Write a program to read a list containing item name, item code, and cost interactively and produce a three column output as shown below. **[6]**

Item Name	Item Code	Cost
Database	1006	550.95
Java Programming	905	99.70

Total No. of Questions : 12]

SEAT No. : [ ]

PA-2712

[Total No. of Pages : 3

[5929]-1004
F.Y. M.C.A. (Engineering)
PRINCIPLES OF PROGRAMMING
(2019 Pattern) (Semester - I) (310904)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***

Q1) a) What are the six programming steps? **[6]**

b) Discuss programming environment. **[6]**

OR

Q2) a) What is importance of learning programming languages and Discuss history of programming languages? **[6]**

b) List four programming paradigms. State which programming languages are based on each type and How? **[6]**

Q3) a) Discuss elementary data types with example declaration in C++. **[6]**

b) State the difference between execution of Conditional execution and iteration in programming? **[6]**

OR

Q4) a) What are abstract data types? With example explain parameterized abstract data types? **[6]**

b) What are design issues of subprograms? **[6]**

P.T.O.

Q5) a) Explain top down and bottom up design approach with example. **[6]**

b) What is coupling in programming? Explain its type and discuss which type of coupling is best? **[5]**

OR

Q6) a) State the difference between local and global variable? Explain usability of Global variable? **[6]**

b) How iterative structures help in reducing complexity of program? Explain with proper example. **[5]**

Q7) a) What is efficiency of an algorithm with example? **[6]**

b) Write algorithm for Generating Prime numbers? **[6]**

OR

Q8) a) Write algorithm for generating Pascal triangle? **[6]**

b) State the difference between Difference Between Procedural and Non-procedural Language? **[6]**

Q9) a) How to calculated complexity of algprithm? Explain with example. **[6]**

b) Write notes on : i) Big O notation ii) Ω notation iii) Φ notation **[6]**

OR

Q10)a) Write algorithm of linear search and calculate best, worst and average case complexity of it? **[6]**

b) Write notes about time complexity? What is the time complexity of following code : **[6]**

```
int a = 0, i = N;

while (i > 0)

{

a + = i;

i / = 2;

}
```

Q11)a) How array data structure is useful in sequential storage? Explain any 3 applications of array data structure? **[6]**

b) Explain step by step bubble sort working? **[5]**

OR

Q12)a) How binary search is superior to linear search technique? Discuss limitations of Binary search. **[6]**

b) Write notes on Database management system. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2713

[Total No. of Pages : 2

[5929]-1005

F.Y. M.C.A (Engineering)

MANAGEMENT THEORY AND PRACTICES

(2019 Pattern) (Semester - I) (310905)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume Suitable data if necessary***

Q1) a) Elaborate the functions of Management. **[6]**

b) Explain Nature and Purpose of Management. **[6]**

OR

Q2) a) Is Management an Art or Science discuss. **[6]**

b) Define planning. Explain different steps involved in planning. **[6]**

Q3) a) Draw diagram and explain Line, Staff Organization structure. **[6]**

b) Define Organizational Structure. Discuss the role of structure in Organization. **[6]**

OR

Q4) a) Distinguish between MOA and AOA. **[6]**

b) With the help of diagram explain matrix organization. **[6]**

Q5) a) Explain Path and Goal theory. **[6]**

b) What is a Group? Explain the types of group. **[5]**

OR

Q6) a) Explain Black and Moutan's theory. **[6]**

b) What are essential qualities of a good leader. **[5]**

P.T.O.

Q7) a) What is conflict? Explain reasons for interpersonal conflict. **[6]**

b) Explain various aspects of Quality. What are benefits of Total Quality Management? **[6]**

OR

Q8) a) What is Theory X and Theory Y of motivation **[6]**

b) Explain objectives and steps involved in Re-engineering. **[6]**

Q9) a) What is CRM? Explain three phases of CRM. **[6]**

b) Explain the role of Management Information Systems (MIS) in academics. **[6]**

OR

Q10)a) Explain tangible and non tangible benefits an ERP can provide. **[6]**

b) Write short note on Supply Chain Management. **[6]**

Q11)a) Write short note on – Herbert Simpson's Model. **[6]**

b) What should be done to reduce the risk of decision making? **[5]**

OR

Q12)a) Write short note on Principle of Rationality/Bounded Rationality. **[6]**

b) Explain Open system and Closed system in managerial decision making environment. **[5]**

❄ ❄ ❄

Total No. of Questions : 12]

SEAT No. :

PA-2714

[Total No. of Pages : 2

[5929]-1006

M.C.A. (Engineering)

PROBABILITY AND STATISTICS

(2019 Pattern) (Semester-II) (310910)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Figures to the right side indicate full marks.***
2) ***Assume suitable data if necessary.***
3) ***Use of probability table, electronic pocket calculator is allowed.***

Q1) a) State and explain different axioms of probability. **[6]**

b) If 8 new teachers are to be divided among 4 schools, how many divisions are possible basic concept of probability and combination to solve the problem. **[6]**

OR

Q2) a) State and prove Bayes' Theorem. **[6]**

b) A bag contains 7 toys, which are all different. In how many ways can we distribute these to three children, such that the elder child gets 2, the younger child gets 2 and the youngest child gets 3? **[6]**

Q3) a) What is sampling explain the types of sampling. **[6]**

b) Below data gives the information of heights of persons calculate mean, median, mode, variance and standard deviation.
heights = [168, 170, 150, 160, 182, 140, 175, 191, 152, 150] **[6]**

OR

Q4) a) Write a note on regression and there methods. **[6]**

b) What are the types of population in statistics? Explain with example. **[6]**

Q5) a) Write a note on Geometric Distribution. **[5]**

b) What is discrete random variable? if X is a discrete random variable having the following probability distribution **[6]**

X	–1	0	1
P[X=x]	1/5	3/10	1/2

Find the probability mass function of

i) 2X–1

ii) 2X–1/4

OR

P.T.O.

Q6) a) Write a note on Binomial Distribution. **[5]**

b) The mean and variance of the Binomial distribution are 4 and 3 respectively. Find P(X=0). **[6]**

Q7) a) Define **[6]**

i) joint distribution

ii) Discrete marginal density

b) Prove :COV [X, Y] = E[X, Y]–{E[X]* E[Y]} **[6]**

OR

Q8) a) F_{xy} (x,y) = 1/240 $8.5 < x < 10.5$ $120 < y < 240$ **[6]**

Find :

i) E[X]

ii) E[Y]

iii) E[X,Y]

b) What is continuous random variable and probability density? **[6]**

Q9) a) What is significance testing? How does it differ from hypothesis testing.**[6]**

b) A random sample of size n is selected from a normal distribution with mean μ and variance σ^2 . Prove that the sample mean $\overline{X}$ is normally distributes with mean μ and variance σ^2/n **[6]**

OR

Q10)a) Explain the terms: **[6]**

i) Interval estimate

ii) Unbiased estimate

iii) Efficient estimate

iv) Confidence limit

b) What is P value of test? How do we computer P value for two tailed test?**[6]**

Q11)a) Describe the chi-square test as a test of goodness of fit. **[5]**

b) What is control chart? Name the types of control charts and explain them in brief. **[6]**

OR

Q12)a) Explain Statistical Quality Control with its advantages and limitations.**[6]**

b) Explain r*c test for independence. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2715

[Total No. of Pages : 2

[5929]-1007
First Year M.C.A. (Enginnering)
SYSTEMS PROGRAMMING & OPERATING SYSTEM
(2019 Pattern) (Semester - II) (310911)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Distinguish system program and application program. **[6]**

b) Write a short note on two pass assembler. **[6]**

OR

Q2) a) What are features of MASM? **[6]**

b) Explain advanced assembler directives. **[6]**

Q3) a) Write a short note on MS-DOS linker. **[6]**

b) Describe code optimization techniques. **[6]**

OR

Q4) a) What are the phases of compiler. **[6]**

b) Explain Compile and Go loader. **[6]**

Q5) a) Draw and explain process control block. **[6]**

b) Explain various states of process with diagram. **[5]**

OR

P.T.O.

Q6) a) Explain SJF in detail. **[6]**

b) Explain scheduling criteria in detail. **[5]**

Q7) a) List the requirements of Mutual Exclusion. **[6]**

b) Write a semaphore solution for readers-writers problem. **[6]**

OR

Q8) a) What is the difference among deadlock avoidance, detection and preventiation? **[6]**

b) Explain the Critical Section Criteria with example. **[6]**

Q9) a) Differentiate - Contiguous & Non-contiguous Memory Allocation. **[6]**

b) Explain with example - Best Fit, Worst Fit & First Fit. **[6]**

OR

Q10)a) Explain the concepts - memory fragmentation, memory compaction **[6]**

b) Differentiate - Paging & Segmentation. **[6]**

Q11)a) Write a note on Disk Structure. **[6]**

b) Explain SSTF when track request - 95, 180, 34, 119, 11, 123, 62, 64. Starting from Track no. 50. **[5]**

OR

Q12)a) Differentiate SCAN and CSCAN with example. **[6]**

b) Explain with example any three File Allocation methods. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2716

[Total No. of Pages : 2

[5929]-1008
F.Y. M.C.A (Engineering)
DATABASE MANAGEMENT SYSTEM
(2019 Pattern) (Semester - II) (310912)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Attempt Q.1 or Q.2, Q.3 or Q4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***All questions are compulsory.***
4) ***Figures to the right indicate full marks.***
5) ***Use of electronic pocket calculator is allowed.***
6) ***Assume suitable data, if necessary.***

Q1) a) Explain components of DBMS along with its Architecture. **[6]**

b) Write difference between DBMS and File Processing System. **[6]**

OR

Q2) a) Explain database schema with example. **[6]**

b) Discuss different layers of data abstraction. **[6]**

Q3) a) Draw an ER diagram for a company needs to store information about employees (identified by ssn, with salary and phone as attributes), departments (identified by dno, with dname and budget as attributes), and children of employees (with name and age as attributes). Employees work in departments, each department is managed by an employee; a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company. **[8]**

b) Explain with example strong and weak entities. **[4]**

OR

Q4) a) Explain types of attributes in ER model with an example. **[6]**

b) Discuss various keys used in database design. **[6]**

P.T.O.

Q5) a) Choose a database application of your choice. Design a schema and apply different types of constraint on Schema. **[8]**

b) Explain Indexing in database with example. **[3]**

OR

Q6) a) State and Explain all the DDL statements with syntax and examples. **[8]**

b) Describe the use of Super key in database design. **[3]**

Q7) What is joins in sql? Explain types of joins with suitable example **[12]**

OR

Q8) a) What is trigger? Explain types of triggers with example. **[6]**

b) Explain difference between stored procedure and function with example. **[6]**

Q9) a) What is the need of normalization? Explain 3 NF in detail. **[6]**

b) What is Lossy and Lossless decomposition? Explain with example. **[6]**

OR

Q10) Normalize following relation up to 3NF with proper explanation and draw ERD {cstno, custname, prodno, proddesc, qty_ordered, custaddress, date_ordered, order_descr, qty_available, price_per_unit,total _cost} **[12]**

Q11) Explain Hbase Architecture. **[11]**

OR

Q12) a) What are the advantages of NOSQL over SQL **[5]**

b) Write short note on :Non Relational Database system **[6]**

Total No. of Questions : 12]

SEAT No. : ____

PA-2717

[Total No. of Pages : 2

[5929]-1009
F.Y. M.C.A. (Engineering)
JAVA PROGRAMMING
(2019 Pattern) (Semester - II) (310913)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume suitable data, if necessary.***

Q1) a) What is array? Expalin with example. **[6]**

b) Write a program to remove white spaces from string in jave. **[6]**

OR

Q2) a) Explain Wrapper classes with example. **[6]**

b) Write note on Enumerated types. **[6]**

Q3) a) Differentiate between Method overloading and Method Overriding. **[6]**

b) Design a class to represent a bank account. Include the following members: Data Members- Name, Account number, Type of account, Balance: Methods- Constructor to assign initial values, deposit, withdraw, display balance. **[6]**

OR

Q4) a) Differentiate between Abstract Class and Interface. **[6]**

b) Explain Constructors with example. **[6]**

Q5) a) Explain Thread life cycle with example. **[6]**

b) Write a program for multiple catch to fire the array index out of Bounds and Arithmetic Exceptions. **[5]**

OR

P.T.O.

Q6) a) What is error? Explain with example. **[6]**

b) Demonstrate how to throw your own exception. **[5]**

Q7) a) What is AWT? Explain useful methods in Component Class. **[6]**

b) Explain Lifecycle of Applet with Example. **[6]**

OR

Q8) a) Write a program to draw a Smiley in Java Applet. **[6]**

b) Differentiate between AWT and Swing. **[6]**

Q9) a) Write a program to copy an input file into an output file. **[6]**

b) Explain Some important Byte stream classes and two important methods of these classes . **[6]**

OR

Q10)a) Write java program to write string in a file. **[6]**

b) Explain Some important Character stream classes and two important methods of these classes. **[6]**

Q11)a) Explain types of JDBC Drivers. **[6]**

b) Write note on J2EE. **[5]**

OR

Q12)a) Write a program to create database of employee using information such as name, id, designation, date of joining etc. Program should disply list all the employees. **[6]**

b) Explain JDBC Architecture. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-3189

[Total No. of Pages : 2

[5929]-1010

F.Y. M.C.A. (Engineering)

COMPUTER ORGANIZATION

(2019 Pattern) (Semester - II) (310914)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) What is utility program? List out some of the task commonly performed by utility program. **[4]**

b) Explain De-Morgans' Theorem and duality theorem. **[4]**

c) Describe different types of software in detail. **[4]**

OR

Q2) a) Convert the following : **[9]**

i) $(6751)_8 = ?_2$ ii) $(939)_{10} = ?_8$

iii) $(F6B)_{16} = ?_2$ iv) $(D4A)_{16} = ?_{10}$

v) $(1001010)_2 = ?_{16}$ vi) $(10010)_2 = ?_8$

b) Explain any two Logic Circuits with truth table. **[3]**

Q3) a) Draw the diagrams for the SR, Jk, D flip flops and construct truth table for each. **[9]**

b) What is Bus ? Explain its various types with function. **[3]**

OR

Q4) a) Explain multiplexer and De-multiplexer in detail. **[6]**

b) What is mean by Counter? Explain the Synchronous & Asynchronous counter? **[6]**

P.T.O.

