

**Seat  
No.**

## **Set P**

# **M.C.A. (Science) (Semester - I) (CBCS) Examination March/April-2019**

## **INTRODUCTION TO COMPUTERS**

Day & Date: Saturday, 27-04-2019  
Time: 12:00 PM To 02:30 PM

Max. Marks: 70

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

### **Q.1 Choose the Correct answer.**

14

- 1) Who is the father of personal computer?
    - a) Edward Roberts
    - b) Allen Turing
    - c) Charles Babbage
    - d) None of these
  - 2) A CPU contains \_\_\_\_\_.
    - a) Card reader and a Printing device
    - b) Analytical engine and a Control unit
    - c) Control unit and an Arithmetic logic unit
    - d) Arithmetic logic unit and a Card reader
  - 3) A combination of hardware and software that facilitates the sharing of information between computing devices \_\_\_\_\_.
    - a) Network
    - b) Peripheral
    - c) Expansion board
    - d) Digital device
  - 4) VGA stands for \_\_\_\_\_.
    - a) Video Graphics Array
    - b) Visual Graphics Array
    - c) Volatile Graphics Array
    - d) Video Graphics Adaption
  - 5) EBCDIC stands for \_\_\_\_\_.
    - a) Extended Binary Coded Decimal Interchange Code
    - b) Extended Bit Code Decimal Interchange Code
    - c) Extended Bit Case Decimal Interchange Code
    - d) Extended Binary Case Decimal Interchange Code
  - 6) Junk e-mail is also called \_\_\_\_\_.
    - a) spam
    - b) spoof
    - c) sniffer script
    - d) spool
  - 7) Who invented the high level language "C"?
    - a) Niklaus Writh
    - b) Seymour Papert
    - c) Dennis M. Ritchie
    - d) Donald Kunth
  - 8) Which of the following are the functions of operating system?
    - a) Allocates resources
    - b) Monitors Activities
    - c) Manages disks and files
    - d) All of the above
  - 9) Which of the following is a network topology?
    - a) LAN
    - b) WAN
    - c) MAN
    - d) BUS
  - 10) To move a copy of file from one computer to another over a communication channel is called \_\_\_\_\_.
    - a) File transfer
    - b) File encryption
    - c) File modification
    - d) File copying

- 11) Which one of the following is NOT a computer language?

  - a) MS-Excel
  - b) BASIC
  - c) COBOL
  - d) C++

12) The common name for the crime of stealing passwords is \_\_\_\_\_.

  - a) Jacking
  - b) Identity theft
  - c) Spoofing
  - d) Hacking

13) Which of the following is binary number?

  - a) 1010
  - b) 1020
  - c) 0420
  - d) 1030

14) UNIVAC stands for \_\_\_\_\_.

  - a) Universal Array Computer
  - b) Unique Automatic Computer
  - c) Unvalued Automatic Computer
  - d) Universal Automatic Computer

**Q.2 A) Answer the following. (Any Four) 08**

- 1) List out the Input devices.
  - 2) Define 1's and 2's Complement.
  - 3) How to convert from Binary to Hexa decimal?
  - 4) List the types of System software.
  - 5) Define operating system.

**B) Write short notes on. (Any Two) 06**

- 1) Mainframe Computer
  - 2) Network system
  - 3) Sorting system

**Q.3 A) Answer the following. (Any Two) 08**

- 1) Explain Block diagram of Computer system.
  - 2) Explain Octal to Hexa Decimal number system and vice versa using suitable example.
  - 3) List the Linux commands.

**B) Answer the following. (Any One)** 06

- Answer the following. (Any one)**

  - 1) State the applications of computers.
  - 2) Why Programming language is required? Justify answer.

**Q.4 A) Answer the following: (Any Two)**

- 1) List the Statistical functions existed in MS-Excel.
  - 2) Discuss types of network.
  - 3) Distinguish between compiler and interpreter.

**B) Answer the following. (Any One) 04**

- 1) What is octal number system? Give one example.
  - 2) Discuss on High level languages.

**Q.5 Answer the following. (Any Two)**

- a)** Discuss types of Operating system.
  - b)** Explain storage devices with examples.
  - c)** Explain Client and server architecture with diagram.

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**M.C.A. (Science) (Semester - I) (CBCS) Examination March/April-2019  
PROGRAMMING USING - C**

Day & Date: Monday, 29-04-2019

Max. Marks: 70

Time: 12:00 PM To 02:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

**Q.1 Choose Correct Alternative from the following.**

14

10) The following program

```
void main()
{
    int i = 5;
    if (i == 5) return;
    else printf("i is not five");
    printf("over");
}
```

results in \_\_\_\_\_.

- a) syntax error
- b) an execution error
- c) printing of over
- d) execution termination without printing anything

11) The statement `printf("%d", (a + +));` \_\_\_\_\_.

- a) prints the current value of a
- b) prints the current value of  $a + 1$
- c) prints an error message
- d) prints garbage value

12) Prototype of a function means \_\_\_\_\_.

- a) Name of function
- b) Output of function
- c) Declaration of function
- d) Input of a function

13) Name the loop that executes at least once \_\_\_\_\_.

- a) for
- b) if
- c) do – while
- d) while

14) If there is any error while opening a file, `fopen` will return \_\_\_\_\_.

- a) Nothing
- b) EOF
- c) NULL
- d) Depends on complier

**Q.2 A) Answer the following (Any four)****08**

- 1) Point out the errors, if any, in the following C statements
  - i. `name = 'Ajay';`
  - ii. `3.14 * r * r = area;`
- 2) Evaluate the following expressions and show their hierarchy.  
 $s = 1 / 3 * a / 4 - 6 / 2 * 6 / g ;$   
( $a = 4$ ,  $g = 3$ , assume  $s$  to be an int)
- 3) What is a pointer value and address?
- 4) Give the general syntax of conditional operator?
- 5) Write a statement using caste operator to print the integer part of the number 23.1234

**B) Write Notes on (Any two)****06**

- 1) `scanf( )` function
- 2) `strcat( )` function
- 3) Algorithm

**Q.3 A) Answer the following (Any two)****08**

- 1) Write a function which takes two values  $p$  and  $q$  and returns the value of  $(p / q)$
- 2) Explain any four functions in `string.h` with example.
- 3) Write a program to swap values of two integer variables without using the temporary variable.

**B) Answer the following (Any one)****06**

- 1) Draw a flow chart to calculate sum of 1 to 10 numbers.
- 2) Write a C Program to sort an integer array of five elements in descending order.

- Q.4 A) Answer the following (Any two)** 10
- 1) How many kinds of loop does C offer and what are they?  
When is the condition tested in each of loops? Which of the loops is always executed once?
  - 2) Explain the various modes used in file operation?
  - 3) How do you pass an array as a parameter to a function? When the parameter is received by a function does C allocate space for a local array and copy the whole array to the new location?
- B) Answer the following (Any one)** 04
- 1) Explain structure in C. How structure is different from array?
  - 2) What is the difference between call by value and call by reference?
- Q.5 Answer the following (Any two)** 14
- a) What is a flow chart? What are different symbols used to draw a flow chart?
  - b) Write a C Program to read a string and then print each character on separate line.
  - c) Write a C Program to print all numbers between 1 to n divisible by 7.

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**M.C.A. (Science) (Semester - I) (CBCS) Examination March/April-2019**  
**DISCRETE MATHEMATICAL STRUCTURES**

Day &amp; Date: Tuesday, 30-04-2019

Max. Marks: 70

Time: 12:00 PM to 02:30 PM

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

**Q.1 Choose Correct Alternative from the following.****14**

- 1) If  $A = \begin{bmatrix} 1 & 2 \\ 6 & -3 \end{bmatrix}$  then  $|A| = \text{_____}$ .
 

a) 15	b) -15
c) -12	d) 12
- 2) In permutations  ${}^n p_r = \text{_____}$ .
 

a) $\frac{(n-1)!}{(n-r)!}$	b) $\frac{n!}{r!(n-r)!}$
c) $\frac{n!}{(n-r)!}$	d) $\frac{n!}{(r-n)!}$
- 3) In lattice L  $a \leq b \forall a, b \in L$  iff  $\text{_____}$ .
 

a) $a \wedge b = a$	b) $a \vee b = b$
c) both $a \wedge b$	d) $a \wedge b = \emptyset$
- 4) If  $p$  is false,  $q$  is false, then  $p \rightarrow q = \text{_____}$ .
 

a) False	b) True
c) 1	d) Both b and c
- 5) In combinations  ${}^{n+1} C_r = \text{_____}$ .
 

a) $\frac{(n+1)!}{r!(n+1-r)!}$	b) $\frac{n!}{(n-r)!}$
c) $\frac{(n+1)!}{r!}$	d) $\frac{(n+1)!}{(n+1-r)!}$
- 6) If  $A$  is skew-symmetric matrix then  $\text{_____}$ .
 

a) $a_{ij} = -a_{ji}$	b) $a_{ij} = +a_{ji}$
c) $a_{ij} = -a_{ij}$	d) $a_{ij} = a_{ji}$
- 7) In how many ways 3 girls can be chosen from 10 girls  $\text{_____}$ .
 

a) $C(10,3)$	b) $P(10,3)$
c) $P(10,4)$	d) $C(10,4)$
- 8) For any binary operation ‘.’ on a set if identity element exists then it is  $\text{_____}$ .
 

a) Unique	b) Different
c) Same (itself)	d) none of these
- 9) In set theory  $(A \cap B)^{\sim} = \text{_____}$ .
 

a) $A^{\sim} \cap B^{\sim}$	b) $A^{\sim} \cup B^{\sim}$
c) $(A \cup B)^{\sim}$	d) $A \cap B^{\sim}$
- 10) If  $p$  is false,  $q$  is false,  $p \Leftrightarrow q = \text{_____}$ .
 

a) False	b) True
c) 1	d) Both b and c
- 11) A vertex of degree 1 is called as  $\text{_____}$ .
 

a) One vertex	b) Isolated vertex
c) Pendent	d) None of these

- 12) A set of parallel lines is an \_\_\_\_\_.  
a) Symmetric Relation      b) Transitive Relation  
c) Partial order relation    d) Equivalence Relation

13) A function  $f: R \rightarrow R$  such that  $f(x) = K \forall x \in R$  where  $K$  is constant is called \_\_\_\_\_.  
a) Constant function      b) Identity function  
c) One-one function        d) Onto function

14) In a set theory  $\bar{A} = \text{_____}$ .  
a)  $A \cup A'$                   b)  $A \cup \cup$   
c)  $A \cup d(A)$               d)  $A \cap d(A)$

**Q.2 A) Answer the following. (Any four)**

08

- 1) Calculate  $C(11, 4)$
  - 2) Define cycle with example.
  - 3) Find determine of  $A = \begin{bmatrix} 6 & 7 \\ 2 & 4 \end{bmatrix}$
  - 4) Write down formula for  ${}^nC_r$  &  ${}^nP_r$
  - 5) Define
    - i) Isolated Vertex
    - ii) Pendent Vertex

**B) Write Notes on. (Any two)**

06

- 1) Define Antisymmetric matrix
  - 2) Bipartite graph
  - 3) Permutation and combination

**Q.3 A) Answer the following. (Any two)**

08

- Answer the following. (Any two)

  - 1) Define Boolean matrix with example.
  - 2) Write Cayley table for  $(Z_6, \oplus_6)$
  - 3) Define Regular graph with example.

**B) Answer the following. (Any one)**

06

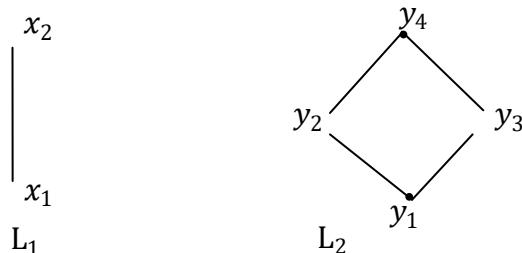
- 1) Find inverse of matrix  $A = \begin{bmatrix} 1 & -2 & 1 \\ 0 & -1 & 1 \\ 2 & 0 & -3 \end{bmatrix}$

2) Show that  ${}^{n+1}C_r = {}^nC_{r-1} + {}^nC_r$

**Q.4 A) Answer the following. (Any two)**

10

- 1) If  $L_1$  &  $L_2$  are two Lattice's  
 $L_1 = \{x_1, x_2\}$        $L_2 = \{y_1, y_2, y_3, y_4\}$   
 find  $L_1 \times L_2$  and draw Lattice  $L_1 \times L_2$



- 2) Show that

  - $a \vee b = b \vee a$
  - $a \wedge a = a \quad \forall a, b \in L$   
Where L is Lattice.

3) Write types of Function

**B) Answer the following. (Any one)**1) Show that  ${}^n p_{n-1} = n!$ 2) If  $A = \begin{bmatrix} 4 & 5 & 6 \\ 2 & -1 & 3 \\ -3 & 2 & 1 \end{bmatrix}$  find adj A**Q.5 Answer the following. (Any two)**a) Find solution of  $x + 3y + 3z = 12$ 

$$x + 4y + 4z = 15$$

$$x + 2y + 4z = 13$$

b) Define walk, path, cycle, trail with example.

c) Show by using Truth table

i)  $\sim(p \wedge q) = \sim p \vee \sim q$

ii)  $\sim(p \vee q) = \sim p \wedge \sim q$

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**M.C.A. (Science) (Semester - I) (CBCS) Examination March/April-2019  
DIGITAL CIRCUITS AND MICROPROCESSORS**

Day & Date: Thursday, 02-05-2019  
Time: 12:00 PM To 02:30 PM

Max. Marks: 70

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

### **Q.1 Choose the correct alternative:**

14

- 1) In which of the following gates, the output is 1, if and only if at least one input is 1?

  - a) NOT
  - b) AND
  - c) OR
  - d) NAND

2) Which table shows the logical state of a digital circuit output for every possible combination of logical states in the inputs?

  - a) Function table
  - b) Truth table
  - c) Routing table
  - d) ASCII table

3) How many lines the truth table for a four-digit input NOR gate would contain to cover all possible input combinations?

  - a) 4
  - b) 8
  - c) 12
  - d) 16

4) The function of a multiplexer is \_\_\_\_\_.

  - a) to decode information
  - b) to select 1 out of N input data sources and to transmit it to single channel
  - c) to transmit data on N lines
  - d) to perform serial to parallel conversion

5) Which is the correct sequential order of operational steps executed in the combinational logic circuits?

  1. Operation of combinational gates over the inputs
  2. Acceptance of n-different inputs
  3. Generation of 'm' different outputs as per the required level
  - a) A, B, C
  - b) A, C, B
  - c) B, A, C
  - d) C, A, B

6) What does the below stated Boolean Law imply, while performing below stated operation of an input with '0'?

Expression of Law:  $A \cdot 0 = 0$

  - a) Output will always be equal to input
  - b) Output will always be high
  - c) Output will always be low
  - d) Output will always be same

7) Which digital system translates coded characters into a more intelligible form?