Q5) a) Write a note on : **[8]**

i) DRAM ii) SDRAM

iii) RDRAM iv) DDR

b) Write a note on -Cache in Pentium IV. **[3]**

OR

Q6) a) What is cache memory? Explain DMA with interfacing with processor. **[8]**

b) Explain levels of Cache Memory. **[3]**

Q7) a) Compare registers of 8085 and 8086. **[6]**

b) Explain various addressing modes. **[6]**

OR

Q8) a) What is instruction fetch and execution cycle? Explain in detail with any instruction. **[6]**

b) Write a note on - Registers in 8086. **[6]**

Q9) a) Explain any one instruction with timing diagram. **[8]**

b) What is pipelining concept? **[4]**

OR

Q10) a) Explain Pentium processor architecture in detail. **[8]**

b) Explain CISC & RISC. **[4]**

Q11) a) Explain parallel computer architecture classification in detail. **[8]**

b) Explain - SISD, MISD **[3]**

OR

Q12) a) What is a cluster? Explain cluster architecture in detail. **[8]**

b) Explain - MIMD, SIMD **[3]**

⌘⌘⌘

Total No. of Questions : 12]

SEAT No. :

PA-2718

[Total No. of Pages : 2

[5929]-1011
S.Y. M.C.A. (Engineering)
WEB PROGRAMMING
(2019 Pattern) (Semester - III) (410901)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Differentiate between HTML and HTML5. **[6]**

b) Define CSS. How it can be used in designing a web page? Explain with a suitable example. **[6]**

OR

Q2) a) Write a code in HTML5 to design a web page of a career councealing firm. **[6]**

b) Explain the concept of XML DTD and XML Schema with a suitable example. **[6]**

Q3) a) What is Client side scripting? Explain any two client side scripting technologies with a suitable example. **[6]**

b) Explain properties and methods of JavaScript. **[6]**

OR

Q4) a) What is DOM Object? Explain its properties and methods. **[6]**

b) Explain the concept of JQuery with selecting, creating, appending elements. **[6]**

Q5) a) Define JSP. What are the advantages of JSP over Servlet? **[6]**

b) Explain Servlet life cycle with a suitable example. **[5]**

OR

P.T.O.

Q6) a) Explain JDBC Connectivity with JSP with a suitable Example. **[6]**

b) Explain the concept of Session Management in Servlet. **[5]**

Q7) a) What is a script? Explain Server side scripting with example. **[6]**

b) Explain the concept of Cookies and sessions with a suitable example. **[6]**

OR

Q8) a) How to create a database in MYSQL and how to create a table in it? Also explain How to insert data into it. **[6]**

b) What is Ajax? Explain its applications in Web Technology. **[6]**

Q9) a) Explain MVC architecture in angular JS. **[6]**

b) Differentiate between Node JS and React JS. **[6]**

OR

Q10) a) What is Struts? Explain its architecture and Configuration. **[6]**

b) Explain the concept of interceptors and Exception handling in Struts. **[6]**

Q11) a) What are Web services? Explain different types of Web Services. **[6]**

b) Differentiate between SOAP and REST. **[5]**

OR

Q12) a) Write a short note on : **[6]**

i) Bootstrap

ii) JSF

iii) Spring.

b) What is EJB? Explain the architecture of EJB. **[5]**

⌘⌘⌘

Total No. of Questions : 12]

SEAT No. : ____

PA-2719

[Total No. of Pages : 2

[5929]-1012
S.Y. M.C.A. (Engineering)
BANKING AND FINANCE
(2019 Pattern) (Semester - III) (410902)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Explain how the regulatory authorities will be beneficial in order to boost the banking sector. **[6]**

b) Explain any 5 laws of bank. **[6]**

OR

Q2) a) Write a note on NABARD. **[6]**

b) Write a note on Negotiable Instrument Act. **[6]**

Q3) a) Write down the difference between NEFT and RTGS. **[6]**

b) What do you mean by Cheques explain all types of cheques. **[6]**

OR

Q4) a) Write the Difference between standing Instructions and straight through processing. **[6]**

b) Write a note on Warrants and dividend. **[6]**

Q5) a) Write a note on CBS(Core Banking System). **[6]**

b) Explain digital payments concept along with example? **[5]**

OR

Q6) a) Write down the difference between Inter and Intra Banking systems. **[6]**

b) Explain any one payment gateway along with example. **[5]**

P.T.O.

Q7) a) What Are the Four Basic Financial Statements? Explain in Detail. **[6]**

b) Explain Types of Bookkeeping system and Methods of Bookkeeping in Detail. **[6]**

OR

Q8) a) What is the preparation of Trial balance? Explain any Five Steps in Preparation of Trial Balance in Detail. **[6]**

b) Write a Difference Between Trading Account and Profit and Loss Account in Detail with any business example. **[6]**

Q9) a) What is Overhead? Classification of Overhead ,explain most common overhead costs that used any business. **[6]**

b) List out and Explain Four Common Liquidity Ratios in Accounting. **[6]**

OR

Q10) a) What Is the Break-Even Point, and How Do You Calculate It? Write a Formula and Explain With Example. **[6]**

b) What are the Key Components of Efficiency Ratios? Explain with Example. **[6]**

Q11) a) List out and explain the different types of working capital? **[6]**

b) How Do You Calculate Working Capital? Explain Steps and Formula for to Calculate Working Capital. **[5]**

OR

Q12) a) Solve this case Using Cash Forecasting Method John Trading Co. has asked you to prepare a working capital forecast using the following information: Issued share capital: $400,000 8% deb.: $ 1,50,000 Fixed assets are valued at $300,000 Production: 100,000 units. Expected ratios of cost to selling price are: R.M. 50%, Wages: 10%, Overheads: 25% = 85%. **[6]**

b) List out and Explain Methods for Estimating Working Capital Requirement in Detail. **[5]**

⌘⌘⌘

Total No. of Questions : 12]

SEAT No. : ____

PA-2720

[Total No. of Pages : 2

[5929]-1013

S.Y. M.C.A (Engineering)

COMPUTER NETWORKS

(2019 Pattern) (Semester - III) (410903)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume Suitable data if necessary***

Q1) a) List out the different types of Networks. **[6]**

b) Explain the process of Manchester Encoding. **[6]**

OR

Q2) a) Compare Frequency Hopping (FHSS) and Direct Sequence (DSSS). **[6]**

b) Explain the process of Differential Manchester Encoding. **[6]**

Q3) a) Explain Go-Back-N-ARQ protocol with neat diagram. **[6]**

b) Write a note on Error Control and Flow Control in Data Link Layer. **[6]**

OR

Q4) a) Explain Stop and Wait ARQ with neat diagram. **[6]**

b) Explain Selective Repeat ARQ protocol with neat diagram. **[6]**

Q5) a) Differentiate between Pure and Slotted ALOHA. **[6]**

b) Compare IEEE 802.11a, b g and n. **[5]**

OR

Q6) a) Explain working of CSMA/CA. **[6]**

b) Explain Static and Dynamic channel allocation. **[5]**

P.T.O.

Q7) a) Write difference between IPV4 and IPV6. **[6]**

b) Explain the services provided by Network layer. Explain any congestion control algorithm in detail. **[6]**

OR

Q8) a) Explain the following terms. i) RIP ii) Mobile IP iii) AODV. **[6]**

b) What is switching? Write difference between packet switching and circuit switching. **[6]**

Q9) a) Write difference between TCP and UDP. **[6]**

b) Explain RTP and SCTP protocols. **[6]**

OR

Q10)a) Explain TCP timer management & TCP congestion control in detail. **[6]**

b) Write the difference between integrated services and differentiated services. **[6]**

Q11)a) Explain how electronics mail works and list out the services offered by SMTP. **[6]**

b) Write difference between peer to peer and client server paradigm. Explain DHCP protocol in detail. **[5]**

OR

Q12)a) How domain Name System converts DNS to IP address write in detail. **[6]**

b) Write short note on : **[5]**

i) HTTP

ii) SMTP

iii) DNS

iv) TFTP

v) MIME.

❄ ❄ ❄

Total No. of Questions : 12]

SEAT No. :

PA-2721

[Total No. of Pages : 2

[5929]-1014
S.Y. M.C.A. (Engineering)
PYTHON PROGRAMMING
(2019 Pattern) (Semester - III) (410904)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Write a Python program to find area of circle by using constant variable. **[6]**

b) Write down the history, features and applications of python. **[6]**

OR

Q2) a) What are different types of operators in python explain each with example. **[6]**

b) Are indentations important in python? Justify. **[6]**

Q3) a) Write a Python program to get the largest number from a list. **[6]**

b) Explain break, continue, pass and else statement with example. **[6]**

OR

Q4) a) Write a Python program to get the 4^{th} element from last in a tuple. **[6]**

b) Write down the difference between list and dictionary. **[6]**

Q5) a) What are commonly used modules in python explain any one module in details. **[6]**

b) Write a note on string slicing along with examples. **[5]**

OR

P.T.O.

Q6) a) What is list write down all built in functions associated with list? **[6]**

b) Write a note on command line arguments. **[5]**

Q7) a) Explain the terms Tuples and Sets. **[6]**

b) Given a dictionary in Python, write a Python program to find the sum of all items in the dictionary. **[5]**

OR

Q8) a) What is Dictionary? Explain any 2 Built- In Functions Used on Dictionaries. **[6]**

b) Write a program Create a dictionary by extracting the keys from a given dictionary. **[5]**

Q9) a) What are the types of Files in Python? Explain with the help of example Reading and Writing CSV Files **[6]**

b) Write short note on Using Special Characters and Regular Expression Methods. **[6]**

OR

Q10) a) How to create a file in Python? Explain with the help of example Reading and Writing Binary Files. **[6]**

b) Write short note on Named Groups in Python Regular Expressions, Regular Expression with glob Module. **[6]**

Q11) a) What is Object Oriented Programming in Python? Explain Polymorphism in Python with the help of suitable example. **[6]**

b) Write short note on Data Compression, Multithreading, GUI Programming. **[6]**

OR

Q12) a) Create a Bus child class that inherits from the Vehicle class. The default fare charge of any vehicle is seating capacity * 100. If Vehicle is Bus instance, we need to add an extra 10% on full fare as a maintenance charge. So total fare for bus instance will become the final amount = total fare + 10% of the total fare. **[6]**

b) Write short note on Operating System Interface for Mathematics, Internet Access, Dates and Times in Python. **[6]**

⌘⌘⌘

Total No. of Questions : 12]

SEAT No. :

PA-2722

[Total No. of Pages : 2

[5929]-1015

S.Y. M.C.A. (Engineering)

MANAGEMENT INFORMATION SYSTEM

(2019 Pattern) (Semester - III) (410905)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume Suitable data if necessary.***

Q1) a) What is MIS? Explain in brief. **[6]**

b) Explain Decision support systems of MIS. **[6]**

OR

Q2) a) How MIS organization within the company? **[6]**

b) Explain Managers view of Information systems. **[6]**

Q3) a) What are the different factors that affect forms of business organization? **[6]**

b) Write note on Information System in the Enterprise. **[6]**

OR

Q4) a) Introduce Enterprise applications. **[6]**

b) Differentiate Integrating functions and business processes. **[6]**

Q5) a) Explain Evolution of an information system. **[6]**

b) Write note on decision making and MIS. **[5]**

OR

Q6) a) How MIS as a technique for making programmed decisions applicable in organisation. **[6]**

b) Explain Basic information systems. **[5]**

P.T.O.

Q7) a) Differentiate Strategic and Project planning for MIS. **[6]**

b) What is General business planning. **[6]**

OR

Q8) a) Explain Strategic and Project planning for MIS. **[6]**

b) Explain appropriate MIS responses. **[6]**

Q9) a) Explain the role of Management Information Systems (MIS) in the academic. **[6]**

b) Explain in detail Transaction Processing Systems as an application of Management Information Systems. **[6]**

OR

Q10)a) Write short note on Supply Chain Management (SCM). **[6]**

b) List the application of MIS. **[6]**

Q11)a) Write a difference between Open System and Closed System. **[6]**

b) How maintain the system. **[5]**

OR

Q12)a) Write short note on- Detailed system design and Implementation. **[6]**

b) Explain Implementation, evaluation and maintenance of MIS. **[5]**

❄ ❄ ❄

Total No. of Questions : 12]

SEAT No. : _____

PA-2723

[Total No. of Pages : 2

[5929]-1016

S.Y. M.C.A (Engineering)

SOFTWARE ENGINEERING & PROJECT MANAGEMENT

(2019 Pattern) (Semester - IV) (410912)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume Suitable data if necessary***

Q1) a) Define : **[6]**

i) Software Process.

ii) Software Engineering Practice.

iii) Software Myths.

b) Explain Personal and Team Process Models. **[6]**

OR

Q2) a) Explain tools DevOps and JIRA. **[6]**

b) Explain Extreme Programming Practices. **[6]**

Q3) a) Explain Functional and Nonfunctional requirements. **[6]**

b) Explain User and system requirements. **[6]**

OR

Q4) a) Explain the Requirements Specification. **[6]**

b) Explain the Requirements Elicitation & Analysis. **[6]**

Q5) a) Explain Agile Development? Agile Manifesto, Agility & Cost of Change. **[6]**

b) Explain SCRUM - process flow and scrum roles. **[5]**

OR

P.T.O.

Q6) a) Explain Extreme Programming XP value, Process. **[6]**

b) Write note on pair programming in Agile. **[5]**

Q7) a) What is software quality? What are factors affecting software quality? **[6]**

b) What do you mean by software measurement size? Explain Function oriented metrics. **[6]**

OR

Q8) a) What do you mean by software metrics? Describe advantages of software Metrics. **[6]**

b) Short note on - Metrics for Testing and maintenance. **[6]**

Q9) a) Short note on - Gantt charts in scheduling project work with example. **[6]**

b) Explain Cost estimation tools and techniques in project planning. **[6]**

OR

Q10)a) Short note on - Work Breakdown structure with example. **[6]**

b) Explain Project imitation and project scope management. **[6]**

Q11)a) Short note on - Software maintenance. **[6]**

b) Explain software project management in detail. **[5]**

OR

Q12)a) Short note on - Software Configuration management. **[6]**

b) Explain importance of project risk management. **[5]**

❄ ❄ ❄

Total No. of Questions : 12]

SEAT No. :

PA-2724

[Total No. of Pages : 2

[5929]-1017
S.Y. M.C.A .(Engineering)
MOBILE COMPUTING
(2019 Pattern) (Semester - IV) (410913)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Explain Types of Handoff. **[6]**

b) Explain the generations of Cellular network (1G, 2G, 2.5G, 3G, 4G) with respective standards. **[6]**

OR

Q2) a) What are the Strategies for Handoff Detection. **[6]**

b) As the signal travels the distance its power becomes weaker-Justify, also explain various wireless communication problems. **[6]**

Q3) a) How Unstructured Supplementary Service Data Mobility Management work. **[6]**

b) Explain Mobility Database. **[6]**

OR

Q4) a) Explain Wireless multiple access protocols. **[6]**

b) What is adaptive clustering for mobile wireless networks. **[6]**

Q5) a) Explain WML. **[6]**

b) Explain WAP Architecture **[5]**

OR

P.T.O.

Q6) a) Explain Mobile TCP. How does a supervisory host send TCP packets to the mobile mode and to a fixed TCP connection? Give the advantages and disadvantages of Mobile TCP. **[6]**

b) What is Reactive Routing Protocol in MANET? Describe DSR Routing Protocols. **[5]**

Q7) a) Explain GSM Architecture. **[6]**

b) Explain GPRS. **[6]**

OR

Q8) a) Compare the features mobile OS : windows and android. **[6]**

b) Explain about UI Layout of android. State the types of layout. Explain in brief two of them. **[6]**

Q9) a) Explain file structure in andriod OS. **[6]**

b) Explain the location based services. **[6]**

OR

Q10)a) Explain GSM : Architecture and Protocols **[6]**

b) Location Update Procedure in GSM. **[6]**

Q11)a) Write a short note on Bluetooth. How it can access in android. **[6]**

b) Explain in brief Peer to peer to communiction. **[5]**

OR

Q12)a) Explain mobile agent based architecture. **[6]**

b) Explain Android Hardware in details. **[5]**

Total No. of Questions: 12]

SEAT No. : ____

PA-2725

[Total No. of Pages : 2

[5929]-1018
S.Y. M.C.A. (Engineering)
DATA SCIENCE WITH R
(2019 Pattern) (Semester-IV) (410914)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data, if necessary.***

Q1) a) Define Big Data and Data Science. Write short note on Data Science Process Overview. **[6]**

b) Explain the terms Data preparation, Data exploration, Data modeling **[6]**

OR

Q2) a) Write short note on Big data. **[6]**

b) Explain Data science process in detail? **[6]**

Q3) a) Explain the basics of R Programming. Explain Importing Data into R. **[6]**

b) Write short note on managing data with R, Exploring and understanding data. **[6]**

OR

Q4) a) What are R Packages, R Control Structure, R data structures? **[6]**

b) Explain the terms **[6]**

i) Exploring numeric variables

ii) Categorical variable

iii) Relationship between variables

Q5) a) What is predictive modeling? Explain decision tree algorithm with example. **[6]**

b) Write a short note on classification performance evaluation. **[5]**

OR

P.T.O.

Q6) a) Explain nearest neighbor classifier and naive Baye's classifier. **[6]**

b) Explain model selection in R. **[5]**

Q7) a) Give examples of using Clustering to solve real life problems. **[6]**

b) What is the difference between a multiclass problem and multilabel problem. **[6]**

OR

Q8) a) Compare hierarchical clustering and k-means clustering? **[6]**

b) What is outlier detection? How clustering can be applied for outlier detection? **[6]**

Q9) a) What is association rules? Explain with example? **[6]**

b) What is the algorithm for association rule? Explain with example. **[6]**

OR

Q10)a) What is FP growth algorithm explain in detail? **[6]**

b) How do you calculate association rule? Explain with example confidence and support calculation? **[6]**

Q11)a) What are different types of R-charts? Explain with syntax. **[6]**

b) List out at least 5 libraries in R that can be used for data visualization. Explain 3 of them briefly. **[5]**

OR

Q12)a) What is scatter plot? Explain with an example of how to create one scatter plot using R libraries? **[6]**

b) How to make multiple plots on to a single page layout in R? Explain with an example. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2726

[Total No. of Pages : 2

[5929]-1019
S.Y. M.C.A. (Engineering)
OBJECT ORIENTED MODELING AND DESIGN
(2019 Pattern) (Semester - IV) (410915)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or 2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8 Q.9 or 10, Q.11 or 12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) What are the benefits of OO software design? **[6]**

b) Differentiate requirement and analysis. **[6]**

OR

Q2) a) Describe COMET use case based software life cycle. **[6]**

b) Explain the design view in 4 + 1 view architecture. **[6]**

Q3) a) Draw Class diagram for "Courier Management System". Make necessary assumptions. **[6]**

b) Explain the concept of Generalizations and Association with example. **[6]**

OR

Q4) a) Draw Class diagram for "Online Shopping Portal". **[6]**

b) Write a note on Object Diagram. **[6]**

Q5) a) How deployment diagram will be useful to distributed client and server system? **[6]**

b) Draw package diagram for College Admission System. **[5]**

OR

P.T.O.

Q6) a) Describe component diagram. Give three types of components. **[5]**

b) How UML is useful in embedded systems? **[6]**

Q7) a) Draw sequence diagram for Transaction Management System. Make suitable assumption. **[6]**

b) What are Communication diagrams? What are the notations used for communication diagram. **[6]**

OR

Q8) a) Explain Partitions and Regions with respect to Activity diagram. **[6]**

b) Draw a timing diagram for ATM System. **[6]**

Q9) a) Differentiate Service oriented Architecture and Component based Architecture. **[6]**

b) What do you understand by architectural design of a system. **[6]**

OR

Q10)a) What is real time software architecture? **[6]**

b) Describe object oriented software architecture. **[6]**

Q11)a) Explain singleton and factory design model. **[6]**

b) Describe observer design pattern. **[5]**

OR

Q12)a) What is iterator design pattern? **[6]**

b) Write a short note on structural design pattern. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2727

[Total No. of Pages : 2

[5929]-1020

M.C.A. - II (Engineering)

ARTIFICIAL INTELLIGENCE

(2019 Pattern) (Semester-IV) (410916A) (Elective-I)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume suitable data if necessary.***

Q1) a) What is artificial intelligence (AI)? How does AI work? Why is artificial intelligence important? What are the advantages and disadvantages of artificial intelligence? **[6]**

b) Explain Problem Solving in AI. **[6]**

OR

Q2) a) Explain in detail types of Artificial Intelligence. **[6]**

b) Discuss and explain in detail applications of AI in real world. **[6]**

Q3) a) Explain Depth Bounded DFS. **[6]**

b) Explain A* algorithm along with example, advantages, disadvantage, time and space complexity. **[6]**

OR

Q4) a) Explain Hill Climbing Algorithm in Artificial Intelligence. **[6]**

b) Explain any one optimal search algorithm in detail. **[6]**

Q5) a) What are the differences between forward reasoning and backward reasoning in AI. **[6]**

b) What is Logic Programming? How to solve any problem using logic programming? **[5]**

OR

P.T.O.

Q6) a) What is knowledge representation and what are types of knowledge? **[6]**

b) Explain in detail Pattern Matching in AI. **[5]**

Q7) a) Explain in detail all the phases of Natural Language Processing (NLP). **[6]**

b) Explain the architecture of information retrieval system. **[5]**

OR

Q8) a) Explain the applications of Natural Language Processing. **[6]**

b) Comment on problem regarding natural language processing (NLP) in information retrieval (IR). **[5]**

Q9) a) Explain the architecture of Artificial Neural Network. **[6]**

b) Write short note on Boltzman Machine. **[6]**

OR

Q10)a) With the help of an architecture diagram explain multilayer feed forward artificial neural network. **[6]**

b) Explain Error Back Propagation algorithm with the help of diagram. **[6]**

Q11)a) Explain supervised and unsupervised learning with an example. **[6]**

b) What is Learning? Explain from examples and Explanation-Based learning. **[6]**

OR

Q12)a) What is Learning? Explain tearning Rote Learning and learning by taking Advice. **[6]**

b) Write a short note on Expert Systems & Its Architecture. **[6]**

Total No. of Questions : 12]

SEAT No. :

PA-2728

[Total No. of Pages : 2

[5929]-1021

M.C.A. (Engineering) - II

INFORMATION SECURITY

(2019 Pattern) (Semester-IV) (Elective-I) (410916B)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume suitable data if necessary.***

Q1) a) Explain Security Policy. **[6]**

b) Difference between Security and Privacy. **[6]**

OR

Q2) a) Explain different elements of information security. **[6]**

b) Explain the Threats and Vulnerability. **[6]**

Q3) a) Explain Data Encryption Standard (DES). **[6]**

b) Explain block ciphers and methods of block cipher. **[6]**

OR

Q4) a) Explain Advance Encryption Standard (AES). **[6]**

b) Describe the applications and limitations of stenography. **[6]**

Q5) a) Explain RSA algorithm in detail. **[6]**

b) Write short note on Kerberos and Cryptography. **[5]**

OR

Q6) a) Explain Define-Hellman Key Exchange Algorithm. **[6]**

b) Write short note on Digital Signature. **[5]**

P.T.O.

Q7) a) Differentiate between IPv4 and IPv6 Explain in detail. **[6]**

b) What is SSL? Explain SSL protocol stack in detail. **[6]**

OR

Q8) a) What is the alert protocol in SSL? Explain various alert messages of Alert protocol in detail. **[6]**

b) What is PGP? Explain the services offered by PGP in detail. **[6]**

Q9) a) What is a Firewall? Explain types of Firewall in detail. **[6]**

b) What is IDS? Explain types of IDS and IPS in detail. **[6]**

OR

Q10)a) What is Password Management? Explain with Definition components, and Best Practices of Password Management. **[6]**

b) What are Trusted Systems in Network security? Explain Trusted Systems based on different level of security. **[6]**

Q11)a) What is personally identifiable information (PII)? List out and explain Sensitive vs. Non-Sensitive Personally Identifiable infromation. **[6]**

b) What is Cyberstalking? Explain How to Prevent Cyber stalking in detail.**[5]**

OR

Q12)a) What is the Information Technology Act, 2000? Explain in detail how it is works as data protection laws in India. **[6]**

b) What is cybercrime? Explain Types of cybercrime with the daily life examples. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2729

[Total No. of Pages : 2

[5929]-1022

S.Y. M.C.A. (Engineering)

ANIMATION & GAMING

(2019 Pattern) (Semester-IV) (410916C)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Attempt Q1 or Q2, Q3 or Q4, Q5, Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***All questions are compulsory.***
4) ***Figures to the right side indicate full marks.***

Q1) a) Define and explain in short following terms: **[6]**

i) Pixel

ii) Line

iii) Polygon

b) Write and Explain Bresenham's line generating algorithm. **[6]**

OR

Q2) a) Write and Explain DDA circle generating algorithm. **[6]**

b) Explain following 2D Transformations in detail along with an example: **[6]**

i) Scaling

ii) Rotation

Q3) a) Explain in detail Animation along with its use, types need,history, applications. **[6]**

b) Explain detail: **[6]**

i) 3D Animation

ii) Principles of Animation

OR

Q4) a) Explain any two kinds of animation techniques in detail. **[7]**

b) Explain web animation in detail. **[5]**

P.T.O.