  - a) Encoder
  - b) Display
  - c) Decoder
  - d) Counter

8) The binary number 10101 is equivalent to decimal number \_\_\_\_\_.

  - a) 19
  - b) 12
  - c) 27
  - d) 21

**Q.2 A) Answer the following. (Any four)**

08

- 1) What is mean by inverter?
  - 2) Which gates are known as Universal gate?
  - 3) What do you mean by address bus?
  - 4) What is the unit to measure the rate of data transfer?
  - 5) State the meaning of digital computer.

**B) Write Notes on. (Any two)**

06

- 1) ALU
  - 2) D-Flip Flop
  - 3) AND Invert

**Q.3 A) Answer the following. (Any Two)**

08

- 1) Define Flip-Flop. Explain in detail J-K flip flop with neat logic diagram?
  - 2) Discuss EU and BIU components of 8086 microprocessor.
  - 3) Describe the meaning of Integrated Circuits?

**B) Answer the Following. (Any One)**

06

- 1) Define subtractor. Discuss half and full subtractor in detail.
  - 2) Discuss in detail decoder as digital components?

**Q.4 A) Answer the following. (Any Two)**

10

- 1) Illustrate Ex-NOR gate with neat diagram and its truth table.
  - 2) Describe in detail architecture of 8085 microprocessor?
  - 3) State and explain De Morgan's theorem with suitable example.

**B) Answer the Following. (Any One)**

04

- 1) State and describe the three basic characteristics of any microprocessor.
  - 2) Briefly state the concept of multiplexer?

**Q.5 Answer the following. (Any Two)**

14

- a) What do you mean by K-map? Simplify the Boolean function:

$$F(A, B, C) = \sum (1, 3, 4, 5, 6)$$

- b)** State and explain the pin diagram of 8085 Microprocessor?  
**c)** What do you mean by Counter? Explain in detail register and shift registers?

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# **MCA (Science) (Semester - I) (CBCS) Examination March/April-2019**

## **MANAGEMENT**

Day & Date: Friday, 03-05-2019

Time: 12:00 PM To 02:30 PM

Max. Marks: 70

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

**Q.1 Choose Correct Alternative from the following.**

14

SLR-DI-6



**Q.2 A) Answer the following (Any four)**

- 1) Explain going concern concept.
  - 2) State the elements of Control process.
  - 3) Define Strategies.
  - 4) List out the names of subsidiary Books.
  - 5) Explain Debit note.

**B) Write Notes on (Any two)**

- 1) Balance sheet Equation concept
  - 2) SWOT analysis
  - 3) Diversification of firm

**Q.3 A)** Following balances are extracted from the books of A/c of Ram and Co.

	Rs.		Rs.
Capital A/c	2,00,000	Debtors A/c	60,000
Reverse A/c	1,00,000	Creditors A/c	30,000
Cash A/c	50,000	Bills Payable A/c	10,000
Bank A/c	40,000	Bills Receivable A/c	25,000
Net profit	35,000	Intangible Assets	5,000

From the above, compute (Any Two)

- i) Proprietors Funds (net Worth)
  - ii) Current Assets
  - iii) Current Liabilities

**B)** Following transactions are extracted from the books of Ganesh Trades  
August 2018 Rs.

1	Started business with cash	9000
2	Opened Bank A/c	5000
3	Received NEFT from Suresh for cash sales	10000
4	Sold good for cash	13000
6	Paid Commission to Ramesh	1530
7	Brought good @2% trade discount and paid by Cheque	13000
8	Paid Office Rent	3500
12	Paid Postage	160
15	Paid Salaries	7000
18	Received on account from Ganesh in full of Rs. 3000	2900
31	Deposited in the Bank	3000

**Answer the following (Any one) :**

1. Prepare three column Cash Book
  2. Journalize the above transactions

**Q.4 A) Answer the following (Any two)**

10

- 1) Following balances are extracted from the books of SV & Co. for the year ending.

	Rs.		Rs.
Cash A/c	7200	Commission received A/c	3900
Bank A/c	11100	Salaries A/c	9000
Furniture	1000	Computer A/c	30000
Creditors	2500	Goodwill A/c	2000
Debtors	2200	Reserves A/c	10000
Rent A/c	4000	Capital A/c	24100
B/P	2000		
Loan from x	24000		

From above, answer (any two)

- i) Prepare Trial Balance
- ii) Find out Net working capital
- iii) Find out Proprietors' funds (Net Worth)

**B) Answer the following (Any one)**

04

- 1) Distinguish between Capital Expenditure and Revenue Expenditure  
2) Explain Trade discount and Cash discount

**Q.5 Answer the following (Any two)**

14

- a) State the characteristics of good M/s.
- b) Explain the objectives of Advertising.
- c) Explain the concept of supply Chain Management.

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# Set P

**M.C.A. (Science) (Semester - II) (CBCS) Examination March/April-2019  
OBJECT ORIENTED PROGRAMMING USING C++**

Day & Date: Saturday, 20-04-2019

Max. Marks: 70

Time: 12:00 PM To 02:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

#### **Q.1 Choose Correct Alternative from the following.**

14

- 10) Which of the following statement is correct?

  - a) A constructor is called at the time of declaration of an object
  - b) A constructor is called at the time of use of an object
  - c) A constructor is called at the time of declaration of a class
  - d) A constructor is called at the time of use of a class

11) Which of the following correctly describes overloading of functions?

  - a) Virtual polymorphism
  - b) Transient polymorphism
  - c) Ad-hoc polymorphism
  - d) Pseudo polymorphism

12) In C++, dynamic memory allocation is accomplished with the operator \_\_\_\_.

  - a) new
  - b) this
  - c) malloc
  - d) delete

13) How can we make a class abstract?

  - a) By making all member functions constant
  - b) By making at least one member function as pure virtual function
  - c) By declaring it abstract using the static keyword
  - d) By declaring it abstract using the virtual keyword

14) One way pointers are useful is to refer to a memory address that has no \_\_\_\_.

  - a) name
  - b) constant
  - c) location
  - d) field

**Q.2 A) Answer the following (Any Four) 08**

- 1) What is a preprocessor in C++?
  - 2) Explain in short inline function.
  - 3) What is manipulator?
  - 4) What is Array?
  - 5) Write use of scope resolution operation.

**B) Write Notes on (Any two) 06**

- 1) Advantages of OOPs
  - 2) Default arguments
  - 3) Function overloading

**Q.3 A) Answer the following (Any two) 08**

- 1) Explain the features of object oriented programming.
  - 2) What is meant by inheritance? Explain single inheritance.
  - 3) Explain dynamic memory allocation in C++.

**B) Answer the following (Any one)** 06

- 1) Explain array of objects with an example.
  - 2) Explain virtual base class with example.

**Q.4 A) Answer the following (Any two)**

- 1) Write the difference between structure and class in detail.
  - 2) Write a C++ program to demonstrate Friend function.
  - 3) Write a C++ program to overload unary minus operator.

**B) Answer the following (Any one) 04**

- 1) How polymorphism is achieved at compile time and run time?
  - 2) Explain file stream classes in C++.

**Q.5 Answer the following (Any two) 14**

- a) Explain Exception handling mechanism with one example.
  - b) What is template? Why to use template explain with examples.
  - c) How does copy constructor works? Explain.

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**M.C.A. (Science) (Semester - II) (CBCS) Examination March/April-2019  
DATA STRUCTURE**

Day & Date: Tuesday, 07-05-2019  
Time: 12:00 PM To 02:30 PM

Max. Marks: 70

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

**Q.1 Multiple Choice Questions:****14**

- 1) What is the worst case performance of Selection sort algorithm?  
a)  $O(\log n)$       b)  $O(n^*n)$   
c)  $O(n)$       d)  $O(n \log n)$
- 2) What sorting algorithms have their best and worst case times equal?  
a) Heap and selection sort      b) Insertion sort & merge sort  
c) Merge sort and heap sort      d) None of these
- 3) The smallest element of an array's index is called its \_\_\_\_\_.  
a) Lower bound      b) Upper bound  
c) Range      d) Extraction
- 4) The extra key inserted at the end of the array is called a, \_\_\_\_\_.  
a) End key      b) Stop key  
c) Sentinel      d) Transposition
- 5) A linear collection of data elements where the linear node is given by means of pointer is called \_\_\_\_\_.  
a) Linked list      b) Node list  
c) Primitive list      d) None of these
- 6) A linked list type that navigates for an item in forward and backward direction is called \_\_\_\_\_.  
a) Doubly Linked List      b) Circular linked List  
c) Linear Linked List      d) Absolute linked List
- 7) Representation of data structure in memory is known as \_\_\_\_\_.  
a) Recursive      b) Abstract data type  
c) Storage structure      d) File structure
- 8) One can convert a binary tree into its mirror image by traversing it in \_\_\_\_\_.  
a) Inorder      b) Preorder  
c) Post order      d) None of these
- 9) The data structure required to evaluate a postfix expression is \_\_\_\_\_.  
a) Queue      b) Stack  
c) Array      d) Linked-list
- 10) The postfix form of the expression is  $(A + B)^*(C*D - E)^*F/G$  is \_\_\_\_\_.  
a)  $AB + CD^*E - FG/^{**}$       b)  $AB + CD^*E - ^* F^*G/$   
c)  $AB + CD^*E - F^{**}G/$       d)  $AB + CDE - ^* F^*G/$
- 11) What data structures you should use for dictionary searching and it should be capable of doing spell check also?  
a) Array      b) Hashing  
c) Linked list      d) Tree

- 12) Which of the following algorithmic paradigm is used in the merge sort?  
a) Dynamic Programming                          b) Back Tracking  
c) Greedy method                                  d) Divide and Conquer
- 13) Two dimensional arrays are also called \_\_\_\_\_.  
a) Tables arrays                                    b) Matrix arrays  
c) Both of the above                              d) None of the above
- 14) A mathematical-model with a collection of operations defined on that model is called \_\_\_\_\_.  
a) Data Structure                                 b) Abstract Data Type  
c) Primitive Data Type                            d) Algorithm

**Q.2 A) Answer the following (Any Four)** 08

- 1) What is sparse matrix?
- 2) Define Binary Tree.
- 3) What is Queue?
- 4) What do you mean by backtracking?
- 5) Define dynamic programming.

**B) Write Notes on (Any two)** 06

- 1) Priority queue.
- 2) Greedy Methods.
- 3) General Trees.

**Q.3 A) Answer the following (Any Two)** 08

- 1) What are the differences between linear search and binary search?
- 2) Write an algorithm for simple merge sort technique.
- 3) Define adjacency matrix and path matrix.

**B) Answer the Following (Any One).** 06

- 1) Discuss linked and array representation of binary trees.
- 2) Evaluate the following postfix expression using stack. 5, 7, 9, \*, +, 4, 9, 3, /, +, -.

**Q.4 A) Answer the following (Any Two)** 10

- 1) What is an AVL tree? Explain AVL rotations with example.
- 2) Write an algorithm to convert infix to postfix using stack.
- 3) Explain applications of Stack.

**B) Answer the Following (Any One)** 04

- 1) What do you mean by algorithm? Give example.
- 2) Discuss the characteristics of an algorithm.

**Q.5 Answer the following (Any Two)** 14

- a) Write an algorithm to add new data at the end of doubly linked list.
- b) Define tree. Construct binary search tree of following series. Justify your answer.  
Series: 12, 3, 4, 13, 10, 5, 1, 8, 18, 7, 9, 11, 6 and 14.
- c) State and perform insertion sort algorithm to sort following numbers in ascending order.  
Series: 78, 55, 13, 105, 48, 23, 149, 65, 99, 28, 86, 66, 35, 8.

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**M.C.A. (Science) (Semester - II) (CBCS) Examination March/April-2019  
OPERATING SYSTEM**

Day & Date: Wednesday, 24-04-2019  
Time: 12:00 PM To 02:30 PM

Max. Marks: 70

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

**Q.1 Choose the correct alternative and rewrite the sentences. 14**

- 1) In \_\_\_\_\_ algorithm, a small unit of time quantum or time slice is defined.
 

a) Long term scheduler	b) Round Robin
c) Shortest Job First	d) Priority
- 2) The \_\_\_\_\_ is akin to reader lock in that several processes can acquire the lock concurrently.
 

a) Shared Lock	b) Exclusive Lock
c) System Lock	d) Hardware Lock
- 3) The \_\_\_\_\_ name begins at root and follows a path down to a specified file, giving the directory names on path.
 

a) Relative path	b) Directory path
c) Absolute path	d) File-Directory path
- 4) The value of \_\_\_\_\_ semaphore can range over an unrestricted domain.
 

a) Binary	b) Decimal
c) Monitor	d) Counting
- 5) The \_\_\_\_\_ is the module that gives control of the CPU to the process selected by the scheduler.
 

a) Memory Scheduler	b) Dispatcher
c) Control system	d) I/O Event Wait
- 6) The \_\_\_\_\_ buffer sometimes refers to as a message system with no buffering.
 

a) Zero capacity	b) Single capacity
c) Double capacity	d) Unbounded capacity
- 7) The rows of the \_\_\_\_\_ represent domains and the columns represent objects.
 

a) private right	b) operation right
c) access right	d) object right
- 8) A \_\_\_\_\_ memory divided into fixed sized blocks is called as frame.
 

a) physical	b) logical
c) frame	d) page
- 9) A \_\_\_\_\_ kernel allows a process to be preempted while it is running in kernel mode.
 

a) Preemptive	b) Non preemptive
c) Active	d) Non active
- 10) A \_\_\_\_\_ is associated with each process, and the CPU is allocated to the process with highest.
 

a) CPU Cycles	b) Wait time
c) Priority	d) Disk Storage

- 11) As processes enter the system, they are put into a \_\_\_\_\_, which consists of all processes in the system.  
a) Device queue                                  b) System queue  
c) Job queue                                      d) Ready queue
- 12) A \_\_\_\_\_ interface which uses a text instruction and a method to entering them.  
a) Computer                                      b) Track ball  
c) Flip Flop                                      d) Command
- 13) \_\_\_\_\_ is CPU scheduling criteria, which means its amount of time taken to execute a particular process.  
a) Start time                                      b) Arrival time  
c) Turnaround time                              d) Response time
- 14) \_\_\_\_\_ provides basis for application programs that acts as an intermediary between the computer user and the computer hardware.  
a) Application Software                        b) Operating system  
c) Shared Libraries                              d) Linked list

**Q.2 A) Answer any four of the following:** 08

- 1) What do you mean by Network Operating System?
- 2) What is mean by file?
- 3) What is system call?
- 4) What is mean by burst time request?
- 5) What do you mean by process control block?

**B) Write note on any two of the following:** 06

- 1) Distributed versus Parallel Computing System
- 2) Swapping
- 3) Critical section problem

**Q.3 A) Answer any two of the following:** 08

- 1) State and explain in detail concept of race condition?
- 2) Enlist various File operations. Discuss First Come First Serve Disk scheduling method with suitable example.
- 3) Define Fragmentation. Discuss in detail contiguous allocation in memory management.