Q5) a) What is an Animator's Drawing Tool? What is use of it? Explain any 2 tools in detail which are mostly used for animation. **[6]**

b) How do I create any character in animation? Explain in detail. **[5]**

OR

Q6) a) Discuss Thumbnails and its important role in the field of animation. **[6]**

b) Explain in short: Essential & qualities of good animation characters. **[5]**

Q7) a) Write a note on Game design process. **[6]**

b) Explain types of games. **[6]**

OR

Q8) a) Write a note on Gaming platforms. **[6]**

b) Write a note on Game Theory. **[6]**

Q9) a) Explain Game programming Languages and architecture. **[6]**

b) What is game development? Explain game development life cycle. **[6]**

OR

Q10)a) Explain Game GUI. **[6]**

b) Write a note on Game AI? Explain game API. **[6]**

Q11)a) Explain current java game development. **[5]**

b) Explain Basic game structure. **[6]**

OR

Q12)a) Write a note on blocks v/s non-blocking loops. **[6]**

b) Write a note on rendering. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2730

[Total No. of Pages : 2

[5929]-1023

M.C.A. - II (Engineering)

INTERNET OF THINGS

(2019 Pattern) (Semester-IV) (Elective-I) (410916D)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5, Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) What is IoT & write the Characteristics of IoT. **[6]**

b) Differentiate Physical design of IoT, Logical design of IoT? **[6]**

OR

Q2) a) Explain the functional blocks of IoT? **[6]**

b) Explain the Communication models & API of IoT. **[6]**

Q3) a) Explain the Software define Network in M2M. **[6]**

b) Explain the Network Function Virtualization in M2M. **[6]**

OR

Q4) a) What is Machine to Machine also write its key features. **[6]**

b) Write the Difference between IoT and M2M. **[6]**

Q5) a) What is Wireless medium access issues in IoT. **[6]**

b) What is MAC protocol survey in IoT. **[5]**

OR

Q6) a) What is Sensor deployment & Node discovery in IoT. **[6]**

b) What is data aggregation & dissemination in IoT. **[5]**

P.T.O.

Q7) a) Differentiate between M2M and WSN protocols. **[6]**

b) Explain the concept of protocol standardization. **[6]**

OR

Q8) a) Differentiate between SCADA and RFID protocols. **[6]**

b) Explain Zigbee architecture in detail. **[6]**

Q9) a) Explain smartie approch of IoT. **[6]**

b) Write short note on smart cities via data aggregation. **[6]**

OR

Q10)a) Explain BACNet protocol in details. **[6]**

b) Explain security, privacy, and trust in IoT-data platforms for smart cities. **[6]**

Q11)a) Explain future factory concepts of IoT. **[6]**

b) Explain use IoT enabled systems in health sector. **[5]**

OR

Q12)a) How hom automation can be carried out with IoT. **[6]**

b) Explain IoT based smart parking system. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2731

[Total No. of Pages : 3

[5929]-1024
T.Y. M.C.A. (Engineering)
DATA MINING & BUSINESS INTELLIGENCE
(2019 Pattern) (Semester - V) (510901)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data if necessary.***

Q1) a) Illustrate the major issues in Data mining? **[5]**

b) Find dissimilarity between binary variables of (Roma, Mary), (Roma, Jim) and (Mary, Jim) Assume the values Y and P = 1 and the values N = 0. **[6]**

Name	Fever	Cough	Test - 1	Test - 2	Test - 3	Test - 4
Roma	N	N	P	N	N	N
Jim	N	P	N	P	N	N
Mary	Y	P	P	N	N	P

OR

Q2) a) Explain similarities and dissimilarities between characterization and clustering, classification and regression. **[6]**

b) Explain types of attributes with examples. **[5]**

Q3) a) Explain any two data cleaning techniques. **[6]**

b) Explain the need of data pre-processing in BI. Explain various data reduction techniques. **[6]**

OR

Q4) a) Explain data discretization techniques. **[6]**

b) Explain Binning method used in data preprocessing with example. **[6]**

P.T.O.

Q5) a) Consider an example with following set of transactions. **[6]**

TID	Items bought
T1	A, B, C
T2	A, B, C, D, E
T3	A, C, D
T4	A, C, D, E
T5	A, B, C, D

Find the frequent itemsets using Apriori algorithm. Consider 40% support.

b) Explain the following terms : **[6]**

i) Constraint based rule mining

ii) Closed and maximal frequent itemsets

OR

Q6) a) Explain Market Basket Analysis with example. **[6]**

b) Explain following measures used in association Rule mining. **[6]**

i) Minimum Support

ii) Minimum Confidence

iii) Association Rule

Q7) a) Explain Decision Tree based classification method with suitable example. **[6]**

b) Explain Classification and predication. **[5]**

OR

Q8) a) Explain Rule based classification. **[6]**

b) Explain linear and logical regression. **[5]**

Q9) a) Explain K-Means algorithm in detail with example. **[6]**

b) Write short note on Supervised, Semi Supervised and Unsupervised Classification. **[6]**

OR

Q10) a) What is Outliers? Explain various types of outliers with suitable example. **[6]**

b) Explain clustering based methods of outlier detection with example. **[6]**

Q11) a) Draw and explain Business intelligence architecture. **[6]**

b) Explain the application of business intelligence in banking. **[6]**

OR

Q12) a) Explain the components and benefits of BI. **[6]**

b) Development of business intelligence system. **[6]**

Total No. of Questions : 12]

SEAT No. :

PA-2732

[Total No. of Pages : 3

[5929]-1025
T.Y. M.C.A. (Engineering)
CLOUD COMPUTING
(2019 Pattern) (Semester - V) (510902)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q1 or Q.2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 and Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Explain Cloud Characteristics with Architecture. **[6]**

b) Why API's is used in cloud services? **[6]**

OR

Q2) a) What are the different models for deployment in cloud computing? **[6]**

b) What is the platform as a service? **[6]**

Q3) a) What is the difference between cloud computing and mobile computing? **[6]**

b) Explain the features of PaaS and its benefits. **[6]**

OR

Q4) a) Explain what is the use of "EUCALYPTUS" in cloud computing? **[6]**

b) Which are the different layers that define cloud architecture? **[6]**

Q5) a) What is Virtualization? Explain Implementation Levels of Virtualization, **[6]**

b) What is the requirement of virtualization platform in implementing cloud? **[5]**

P.T.O.

OR

Q6) a) Explain Virtualization of CPU, Memory, and I/O Devices. **[6]**

b) Explain Virtualization for Data-Center Automation. **[5]**

Q7) a) Explain how cloud resources are exchanged globally With a suitable example. **[6]**

b) Write Short notes on : **[6]**

i) Amazon cloud services

ii) Google cloud applications.

OR

Q8) a) What is resource provisioning? Explain various methods of resource provisioning. **[6]**

b) Explain the working of following cloud applications : **[6]**

i) Social Networking

ii) Google Apps

Q9) a) Explain the concept of hashing and digital signature in detail. **[6]**

b) What is single sign on (SSO)? Explain in detail. **[6]**

OR

Q10) a) Explain the following cloud security mechanisms. **[6]**

i) Public key infrastructure (PKI)

ii) Identity and Access Management (IAM)

b) Discuss various cloud issues like **[6]**

i) stability

ii) Regulatory Issues

iii) Service level agreements.

Q11) a) Explain the concept of energy aware cloud computing. **[6]**

b) What is docker? Explain its architecture and workflow? **[5]**

OR

Q12) a) How cloud can be implemented in futuristic applications like intelligent fabrics and paints? Explain in detail. **[6]**

b) What is mobile cloud and multimedia cloud? Explain in detail. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2733

[Total No. of Pages : 2

[5929]-1026
T.Y. M.C.A. (Engineering)
SOFTWARE TESTING & QUALITY ASSURANCE
(2019 Pattern) (Semester - V) (510903)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Explain Six Sigma measure of software quality. **[6]**

b) Explain CMMI levels. **[6]**

OR

Q2) a) Explain the difference between Quality assurance and Quality control with example. **[6]**

b) Short note on - Total Quality Management. **[6]**

Q3) a) Write test cases for an Ecommerce websites - “Payment Gateway”. **[6]**

b) Explain testing life cycle in detail. **[6]**

OR

Q4) a) Write test cases for deposit and withdraw in banking system. **[6]**

b) Why is software testing? List out the advantages of software testing. **[6]**

Q5) a) List the components of test plan. Explain test environment and test deliverables in detail. **[6]**

b) Write short note on - Black box testing. **[5]**

OR

P.T.O.

Q6) a) Distinguish between Positive testing and Negative testing. **[6]**

b) Write short note on - White box testing. **[5]**

Q7) a) State difference between System Testing and Acceptance Testing? **[6]**

b) What is Web Application Testing? Explain Web Application Testing - Techniques. **[6]**

OR

Q8) a) How to perform Object Oriented Testing in Software Testing? **[6]**

b) Is There a Difference Between Usability and Accessibility Testing? Explain with examples. **[6]**

Q9) a) What are different skills needed for software Automation? Give 2 examples. **[6]**

b) What are Challenges in Automation Tracking the Bug? Write any 6 common problems. **[6]**

OR

Q10)a) State difference between manual testing and automated testing? **[6]**

b) Write note on Software Test Automation? **[6]**

Q11)a) What is Selenium IDE? Write 6 Features of Selenium. **[6]**

b) Write components of selenium suite tools list with explanation? **[5]**

OR

Q12)a) Explain the Brief History of the Selenium? **[6]**

b) What are advantages and disadvantages of Selenium tools? **[5]**

Total No. of Questions : 12]

SEAT No. : ____

PA-2734

[Total No. of Pages : 4

[5929]-1027
T.Y. M.C.A. (Engineering)
OPERATIONS RESEARCH
(2019 Pattern) (Semester - V) (510904)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 and Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

SECTION - I

Q1) a) What is Linear Programming Problem? Explain methods to solve it. **[6]**

b) Calculate the maximal and minimal value of $z = 5x + 3y$ for the following constraints. **[6]**

$x + 2y \leq 14$

$3x - y \geq 0$

$x - y \leq 2$

OR

Q2) a) Give difference between primal and dual in linear programming problem. **[6]**

b) Find dual from primal conversion **[6]**

MIN $z = x_1 - 3x_2 - 2x_3$

subject to

$3x_1 - x_2 + 2x_3 <= 7$

$2x_1 - 4x_2 >= 12$

$-4x_1 + 3x_2 + 8x_3 = 10$

and $x_1, x_2 >= 0$ and x_3 unrestricted in sign

P.T.O.

Q3) a) Explain transportation problem with example. **[6]**

b) Obtain an initial basic feasible solution to the following transportation problem by north west corner method. **[6]**

	D	E	F	G	Available
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Required	200	225	275	250	

OR

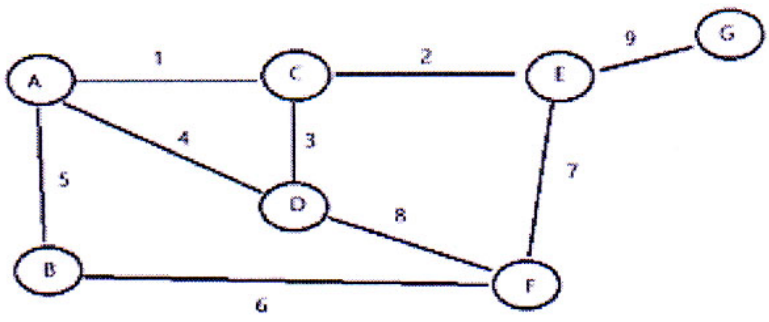
Q4) a) What is Assignment Problem? Explain method to solve it. **[6]**

b) Solve the following assignment problem. Cell values represent cost of assigning job A, B, C and D to the machines I, II, III and IV. **[6]**

		machines			
		I	II	III	IV
	A	10	12	19	11
jobs	B	5	10	7	8
	C	12	14	13	11
	D	8	15	11	9

Q5) a) What is Minimum spanning tree? Explain two algorithms to find it. **[6]**

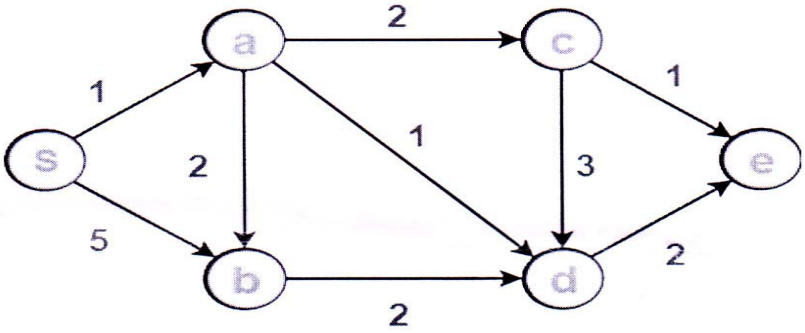
b) Find MST using Kruskal's Algorithm. **[5]**



OR

Q6) a) How to implement Dijkstra's Algorithm explain. **[5]**

b) Using Dijkstra's Algorithm, find the shortest distance from source vertex 'S' to remaining vertices in the following graph - **[6]**

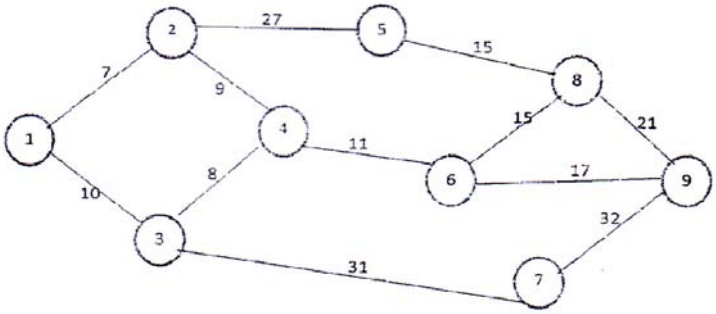


Also, write the order in which the vertices are visited.

SECTION - II

Q7) a) Write algorithm of shortest path model by Flyod. **[6]**

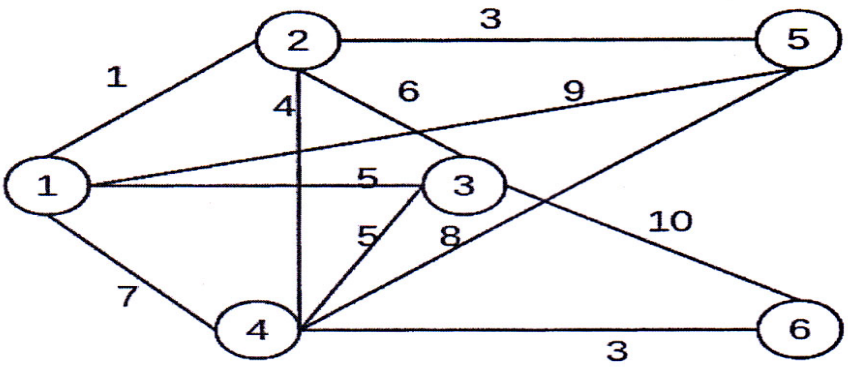
b) Find the shortest distance between node 1 to node 9 by using Dijkstra's algorithm for the given Distance network. **[6]**



OR

Q8) a) Write short note on Goal Programming. **[4]**

b) Draw the minimum spanning tree and calculate shortest distance. **[8]**



Q9) Estimated levels of scales (units) **[12]**

Strategies	N1	N2	N3
S1	7,00,000	3,00,000	1,50,000
S2	5,00,000	4,50,000	0
S3	3,00,000	3,00,000	3,00,000

Which strategy should be concern executive choose the basis of

i) Maximin

ii) Minimax

iii) Maximax

iv) Laplace

OR

Q10) a) What is Decision Making Under Risk. Explain Expected value criterion. **[6]**

b) Explain Decision Making under Certainty using AHP. **[6]**

Q11) a) Explain the three most common methods for collecting observations in simulation. **[7]**

b) What are random numbers? Why they are called pseudo random. **[4]**

OR

Q12) a) What are merits and demerits of simulation? **[4]**

b) A bakery keeps stock of popular brand of cake. Previous experience shows that the daily demand pattern for the item with associated probabilities is given below. **[7]**

Daily Demand	0	10	20	30	40	50
Probability	0.01	0.20	0.15	0.50	0.12	0.02

Use the following sequence of random numbers to simulate the demand for next 10 days. Also the average demand per day.

Random no. : 25 39 65 76 12 05 73 89 19

□□□

Total No. of Questions : 12]

SEAT No. :

PA-2735

[Total No. of Pages : 2

[5929]-1028
T.Y. M.C.A. (Engineering)
MACHINE LEARNING
(2019 Pattern) (Semester - V) (510905A)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume suitable data if necessary.***

Q1) a) What is machine learning? What are applications of machine learning? **[6]**

b) Write down the difference between training and testing? **[6]**

OR

Q2) a) What are various types of learning? **[6]**

b) What is Principal Component Analysis? Explain Properties of Principal Component. **[6]**

Q3) a) Explain all linear models in detail. **[6]**

b) Explain the concept of one Verses One multiclass classification. **[6]**

OR

Q4) a) Explain the concept of support vector machine along with diagram and example. **[6]**

b) Explain the concept of one Verses One multiclass classification. **[6]**

P.T.O.

Q5) a) Write a note on Least Squares Method. **[6]**

b) Write a note on multivariate linear regression. **[5]**

OR

Q6) a) Explain the concept of linear regression in detail. **[6]**

b) Explain polynomial curve fitting example. **[5]**

Q7) a) Differentiate between k means and k medoids algorithms. **[6]**

b) Explain different distance based clustering algorithms with an example. **[6]**

OR

Q8) a) Explain Tree Based Models. **[8]**

b) Write a note on Hierarchical clustering. **[4]**

Q9) a) Explain Naïve Bayes classification. **[8]**

b) Explain Normal Distribution. **[4]**

OR

Q10) a) Define Gaussian Mixtures. **[6]**

b) Explain Expectation - Maximization methods in ML. **[6]**

Q11) a) Write a note on Bagging, Randomization and Boosting. **[6]**

b) Explain Reinforcement Learning. **[5]**

OR

Q12) a) Explain Feed Forward Neural Networks. **[6]**

b) Explain Sigmoid, Tanh and ReLU Neurons. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2736

[Total No. of Pages : 2

[5929]-1029
T.Y. M.C.A (Engineering)
BIG DATA ANALYTICS
(2019 Pattern) (Semester - V) (510905B)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume suitable data if necessary and clearly state.***

Q1) a) What is big data analytic? Why it is important? **[6]**

b) Explain 5 V's of big data in detail. **[6]**

OR

Q2) a) Give difference between BI & Data Science. **[6]**

b) Write a short note on types of big data. **[6]**

Q3) a) What is regression analysis? Explain linear regression in detail? **[6]**

b) What is SVM? Explain types of it? **[6]**

OR

Q4) a) What is apriori algorithm? Explain components of it. **[6]**

b) Write a short note on association rule learning. **[6]**

Q5) a) What are recommendation systems? Why they are used? **[6]**

b) How do content based recommender systems work? **[5]**

OR

Q6) a) Explain collaborative filtering with example. **[6]**

b) How are social networks represented as graphs? **[5]**

P.T.O.

Q7) a) What is big data? How can big data analytics benefit business? **[6]**

b) What are the key steps in deploying a big data platform? **[6]**

OR

Q8) a) What are the steps involved in data analysis process? **[6]**

b) Explain what should be done with suspected or missing data? **[6]**

Q9) a) What are Hadoop's primary operational modes? **[6]**

b) What are three common input formats in Hadoop? **[6]**

OR

Q10) a) What is HDFS and what are its main components? **[6]**

b) What is Hadoop YARN and what are its main components? **[6]**

Q11) a) What are some vendor-specific distributions of Hadoop? **[6]**

b) What are some of the main configuration files used in Hadoop? **[5]**

OR

Q12) a) What is Hadoop and what are its main components? **[6]**

b) Why is Hadoop so popular in big data analytics? **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2737

[Total No. of Pages : 2

[5929]-1030

T.Y. M.C.A. (Engineering)

BLOCKCHAIN TECHNOLOGY

(2019 Pattern) (Semester - V) (Elective - II) (510905C)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) What is blockchain? Explain basic architecture of blockchain. **[6]**

b) Explain design principle of blockchain. **[6]**

OR

Q2) a) How PoW works? Explain with diagram. **[6]**

b) Explain consensus algorithm in detail. **[6]**

Q3) a) What is SHA256 Hash? Explain it with example. **[6]**

b) Explain elliptic curve cryptography in detail. **[6]**

OR

Q4) a) What is Hyperledger? Explain Public and Private ledger. **[6]**

b) What is hashing? Explain signature schemes, encryption schemes in detail. **[6]**

Q5) a) What is Bitcoin? How bitcoin works. What are basic components of bitcoin? **[6]**

b) How to Choose Bitcoin Wallet? How does Merkle trees work? **[5]**

OR

P.T.O.

Q6) a) What is Bitcoin blockchain? What are its challenges. **[6]**

b) What is the use of Bitcoin scripting language? Explain its use and advantages. **[5]**

Q7) a) What is Smart Contracts? List some applications of Smart Contracts. **[6]**

b) Explain any 3 applications of Ethereum. **[6]**

OR

Q8) a) What is difference between Bitcon and Ethereum Blockchain? **[6]**

b) Explain steps of Smart Contracts Development from a business perspective. **[6]**

Q9) a) Explain any 3 popular Cryptocurriences. **[6]**

b) How does Bitcoin use in Blockchain? **[6]**

OR

Q10) a) List and explain any 3 cryptographic algorithms. **[6]**

b) Explain crypto wallet. **[6]**

Q11) a) What are different types of Blockchain. **[6]**

b) Explain a real life use case where a block chain is being used. **[5]**

OR

Q12) a) Explain 51% attack. **[6]**

b) Write short note on SNARK. **[5]**

⌘⌘⌘

Total No. of Questions : 12]

SEAT No. :

PA-2738

[Total No. of Pages : 3

[5929]-1032
F.Y. M.C.A. (Engineering)
DATA BASE MANAGEMENT SYSTEM
(2019 Pattern) (Semester - II) (310912)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) What is DBA? Describe various functions of DBA? **[6]**

b) What is DDL and DML statements and explain with example. **[6]**

OR

Q2) a) A bank has many branches, the bank has many customers. A customer can open many different kinds of accounts with the bank. Any customer of the bank can take a loan from the bank. All branches can give loans. Bank has also installed automatic teller machines, from which a customer can withdraw from his/her bank. Draw an ER diagram for the bank. **[6]**

b) Explain the concept of data abstraction. **[6]**

Q3) a) Solve the following queries by using tables EMP & DEPT. **[6]**

EMP(Empno,Ename,Job,Mgr,Hiredate,Sal,Comm,Deptno)

DEPT(Deptno,Dname,Location)

1) Display the details of all employees who report to BLAKE
2) Find out department in which no employee is working.
3) Find out in which century JAMES joined.
4) Display the department name which has more than 3 employees in it.
5) Find out details of employees where commission is greater than 7% of salary.

b) Write a cursor which will update the employee salary by 5000 and display the count of employees received the increment. **[6]**

P.T.O.

OR

Q4) a) Solve the following queries by creating tables with proper constraints. **[6]**

STUDENT (Membership_No , Name , Course)

BOOK (Book_ID, Category , Title, Author, Price ,Status)

BOOK_STATUS (Book_ID , Membership_No , Issue_Date, Return_Date, Fine_Charger, Fine_Paid)

1) Display the books under the category "Networking" currently available in library.

2) Find the member who has paid maximum fine.

3) Display all book details which are returned today.

b) Write an explicit cursor which will display employee number and name of all employees make use of the EMP table

EMP(Empno,Ename,Job,Mgr,Hiredate,Sal,Comm,Deptno) **[6]**

Q5) a) What are constraints? Explain Different types of constraints in detail? **[6]**

b) Explain any5 CODD's rules in detail? **[5]**

OR

Q6) a) What is normalization Explain all types of normalization. **[6]**

b) Explain Database Design Methodology. **[5]**

Q7) a) Explain the concept of deadlocks with proper example. **[6]**

b) Explain transaction management. **[5]**

OR

Q8) a) Explain two types of Log based protocol. **[8]**

b) Explain Shadow Paging. **[3]**

Q9) a) Explain Parallel databases with its types. **[6]**

b) Write a short note on Speed up and scale up. **[6]**

OR

Q10)a) Explain Data server architecture. **[8]**

b) Differentiate between client - server and centralized architecture. **[4]**

Q11)a) Explain how to deal with massive datasets using Map Reduce and Hadoop. **[6]**

b) Explain working of different nodes in HDFS. **[6]**

OR

Q12)a) Explain CRUD operation in Mango DB. **[6]**

b) Explain the concept of Indexing in Mango DB. **[6]**

Total No. of Questions : 12]

SEAT No. :

PA-2739

[Total No. of Pages : 2

[5929]-1033
First Year M.C.A. (Engineering)
COMPUTER NETWORK
(2020 Pattern) (Semester - II) (310913)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Write short note on LAN, WAN, PAN. **[6]**

b) Describe Frequency Hopping and Hierarchical topology. **[6]**

OR

Q2) a) Explain OSI model. **[6]**

b) Explain Gateway, switches and Brouters in detail with diagram. **[6]**

Q3) a) Explain Error Control and Flow Control in detail. **[6]**

b) Explain stop and wait protocol with suitable example. **[6]**

OR

Q4) a) Explain sliding window protocol with suitable example. **[6]**

b) Write short note on PPP and HDLC. **[6]**

Q5) a) Explain Pure and Slotted ALOHA. **[6]**

b) Describe about CSMA and WDMA in detail. **[5]**

OR

P.T.O.

Q6) a) Explain in detail Fast Ethernet, Gigabit Ethernet. **[6]**

b) Explain static and dynamic channel allocation. **[5]**

Q7) a) Differentiate between IPv4 and IPv6 addressing. **[6]**

b) Describe mobile IP and DSR. **[6]**

OR

Q8) a) Explain Distance Vector and Link state routing protocol. **[6]**

b) Write short note on CIDR and OSPF. **[6]**

Q9) a) Explain the services provided by transport layer. **[6]**

b) Explain RTP and SCTP. **[6]**

OR

Q10)a) Discuss in detail about TCP Congestion Control. **[6]**

b) Differentiate between TCP and UDP. **[6]**

Q11)a) Explain DNS and FTP in detail. **[6]**

b) Explain TFTP and TELNET. **[5]**

OR

Q12)a) Explain SMTP and POP3 protocol. **[6]**

b) Explain DHCP in detail. **[5]**

Total No. of Questions: 12]

SEAT No. : [ ]

PA-2740

[Total No. of Pages : 2

[5929]-1034
First Year M.C.A. (Engineering)
JAVA PROGRAMMING
(2020 Pattern) (Semester-II) (310914)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherver necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Assume Suitable data if necessary.***

Q1) a) What is meant by package? How they are crated? Explain with example. **[6]**

b) What is inheritance? With example explain the use of 'Super' keyword in it. **[6]**

OR

Q2) a) Explain the concept of Interfaces in Java with example. **[6]**

b) Explain the concept of static Members of Java. **[6]**

Q3) a) Explain thread Synchronization with example. **[6]**

b) What is the utilization of file class? Explain different constructors associated with file class. **[6]**

OR

Q4) a) What is meant by multithreading? Explain different ways of creating thread in Java. **[6]**

b) What are the reader and writer classes available in java? **[6]**

Q5) a) What is the use of Adapter classes in Java? Explain with example. **[6]**

b) Explain different types of containers in AWT. **[5]**

OR

Q6) a) Write the similarities and dissimilarities between swing and AWT. **[6]**

b) Explain lifecycle of an applet with diagram. **[5]**

P.T.O.