**B) Answer any one of the following:** 06

- 1) What is mean by Process? Explain in detail different process state?
- 2) What do you mean by Demand paging? Explain in detail steps involved in handling page fault?

**Q.4 A) Answer any two of the following:** 10

- 1) Define the Deadlock. Explain in detail necessary conditions to cause a deadlock?
- 2) What do you mean Multi-programmed System? Discuss various types of scheduler in detail.
- 3) Explain in detail directory structure in file system organization?

**B) Answer any one of the following:** 04

- 1) Define the term Cooperative Process. Discuss in detail the concept of inter-process communication.
- 2) What do you mean by file structure? Explain various allocation methods of file system management?

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

14

- 1) Calculate the total number of page fault using Most Recently Used (MRU) Page Replacement on following reference string having maximum 03 frames –  
7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1
- 2) What is meant by Operating System? Discuss in detail vital role of Operating System as being control program.
- 3) What is CPU Scheduling? Discuss working of Shortest Job First algorithm using following data-

P_NAME	P_Burst Time
ABC	28
XYZ	19
PQR	6
LMN	13
STU	25

Seat No. Set  P**M.C.A. (Science) (Semester - II) (CBCS) Examination March/April-2019  
SOFTWARE ENGINEERING**

Day &amp; Date: Thursday, 25-04-2019

Max. Marks: 70

Time: 12:00 PM To 02:30 PM

**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.**Q.1 Multiple choice questions****14**

- 1) RAD stands for \_\_\_\_\_.  
a) Relative Application Development  
b) Rapid Application Development  
c) Rapid Application Document  
d) None of the mentioned
  
- 2) Which one of the following models is not suitable for accommodating any change?  
a) Build & Fix Model  
b) Prototyping Model  
c) RAD Model  
d) Waterfall Model
  
- 3) SDLC stands for \_\_\_\_\_.  
a) Software Development Life Cycle  
c) Software Design Life Cycle  
b) System Development Life Cycle  
d) System Design Life Cycle
  
- 4) Which model can be selected if user is involved in all the phases of SDLC?  
a) Waterfall Model  
b) Prototyping Model  
c) RAD Model  
d) both Prototyping Model & RAD Model
  
- 5) A \_\_\_\_\_ view shows the system hardware and how software components are distributed across the processors in the system.  
a) Physical  
b) Logical  
c) Process  
d) All of the mentioned
  
- 6) A description of each function presented in the DFD is contained, in a \_\_\_\_\_.  
a) Data flow  
b) Process specification  
c) Control specification  
d) Data store
  
- 7) A data model contains \_\_\_\_\_.  
a) Data object  
b) Attributes  
c) Relationships  
d) All of the mentioned
  
- 8) The user system requirements are the parts of which document?  
a) SDD  
b) SRS  
c) DDD  
d) SRD
  
- 9) Which of the following is golden rule for interface design?  
a) Place the user in control  
b) Reduce the user's memory load  
c) Make the interface consistent  
d) All of the mentioned

- 10) Which of the following is not a user interface design process?  
a) User, task, and environment analysis and modeling  
b) Interface design  
c) Knowledgeable, frequent users  
d) Interface validation
- 11) A software might allow a user to interact via \_\_\_\_\_.  
a) Keyboard commands                          b) Mouse movement  
c) Voice recognition commands                d) All of the mentioned
- 12) What incorporates data, architectural, interface, and procedural representations of the software?  
a) Design model                                b) User's model  
c) Mental image                                d) System image
- 13) What is the first step of requirement elicitation?  
a) Identifying Stakeholder                    b) Listing out Requirements  
c) Requirements Gathering                  d) All of the mentioned
- 14) Why is Requirements Elicitation a difficult task?  
a) Problem of scope                            b) Problem of understanding  
c) Problem of volatility                        d) All of the mentioned

<b>Q.2</b>	<b>A) Answer the following (Any four)</b>	<b>08</b>
	1) Define function point. 2) What is KLOC? 3) What is Alpha Testing? 4) Define Software Metrics. 5) Define the term Entity.	
<b>B) Write notes on. (Any two)</b>		<b>06</b>
	1) Prototyping model 2) Data Dictionary 3) Software Quality Assurance	
<b>Q.3</b>	<b>A) Answer the following (Any two)</b>	<b>08</b>
	1) What are the limitations of waterfall model? 2) Differentiate between coupling and cohesion. 3) Describe Transform and Transaction mapping.	
<b>B) Answer the following. (Any one)</b>		<b>06</b>
	1) Describe the phases of SDLC in details. 2) What is software testing? How is white box testing differs from black box testing?	
<b>Q.4</b>	<b>A) Answer the following: (Any two)</b>	<b>10</b>
	1) Discuss the role of metrics in the process and project. 2) Explain architectural design with suitable example. 3) What are the causes for software crises? Explain.	
<b>B) Answer the following. (Any one)</b>		<b>04</b>
	1) Explain the principles of software design. 2) What are the components of Data flow diagram?	
<b>Q.5</b>	<b>Answer the following. (Any two)</b>	<b>14</b>
	a) Explain object oriented concepts of software engineering in detail. b) What is software design? Explain various concepts of Design. c) What is data modelling? Explain entity relationships diagram with example.	

<b>Seat No.</b>	
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**Set P****M.C.A. (Science) (Semester - III) (CBCS) Examination March/April-2019  
SYSTEM SOFTWARE**

Day & Date: Saturday, 27-04-2019  
Time: 03:30 PM To 06:00 PM

Max. Marks: 70

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

**Q.1 Choose correct alternatives.****14**

- 1) YACC builds up \_\_\_\_\_.  
a) LALR parsing table      b) SLR parsing table  
c) canonical LR parsing table      d) none of these
- 2) A non relocatable program is the one which \_\_\_\_\_.  
a) can itself perform the relocation of its address sensitive portions  
b) consists of a program and relevant information for its relocation  
c) cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation  
d) all of these
- 3) In which addressing mode the operand is given explicitly in the instruction?  
a) Absolute mode      b) Immediate mode  
c) Indirect mode      d) Index mode
- 4) Storage mapping is done by \_\_\_\_\_.  
a) Loader      b) Linker  
c) OS      d) Compiler
- 5) The linker is \_\_\_\_\_.  
a) same as the loader  
b) required to create a load module  
c) always used before programs are executed  
d) none of these
- 6) Relocatable programs \_\_\_\_\_.  
a) cannot be used with fixed partitions  
b) can be loaded almost anywhere in memory  
c) Links do not need a linker  
d) can be loaded only at one specific location
- 7) Binder performs the functions of \_\_\_\_\_.  
a) allocation      b) relocation  
c) linking      d) all of these
- 8) Which of the following system software always resides in the main memory?  
a) Text Editor      b) Assembler  
c) Linker      d) Loader
- 9) Assembler is a program that \_\_\_\_\_.  
a) places programs into memory and prepares them for execution  
b) automates the translation of assembly language into machine language  
c) accepts a program written in a high level language and produces an object program  
d) appears to execute a resource as if it were machine language

- 10) The dynamic linking postpones linking function until \_\_\_\_\_.  
a) Load b) Execution  
c) Compile d) None of these
- 11) The main data structures involved in a one-pass macro processors are \_\_\_\_\_.  
a) DEFTAB b) NAMTAB  
c) ARGTAB d) All of these
- 12) The SIC machine uses \_\_\_\_\_ addressing modes.  
a) Direct b) Indexed  
c) Both a) and b) d) None of these
- 13) Bottom up parsing involves?  
a) Shift reduce b) Handle pruning  
c) Operator check d) only a) and b)
- 14) A Compiler has \_\_\_\_\_ phases?  
a) 7 b) 6  
c) 8 d) None of these

<b>Q.2</b>	<b>A) Answer the following. (Any Four)</b>	<b>08</b>
	1) What is MASM assembler? 2) Explain Nested macros. 3) What is Interpreter? 4) What is Loader? 5) Explain program blocks.	
<b>B) Write short notes on. (Any Two)</b>		<b>06</b>
	1) RISC 2) Features of machine-dependent compiler 3) Shift / reduce parsing	
<b>Q.3</b>	<b>A) Answer the following. (Any Two)</b>	<b>08</b>
	1) Explain location counter in assembler. 2) Explain MS-DOS linker and SUN OS linker. 3) Explain in brief N-pass compiler.	
<b>B) Answer the following. (Any one)</b>		<b>06</b>
	1) Explain any three assembly directives. 2) Explain various phases of compilation process.	
<b>Q.4</b>	<b>A) Answer the following: (Any Two)</b>	<b>10</b>
	1) Explain the instruction formats and addressing modes of SIC/XE machine architecture. 2) Design algorithm for macro expansion technique. 3) Explain syntactic analysis in detail.	
<b>B) Answer the following. (Any One)</b>		<b>04</b>
	1) Explain lexical analysis. 2) Explain Bootstrap loader.	
<b>Q.5</b>	<b>Answer the following. (Any Two)</b>	<b>14</b>
	a) How object program can be processed using linkage editor? Explain with diagram. b) What are Literals? Differentiate literals from immediate operands. c) Design a flowchart for two pass assembler.	

<b>Seat No.</b>	
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**Set P**

**M.C.A. (Science) (Semester - III) (CBCS) Examination March/April-2019**  
**DBMS**

Day &amp; Date: Monday, 29-04-2019

Max. Marks: 70

Time: 03:30 PM To 06:00 PM

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

**Q.1 Choose correct alternative from the following:****14**

- 1) In an object-oriented model, one object can access data of another object by passing \_\_\_\_\_.  
 a) instance variable    b) message  
 c) variable    d) none of these
- 2) Which of the following is an aggregate function used in SQL?  
 a) Union    b) Like  
 c) Group By    d) Max
- 3) Tree structures are used to store data in \_\_\_\_\_.  
 a) Network model    b) Relational model  
 c) Hierarchical model                                      d) File based system
- 4) Which of the following is not a recovery technique?  
 a) Deferred update    b) Immediate update  
 c) Two-phase commit                                        d) Shadow paging
- 5) Every Boyce-Codd normal form is in \_\_\_\_\_.  
 a) First normal form                                        b) Second normal form  
 c) Third normal form                                        d) All of the above
- 6) Which command is used to add a column to an existing table?  
 a) Create     b) Update  
 c) Alter    d) None of these
- 7) \_\_\_\_\_ operator is used to compare a value to a list of literals values that have been specified.  
 a) LIKE    b) COMPARE  
 c) BETWEEN    d) IN
- 8) In ER model the details of the entities are hidden from the user. This process is called \_\_\_\_\_.  
 a) generalization    b) specialization  
 c) abstraction    d) none of these
- 9) Isolation of the transactions is ensured by \_\_\_\_\_.  
 a) transaction management                                b) application programmer  
 c) concurrency control                                      d) recovery management
- 10) A view of database that appears to an application program is known as \_\_\_\_\_.  
 a) Schema    b) Subschema  
 c) Virtual table     d) None of these
- 11) \_\_\_\_\_ command can be used to modify a column in a table.  
 a) Alter    b) Update  
 c) Set    d) Create

- 12) \_\_\_\_\_ is a full form of SQL.  
a) Standard query language      b) Sequential query language  
c) Structured query language      d) Server-side query language
- 13) The key to represent relationship between tables is called \_\_\_\_\_.  
a) Primary key      b) Secondary key  
c) Foreign key      d) None of these
- 14) \_\_\_\_\_ statements can use correlated sub queries.  
a) DELETE      b) SELECT  
c) UPDATE      d) INSERT

**Q.2 A) Answer the following: (Any Four)** 08

- 1) Define database.
- 2) What is transaction? Give example.
- 3) What is candidate key? Give example.
- 4) What is ER model?
- 5) What are cardinalities?

**B) Write notes on: (Any two)** 06

- 1) Client
- 2) Commit Command
- 3) %TYPE

**Q.3 A) Answer the following: (Any two)** 08

- 1) What is % ROWTYPE? Give Example.
- 2) Explain large objects with example.
- 3) Explain explicit cursor.

**B) Answer the following: (Any one)** 06

- 1) Explain nested tables.
- 2) Describe fragmentation concept.

**Q.4 A) Answer the following: (Any two)** 10

- 1) Explain relational algebra.
- 2) Explain any two data models.
- 3) Explain GROUP BY Clause with example.

**B) Answer the following: (Any one)** 04

- 1) Describe BETWEEN and IN predicate with example.
- 2) Differentiate between SQL and PL/SQL.

**Q.5 Answer the following: (Any two)** 14

- a) Explain functional dependencies and multi valued dependencies.
- b) Describe the different limitations of traditional file processing system over database system.
- c) Explain SELECT Clause with all options.

Seat No.	
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**M.C.A. (Science) (Semester - III) (CBCS) Examination March/April-2019  
JAVA PROGRAMMING**

Day & Date: Tuesday, 30-04-2019  
Time: 03:30 PM To 06:00 PM

Max. Marks: 70

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

**Q.1 Choose correct alternatives:****14**

- 1) Java source code is compiled into \_\_\_\_\_.  
a) .Exe   b) .Obj  
c) Byte code                                      d) Dynamic Library
  
- 2) A subclass can call a constructor method defined by its super class by use of the keyword.  
a) static   b) super  
c) base   d) construct
  
- 3) When does method overriding is determined?  
a) At run time                                   b) At compile time  
c) At coding time                               d) At load time
  
- 4) \_\_\_\_\_ are small java programs developed for internet applications.  
a) Applet   b) AWT  
c) Both a and b                                   d) None of these
  
- 5) \_\_\_\_\_ is the default package of Java.  
a) java.lang                                       b) java.io  
c) java.awt                                       d) All of these
  
- 6) Thread priority in Java is \_\_\_\_\_.  
a) Integer    b) Float  
c) Double   d) Long
  
- 7) An interface can extend another interface.  
a) True   b) False
  
- 8) \_\_\_\_\_ is a super class of all predefined and user-defined classes.  
a) String   b) Object  
c) StringBuilder                                   d) None of these
  
- 9) \_\_\_\_\_ is a default layout in a AWT.  
a) BorderLayout                                   b) GridLayout  
c) FlowLayout                                     d) ButtonLayout
  
- 10) The prepareCall() method executes a simple query and returns a single Result Set object.  
a) True   b) False
  
- 11) \_\_\_\_\_ method is used to execute the DML queries.  
a) execute   b) executeUpdate  
c) executeQuery                                   d) executeBatch
  
- 12) Which of the following is not the Thread class method?  
a) start()                                        b) run()  
c) wait()   d) terminate()

13) \_\_\_\_\_ method is used to destroy the objects created by the constructor.

- a) Final() b) Destroy()
- c) Finalize() d) Terminate()

14) Applet can call init() method multiple times during its life cycle.

- a) True b) False

**Q.2 A) Answer the following. (Any Four)**

**08**

- 1) List the functions of StringBuilder class.
- 2) Differentiate between class and interface.
- 3) Give the meaning of byte code.
- 4) Differentiate between thread and process.
- 5) Give the use of JVM & JRE.