Q7) a) Explain with diagram of all drivers in JDBC. **[6]**

b) Explain the interfaces used in JDBC with example. **[6]**

OR

Q8) a) Explain with example types of statements in JDBC **[6]**

b) Write a program to create connection in JDBC. **[6]**

Q9) a) Explain various Java Networking Terminologies. **[6]**

b) What is URL? Explain various URL connection Class Methods. **[6]**

OR

Q10)a) What is Datagram? Write a note on Datagram Server & Client. **[6]**

b) Explain any three classes in java.net package. **[6]**

Q11)a) Write a note on Life cycle of Servlet. **[6]**

b) Explain the architecture of JSP. **[5]**

OR

Q12)a) Write a difference between Servlet and JSP. **[6]**

b) Explain the architecture of Servlet. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2741

[Total No. of Pages : 2

[5929]-1035
F.Y. M.C.A. (Engineering)
OPERATING SYSTEMS
(2020 Pattern) (Semester - II) (310915)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) What is an operating system and why do we need it? Describe the two main goal operating system. **[6]**

b) What is Kernal? Explain its main function. What relationship with operating system? **[6]**

OR

Q2) a) Write a short note on evolution of operating system. **[6]**

b) Describe virtual machine in detail. **[6]**

Q3) a) What is a thread? Define User Level Thread and Kernal Level Thread. **[6]**

b) Explain Concept of Multithreading in detail. **[6]**

OR

Q4) a) Explain SJF in detail. **[6]**

b) Explain scheduling criteria in detail. **[6]**

Q5) a) List the requirements of Mutual Exclusion. **[6]**

b) Write a semaphore solution for readers-writers problem. **[5]**

OR

P.T.O.

Q6) a) What is the difference among deadlock avoidance, detection and prevention? **[6]**

b) Explain monitor in brief. **[5]**

Q7) a) Compare single contiguous allocation and partitioned memory allocation. **[6]**

b) Explain the concepts-memory fragmentation, memory compaction. **[6]**

OR

Q8) a) Write short note on Virtual memory management. **[6]**

b) What is segmented memory management. **[6]**

Q9) a) Explain Disk structure with suitable diagram. **[6]**

b) Explain the concept of segmentation. What is paged segmentation. **[6]**

OR

Q10)a) Explain SCAN algorithm with eg. **[6]**

b) Why demand paging approach is preffered over segmentation. Explain. **[6]**

Q11)a) Explain any 6 shell commands with eg. **[6]**

b) Explain salient features of Linux. **[5]**

OR

Q12)a) Explain basic elements or components of Linux. **[6]**

b) What is Kernel. Explain its functions. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2742

[Total No. of Pages : 2

[5929]-1036

M.C.A. - I (Engineering)

MOBILE COMPUTING

(2020 Pattern) (Semester-II) (310916A)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume suitable data if necessary.***

Q1) a) Explain Value Added Services of Mobile. **[6]**

b) Explain the generations of Cellular network (1G, 2G, 2.5G, 3G, 4G) with respective standards. **[6]**

OR

Q2) a) Explain GPRS. **[6]**

b) Explain overview of wireless telephony. **[6]**

Q3) a) Explain Wireless multiple access protocols. **[6]**

b) Write in brief Wireless networking. **[6]**

OR

Q4) a) Explain Wireless LAN Overview. **[6]**

b) Explain IEEE 802.11. **[6]**

Q5) a) Explain data replication for mobile computers. **[6]**

b) Explain File system in Mobile computers. **[5]**

OR

Q6) a) Write in brief adaptive clustering for mobile wireless networks. **[6]**

b) Explain Mobile data management issues. **[5]**

P.T.O.

Q7) a) Explain J2ME. **[6]**

b) Explain Palm OS. **[6]**

OR

Q8) a) Compare the features mobile os: windows and android. **[6]**

b) Explain about UI Layout of android. State the types of layout. Explain in brief two of them. **[6]**

Q9) a) Explain file structure in android OS. **[6]**

b) Explain File Management tools of Android OS. **[6]**

OR

Q10)a) Write note on Android Application. **[6]**

b) Explain retrieval and Sharing: File system in android. **[6]**

Q11)a) Explain GTalk Service. **[6]**

b) Explain in brief SQLite database. **[5]**

OR

Q12)a) Explain Manage network and Wi-Fi connections. **[6]**

b) Explain Android Hardware in details. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2743

[Total No. of Pages : 2

[5929]-1037

F.Y. M.C.A. (Engineering)

ARTIFICIAL INTELLIGENCE

(2020 Pattern) (Semester-II) (Elective-I) (310916B)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data if necessary.***

Q1) a) What is artificial intelligence (AI)? How does AI work? Why is artificial intelligence important? What are the advantages and disadvantages of artificial intelligence? **[6]**

b) Explain in detail Intelligent Agents. **[6]**

OR

Q2) a) What are the types of Artificial Intelligence. **[6]**

b) Explain in detail applications of AI in real world. **[6]**

Q3) a) What are the conditions for optimality in A* search? **[6]**

b) Explain A* algorithm along with example, advantages, disadvantage, time and space complexity. **[6]**

OR

Q4) a) How does bidirectional search work in AI? **[6]**

b) What is depth limited search? Explain with an example. **[6]**

Q5) a) Explain TMS (truth maintenance system). **[6]**

b) What is quantification in AI? What are the 2 types of quantification? **[5]**

OR

Q6) a) What is knowledge representation and what are types of knowledge? **[6]**

b) Describe predicates in artificial intelligence? How predicate logic is used in AI? **[5]**

Q7) a) Explain main difference between search and planning with the consideration of any four parameters of comparison. **[6]**

b) List out and explain any six components or elements of planning in AI. **[6]**

OR

P.T.O.

Q8) a) What do you mean by Sussman's Anomaly? Explain with Example how it is solve with Nonlinear planning using constraint posting. **[6]**

b) Explain Hierarchical Plan to travel from a certain Source to Destination by Bus by using Hierarchical Planning of AI. **[6]**

Q9) a) List out the ANN applications and explain any two applications in detail.**[6]**

b) What is the Error Backpropagation Learning Algorithm? How does Error Backpropagation Work? Explain in Detail. **[6]**

OR

Q10)a) What are the main components of ANN that explain the features of each of them? **[6]**

b) What is FNN? Explain Single - layer perceptron and Multi-layer perceptron in Detail. **[6]**

Q11)a) What are the main components of the expert system? Explain Four main components of the expert system in Detail. **[6]**

b) Give any two examples of expert system in use today? Explain in Detail.**[5]**

OR

Q12)a) What are the Five parts of an expert system? Explain in detail. **[6]**

b) Can a human doctor be replaced by an expert system? Explain your View in detail. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2744

[Total No. of Pages : 2

[5929]-1038

M.C.A. (Part - I) (Engieering)

CYBER SECURITY

(2019 Pattern) (Semester - II) (Elective - I) (310916C)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the irght side indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Explain the Challenges and Constraints of Internet Governance. **[6]**

b) Explain the need for a comprehensive Cyber Security Policy. **[6]**

OR

Q2) Explain in details Cyber Threats. **[12]**

Q3) a) Explain the Complex Network Architectures in Vulnerabilities and Access Control. **[6]**

b) Explain the Poor Cyber Security Awareness. **[6]**

OR

Q4) a) Explain the Access control, Audit, Authentication of Cyber Security Safeguards. **[6]**

b) Explain the Intrusion Detection Systems. **[6]**

Q5) a) Explain the Intrusion, Physical Theft in cyber security. **[6]**

b) Explain the Abuse of Privileges in cyber security. **[5]**

OR

Q6) a) Explain the Intrusion detection and Prevention Techniques. **[6]**

b) Explain the Malware infection. **[5]**

Q7) a) What is cryptography? Explain the concept of Symmetric key Cryptography with a suitable example. **[6]**

b) Write a short note on. **[6]**

i) Digital Signature

ii) Message Authentication.

OR

P.T.O.

Q8) a) What is a firewall? How it functions? Explain its types in detail. **[6]**

b) What is VPN? Explain Security at application layer and transport layer. **[6]**

Q9) a) What is cyber space? Explain Indian Cyber space. **[6]**

b) Discuss various cyber security regulations and standards in detail. **[6]**

OR

Q10) a) Explain the details of National Cyber Security Policy 2013. **[6]**

b) What is the role of private sector and International law in cyber space? **[6]**

Q11) a) What is cyber forensics? How Preliminary investigations are handled in it? **[6]**

b) Explain how disk based analysis is conducted? **[5]**

OR

Q12) a) Explain how the E-mails are scrutinized and validated with a suitable example. **[6]**

b) Write a short note on. **[5]**

i) Tracing Internet Access.

ii) Tracing memory in real time.

Total No. of Questions : 12]

SEAT No. :

PA-2745

[Total No. of Pages : 2

[5929]-1039

F.Y.M.C.A. (Engineering)

BLOCK CHAIN

(2020 Pattern) (Semester - II) (310916D)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) What is DFS? Explain How Hadoop can use the DFS Structure in HDFS File System. **[6]**

b) Explain in detail Digital Signature in Blockchain. **[6]**

OR

Q2) a) Explain the Steps of Byzantine General problem and Fault Tolerance With Example. **[6]**

b) Explain secure Hash algorithm and Distributed Hash tables. **[6]**

Q3) a) Briefly discuss what are the different types of Block Chains? **[6]**

b) Explain with example Distributed Consensus. **[6]**

OR

Q4) a) List out various real time applications of blockchain technology & explain any two application in Details. **[6]**

b) Identify two major properties of a blockchain network. **[6]**

Q5) a) Explain in detail about Sybil attack with scenarios. **[6]**

b) Explain with example Nakamoto Consensus. **[5]**

OR

Q6) a) Explain Energy Efficiency of Blockchain Technologies. **[6]**

b) Explain Proof-of-work v/s Proof-of-stake protocol. **[5]**

Q7) a) Define the three major characteristics of money that bitcoin possesses. **[6]**

b) Write a short note on Smart Contracts. **[6]**

P.T.O.

Q8) a) Explain and Difference between Bit coin block chain and Ethereum Block chain? **[6]**

b) Explain whether sidechains need to be interoperable. **[6]**

Q9) a) What is Namecoin? What can Namecoin be used for? **[6]**

b) Describe how blockchain is helpful for e-commerce. **[6]**

OR

Q10)a) Explain in detail types of cryptocurrency. **[6]**

b) List various Block chain applications. Explain block chain application in Health care. **[6]**

Q11)a) What is Hyper Ledger explain with example. **[6]**

b) Discuss the benefits of Hyperledger. **[5]**

OR

Q12)a) Explain the architecture of Hyper Ledger. **[6]**

b) Explain the relationship between Hyper Ledger and Blockchain. **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2746

[Total No. of Pages : 2

[5929]-1041
S.Y. M.C.A. (Engineering) (Semester - III)
DATA SCIENCE
(2020 Pattern) (410901)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicates full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) What is Data science? Explain purpose of data science. **[6]**

b) Differentiate between Qualitative vs Quantitative Data and Big Data Vs. Little Data. **[6]**

OR

Q2) a) Explain different data science Roles. **[6]**

b) Explain Data science process in detail? **[6]**

Q3) a) Explain steps in data preprocessing. **[6]**

b) What is Data preprocessing? What are different Data Preprocessing Techniques? **[6]**

OR

Q4) a) What is Data Warehouse? Explain Types of Data Warehouse? **[6]**

b) Explain Tools of Data warehouse? **[6]**

Q5) a) Explain working of Nearest Neighbor classifier with suitable example. **[6]**

b) Explain Naive Bayes classifier with algorithm? **[5]**

OR

Q6) a) How Decision tree works? Explain with example step by step. **[6]**

b) Where Regression methods are applied? How it plays important role in data analysis? **[5]**

P.T.O.

Q7) a) What is Association rule? What are the Applications of Association rule mining? **[6]**

b) What is the purpose of Apriori algorithm? Explain steps of Apriori algorithm **[6]**

OR

Q8) a) Define FP growth What are the advantages of FP growth over Apriori Agorithm. **[6]**

b) Explain Eclat algorithm. **[6]**

Q9) a) What is clustering? Explain types of clustering. **[6]**

b) Differentiate hierarchical clustering and K-Means Clustering. **[6]**

OR

Q10)a) Explain DBScan Algorithm for Density based Clustering. **[6]**

b) Explain Applications of clustering. **[6]**

Q11) a) What is Data Visualization? Explain benefits of Data Visualization. **[6]**

b) Explain techniques of Data Visualization. **[5]**

OR

Q12)a) What are the challenges for visualizing data? **[6]**

b) Explain Types of data visualization. **[5]**

▽▽▽▽

Total No. of Questions : 12]

SEAT No. :

PA-2747

[Total No. of Pages : 2

[5929]-1042
S.Y. M.C.A. (Engineering) (Semester - III)
WEB TECHNOLOGIES
(2020 Pattern) (410902)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10., Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Write the Structure of HTML Document and explain it. **[6]**

b) Explain text formatting in HTML document in detail. **[6]**

OR

Q2) a) Explain HTML in detail. **[6]**

b) How to use CSS in HTML document. **[6]**

Q3) a) Explain features of XML. **[6]**

b) Explain XML name spaces in detail. **[6]**

OR

Q4) a) What are the various components of XML, Explain. **[6]**

b) What is the difference between XSLT and XML? **[6]**

Q5) a) Explain Control Structures in Java Script. **[6]**

b) Write any five JavaScript-Array Properties. **[5]**

OR

Q6) a) Write 3 Loop Controls in Java Script, Explain with syntax and example. **[6]**

b) Explain JavaScript functions and Events. **[5]**

P.T.O.

Q7) a) Explain Angular JS in detail. **[6]**

b) Explain Model-View-Controller Architecture. **[6]**

OR

Q8) a) Explain basic directives used in Angular JS with the help of program. **[6]**

b) How to create a Table using 'ng-repeat' directive in Angular JS. **[6]**

Q9) a) Define PHP operators. Explain it's types along with an example. **[6]**

b) What is Cookie in PHP? How to create, modify, delete a cookie in PHP? **[6]**

OR

Q10) a) Explain PHP Exceptions in detail. **[6]**

b) Explain PHP Associative Arrays in detail. **[6]**

Q11) a) Enlist different components of ASP.NET and explain in detail. **[6]**

b) How to create any web service in ASP.NET? **[5]**

OR

Q12) a) Explain Features of ASP.NET along with diagram. **[6]**

b) Explain basic controls in ASP.NET. **[5]**

▽▽▽▽

Total No. of Questions : 12]

SEAT No. :

PA-2748

[Total No. of Pages : 2

[5929]-1043
S.Y. M.C.A. (Engineering)
CLOUD COMPUTING
(2020 Pattern) (Semester - III) (410903)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) What is Cloud? Explain the Cloud Characteristics. **[6]**

b) Explain the Cloud computing architecture. **[6]**

OR

Q2) a) Explain the client-server model in Cloud Computing. **[6]**

b) Explain the P-to-P Computing. **[6]**

Q3) a) Explain the Software as a Service (SaaS). **[6]**

b) Explain the Platform as a Service (PaaS). **[6]**

OR

Q4) a) Explain the Comparison of various cloud computing providers/ Softwares. **[6]**

b) Explain the DBaaS (Database as services). **[6]**

Q5) a) Explain the Implementation Levels of Virtualization. **[6]**

b) Explain the Virtualization Structures/Tools and Mechanisms. **[5]**

OR

Q6) a) Explain the Virtual Clusters and Resource Management. **[6]**

b) Explain the Virtualization of CPU. **[5]**

P.T.O.

Q7)	a)	What are the Resource Provisioning Methods in Cloud?	**[6]**
	b)	What is Inter Cloud Resource Management?	**[6]**

OR

Q8)	a)	What is the difference between AWS Google and Microsoft Azure?	**[6]**
	b)	Difference between AWS, Azure, and Google Cloud Platform.	**[6]**

Q9)	a)	What are Cloud Security Types?	**[6]**
	b)	What are the four areas of Cloud Security?	**[6]**

OR

Q10)	a)	How does Cloud Security Work?	**[6]**
	b)	What are the 3 categories of cloud security?	**[6]**

Q11)	a)	Is cloud computing a good career for future?	**[6]**
	b)	Why companies embrace docker.	**[5]**

OR

Q12)	a)	How the Cloud Will Change Operating Systems?	**[6]**
	b)	What is docker in cloud computing? How does docker work.	**[5]**

⌘⌘⌘

Total No. of Questions : 12]

SEAT No. :

PA-2749

[Total No. of Pages : 2

[5929]-1044
S.Y. M.C.A. (Engineering)
BIG DATA ANALYTICS
(2020 Pattern) (410904A) (Elective - II) (Semester - III)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10., Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicates full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Explain with diagram Data analytic lifecycle? **[6]**

b) What are different application areas of Big data? **[6]**

OR

Q2) a) What are different types of data? How big data is different from normal data base management system? **[6]**

b) What are the different big data processing techniques? **[6]**

Q3) a) What is Cluster Analysis? What are the requirements of cluster analysis? **[6]**

b) Define k-means clustering? Discuss it's uses and applications of it. **[6]**

OR

Q4) a) Briefly describe SVM-Support Vector Machine technique. **[6]**

b) Discuss Analysis of Variance (ANOVA) of correlation indicators of linear relationship. **[6]**

Q5) a) What type of graph is social network? How does social media uses graph analysis? **[6]**

b) How does clustering of social network graph works? **[5]**

OR

Q6) a) Explain content - based filtering in detail. **[6]**

b) Explain Collaborative filtering in detail. **[5]**

P.T.O.

Q7) a) What is data visualization? Why is data visualization important? **[6]**

b) What do you mean by The science of data visualization? **[6]**

OR

Q8) a) What are data visualization tools? And What is the best visualization tool? **[6]**

b) What is big data analytic techniques? What are the challenges in big data visualization? **[6]**

Q9) a) How does Hadoop Works? What are the advantages of Hadoop. **[6]**

b) What is Hadoop ecosystem? **[6]**

OR

Q10)a) What is Map Reduce Programming Model? How to apply Map Reduce Analysis on social media data like twitter? **[6]**

b) Briefly discuss about Map Reduce and YARN. **[6]**

Q11) a) Compare the main differences between HDFS (Hadoop Distributed File System) and Network Attached Storage (NAS)? **[6]**

b) What is Hadoop cluster configuration? How Map Reduce works explain with example? **[5]**

OR

Q12)a) List out different features of HDFS? **[6]**

b) What are the Limitations of Hadoop 1.0? **[5]**

▽▽▽▽

Total No. of Questions : 12] **SEAT No. :**

PA-2750 **[Total No. of Pages : 2**

[5929]-1045
S.Y. M.C.A. (Engineering)
MACHINE LEARNING
(2020 Pattern) (Semester - III) (Elective - II) (410904B)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data if necessary.***

Q1) a) What is Machine Learning? Explain types of machine learning. **[6]**

b) State any four applications where machine learning is used? **[6]**

OR

Q2) a) What is the need of Dimensionality Reduction in machine learning? How PCA is used for dimensionality reduction? **[6]**

b) Differentiate supervised and unsupervised machine learning. **[6]**

Q3) a) Explain SVM algorithm in detail. **[6]**

b) What is cross Validation? **[6]**

OR

Q4) a) What are support vector in SVM? **[6]**

b) What is SVM in machine learning? What are the classification methods that SVM can handle? **[6]**

Q5) a) What do you mean by linear regression? With suitable example, describe how linear regression is used to predict the output for test example/input sample. **[6]**

b) Explain the bias-variance trade-off. **[5]**

OR

P.T.O.

Q6) a) State the assumptions in a linear regression model. **[6]**

b) What do you understand by regularization? **[5]**

Q7) a) Explain nearest neighbor classification in machine learning? **[6]**

b) Differentiate between k means and k medoids algorithms. **[6]**

OR

Q8) a) Explain Apriori algorithm in machine learning with example. **[6]**

b) Write a note on Hierarchical clustering. **[6]**

Q9) a) Write a note on Naive Bayes Classifier. **[6]**

b) Explain Discriminative Learning with Maximum Likelihood with respect to machine learning. **[6]**

OR

Q10)a) Explain Expectation-Maximization methods in ML. **[6]**

b) Write a note on Normal Distribution and its Geometric Interpretation. **[6]**

Q11)a) Write a note on Reinforcement Learning. **[6]**

b) Write a note on Feed Forward Neural Networks. **[5]**

OR

Q12)a) Write a note on Bagging, Randomization and Boosting. **[6]**

b) Explain Sigmoid, Tanh and ReLU Neurons. **[5]**

Total No. of Questions : 12]

SEAT No. : ____

PA-2751

[Total No. of Pages : 2

[5929]-1046

S.Y. M.C.A (Engineering)

OBJECT ORIENTED ANALYSIS AND DESIGN

(2020 Pattern) (Semester - III) (410904C) (Elective - II)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume Suitable data if necessary***

Q1) a) Explain 4+1 architecture views. **[6]**

b) Draw Use case diagram for online shopping system. **[6]**

OR

Q2) a) Explain unified process. **[6]**

b) Draw Use case diagram for ATM system. **[6]**

Q3) a) Differentiate between Aggregation and Composition. **[6]**

b) Draw Class diagram for library management system. **[6]**

OR

Q4) a) What is association? Explain different types of association. **[6]**

b) Draw class diagram for online flight booking system. **[6]**

Q5) a) Explain component diagram with example. **[6]**

b) Write note on Package diagram. **[5]**

OR

Q6) a) Explain deployment diagram with example. **[6]**

b) Write note on 'Applications of UML in embedded systems'. **[5]**

P.T.O.

Q7) a) Draw Activity diagram for opening e-mail account. **[6]**

b) Draw sequence diagram for online registration for medical test. Make suitable assumptions. **[6]**

OR

Q8) a) Draw the transition diagram for Online Auction Process. **[6]**

b) Draw activity diagram for online test for candidate for placement. Make suitable assumptions. **[6]**

Q9) a) Write a note on Object oriented software architecture. **[6]**

b) Explain client server architecture model. **[6]**

OR

Q10)a) Write a note on real time software architecture. **[6]**

b) Explain component diagram with suitable example. **[6]**

Q11)a) Write a note on adaptor design pattern. **[6]**

b) What is meant by Iterator design pattern? **[5]**

OR

Q12)a) Write a note on observer design pattern. **[6]**

b) Describe architectural design patterns in brief. **[5]**

❄ ❄ ❄

Total No. of Questions : 12]

SEAT No. :

PA-2752

[Total No. of Pages : 2

[5929]-1047
S.Y. M.C.A. (Engineering)
INTERNET OF THINGS
(2020 Pattern) (Semester - III) (Elective - II) (410904 D)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Explain Application Domain and Characteristic of Embedded System? **[6]**

b) Explain physical and logical design of IoT. **[6]**

OR

Q2) a) Explain the Real time systems and Real time scheduling. **[6]**

b) Define communication protocols in IoT? **[6]**

Q3) a) What is the difference between M2M and IoT explain with examples? **[6]**

b) Commit "An emerging industrial structure for IoT" **[6]**

OR

Q4) a) Describe M2M to IoT architecture. **[6]**

b) What is global information monopolies. **[6]**

Q5) a) What are different layers of IoT reference model? **[6]**

b) What is deployment and operational view of reference architecture? **[5]**

OR

Q6) a) What does functional view of IoT reference architecture describe? **[6]**

b) What is difference between IoT reference model and reference architecture? **[5]**

P.T.O.

Q7) a) Write a note on zigbee architecture in IoT. **[6]**

b) Explain SCADA and RFID Protocols. **[6]**

OR

Q8) a) Explain the issues with IoT Standardization? **[6]**

b) Write a note on Unified Data Standards. **[6]**

Q9) a) What is FP7 Project? Explain contribution from FP7 Projects in IoT. **[6]**

b) What are the main types of data aggregation being used in the IoT? **[6]**

OR

Q10)a) Explain Smartie approach for IoT. **[6]**

b) What are the major privacy and security issues in IoT? **[6]**

Q11)a) How IoT can be used in home automation system? **[6]**

b) How IoT is transforming manufacturing? Explain future factory concepts in IoT. **[5]**

OR

Q12)a) What are surveillance applications in IoT? **[6]**

b) How To Use IoT For Smart Parking Solution Development? **[5]**

Total No. of Questions : 12]

SEAT No. :

PA-2753

[Total No. of Pages : 3

[5929]-1049

S.Y. M.C.A. (Engineering)

SOFTWARE TESTING AND QUALITY ASSURANCE

(2020 Pattern) (Semester - III) (410905)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) What is Software Quality Assurance? Explain various activities of SQA. **[6]**

b) Explain software process models in details. **[6]**

OR

Q2) a) Differentiate Quality Control and Quality Assurance with example. **[6]**

b) Write short note on : **[6]**

i) Six Sigma

ii) CMMI

Q3) a) Describe testing life cycle in details. **[6]**

b) What are the origins of defects? Explain defect classes. **[6]**

OR

Q4) a) What are the components of Test Plan? Explain test environment and test deliverables in detail. **[6]**

b) Write the test cases for deposit and withdraw money in banking system. **[6]**

P.T.O.

Q5) a) What is Black Box testing? Explain Boundary value analysis with example. **[6]**

b) What is process for Mutation testing? Apply mutation testing on following code. **[5]**

Read Age

If Age > 14

Doctor = General Physician

End if

And Data set is 14, 15, 0, 13

OR

Q6) a) Draw control flow graph for the program to check whether given number is prime or not. Calculate cyclomatic complexity of the same program. **[6]**

b) Differentiate Positive and Negative testing. **[5]**

Q7) a) Differentiate between usability and accessibility testing in details. **[6]**

b) What is integration testing? What are the 4 approaches of integration testing? **[6]**

OR

Q8) a) What is Scenario Testing? Write down the Strategies to Create Good Scenarios.

b) Who determines the severity of bug under Specification-based technique. **[6]**

Q9) a) Write a note on : **[6]**

i) Cypress

ii) Testcafe

iii) Protractor

b) What the challenges are in may face during Test Automation. **[6]**

OR

Q10) a) Write down the area where to focus before you go any further for Software Test Automation project. **[6]**

b) Do your automated tests execute anywhere, anytime? Justify your answer. **[6]**

Q11) a) Can selenium be used to launch web browsers? Justify your answer. **[6]**

b) In Selenium, how will you wait until a web page has been loaded completely? **[5]**

OR

Q12) a) What are the advantages of using Selenium as an automation tool? **[6]**

b) What is meant by XPath in Selenium. Explain XPath Absolute and XPath Relative. **[5]**

⌘⌘⌘

Total No. of Questions : 12]

SEAT No. : ____

PA-4317

[Total No. of Pages : 3

[5929]-1050
F.Y. M.C.A. (Engineering)
DISCRETE MATHEMATICS AND STATISTICS
(2020 Pattern) (Semester - I) (310901)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) How many integers between 1 - 500 are divisible by 2, 3, 5, or 7? **[6]**

b) Verify that If A & B are finite sets, then $|A \cup B| = |A|+|B|-|A \cap B|$. **[6]**

OR

Q2) a) It was found that in the first year Computer Science of 80 students know oracle, 55 know CPP and 46 know JAVA. It was also found that 37 know CPP and oracle, 28 know CPP and JAVA, 25 JAVA and oracle, 7 students does not know any language.