**B) Write short notes on: (Any Two)**

**06**

- 1) List Advantages of Wrapper classes.
- 2) Advantages of AWT.
- 3) Byte stream classes.

**Q.3 A) Answer the following. (Any Two)**

**08**

- 1) Write a program to check given number is prime or not.
- 2) Explain any two predefined Packages in java.
- 3) What is method overriding? Give one example.

**B) Answer the following. (Any One)**

**06**

- 1) Explain the concept of Multithreading by Runnable interface.
- 2) Explain the concept of static class.

**Q.4 A) Answer the following. (Any Two)**

**10**

- 1) Explain Constructor overloading with suitable example.
- 2) Explain the term ListBox and CheckBox class.
- 3) Write a program to copy one file into another byte file.

**B) Answer the following. (Any One)**

**04**

- 1) Give the purpose of throw and throws keyword.
- 2) Give the use and characteristics of abstract keyword.

**Q.5 Answer the following. (Any Two)**

**14**

a) Create a windows application to insert and display employee information.

b) Explain thread life cycle.

c) Explain different character stream classes.

<b>Seat No.</b>	
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**M.C.A. (Science) (Semester - III) (CBCS) Examination March/April-2019**  
**COMPUTER COMMUNICATION NETWORK**

Day & Date: Thursday, 02-05-2019  
 Time: 03:30 PM To 06:00 PM

Max. Marks: 70

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

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

14

- 1) The header length of an IPv6 datagram is \_\_\_\_\_.  
 a) 10 bytes                                  b) 25 bytes  
 c) 30 bytes                                    d) 40 bytes
- 2) In virtual circuit network each packet contains \_\_\_\_\_.  
 a) full source and destination address  
 b) a short VC number  
 c) both (a) and (b)  
 d) none
- 3) Which error correction method consists of just one redundant bit per data unit \_\_\_\_\_.  
 a) CRC  
 b) Checksum  
 c) Simple Parity check  
 d) Two- Dimensional parity check
- 4) In a \_\_\_ connection, two and only two devices are connected by a dedicated link.  
 a) Multipoint                                    b) Point to point  
 c) (a) and (b)                                 d) none
- 5) This is not an application layer protocol.  
 a) HTTP    b) FTP  
 c) TCP    d) SMTP
- 6) In \_\_\_\_\_, each node maintains a vector (table) of minimum distances to every node.  
 a) Path vector                                    b) Distance vector  
 c) Link state                                     d) None
- 7) \_\_\_\_\_ primitive is used to accept incoming connections.  
 a) RECEIVE                                        b) CONNECT  
 c) LISTEN                                         d) None
- 8) HTTP uses the services of \_\_\_\_\_ on well-known port 80.  
 a) UDP    b) IP  
 c) TCP    d) None
- 9) In \_\_\_\_\_, we try to create an appropriate environment for the traffic.  
 a) Congestion control                            b) Quality of service  
 c) Either (a) or (b)                            d) Both (a) and (b)
- 10) In byte stuffing, a special byte is added to data section of frame when there is a character with same pattern as the \_\_\_\_\_.  
 a) flag    b) error  
 c) sender                                         d) destination

- 11) In \_\_\_\_\_ the router may forward the received packet through several of its interfaces.

  - a) Unicasting
  - b) Multicasting
  - c) Broadcasting
  - d) None

12) HDLC is an acronym for \_\_\_\_\_.

  - a) Half-duplex digital link combination
  - b) Host double-level circuit
  - c) High-duplex line communication
  - d) High-level data link control

13) UDP needs the \_\_\_\_\_ address to deliver the user datagram to the correct application process.

  - a) Port
  - b) Application
  - c) Internet
  - d) None

14) \_\_\_\_\_ is a repository of information linked together from points all over the world.

  - a) The WWW
  - b) HTTP
  - c) HTML
  - d) None

**Q.2 A) Answer the following. (Any four)**

08

- Answer the following (Any 5cm)**

  - 1) What is meant by adaptive routing algorithm?
  - 2) What is meant by framing?
  - 3) What is meant by optimality principle?
  - 4) What is a three way handshaking mechanism?
  - 5) What is the user agent?

**B) Write notes on. (Any two)**

06

- Write notes on (Any two)**

  - 1) Which are the various design issues for layers?
  - 2) Explain flooding in detail.
  - 3) What is the wireless web?

**Q.3 A) Answer the following. (Any Two)**

08

- Answer the following. (Any Two)**

  - 1) Classify the computer network according to scale.
  - 2) Explain various congestion prevention policies.
  - 3) Explain static web documents.

**B) Answer the Following. (Any One)**

06

- 1) Explain concatenated virtual circuit.  
2) Draw the TCP header format.

**Q.4 A) Answer the following. (Any Two)**

10

- Answer the following. (Any Two)**

  - 1) Explain HDLC in detail.
  - 2) Compare virtual circuit subnet and datagram subnet.
  - 3) Explain Real time transport Protocol in detail

**B) Answer the Following. (Any One)**

04

- Answer the Following. (Any One)**

  - 1) Explain Connection less service.
  - 2) The following character encoding is used in a data link protocol:

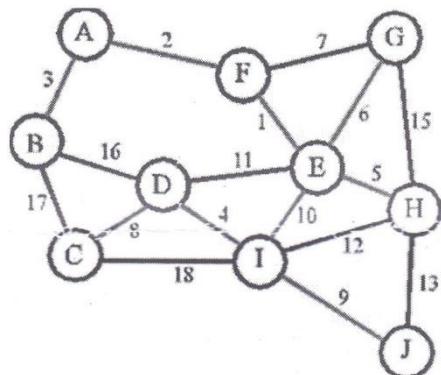
The following character encoding is used in a data link protocol:  
A: 01000111; B: 11100011; FLAG: 01111110; ESC: 11100000  
Show the bit sequence transmitted (in binary) for the four-character frame A-B-ESC-FLAG.

frame: A B ESC FLAG  
when each of the following framing methods are used:

- a) Character count
  - b) Flag bytes with byte stuffing.
  - c) Starting and ending flag bytes, with bit stuffing.

**Q.5 Answer the following (Any Two)**

- a) Explain Go Back n-ARQ protocol.
- b) Explain the architecture of Internet.
- c) Consider the following network with the indicated link cost. Use Dijkstra's shortest path algorithm to compute the shortest paths from A to I and H.



**Seat  
No.**

## Set P

**M.C.A. (Science) (Semester - III) (CBCS) Examination March/April-2019  
PROGRAMMING WITH PHP**

Day & Date: Thursday, 02-05-2019

**Max. Marks: 70**

Time: 03:30 PM to 06:00 PM

**Instructions:** 1) All questions are compulsory

2) Figures to the right indicate full marks.

**Q.1 Choose Correct Alternative from the following.**

14

- 1) Which of the functions is used to sort an associative array according to value in descending order?  
a) sort()  
b) arsort()  
c) rsort()  
d) dsort()

2) What is the strlen () function in PHP?  
a) Returns value of string  
b) Returns length of string  
c) Returns type of string  
d) Returns subset of string

3) Which one of the following functions will converts the first character of a string to uppercase?  
a) strtoupper()  
b) uppercase()  
c) str\_uppercase()  
d) ucfirst()

4) Where the session\_start() function must appear in PHP?  
a) With tag  
b) Anywhere  
c) After tag  
d) Before tag

5) When you use the \$\_GET variable to collect data, the data is visible to \_\_\_\_.  
a) none  
b) only you  
c) everyone  
d) selected few

6) Which one of the Concatenation operator in PHP?  
a) .(dot)  
b) &(Ampersand)  
c) +(Plus)  
d) %(Percentage)

7) <?php  
\$array = array (1, 2, 3, 5, 8, 13, 21, 34, 55);  
\$sum = 0;  
for (\$i = 0; \$i < 5; \$i++) {  
\$sum += \$array[\$array[\$i]];  
}  
echo \$sum;  
?>  
a) 78  
b) 19  
c) NULL  
d) 5

8) Which one of the following format parameter can be used to identify timezone?  
a) T  
b) N  
c) E  
d) I

9) Which function is used to erase all session variables stored in the current session?  
a) session\_destroy()  
b) session\_change()  
c) session\_remove()  
d) session\_unset()

- 10) What is the description of Error level E\_ERROR?  
a) Fatal run-time error                                  b) Near-fatal error  
c) Compile-time error                                    d) Fatal Compile-time error

- 11) What will be the output of the following PHP code?

```
<?php  
$x = 3.3;  
$y = 2;  
echo $x % $y;  
?>
```

- a) 0    b) 1  
c) 3    d) Error

- 12) Which two predefined variables are used to retrieve information from forms?

- a) \$GET & \$SET                                        b) \$\_GET & \$\_SET  
c) GET & SET    d) None of these

- 13) What will be the output of the following PHP code?

```
<?php  
$date = new DateTime();  
echo $date->format('l,F,js,Y')  
?>
```

a) Sunday, February 24th 2008                      b) Sunday, 02 24 2008  
c) Sunday, 24 02 2008                                d) Sunday, 24th February 2008

- 14) Which method returns the error code generated from the execution of the last MySQL function?

- a) errno()     b) errnumber()  
c) errorno()    d) errornumber()

**Q.2 A) Answer the following. (Any Four)**

**08**

- 1) What are different data types in PHP?
- 2) What is the difference between == and === in PHP?
- 3) How to submit the form by using POST method?
- 4) How to register the variable in PHP session?
- 5) What is the purpose of @ in PHP?

**B) Write short notes on. (Any two)**

**06**

- 1) White Space
- 2) Variable Scope
- 3) Displaying PHP Errors

**Q.3 A) Answer the following. (Any two)**

**08**

- 1) What is the difference between include and require?
- 2) Write the role of foreach in PHP?
- 3) What is the difference between unset and unlink?

**B) Answer the following. (Any one)**

**06**

- 1) Write a program to print length of array in PHP.
- 2) Write a program to print sum of first 10 odd numbers.

**Q.4 A) Answer the following. (Any two)**

**10**

- 1) Write a program to sort an associative array in descending order by value.
- 2) Explain the PHP debugging techniques.
- 3) Explain any five Date functions in PHP.

**B) Answer the following. (Any one)**

**04**

- 1) How the constant define in PHP?
- 2) How to get number of days between two given dates in PHP?

**Q.5 Answer the following. (Any two)**

14

- a) What is the difference between session and cookie? Explain with an example.
- b) What is SQL? How to update the contents from TABLE A to TABLE B?
- c) What is My SQL? Explain the steps of creating connection between PHP and My SQL with example.

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**M.C.A. (Science) (Semester - IV) (CBCS) Examination March/April-2019  
.NET**

Day &amp; Date: Saturday, 20-04-2019

Max. Marks: 70

Time: 03.30 PM To 6.00 PM

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

**Q.1 Choose Correct Alternative from the following.**

14

1) What does the following C#.NET code snippet will print?

```
int i = 0, j = 0;
label:
    i++;
    j+=l;
if (i<10)
{
    Console.WriteLine (i + " ");
    goto label;
}
```

- |                  |                  |
|------------------|------------------|
| a) Prints 1 to 9 | b) Prints 0 to 8 |
| c) Prints 2 to 8 | d) Prints 2 to 9 |

2) Which of the following is the correct output for the C#.NET program given below?

```
int i = 20;
for( ; ; )
{
    Console.WriteLine (i + " ");
    if (i >= -10)
        i -= 4;
    else
        break;
```

- |                             |                   |
|-----------------------------|-------------------|
| a) 20 16 12 8 4 0 -4 -8     | b) 20 16 12 8 4 0 |
| c) 20 16 12 8 4 0 -4 -8 -12 | d) 16 12 8 4 0    |

3) A function returns a value, whereas a subroutine cannot return a value.

- |                 |                  |
|-----------------|------------------|
| a) True         | b) False         |
| c) Both a and b | d) None of these |

4) Which of the following CANNOT occur multiple number of times in a program?

- |              |               |
|--------------|---------------|
| a) namespace | b) Entrypoint |
| c) Class     | d) Function   |

5) An Employee class has a property called age and emp is reference to a Employee object and we want the statement Console.WriteLine(emp.age) to fail. Which of the following options will ensure this functionality?

- |  |
|--|
| a) Declare age property with only get accessor             |
| b) Declare age property with only set accessor             |
| c) Declare age property with both get and set accessors    |
| d) Declare age property with get, set and normal accessors |

- 6) Which of the following statements is correct about an Exception?
- It occurs during compilation
  - It occurs during linking
  - It occurs at run-time
  - It occurs during Just-In-Time compilation
- 7) In C#.NET if we do not catch the exception thrown at runtime then which of the following will catch it?
- |             |           |
|-------------|-----------|
| a) Compiler | b) CLR    |
| c) Linker   | d) Loader |
- 8) Which of the following is NOT an Exception?
- |                        |                                    |
|------------------------|------------------------------------|
| a) StackOverflow       | b) Division By Zero                |
| c) Insufficient Memory | d) Incorrect Arithmetic Expression |
- 9) Which of the following statements is correct about an interface used in C#.NET?
- One class can implement only one interface
  - In a program if one class implements an interface then no other class in the same program can implement this interface
  - From two base interfaces a new interface cannot be inherited
  - Properties can be declared inside an interface
- 10) Which of the following statements are correct about delegates?
- Delegates cannot be used to call a static method of a class
  - Delegates cannot be used to call procedures that receive variable number of arguments
  - If signatures of two methods are same they can be called through the same delegate object
  - Delegates cannot be used to call an instance function. Delegates cannot be used to call an instance subroutine
- 11) Which of the following statements is valid about advantages of generics?
- Generics shift the burden of type safety to the programmer rather than compiler
  - Generics require use of explicit type casting
  - Generics provide type safety without the overhead of multiple implementations
  - Generics eliminate the possibility of run-time errors
- 12) Choose the correct option about DataReader object.
- DataReader object is a forward-only object
  - It provides connection oriented environment
  - DataReader is read only object
  - All of the above
- 13) What are the three main objects when working with a DataSet?
- DataTable, DataColumn, and type
  - DataTable, DataRelation, and DataAdapter
  - DataTable, DataColumn, and DataRelation
  - DataReader, DataAdapter, and Command
- 14) Which validation control in ASP.NET can be used to determine if the data is entered into a TextBox control is of type Currency?
- |                           |                      |
|---------------------------|----------------------|
| a) ValidationSummary      | b) CompareValidator  |
| c) RequiredFieldValidator | d) None of the above |

<b>Q.2</b>	<b>A) Answer the following. (Any four)</b>	<b>08</b>
	1) Definition of Event and Delegate 2) Declaration of Class 3) Declaration of Array in C# 4) Data types of C# 5) Web Page in ASP.NET	
	<b>B) Write Notes on. (Any two)</b>	<b>06</b>
	1) TextBox Control 2) Namespace 3) Attributes	
<b>Q.3</b>	<b>A) Answer the following. (Any two)</b>	<b>08</b>
	1) Explain Custom validation with example. 2) Explain DataReader with example. 3) Explain Com interoperability with example.	
	<b>B) Answer the following. (Any one)</b>	<b>06</b>
	1) Link Button with properties. 2) What is the use of Session State in ASP.NET? Explain with example.	
<b>Q.4</b>	<b>A) Answer the following. (Any two)</b>	<b>10</b>
	1) Describe the delegate with example. 2) What are properties in DOT NET? Explain with example. 3) Life cycle of web page.	
	<b>B) Answer the following. (Any one)</b>	<b>04</b>
	1) Why we use IsPostBack event in ASP.NET web page development? 2) How to use RangeValidator in ASP.NET?	
<b>Q.5</b>	<b>Answer the following. (Any two)</b>	<b>14</b>
	a) Explain the architecture of ASP.NET. b) What is ADO.NET? Explain the components of ADO.NET. c) What is master page? How to select dynamically master page in ASP.NET application.	