Find : **[6]**

i) How many know all the three languages?

ii) How many know exactly two languages?

b) Prove that that $(p \rightarrow (q \rightarrow r)) \Rightarrow (p \rightarrow q) \rightarrow (p \rightarrow r))$ **[6]**

Q3) a) For each of these relations on set A = {1,2,3,4} decide whether it is reflexive, symmetric, transitive relation **[6]**

R1 = {(1,1),(1,2),(2,2),(2,1),(3,3),(4,4)}

R2 = {(1,3),(1,4),(2,3),(2,4),(3,1),(3,4)}

b) Given a relation R ={(1,2),(2,3),(3,4),(2, 1)} on A = {1, 2, 3, 4). Find the transitive closure of R by Warshall's algorithm. **[6]**

OR

P.T.O.

Q4) a) Write the following statements in symbolic forms : **[6]**

i) if I finish my homework before dinner and it does not rain, then I will go to the ball game.

ii) I will go to a movie only if I will not study discrete structures.

iii) Either the food is good or service is good, but not both.

b) Let f(x) =2x+3, g(x) =3x+4, h(x) =4x for x € R, where R = set of all real numbers. Find gof, fog, foh, hof, goh. **[6]**

Q5) a) Two dice are rolled. What is the probability that the sum of the faces will not exceed 7? Given that at least one face shows a 4. **[5]**

b) Solve the following : **[6]**

i) How many different car number plates are possible with 2 letters followed by 3 digits.

ii) How many of these number plates begin with 'MH'

OR

Q6) a) Four persons are chosen at random from a group containing 3 men, 2 women and 4 children. Find the chance that exactly two of them will be children. **[6]**

b) i) Suppose repetitions are not permitted, then how many 4 digit numbers can be formed from the six digits 1, 2, 3, 5, 7, 8?

ii) How many such a numbers are less than 4000?

iii) How many numbers in (i) are even?

iv) How many numbers in (ii) are odd?

v) How many of the numbers in (i) contain both the digits 3 and 5?

[5]

Q7) a) List and Explain Axioms of Probability Every Data Scientist Should Know? **[6]**

b) A box contains 2 white balls, 3 black balls and 4 red balls. In how many ways can 3 balls be drawn from the box, if at least one black ball is to be included in the draw? **[6]**

OR

Q8) a) Define : **[6]**

i) Probability

ii) Sample space

iii) Event

b) In a class, there are 15 boys and 10 girls. Three students are selected at random. Find The probability that 1 girl and 2 boys are selected. **[6]**

Q9) a) What are the sampling methods or Sampling Techniques? Explain in Detail. **[6]**

b) Find the variance and standard deviation for the following data : 57, 64, 43, 67, 49, 59, 44, 47, 61, 59. **[6]**

OR

Q10)a) Explain the Types of Regression and their properties in detail. **[6]**

b) Explain Correlation Coefficient Types, Formulas with Examples. **[6]**

Q11)a) Find the expectation of a random variable X? use the following data **[6]**

x	0	1	2	3
f(x)	1/6	2/6	2/6	1/6

b) What are the steps of hypothesis testing? Explain Five Steps in Hypothesis Testing. **[5]**

OR

Q12)a) In each of 4 races, the Democrats have a 60% chance of winning. Assuming that the races are independent of each other, what is the probability by using the Binomial Distribution that : i) The Democrats will win 0 races, 1 race, 2 races, 3 races, or all 4 races? ii) The Democrats will win at least 1 race **[6]**

b) What are the three types of random variables? Explain in Detail. **[5]**

Total No. of Questions : 12] **SEAT No. :**

PA-4318 **[Total No. of Pages : 3**

[5929] - 1051

F.Y. M.C.A. (Engineering)

DATA STRUCTURES AND ALGORITHMS

(2020 Pattern) (Semester - I) (310902)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Explain Divide and Conquer algorithm strategy with suitable example. **[6]**

b) What is a sparse matrix? How it is represented in triplet format? **[6]**

OR

Q2) a) What are two dimensional arrays? Explain row major and column major representation of array storage. **[6]**

b) Discuss about algorithm complexity in terms of space and time. **[6]**

Q3) a) Explain Linked List as Abstract Data Type with diagram. **[6]**

b) Explain insert operations in doubly linked list with diagram? **[6]**

OR

Q4) a) Explain Linked List ADT with diagram. **[6]**

b) How circular list are advantageous than singly linked list? Explain working of circular linked list with diagram? **[6]**

P.T.O.

Q5) a) How stacks are represented using sequential organization? Which one is better? Explain with examples. **[6]**

b) How stacks are useful to implement using recursion process? Explain with application. **[5]**

OR

Q6) a) Write short note on : **[6]**

i) Queue.

ii) Circular Queue.

iii) Dequeue.

b) What is priority queue? Explain its array implementation? **[5]**

Q7) a) Write a C/C++ function to insert and search a node in Binary Search Tree. **[8]**

b) Write a short note on AVL tree. **[4]**

OR

Q8) a) Explain application of tree as decision tree with example. **[6]**

b) Define following terms : **[6]**

i) Binary Tree.

ii) Degree of a node.

iii) Height of a node.

Q9) a) Explain following terms : **[6]**

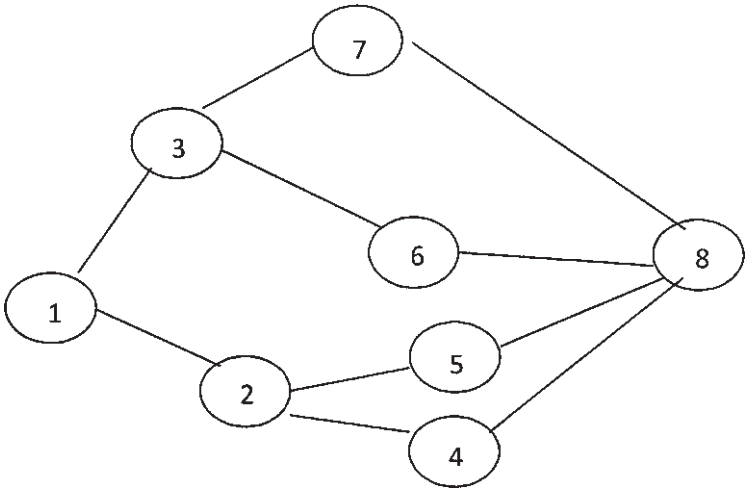
i) Connected component.

ii) Adjacency matrix.

b) Explain Dijkstra's shortest path algorithm with an example? **[6]**

OR

Q10) a) For the following graph, give the result of DFS and BFS traversals. Starting vertex is 7. **[4]**



b) Explain Kruskal Algorithms with suitable example. **[8]**

Q11) a) Write a pseudo C code for Quick sort algorithm. **[6]**

b) Write a C/C++ non recursive function for binary search. **[5]**

OR

Q12) a) Show the stepwise execution of the Bubble sort algorithm and selection sort for the following list. 17,24,49,7,8,67,23. **[6]**

b) Explain sentinel search with suitable example. **[5]**

Total No. of Questions : 12] **SEAT No. :**

PA-4319 **[Total No. of Pages : 2**

[5929] - 1052

F.Y. M.C.A. (Engineering)

OBJECT ORIENTED PROGRAMMING

(2020 Pattern) (Semester - I) (310903)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***

Q1) a) Explain-Need of Object Oriented Programming. **[5]**

b) Explain the structure of Bottom up approach. **[6]**

OR

Q2) a) Compare C & C++ platforms. **[6]**

b) Write a note on Data Hiding in OOP. **[5]**

Q3) a) Write the various operators with example used in C++. **[6]**

b) Write a C++ program to calculate factorial of a no to explain Constructor and Destructor. **[6]**

OR

Q4) a) Explain the concept of Decision Making statements with example. **[6]**

b) Create a class staff having fields : **[6]**
Staff_id, name, salary. Write a menu driven program for :
i) To accept the data.
ii) To display the data.

Q5) a) Explain the term class in inherited Publicly, Privately and Protectedly. **[6]**

b) Why to overload and override a function? Explain with example. **[6]**

OR

P.T.O.

Q6) a) Write a program to overload binary operators '>' and '<' to compare two strings. **[6]**

b) What is Polymorphism? Draw diagrams of various types of polymorphism with syntax. **[6]**

Q7) a) What is member a class? How to access members of a class with non members? **[6]**

b) What is Dynamic Binding? **[5]**

OR

Q8) a) What is the use of this pointer? **[5]**

b) What is abstract class? Explain with example. **[6]**

Q9) a) Why templates are used in C++? How many types of templates are there in C++? **[6]**

b) Write a Program to find Largest among two numbers using function template. **[6]**

OR

Q10) a) Write a program to handle exception for "divide by zero". **[6]**

b) What is generic programming? How is it implemented in C++? **[6]**

Q11) a) Discuss the various forms of get() function supported by the input system. How are they used? **[6]**

b) What is a file mode? Describe the various file mode options available. **[6]**

OR

Q12) a) What is input stream and output stream? Explain various methods to open a file. **[6]**

b) Write a program to read a list containing item name, item code and cost interactively and produce a three column output as shown below. **[6]**

Item Name	Item Code	Cost
Database	1006	550.95
Java Programming	905	99.70

Total No. of Questions : 12]

SEAT No. :

PA-4320

[Total No. of Pages : 2

[5929]-1053

F.Y. M.C.A. (Engineering)

SOFTWARE ENGINEERING & PROJECT MANAGEMENT

(2020 Pattern) (Semester-I) (310904)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data if necessary.***

Q1) a) What are the major tasks conducted as part of Clean room software engineering? **[6]**

b) Explain Personal & Team Process Model. **[6]**

OR

Q2) a) Explain all levels of CMMI. **[6]**

b) Compare between Evolutionary and Incremental Models. **[6]**

Q3) a) How to prioritize software requirements based on Knao Analysis? **[6]**

b) Explain the importance of Requirement Engineering. **[6]**

OR

Q4) a) What is meant by normal and exciting requirements? How requirements are validated? **[6]**

b) Draw state diagram for ATM operations. **[6]**

Q5) a) Write short note on following: **[6]**

i) Pair programming

ii) Burndown chart

b) What is the importance of Agile/XP methodology for project development? **[5]**

OR

P.T.O.

Q6)	a)	Write the manifesto for agile software development.	**[6]**
	b)	Draw and explain concept of SCRUM.	**[5]**
Q7)	a)	Short note on - Work Breakdown structure with example.	**[6]**
	b)	Explain Cost estimation tools and techniques in project planning.	**[6]**

OR

Q8)	a)	Write short note on - Gantt charts in scheduling project work.	**[6]**
	b)	Explain Project initiation and project scope management.	**[6]**
Q9)	a)	Explain Risk mitigation, Risk monitoring and management.	**[6]**
	b)	Write Short note on - Software Configuration management.	**[6]**

OR

Q10)	a)	Explain role of Six Sigma in quality control of project.	**[6]**
	b)	Write Short note on - Tools for Project management.	**[6]**
Q11)	a)	Write Short note on - Leadership styles.	**[6]**
	b)	Explain about Ethical leadership in software projects.	**[5]**

OR

Q12)	a)	Write Short note on - Code of ethics.	**[6]**
	b)	Explain Professional Practices to be followed as a Project leader.	**[5]**

Total No. of Questions : 12]

SEAT No. :

PA-4321

[Total No. of Pages : 2

[5929]-1054

M.C.A. (Engineering)

INFORMATION SYSTEMS AND ENGINEERING ECONOMICS

(2020 Pattern) (Semester-I) (310905)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data if necessary.***

Q1) a) Define management. Explain different functions of management. **[6]**

b) Briefly explain any six features of Management. **[6]**

OR

Q2) a) Explain Role of Information system in organization with suitable example. **[6]**

b) Write short note on : Memorandum of Association (MOA) and Articles of Association (AOA). **[6]**

Q3) a) What do you mean Leveraging Information Systems? **[6]**

b) Write a short note on ICT for Development E-Governance. **[6]**

OR

Q4) a) Briefly Explain Project Management. **[6]**

b) Explain knowledge management system? **[6]**

Q5) a) Define MIS, Explain Role of MIS, structure of MIS based on management activity and functions. **[6]**

b) Write a short note on - Supply Chain Management (SCM). **[5]**

OR

Q6) a) What is Customer Relationship Management? Explain the challenges in Customer Relationship Management. **[6]**

b) Explain Structure of MIS based on Social activity? **[5]**

P.T.O.

Q7) a) What are features of Decision Support Systems. **[6]**

b) Explain Decision making under risk with example. **[6]**

OR

Q8) a) Define Decision Support Systems? What are its uses? **[6]**

b) Explain Simpson's Model for decision making. **[6]**

Q9) a) Differentiate between Book keeping and Accounting. **[6]**

b) What is Petty Cash Book? State different types of Petty Cash Book. **[6]**

OR

Q10)a) Differentiate between manual accounting and computerized accounting. **[6]**

b) What is Balance Sheet and what purpose does it fulfill? **[6]**

Q11)a) What is Ratio analysis? **[6]**

b) A company proposes to introduce a new product in the market. The company wants to maintain P/V Ratio at 25%. If variable cost of the product is Rs. 300. What will be the Selling price. **[5]**

OR

Q12)a) Why is Breakeven point? Describe its applications. **[6]**

b) ABC Company produces as single article. Following Cost data is given about its product. **[5]**

Selling Price per unit Rs. 40

Marginal cost per unit Rs. 24

Fixed cost per annum Rs. 16,000

Calculate PV ratio, Break even sales.