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**M.C.A. (Science) (Semester - IV) (CBCS) Examination March/April-2019**  
**DATA MINING AND WAREHOUSE**

Day & Date: Tuesday, 07-05-2019  
 Time: 03:30 PM To 06:00 PM

Max. Marks: 70

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

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

**14**

- 1) The full form of OLTP is \_\_\_\_\_.  
 a) Online Transaction Processing  
 b) Online Transfer Processing  
 c) Online Transport Preparation  
 d) Online Transportation Performance
  
- 2) An \_\_\_\_\_ system is market-oriented and is used for data analysis by knowledge workers.  
 a) OLAP    b) OLTP  
 c) OLEP    d) none of these
  
- 3) \_\_\_\_\_ schema can be viewed as a collection of stars.  
 a) Star    b) Snowflake  
 c) Fact constellation                              d) Hybrid
  
- 4) The \_\_\_\_\_ operation performs aggregation on a data cube, either by climbing up a concept hierach for a dimension or by dimension reduction.  
 a) Roll-up    b) Drill-down  
 c) drill-rotate                                      d) Rule-up
  
- 5) \_\_\_\_\_ it navigates from less detailed data to more detailed data.  
 a) Roll-up    b) Drill-down  
 c) drill-rotate                                      d) Rule-up
  
- 6) The \_\_\_\_\_ operation performs a selection on one dimension of the given cube, resulting in a subcube.  
 a) Dice    b) Drill-down  
 c) Roll-up     d) Slice
  
- 7) A \_\_\_\_\_ is a set of views over operational databases.  
 a) Enterprise warehouse                            b) Data Mart  
 c) Virtual warehouse                                d) Refresh
  
- 8) A \_\_\_\_\_ contains a subset of corporate-wide data that is of value to a specific group of users.  
 a) Enterprise warehouse                            b) Data Mart  
 c) Virtual warehouse                                d) Refresh
  
- 9) \_\_\_\_\_, which detects errors in the data and rectifies them when possible.  
 a) Refresh Data                                      b) Data Transformation  
 c) Data Cleaning                                     d) Data Extraction
  
- 10) \_\_\_\_\_ include concept description, association, classification, prediction and clustering.  
 a) Task Relevant data                                b) Kinds of Knowledge  
 c) Background Knowledge                            d) Interestingness measure

- 11) The deeper the abstraction level, the smaller the corresponding threshold.  
a) Reduced Support                          b) Same support  
c) Uniform support                            d) Minimum support
- 12) Multidimensional association rules with no repeated predicates are called \_\_\_\_\_.  
a) Single dimensional association rules  
b) Interdimensional Association rules  
c) Hybrid-dimensional Association rules  
d) None of these
- 13) The class label of each training tuple is not known, and the number or set of classes to be learned may not be learned may not be known in advance is known as:  
a) Unsupervised learning                      b) self learning  
c) supervised learning                         d) None of these
- 14) A divisive hierarchical clustering method employs a \_\_\_\_\_ strategy.  
a) Top-down                                    b) Bottom-up  
c) Random                                      d) None of these

**Q.2 A) Answer the following (Any Four)** 08

1) Explain Agglomerative hierarchical clustering method with example.  
2) What is Data Mart? Explain in short.  
3) Explain in short the strategies to fill missing values.  
4) What is data Integration? Explain in short.  
5) What is Unsupervised learning?

**B) Write Notes on (Any two)** 06

1) DMQL  
2) FP-Tree  
3) Reduced support

**Q.3 A) Answer the following (Any Two)** 08

1) What is data mining? Explain 'kind of knowledge to be mined'.  
2) What is Association Rule? Explain Market basket analysis.  
3) How to choose data mining system? Explain in detail.

**B) Answer the Following (Any One).** 06

1) What is data cube? Explain snowflake schema with diagram.  
2) Define Data warehouse. Explain difference between OLAP & OLTP.

**Q.4 A) Answer the following (Any Two)** 10

1) Explain the procedure for decision tree induction method with example.  
2) Explain the procedure of Apriori algorithm with suitable example.  
3) Explain how data mining is useful in 'Intrusion Detection'.

**B) Answer the Following (Any One)** 04

1) Explain how association's rules are constructed in multi-level hierarchy.  
2) What is supervised learning? Explain with example.

**Q.5 Answer the following (Any Two)** 14

a) Explain k-medoid algorithm with suitable example.  
b) Explain Three-tier architecture of Data warehouse with well labelled diagram.  
c) What is cluster analysis? Explain different types of data in cluster analysis.

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**M.C.A. (Semester - IV) (CBCS) Examination March/April-2019**  
**Science**  
**UML**

Day &amp; Date: Friday, 26-04-2019

Max. Marks: 70

Time: 03:30 PM To 06:00 PM

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

**Q.1 Choose Correct Alternative from the following.****14**

- 1) SDLC stands for \_\_\_\_\_.  
 a) Software Design Life Cycle  
 b) Software Development Last Cycle  
 c) Software Development Life Cycle  
 d) Software Development Life Code
- 2) In Unified Modeling Language, diagrams that organize system elements into groups are classified as \_\_\_\_\_.  
 a) Package diagrams                          b) Organized diagrams  
 c) System diagrams                            d) Class diagrams
- 3) At Conceptual level Class diagrams should include \_\_\_\_\_.  
 a) operations only                            b) attributes only  
 c) Both operations and attributes         d) None of these
- 4) What is collection of model elements called?  
 a) Box    b) Dependency  
 c) UML packages                                d) Package members
- 5) Which of the following UML diagrams has a static view?  
 a) Collaboration                              b) Use case  
 c) State chart                                 d) None of these
- 6) An object symbol is divided into what parts?  
 a) Top compartment                            b) Bottom Compartment  
 c) All of the mentioned                        d) None of these
- 7) If you are working on real-time process control applications or systems that involve concurrent processing, you would use a \_\_\_\_\_.  
 a) Activity diagram                            b) Sequence diagram  
 c) Statechart diagram                         d) Object diagram
- 8) Diagrams in unified modified language which are used to test class diagrams for accuracy purpose are called \_\_\_\_\_.  
 a) Deployment diagrams                      b) Component diagrams  
 c) Object diagrams                            d) Package diagrams
- 9) Which things are dynamic parts of UML models?  
 a) Structural things                            b) Behavioural things  
 c) Grouping things                            d) Annotational things
- 10) What refers to the value associated with a specific attribute of an object and to any actions or side?  
 a) Object                                        b) State  
 c) Interface                                    d) none of these

- 11) Dynamic aspects related to a system are shown with help of \_\_\_\_\_.  
a) Sequence diagrams                            b) Interaction diagrams  
c) Deployment diagrams                        d) Use case diagrams
- 12) Which diagram shows the configuration of run-time processing elements?  
a) Deployment diagram                            b) Component diagram  
c) Node diagram                                    d) ER-diagram
- 13) What does a simple name in UML Class and objects consists of?  
a) Letters    b) Digits  
c) Punctuation Characters                        d) All of these
- 14) Which diagram in UML emphasizes the time-ordering of messages?  
a) Activity    b) Sequence  
c) Collaboration                                    d) Class

<b>Q.2</b>	<b>A)</b> <b>Answer the following (Any Four)</b>	<b>08</b>
	1) What is package? 2) Define activity diagrams. 3) What is synchronization? 4) What do you mean by UML? 5) Define advanced classes.	
<b>B)</b>	<b>Write Notes on (Any two)</b>	<b>06</b>
	1) Stereotypes in UML 2) State machines 3) Package in structural modeling	
<b>Q.3</b>	<b>A)</b> <b>Answer the following (Any two)</b>	<b>08</b>
	1) What is the importance of using UML? 2) What are the features of OOP? 3) Describe the structural part of the collaboration.	
<b>B)</b>	<b>Answer the following (Any one)</b>	<b>06</b>
	1) Describe action states and activity states. 2) Explain the difference between collaboration diagram and sequence diagram.	
<b>Q.4</b>	<b>A)</b> <b>Answer the following (Any two)</b>	<b>10</b>
	1) What are the objects of interaction diagram? Explain in detail. 2) Explain process and threads in details. 3) Explain the structural things in UML.	
<b>B)</b>	<b>Answer the following (Any one)</b>	<b>04</b>
	1) Explain software development life cycle. 2) Explain how we can depict a message in collaboration diagrams.	
<b>Q.5</b>	<b>Answer the following (Any two)</b>	<b>14</b>
	a) What are the common modelling techniques for deployment diagram? b) What are the advantages of UML? Also explain the building blocks of UML. c) What are the benefits of sequence diagram? Explain sequence diagram for making a hotel reservation.	

Seat No.	
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**M.C.A. (Science) (Semester - IV) (CBCS) Examination March/April-2019**  
**FINITE AUTOMATA**

Day & Date: Wednesday, 24-04-2019  
 Time: 03:30 PM To 06:00 PM

Max. Marks: 70

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

**Q.1 Choose the correct alternative and rewrite the sentences. 14**

- 1) All possible subset of set is known as \_\_\_\_\_.  
 a) sub set                                  b) power set  
 c) super set                                d) none of these
- 2) Function which mapping one to one from input to output such function is known as \_\_\_\_\_ function.  
 a) machine                                    b) state  
 c) both a and b                              d) none of these
- 3) Regular expression are \_\_\_\_\_.  
 a) Type 0 language                            b) Type 1 language  
 c) Type 2 language                            d) Type 3 language
- 4) Pumping lemma is used to proving given language is \_\_\_\_\_.  
 a) irregular                                    b) context sensitive  
 c) restricted                                    d) none of these
- 5) If rightmost and leftmost production is single non-terminal then it is known as \_\_\_\_\_ production.  
 a) unit    b) self  
 c) cross    d) none of these
- 6) If the grammar  $\{S \rightarrow aB \mid bA, A \rightarrow a \mid aS \mid bAA, B \rightarrow b \mid bS \mid aBB\}$  then generated string is \_\_\_\_\_.  
 a) aaabbb                                      b) bbbaaa  
 c) baba    d) all of the above
- 7) The language of PDA is \_\_\_\_\_.  
 a) context free language                        b) regular language  
 c) both a and b                                    d) none of these
- 8) A grammar that produce more than one parse tree for some sentence is called \_\_\_\_\_.  
 a) context free                                    b) regular  
 c) ambiguous                                      d) none of these
- 9) The grammar in which right hand side production contains at most one non-terminal is called \_\_\_\_\_ grammer.  
 a) context free                                    b) context sensitive  
 c) recursive                                        d) regular
- 10) In PDA one situation has only one transition then it is known as \_\_\_\_\_.  
 a) TM    b) DPDA  
 c) NPDA    d) Stack

- 11) In GNF grammar is required in the form of \_\_\_\_\_.  
 a)  $A \rightarrow BC | a$       b)  $A \rightarrow a\alpha$   
 c) Both a and b      d) none of these
- 12) The \_\_\_\_\_ is accepted unrestricted grammar.  
 a) TM      b) PDA  
 c) DFA      d) None of these
- 13) The regular expression for Arden's algorithm is \_\_\_\_\_.  
 a)  $Rij(K)$       b)  $R=R+QP$   
 c)  $R=Q+RP$       d) None of these
- 14) PDA is more powerful than TM.  
 a) True      b) False

**Q.2 A) Answer the following. (Any four)** 08

- 1) Let  $R=\{(a,b),(b,c),(c,a)\}$ . Find  $R^+, R^*$
- 2) Define: a) Regular Expression b) Alphabet
- 3) Find language for the following regular expression
  - i)  $ab^* + ab^*$
  - ii)  $(0+1)^* 00 (0+1)^*$
- 4) State difference between DPDA and NPDA machine.
- 5) How many ways PDA accept language? Give names.

**B) Writes note on. (Any two)** 06

- 1) Turing Machine Model
- 2) Explain notations used in CFG.
- 3) Construct DFA for accepting string over  $\{a,b,c\}$  which string start with 'a' and not having substring 'abc' in it.

**Q.3 A) Answer any two of the following.** 08

- 1) Convert the following NFA to its equivalent DFA

	0	1
p	{p,q}	{p}
q	{r}	{r}
r	{s}	$\emptyset$
*s	{s}	{s}

- 2) Convert the following right linear grammar to equivalent left linear grammar.

$$\begin{aligned} S &\rightarrow bB \\ B &\rightarrow bC \\ B &\rightarrow aB \\ C &\rightarrow a \\ B &\rightarrow b \end{aligned}$$

- 3) Design a PDA to check whether a given string over  $\{a,b\}$  ends in aba.

**B) Write note on. (Any one)** 06

- a) What is pumping lemma? Using pumping lemma check  $\{a^n b^{n+1} | n \geq 1\}$  is regular or not.
- b) Check whether the following grammar is ambiguous or not; if ambiguity found remove the ambiguity and rewrite an equivalent grammar.  
 $E \rightarrow E+E \mid E^*E \mid id$

**Q.4 A) Attempt any two of the following.** 10

- a) Construct F.A. equivalent to R.E.  
 $(a+b)^* (aaa+bab)^* (a+b)^*$
- b) Find a grammar in CNF equivalent to grammar.  
 $E \rightarrow E+E \mid T,$   
 $T \rightarrow T^*F \mid F,$   
 $F \rightarrow (E) \mid a$

- c) Construct PDA that accepts the language generated by CFG.  
 $S \rightarrow S+S \mid S^*S \mid 2 \mid 4$   
 Give the acceptance of string “2+2\*4” by PDA.

**B) Answer the following. (Any one)**

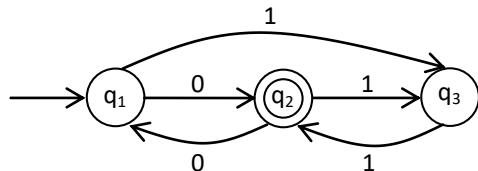
**04**

- a) Construct Turing Machine for copy string over  $\Sigma = \{a, b\}$   
 b) Construct DFA for find out given number is divisible by 3.

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

**14**

- a) Design TM for  $L = \{a^n b^n c^n \mid n > 1\}$   
 b) Construct RE for following DFA by using Arden's theorem.



- c) Explain simplification of grammar.

<b>Seat No.</b>	
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**Set P****M.C.A. (Science) (Semester - IV) (CBCS) Examination March/April-2019  
DISTRIBUTED OPERATING SYSTEM**

Day & Date: Thursday, 25-04-2019  
Time: 03:30 PM To 06:00 PM

Max. Marks: 70

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

**Q.1 Multiple choice questions****14**

- 1) Remote Procedure Calls are used :
  - a) For communication between two processes remotely different from each other on the same system
  - b) For communication between two processes on the same system
  - c) For communication between two processes on separate systems
  - d) None of the mentioned
- 2) To differentiate the many network services a system supports \_\_\_\_\_ are used.

a) Variables	b) Sockets
c) Ports	d) Service names
- 3) RPC provides a(an) \_\_\_\_\_ on the client side, a separate one for each remote procedure.

a) Stub	b) Identifier
c) Name	d) Process identifier
- 4) What are the advantages of file replication?
  - a) Improves availability & performance
  - b) Decreases performance
  - c) They are consistent
  - d) Improves speed
- 5) The full form of RMI:

a) Remote Memory Installation	b) Remote Memory Invocation
c) Remote Method Installation	d) Remote Method Invocation
- 6) Which is not a major component of file system?

a) Directory service	b) Authorization service
c) Shadow service	d) System service
- 7) What is a stateless file server?
  - a) It keeps tracks of states of different objects
  - b) It maintains internally no state information at all
  - c) It maintains some information in them
  - d) None of the mentioned
- 8) What are the characteristics of stateless server?
  - a) Easier to implement
  - b) They are not fault-tolerant upon client or server failures
  - c) They store all information file server
  - d) They are redundant to keep data safe

**Q.2 A) Answer the following (Any four) 08**

- 1) Define Deadlock.
  - 2) Define virtual memory
  - 3) What is circular wait?
  - 4) What is thread?
  - 5) What is Paging?

**B) Write notes on (Any two) 06**

- 1) Disk-ful workstation Model
  - 2) Bus based multicomputer
  - 3) Client Server Model

**Q.3 A) Answer the following (Any two) 08**

- 1) What are the necessary conditions for deadlock?
  - 2) Differentiate between User Level verses Kernel Level Thread.
  - 3) Differentiate between Closed group and Open group communication.

**B) Answer the following (Any one)** 06

- 1) What do you mean by mutual exclusion? Discuss the centralized algorithm to achieve mutual exclusion in Distributed OS.
  - 2) What is election algorithm? Explain ring algorithm.

**Q.4 A) Answer the following (Any two) 10**

- 1) Explain in details the Deadlock in distributed system and what are the strategies to handle it?
  - 2) What are the steps involved in process migration. Discuss the desirable features of good process migration.
  - 3) Describes the different layers in OSI Reference model for communication.

- B) Answer the following (Any one)** 04
- 1) Explain the concept of File Replication.
  - 2) Explain the atomic transaction.
- Q.5 Answer the following (Any two)** 14
- a) Explain in detail how remote procedure call occurs in distributed OS with suitable diagram.
  - b) What do you mean by processor allocation? Discuss scheduling in distributed system with suitable example.
  - c) Explain the concept of Clock Synchronization with logical clock synchronization algorithm.

<b>Seat No.</b>	
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**Set P**

**M.C.A. (Science) (Semester - V) (New) (CBCS) Examination**  
**March/April-2019**  
**DIGITAL IMAGE PROCESSING**

Day &amp; Date: Saturday, 27-04-2019

Max. Marks: 70

Time: 12:00 PM To 02:30 PM

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

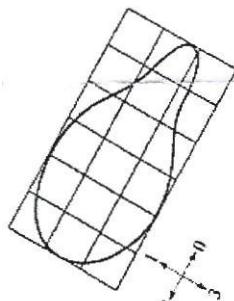
**Q.1 Multi choice Questions.****14**

- 1) Which is the correct extension of CAT?  
a) computerized axial tomography      b) computerized axis tomography  
c) computer axial tomography      d) computer axis tomography
- 2) Radar waves have capacity of penetration through \_\_\_\_\_.  
a) clouds, vegetation      b) vegetation, ice  
c) clouds, ice      d) clouds, vegetation, ice
- 3) Size of a grayscale image with 256 grey levels having 32 rows and 64 columns will be \_\_\_\_\_ bits.  
a) 2048      b) 16384  
c) 65536      d) 524288
- 4) A binary square image requires 2 KB of storage. How many rows are there in this image?  
a) 8      b) 16  
c) 32      d) 128
- 5) Properties of second order derivatives are \_\_\_\_\_.  
i) must be zero in flat areas  
ii) must be nonzero at the onset and end of a gray-level step or ramp  
iii) must be nonzero along ramps of constant slope  
a) i) and ii)      b) i) and iii)  
c) ii) and iii)      d) i), ii) and iii)
- 6) FFTs were discovered in late \_\_\_\_\_.  
a) 1940s      b) 1950s  
c) 1960s      d) 1970s
- 7) Which of the following statements is correct?  
i. Fourier transform of the sum of two functions is separable  
ii. Fourier transform of the product of two functions is separable  
a) (i)      b) (ii)  
c) (i) and (ii)      d) None
- 8) Median filter is more effective for\_\_\_\_\_ noise.  
a) Exponential      b) Gaussian  
c) Impulse      d) Uniform
- 9) To find object boundary the operations used are \_\_\_\_\_.  
i. Subtraction  
ii. Erosion  
iii. Dilation  
a) (i) and (ii)      b) (i) and (iii)  
c) (i), (ii) and (iii)      d) Both (a) and (b)

- 10) Morphological opening operation is performed on an equilateral triangle with base 5 cm using an equilateral triangle with base 1 cm. This operation will cause \_\_\_\_\_.  
a) Change in top corner                          b) Change in all corners  
c) Decrease in area                                d) No change

- 11) Adaptive thresholding is best when \_\_\_\_\_.  
a) Global thresholding is not possible  
b) Image is of low contrast  
c) Illumination in image is uneven  
d) Image requires segmentation in multiple objects

- 12) The chain code of the following shape is:



- a) 000030032232221211                          b) 003010203310321032  
c) 022332103210201330                            d) 012302301023100321

- 13) Recognition patterns using machine involves techniques to assign patterns to their respective \_\_\_\_\_.  
a) Vectors    b) Matricess  
c) Classes    d) Arrays
- 14) Distance between two shapes is a \_\_\_\_\_.  
a) Positive integer value                              b) Positive real value  
c) Any integer value                                    d) Any real value

**Q.2 A) Answer any four of the following.**

**08**

- 1) What are the components of EM wave in the ascending order of their wavelength?
- 2) Define linear operation.
- 3) How periodic noise is generated? How to reduce it?
- 4) Define dilation and erosion.
- 5) Define Eulers number.

**B) Write note on any two.**

**06**

- 1) What is fluorescence? How it is generated?
- 2) What is morphology? What is its significance in mathematics? What are morphological techniques?
- 3) Define compactness of a region. Give its properties.

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

**08**

- 1) Describe bit plain slicing.
- 2) Discuss arithmetic mean filter and its uses. Compare it with other mean filters.
- 3) Define measure of similarity. Give an example.

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

- 1) Apply median filter of size  $3 \times 3$  on the given image segment. For boundary condition only consider pixels within image segment.

13	148	21	76
128	150	191	188
162	153	182	191
148	149	82	16
98	144	214	228

- 2) Two classes of objects denoted as  $\omega_1, \omega_2$  have the sample mean vector  $m_1 = (8, 12, 5)^T$  and  $m_2 = (1, 4, 10)^T$  respectively. Compute the equation for the boundary which bisects these two classes. Following are the feature vector of some fruits. Find out the class of  $(4, 8, 7)^T$

**Q.4 A) Answer any two of the following.**

- 1) What is sampling and quantization? How they are performed? Explain.  
 2) Discuss dam construction technique for watershed segmentation algorithm.  
 3) Derive expression for Hotelling transform.

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

- 1) Find shortest m-path between P and Q in the following binary image and give path length.

P1	0	0	1	0
1	1	1	0	1
1	0	1	1	1
0	1	0	0	1
1	1	0	1	1
1	0	1	1	Q1

- 2) Construct expression using basic primitives,  $a, b, c$  and  $d$  as



respectively, for the structure:

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

- a) Write a note on watershed segmentation technique.  
 b) For the following intensities perform contrast stretching:

Intensity	0	1	2	3	4	5	6	7	8	9	10	11
No. of pixels	0	0	21	19	4	11	0	19	8	0	0	0

- c) Threshold the following image using Global thresholding algorithm. The initial threshold may be selected using the mean filter on entire image and the algorithm iteration must stop when difference of threshold is less than 0.1

195	133	199	89
142	93	178	209
149	163	190	210
169	188	205	177

<b>Seat No.</b>	
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# **Set P**

**M.C.A. (Science) (Semester - V) (New) (CBCS) Examination  
March/April-2019  
WEB DESIGN TECHNIQUES**

Day & Date: Monday, 29-04-2019  
Time: 12:00 PM To 02:30 PM

**Max. Marks: 70**

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

#### **Q.1 Choose Correct Alternative from the following.**

14

**Q.2 A) Answer the following (Any Four) 08**

- 1) Explain rowspan and colspan property with example.
  - 2) What are different Logical operators used in JavaScript?
  - 3) What is syntax of JQuery?
  - 4) What is Web Server?
  - 5) Explain all attributes of body tags.

**B) Answer the following (Any Two) 06**

- 1) Explain use of id in CSS with an example.
  - 2) Explain Selection Index Filters with example.
  - 3) What are drawbacks of HTML? Discuss in detail.

**Q.3 A) Answer the following (Any Two) 08**

- 1) How to give link within document? Explain with example.
  - 2) Explain windows object with any four methods. Give example.
  - 3) What is SOAP? Explain in detail.

**B) Answer the following (Any One)** 06

- 1) What is DTD? Explain different types of DTD with example.
  - 2) Explain different jQuery Traversing methods with example.

**Q.4 A) Answer the following (Any Two)**

- 1) What is AJAX? Explain different component of AJAX in detail.
  - 2) Write JavaScript which sort and reverse the array.
  - 3) Explain different margin properties and color properties of CSS.

**B) Answer the following (Any One) 04**

- 1) How to add site to web server? Explain step by step technique.
  - 2) Explain any four string methods in JavaScript. Give example.

**Q.5 Answer the following (Any Two)**

- a) Write XSLT file which display XML data in tabular form.
  - b) How to Get and Set content in JQuery? Explain with example.
  - c) Write JavaScript for Prime number and palindrome number.

**Seat  
No.**

# Set P

**M.C.A. (Science) (Semester - V) (New) (CBCS) Examination  
March/April-2019  
MOBILE COMPUTING**

Day & Date: Tuesday, 30-04-2019

Max. Marks: 70

Time: 12:00 PM To 02:30 PM

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

## **Q.1 Multiple Choice Questions:**

14

- 1) A television broadcast is an example of \_\_\_\_\_ transmission.
    - a) Full-duplex
    - b) Automatic
    - c) Simplex
    - d) Half-duplex
  - 2) PSTN stands for \_\_\_\_\_.
    - a) Public Station Telephone network
    - b) Public Switch Telephone Network
    - c) Public Socket Telephone Network
    - d) Public Switch Transport Network
  - 3) If mounted on the roof of a car, the length of \_\_\_\_\_ is efficient. This is also known as Marconi antenna.
    - a)  $\lambda/4$
    - b)  $\lambda/2$
    - c)  $\lambda/6$
    - d)  $\lambda/5$
  - 4) MAC sub layer is the part of \_\_\_\_\_.
    - a) Logical link control
    - b) Physical Layer
    - c) Data link layer
    - d) Access control mechanism
  - 5) BSS in GSM stands for \_\_\_\_\_.
    - a) Basic Service Sub-system
    - b) Basic Services Set
    - c) Base Station Sub-system
    - d) Base Station Service
  - 6) \_\_\_\_\_ is essential for database in android.
    - a) Open GL
    - b) SQLite
    - c) Webkit
    - d) Layout
  - 7) \_\_\_\_\_ is useful to receive broadcast messages from the system.
    - a) Broadcast receivers
    - b) Activity
    - c) Content providers
    - d) Services
  - 8) MANET stands for \_\_\_\_\_.
    - a) Mobile Application for Network
    - b) Mobile Access Network
    - c) Mobile ad-hoc networking
    - d) Mobile Advance network
  - 9) Radio transmission starts at several kHz, the \_\_\_\_\_ range.
    - a) Ultra High frequency
    - b) Very low frequency
    - c) High frequency
    - d) Super high frequency
  - 10) \_\_\_\_\_ is used for allocating a separated space to users in wireless networks.
    - a) FDMA
    - b) SDMA
    - c) TDMA
    - d) None of these

- 11) Infra-red technology uses diffuse light reflected at walls, furniture etc. or directed light if \_\_\_\_\_ exists between sender and receiver.

  - a) Shielding
  - b) Line-of-Sight (LOS)
  - c) Synchronization
  - d) Infrared Data Association (IrDA)

12) PLCP stands for \_\_\_\_\_.

  - a) Physical layer convergence protocol
  - b) Physical layer cognitive probe
  - c) Physical lower code protocol
  - d) Primary layer code protocol

13) \_\_\_\_\_ is based on a client/server model.

  - a) DHCP
  - b) DPHC
  - c) DCHP
  - d) DCPH

14) GSM stands for \_\_\_\_\_.

  - a) Global structure for mobile
  - b) Global system for module communications
  - c) Global segment for mobile
  - d) Global system for mobile communications

<b>Q.2</b>	<b>A)</b> <b>Answer the following. (Any Four)</b>	<b>08</b>
	1) What is FDD? 2) Define digital modulation. 3) What is multiplexing? 4) What is signal propagation? 5) What is spread spectrum?	
<b>B)</b>	<b>Write Notes on. (Any Two)</b>	<b>06</b>
	1) Mobile computing applications 2) FDMA 3) DHCP	
<b>Q.3</b>	<b>A)</b> <b>Answer the following. (Any Two )</b>	<b>08</b>
	1) Define the terms mobile node and correspondent node. 2) What are main benefits of spread spectrum system? 3) Explain in detail mobile TCP.	
<b>B)</b>	<b>Answer the following. (Any One)</b>	<b>06</b>
	1) Explain indirect TCP and snooping TCP in detail. 2) Explain android application priority and process states.	
<b>Q.4</b>	<b>A)</b> <b>Answer the following. (Any Two)</b>	<b>10</b>
	1) Explain space and code division multiplexing scheme. 2) What is the problem of hidden and exposed terminals? 3) Explain FHSS with suitable example?	
<b>B)</b>	<b>Answer the following. (Any One)</b>	<b>04</b>
	1) Explain handover with its types. 2) Compare infrastructure based network with ad-hoc network.	
<b>Q.5</b>	<b>Answer the following. (Any Two)</b>	<b>14</b>
	a) Discuss mobile terminated call (MTC) scheme in GSM. b) Explain IEEE 802.11 protocol architecture. c) What is android? Explain the architecture and application of android.	

<b>Seat No.</b>	
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# Set P

**M.C.A. (Science) (Semester - V) (New) (CBCS) Examination  
March/April-2019  
ARTIFICIAL INTELLIGENCE**

Day & Date: Thursday, 02-05-2019  
Time: 12:00 PM To 02:30 PM

**Max. Marks: 70**

Time: 12:00 PM To 02:30 PM

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

## **Q.1 Multiple Choice Questions:**

14

- 1) A problem in a search space is defined by one of these states \_\_\_\_\_.
    - a) Initial state
    - b) Last state
    - c) Intermediate state
    - d) All of the above
  - 2) Hill-Climbing algorithm terminates when, \_\_\_\_\_.
    - a) Stopping criterion met
    - b) Global Min/Max is achieved
    - c) No neighbor has higher value
    - d) All of the mentioned
  - 3) A search algorithm takes \_\_\_\_\_ as an input and returns \_\_\_\_\_ as an output.
    - a) Input, output
    - b) Problem, solution
    - c) Solution, problem
    - d) Parameters, sequence of actions
  - 4) Which search method takes less memory?
    - a) Depth-First Search
    - b) Breadth-First search
    - c) Linear Search
    - d) Optimal search
  - 5) A production rule consists of \_\_\_\_\_.
    - a) Only set of Rule
    - b) Only sequence of steps
    - c) Set of Rule & sequence of steps
    - d) Arbitrary representation to problem
  - 6) Which is the best way to go for Game playing problem?
    - a) Linear approach
    - b) Heuristic approach (Some knowledge is stored)
    - c) Random approach
    - d) An Optimal approach
  - 7) What is Artificial intelligence?
    - a) Putting your intelligence into Computer
    - b) Programming with your own intelligence
    - c) Making a Machine intelligent
    - d) Playing a Game
  - 8) A.M. turing developed a technique for determining whether a computer could or could not demonstrate the artificial Intelligence, Presently, this technique is called \_\_\_\_\_.
    - a) Turing Test
    - b) Algorithm
    - c) Boolean Algebra
    - d) Logarithm

**Q.2 A) Answer the following. (Any Four) 08**

- 1) What is slot?
  - 2) Define Local Maxima.
  - 3) What is state space?
  - 4) What do you mean by fuzzy logic?
  - 5) Define intelligent agent.

**B) Write notes on. (Any Two) 06**

- 1) Complex sentences with example
  - 2) Need of predicate logic
  - 3) Heuristic search technique

**Q.3 A) Answer the following. (Any Two) 08**

- 1) Differentiate between Top-Down versus Bottom-Up Parsing.
  - 2) What is conceptual dependency and list any four primitive ACTs.
  - 3) State and explain the Hill Climbing algorithm.

**B) Answer the Following. (Any One)** 06

- 1) State and discuss in detail process of explanation and knowledge acquisition as a part of Expert system.
  - 2) What is Production System? Discuss the different types of rules used in Production System.

**Q.4 A) Answer the following. (Any Two)** 10

- 1) Explain the steps in natural language processing.
  - 2) Discuss concept of constraint satisfaction to solve following crypt-arithmetic problem.

SEND  
+ MORE  
-----  
MONEY

- 3) Write note on AI Problems and AI Techniques.

<b>B) Answer the Following. (Any One)</b>	<b>04</b>
1) Give the difference between BFS and DFS.	
2) Explain the Bayes Theorem.	
<b>Q.5 Answer the following. (Any Two)</b>	<b>14</b>
a) What do you mean by Script? Write a College Canteen script with a story: <i>"Ramesh went to Canteen. He ordered rice plate. He ate food and ordered coffee. He paid bill and left for class."</i>	
b) What do you mean by Reasoning? Explain in detail the four factor influence to decide a better kind of reasoning?	
c) What is the meaning of Uncertainty in reasoning? Explain different statistical techniques to handle uncertainty.	

<b>Seat No.</b>	
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**Set P**

**MCA (Science) (Semester - V) (New) (CBCS) Examination**  
**March/April-2019**  
**NETWORK SECURITY**

Day & Date: Friday, 03-05-2019  
Time: 12:00 PM To 02:30 PM

Max. Marks: 70

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

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

**14**

- 1) \_\_\_\_\_ identifies a security association.  
a) Sequence Number                            b) Security parameters Index  
c) Payload Data (variable)                 d) None of these
- 2) \_\_\_\_\_ Indicates the number of pad bytes immediately preceding this field.  
a) Pad Length (8 bits)                        b) Next Header (8 bits)  
c) Authentication Data (variable)            d) None of these
- 3) \_\_\_\_\_ An individual who is not authorized to use the computer and who penetrates a system's access controls to exploit a legitimate user's account.  
a) Clandestine user                              b) Misfeasor  
c) Masquerader                                  d) None of these
- 4) \_\_\_\_\_ involves the passive capture of a data unit and its subsequent retransmission to produce an unauthorized effect.  
a) Modifications of message                    b) Replay  
c) Masquerade                                    d) denial of service
- 5) \_\_\_\_\_ is an open-source freely available software package for e-mail security.  
a) TCP    b) IBM  
c) Windows                                      d) PGP
- 6) \_\_\_\_\_ prevents either sender or receiver from denying a transmitted message.  
a) Data Confidentiality                        b) Nonrepudiation  
c) Access control                                d) Data Integrity
- 7) The numbers of subkeys generated in IDEA algorithm are \_\_\_\_\_.  
a) 54    b) 48  
c) 52    d) 50
- 8) \_\_\_\_\_ Description of a packet encryption extension to IPv4 and IPv6.  
a) RFC 2401                                    b) RFC 2402  
c) RFC 2408                                    d) RFC 2406
- 9) SET stands for \_\_\_\_\_.  
a) Secure Electronic Transaction  
b) Secure Encryption Transmission  
c) Sequential Electronic Transaction  
d) Serial Encryption Transaction
- 10) Typically, PKI implementation makes use of \_\_\_\_\_.  
a) Digital Signature                            b) X.509 certificates  
c) Biometric                                    d) None of these

- 11) \_\_\_\_\_ : Anything to which access is controlled. Examples include files, portions of files, programs, and segments of memory.

  - a) Object
  - b) Subject
  - c) Access right
  - d) None of these

12) \_\_\_\_\_ determines the direction in which particular service requests may be initiated and allowed to flow through the firewall.

  - a) Service control
  - b) Behavior control
  - c) User control
  - d) Direction control

13) A nonnegative integer that may be incremented or decremented typically it is used to measure the current value of some entity.

  - a) Gauge
  - b) Interval timer
  - c) Counter
  - d) Resource utilization

14) A \_\_\_\_\_ model focuses on time intervals, looking for sequences of events that happen too rapidly or too slowly.

  - a) Multivariate
  - b) Markov process
  - c) time series
  - d) operational

**Q.2 A) Answer the following (Any Four)**

08

- 1) What is Active Attack?
  - 2) What do you mean by Data Confidentiality?
  - 3) What is cryptology?
  - 4) Explain some policies to set strong password.
  - 5) Explain the features of Proxy servers.

**B) Write Notes on (Any Two)**

06

- 1) Access matrix**
  - 2) Symmetric key**
  - 3) Internet Standards and the Internet Society**

**Q.3 A) Answer the following (Any Two)**

08

- 1) What is Attack? Explain different types of passive attack.
  - 2) Explain working of Clark-Wilson Model with Example.
  - 3) Explain IP Security Architecture with well labelled diagram.

**B) Answer the Following (Any One).**

06

- 1) Explain the working of IDEA algorithm with suitable example.
  - 2) Explain the use of IP encapsulating Security Protocol in detail.

**Q.4 A) Answer the following (Any Two)**

10

- 1) What is mean by smart card? Explain types of smart cards.
  - 2) What is Secure Socket Layer Protocol? Explain the use of Handshake protocol.
  - 3) What is Biometric? Explain the applications of biometrics in different field.

**B) Answer the Following (Any One)**

04

- 1) What is Key Escrow? Explain the importance of Key Escrow.
  - 2) Explain how Role Based Model works.

**Q.5 Answer the following (Any Two)**

14

- a) Explain the procedure of DES algorithm with suitable example.
  - b) What is intruder? Explain Audit Record as a Intrusion detection tool.
  - c) What is Firewall? Explain the types of firewall.

<b>Seat No.</b>	
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**Set P**

**M.C.A. (Science) (Semester - V) (Old) (CBCS) Examination**  
**March/April-2019**  
**DIGITAL IMAGE PROCESSING**

Day &amp; Date: Saturday, 27-04-2019

Max. Marks: 70

Time: 12:00 PM To 02:30 PM

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

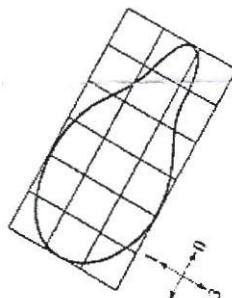
**Q.1 Multi choice Questions.****14**

- 1) Which is the correct extension of CAT?
  - a) computerized axial tomography
  - b) computerized axis tomography
  - c) computer axial tomography
  - d) computer axis tomography
- 2) Radar waves have capacity of penetration through \_\_\_\_\_.
  - a) clouds, vegetation
  - b) vegetation, ice
  - c) clouds, ice
  - d) clouds, vegetation, ice
- 3) Size of a grayscale image with 256 grey levels having 32 rows and 64 columns will be \_\_\_\_\_ bits.
  - a) 2048
  - b) 16384
  - c) 65536
  - d) 524288
- 4) A binary square image requires 2 KB of storage. How many rows are there in this image?
  - a) 8
  - b) 16
  - c) 32
  - d) 128
- 5) Properties of second order derivatives are \_\_\_\_\_.
  - i) must be zero in flat areas
  - ii) must be nonzero at the onset and end of a gray-level step or ramp
  - iii) must be nonzero along ramps of constant slope
  - a) i) and ii)
  - b) i) and iii)
  - c) ii) and iii)
  - d) i), ii) and iii)
- 6) FFTs were discovered in late \_\_\_\_\_.
  - a) 1940s
  - b) 1950s
  - c) 1960s
  - d) 1970s
- 7) Which of the following statements is correct?
  - i. Fourier transform of the sum of two functions is separable
  - ii. Fourier transform of the product of two functions is separable
  - a) (i)
  - b) (ii)
  - c) (i) and (ii)
  - d) None
- 8) Median filter is more effective for \_\_\_\_\_ noise.
  - a) Exponential
  - b) Gaussian
  - c) Impulse
  - d) Uniform
- 9) To find object boundary the operations used are \_\_\_\_\_.
  - i. Subtraction
  - ii. Erosion
  - iii. Dilation
  - a) (i) and (ii)
  - b) (i) and (iii)
  - c) (i), (ii) and (iii)
  - d) Both (a) and (b)

- 10) Morphological opening operation is performed on an equilateral triangle with base 5 cm using an equilateral triangle with base 1 cm. This operation will cause \_\_\_\_\_.  
a) Change in top corner                            b) Change in all corners  
c) Decrease in area                                d) No change

- 11) Adaptive thresholding is best when \_\_\_\_\_.  
a) Global thresholding is not possible  
b) Image is of low contrast  
c) Illumination in image is uneven  
d) Image requires segmentation in multiple objects

- 12) The chain code of the following shape is:



- a) 000030032232221211                            b) 003010203310321032  
c) 022332103210201330                            d) 012302301023100321

- 13) Recognition patterns using machine involves techniques to assign patterns to their respective \_\_\_\_\_.  
a) Vectors    b) Matrices  
c) Classes    d) Arrays
- 14) Distance between two shapes is a \_\_\_\_\_.  
a) Positive integer value                            b) Positive real value  
c) Any integer value                                    d) Any real value

**Q.2 A) Answer any four of the following.**

**08**

- 1) What are the components of EM wave in the ascending order of their wavelength?
- 2) Define linear operation.
- 3) How periodic noise is generated? How to reduce it?
- 4) Define dilation and erosion.
- 5) Define Eulers number.

**B) Write note on any two.**

**06**

- 1) What is fluorescence? How it is generated?
- 2) What is morphology? What is its significance in mathematics? What are morphological techniques?
- 3) Define compactness of a region. Give its properties.

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

**08**

- 1) Describe bit plain slicing.
- 2) Discuss arithmetic mean filter and its uses. Compare it with other mean filters.
- 3) Define measure of similarity. Give an example.

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

06

- 1) Apply median filter of size  $3 \times 3$  on the given image segment. For boundary condition only consider pixels within image segment.

13	148	21	76
128	150	191	188
162	153	182	191
148	149	82	16
98	144	214	228

- 2) Two classes of objects denoted as  $\omega_1, \omega_2$  have the sample mean vector  $m_1 = (8, 12, 5)^T$  and  $m_2 = (1, 4, 10)^T$  respectively. Compute the equation for the boundary which bisects these two classes. Following are the feature vector of some fruits. Find out the class of  $(4, 8, 7)^T$

**Q.4 A) Answer any two of the following.**

10

- 1) What is sampling and quantization? How they are performed? Explain.  
 2) Discuss dam construction technique for watershed segmentation algorithm.  
 3) Derive expression for Hotelling transform.

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

04

- 1) Find shortest m-path between P and Q in the following binary image and give path length.

P1	0	0	1	0
1	1	1	0	1
1	0	1	1	1
0	1	0	0	1
1	1	0	1	1
1	0	1	1	Q1

- 2) Construct expression using basic primitives,  $a, b, c$  and  $d$  as



respectively, for the structure:

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

14

- a) Write a note on watershed segmentation technique.  
 b) For the following intensities perform contrast stretching:

Intensity	0	1	2	3	4	5	6	7	8	9	10	11
No. of pixels	0	0	21	19	4	11	0	19	8	0	0	0

- c) Threshold the following image using Global thresholding algorithm. The initial threshold may be selected using the mean filter on entire image and the algorithm iteration must stop when difference of threshold is less than 0.1

195	133	199	89
142	93	178	209
149	163	190	210
169	188	205	177

<b>Seat No.</b>	
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**Set P**

**M.C.A. (Science) (Semester - V) (Old) (CBCS) Examination**  
**March/April-2019**  
**WEB DESIGN TECHNIQUES**

Day &amp; Date: Monday, 29-04-2019

Max. Marks: 70

Time: 12:00 PM To 02:30 PM

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

**Q.1 Choose Correct Alternative from the following.****14**

- 1) For referring an external java script called "test.js", \_\_\_\_\_ code is used.  
a) <script href="test.js">                          b) <script name="test.js">  
c) <script src="test.js">                          d) none of these
- 2) Suppose you want to test the condition age>100, \_\_\_\_\_ xslt statement is correct.  
a) <xsl:if test="@age &gt; 100 " >  
b) <xsl:if test="@age > 100 " >  
c) <xsl:choice test="@age &gt; 100 " >  
d) <xsl:choice test="@age > 100 " >
- 3) next() method returns the next tag of selected element.  
a) True    b) False
- 4) To match the root node in XMLT transform the syntax will be \_\_\_\_\_.  
a) <xsl:template match="Document">  
b) <xsl:template match="Root">  
c) <xsl:template match="RootNode">  
d) <xsl:template match="/">
- 5) Using AJAX we can made our web page \_\_\_\_\_.  
a) more interactive and faster  
b) more dynamic  
c) easy to connect web page with server  
d) more user friendly
- 6) Length property of history object returns \_\_\_\_\_ in the history list.  
a) Lengths of URL                                      b) Maximum Lengths of URL  
c) the number of URLs                                    d) Maximum number of URLs
- 7) Output of following statement is \_\_\_\_\_  
varexpr=eval("10\*10+5");  
a) 150    b) 105  
c) 10\*10+5    d) None of these
- 8) \_\_\_\_\_ statement selects all <button> elements and <input> elements of type="button".  
a) \$(":button")                                        b) \$(":btn")  
c) \$("input:button")                                    d) \$(":inputbutton")
- 9) \_\_\_\_\_ of the following is not jQuery Up Traversing method.  
a) parent()    b) parentuntil()  
c) find()    d) none of these

- 10) \_\_\_\_\_ method is used to makes a copy of selected elements.

  - a) copy()
  - b) duplicate()
  - c) clone()
  - d) makecopy()

11) getDay() method of date object return Full day name like Sunday, Monday etc.

  - a) True
  - b) False

12) The \_\_\_\_\_ tag is most used to link to style sheets.

  - a) script
  - b) src
  - c) style
  - d) link

13) DHTML stands for \_\_\_\_\_.

  - a) Dynamic Hyper Text Markup Language
  - b) Data Hyper Text Markup Language
  - c) Digital Hyper Text Markup Language
  - d) Document Hyper Text Markup Language

14) Ajax is a programming language

  - a) True
  - b) False

**Q.2 A) Answer the following (Any Four) 08**

- 1) Explain rowspan and colspan property with example.
  - 2) What are different Logical operators used in JavaScript?
  - 3) What is syntax of JQuery?
  - 4) What is Web Server?
  - 5) Explain all attributes of body tags.

**B) Answer the following (Any Two) 06**

- 1) Explain use of id in CSS with an example.
  - 2) Explain Selection Index Filters with example.
  - 3) What are drawbacks of HTML? Discuss in detail.

**Q.3 A) Answer the following (Any Two) 08**

- 1) How to give link within document? Explain with example.
  - 2) Explain windows object with any four methods. Give example.
  - 3) What is SOAP? Explain in detail.

**B) Answer the following (Any One) 06**

- 1) What is DTD? Explain different types of DTD with example.
  - 2) Explain different jQuery Traversing methods with example.

**Q.4 A) Answer the following (Any Two) 10**

- 1) What is AJAX? Explain different component of AJAX in detail.
  - 2) Write JavaScript which sort and reverse the array.
  - 3) Explain different margin properties and color properties of CSS.

**B) Answer the following (Any One) 04**

- 1) How to add site to web server? Explain step by step technique.
  - 2) Explain any four string methods in JavaScript. Give example.

**Q.5 Answer the following (Any Two)**

- a)** Write XSLT file which display XML data in tabular form.
  - b)** How to Get and Set content in JQuery? Explain with example.
  - c)** Write JavaScript for Prime number and palindrome number.

**Seat  
No.**

## Set P

**M.C.A. (Science) (Semester - V) (Old) (CBCS) Examination  
March/April-2019  
MOBILE COMPUTING**

Day & Date: Tuesday, 30-04-2019  
Time: 12:00 PM To 02:30 PM

Max. Marks: 70

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

## **Q.1 Multiple Choice Questions:**

14

- 1) A television broadcast is an example of \_\_\_\_\_ transmission.  
a) Full-duplex  
b) Automatic  
c) Simplex  
d) Half-duplex

2) PSTN stands for \_\_\_\_\_.  
a) Public Station Telephone network  
b) Public Switch Telephone Network  
c) Public Socket Telephone Network  
d) Public Switch Transport Network

3) If mounted on the roof of a car, the length of \_\_\_\_\_ is efficient. This is also known as Marconi antenna.  
a)  $\lambda/4$   
b)  $\lambda/2$   
c)  $\lambda/6$   
d)  $\lambda/5$

4) MAC sub layer is the part of \_\_\_\_\_.  
a) Logical link control  
b) Physical Layer  
c) Data link layer  
d) Access control mechanism

5) BSS in GSM stands for \_\_\_\_\_.  
a) Basic Service Sub-system  
b) Basic Services Set  
c) Base Station Sub-system  
d) Base Station Service

6) \_\_\_\_\_ is essential for database in android.  
a) Open GL  
b) SQLite  
c) Webkit  
d) Layout

7) \_\_\_\_\_ is useful to receive broadcast messages from the system.  
a) Broadcast receivers  
b) Activity  
c) Content providers  
d) Services

8) MANET stands for \_\_\_\_\_.  
a) Mobile Application for Network  
b) Mobile Access Network  
c) Mobile ad-hoc networking  
d) Mobile Advance network

9) Radio transmission starts at several kHz, the \_\_\_\_\_ range.  
a) Ultra High frequency  
b) Very low frequency  
c) High frequency  
d) Super high frequency

10) \_\_\_\_\_ is used for allocating a separated space to users in wireless networks.  
a) FDMA  
b) SDMA  
c) TDMA  
d) None of these

- 11) Infra-red technology uses diffuse light reflected at walls, furniture etc. or directed light if \_\_\_\_\_ exists between sender and receiver.

  - a) Shielding
  - b) Line-of-Sight (LOS)
  - c) Synchronization
  - d) Infrared Data Association (IrDA)

12) PLCP stands for \_\_\_\_\_.

  - a) Physical layer convergence protocol
  - b) Physical layer cognitive probe
  - c) Physical lower code protocol
  - d) Primary layer code protocol

13) \_\_\_\_\_ is based on a client/server model.

  - a) DHCP
  - b) DPHC
  - c) DCHP
  - d) DCPH

14) GSM stands for \_\_\_\_\_.

  - a) Global structure for mobile
  - b) Global system for module communications
  - c) Global segment for mobile
  - d) Global system for mobile communications

<b>Q.2</b>	<b>A)</b>	<b>Answer the following. (Any Four)</b>	<b>08</b>
	1)	What is FDD?	
	2)	Define digital modulation.	
	3)	What is multiplexing?	
	4)	What is signal propagation?	
	5)	What is spread spectrum?	
<b>Q.3</b>	<b>B)</b>	<b>Write Notes on. (Any Two)</b>	<b>06</b>
	1)	Mobile computing applications	
	2)	FDMA	
	3)	DHCP	
<b>Q.3</b>	<b>A)</b>	<b>Answer the following. (Any Two )</b>	<b>08</b>
	1)	Define the terms mobile node and correspondent node.	
	2)	What are main benefits of spread spectrum system?	
	3)	Explain in detail mobile TCP.	
<b>Q.4</b>	<b>B)</b>	<b>Answer the following. (Any One)</b>	<b>06</b>
	1)	Explain indirect TCP and snooping TCP in detail.	
	2)	Explain android application priority and process states.	
<b>Q.4</b>	<b>A)</b>	<b>Answer the following. (Any Two)</b>	<b>10</b>
	1)	Explain space and code division multiplexing scheme.	
	2)	What is the problem of hidden and exposed terminals?	
	3)	Explain FHSS with suitable example?	
<b>Q.5</b>	<b>B)</b>	<b>Answer the following. (Any One)</b>	<b>04</b>
	1)	Explain handover with its types.	
	2)	Compare infrastructure based network with ad-hoc network.	
<b>Q.5</b>	<b>A)</b>	<b>Answer the following. (Any Two)</b>	<b>14</b>
	a)	Discuss mobile terminated call (MTC) scheme in GSM.	
	b)	Explain IEEE 802.11 protocol architecture.	
	c)	What is android? Explain the architecture and application of android.	

<b>Seat No.</b>	
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# Set P

**M.C.A. (Science) (Semester - V) (Old) (CBCS) Examination  
March/April-2019  
ARTIFICIAL INTELLIGENCE**

Day & Date: Thursday, 02-05-2019  
Time: 12:00 PM To 02:30 PM

Max. Marks: 70

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

## **Q.1 Multiple Choice Questions:**

14

- 1) A problem in a search space is defined by one of these states \_\_\_\_.
    - a) Initial state
    - b) Last state
    - c) Intermediate state
    - d) All of the above
  - 2) Hill-Climbing algorithm terminates when, \_\_\_\_
    - a) Stopping criterion met
    - b) Global Min/Max is achieved
    - c) No neighbor has higher value
    - d) All of the mentioned
  - 3) A search algorithm takes \_\_\_\_\_ as an input and returns \_\_\_\_\_ as an output.
    - a) Input, output
    - b) Problem, solution
    - c) Solution, problem
    - d) Parameters, sequence of actions
  - 4) Which search method takes less memory?
    - a) Depth-First Search
    - b) Breadth-First search
    - c) Linear Search
    - d) Optimal search
  - 5) A production rule consists of \_\_\_\_\_.
    - a) Only set of Rule
    - b) Only sequence of steps
    - c) Set of Rule & sequence of steps
    - d) Arbitrary representation to problem
  - 6) Which is the best way to go for Game playing problem?
    - a) Linear approach
    - b) Heuristic approach (Some knowledge is stored)
    - c) Random approach
    - d) An Optimal approach
  - 7) What is Artificial intelligence?
    - a) Putting your intelligence into Computer
    - b) Programming with your own intelligence
    - c) Making a Machine intelligent
    - d) Playing a Game
  - 8) A.M. turing developed a technique for determining whether a computer could or could not demonstrate the artificial Intelligence, Presently, this technique is called \_\_\_\_\_.
    - a) Turing Test
    - b) Algorithm
    - c) Boolean Algebra
    - d) Logarithm

**Q.2 A) Answer the following. (Any Four) 08**

- 1) What is slot?
  - 2) Define Local Maxima.
  - 3) What is state space?
  - 4) What do you mean by fuzzy logic?
  - 5) Define intelligent agent.

**B) Write notes on. (Any Two)** 06

- 1) Complex sentences with example
  - 2) Need of predicate logic
  - 3) Heuristic search technique

**Q.3 A) Answer the following. (Any Two) 08**

- 1) Differentiate between Top-Down versus Bottom-Up Parsing.
  - 2) What is conceptual dependency and list any four primitive ACTs.
  - 3) State and explain the Hill Climbing algorithm.

**B) Answer the Following. (Any One)** **06**

- 1) State and discuss in detail process of explanation and knowledge acquisition as a part of Expert system.
  - 2) What is Production System? Discuss the different types of rules used in Production System.

**Q.4 A) Answer the following. (Any Two) 10**

- 1) Explain the steps in natural language processing.
  - 2) Discuss concept of constraint satisfaction to solve following crypt-arithmetic problem.

SEND  
+ MORE  
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MONEY

- 3) Write note on AI Problems and AI Techniques.

<b>B) Answer the Following. (Any One)</b>	<b>04</b>
1) Give the difference between BFS and DFS.	
2) Explain the Bayes Theorem.	
<b>Q.5 Answer the following. (Any Two)</b>	<b>14</b>
a) What do you mean by Script? Write a College Canteen script with a story: <i>"Ramesh went to Canteen. He ordered rice plate. He ate food and ordered coffee. He paid bill and left for class."</i>	
b) What do you mean by Reasoning? Explain in detail the four factor influence to decide a better kind of reasoning?	
c) What is the meaning of Uncertainty in reasoning? Explain different statistical techniques to handle uncertainty.	

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**Set P**

**MCA (Science) (Semester - V) (Old) (CBCS) Examination**  
**March/April-2019**  
**NETWORK SECURITY**

Day & Date: Friday, 03-05-2019  
Time: 12:00 PM To 02:30 PM

Max. Marks: 70

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

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

**14**

- 1) \_\_\_\_\_ identifies a security association.
  - a) Sequence Number
  - b) Security parameters Index
  - c) Payload Data (variable)
  - d) None of these
- 2) \_\_\_\_\_ Indicates the number of pad bytes immediately preceding this field.
  - a) Pad Length (8 bits)
  - b) Next Header (8 bits)
  - c) Authentication Data (variable)
  - d) None of these
- 3) \_\_\_\_\_ An individual who is not authorized to use the computer and who penetrates a system's access controls to exploit a legitimate user's account.
  - a) Clandestine user
  - b) Misfeasor
  - c) Masquerader
  - d) None of these
- 4) \_\_\_\_\_ involves the passive capture of a data unit and its subsequent retransmission to produce an unauthorized effect.
  - a) Modifications of message
  - b) Replay
  - c) Masquerade
  - d) denial of service
- 5) \_\_\_\_\_ is an open-source freely available software package for e-mail security.
  - a) TCP
  - b) IBM
  - c) Windows
  - d) PGP
- 6) \_\_\_\_\_ prevents either sender or receiver from denying a transmitted message.
  - a) Data Confidentiality
  - b) Nonrepudiation
  - c) Access control
  - d) Data Integrity
- 7) The numbers of subkeys generated in IDEA algorithm are \_\_\_\_\_.
  - a) 54
  - b) 48
  - c) 52
  - d) 50
- 8) \_\_\_\_\_ Description of a packet encryption extension to IPv4 and IPv6.
  - a) RFC 2401
  - b) RFC 2402
  - c) RFC 2408
  - d) RFC 2406
- 9) SET stands for \_\_\_\_\_.
  - a) Secure Electronic Transaction
  - b) Secure Encryption Transmission
  - c) Sequential Electronic Transaction
  - d) Serial Encryption Transaction
- 10) Typically, PKI implementation makes use of \_\_\_\_\_.
  - a) Digital Signature
  - b) X.509 certificates
  - c) Biometric
  - d) None of these

- 11) \_\_\_\_\_ : Anything to which access is controlled. Examples include files, portions of files, programs, and segments of memory.

  - a) Object
  - b) Subject
  - c) Access right
  - d) None of these

12) \_\_\_\_\_ determines the direction in which particular service requests may be initiated and allowed to flow through the firewall.

  - a) Service control
  - b) Behavior control
  - c) User control
  - d) Direction control

13) A nonnegative integer that may be incremented or decremented typically it is used to measure the current value of some entity.

  - a) Gauge
  - b) Interval timer
  - c) Counter
  - d) Resource utilization

14) A \_\_\_\_\_ model focuses on time intervals, looking for sequences of events that happen too rapidly or too slowly.

  - a) Multivariate
  - b) Markov process
  - c) time series
  - d) operational

**Q.2 A) Answer the following (Any Four)**

08

- 1) What is Active Attack?
  - 2) What do you mean by Data Confidentiality?
  - 3) What is cryptology?
  - 4) Explain some policies to set strong password.
  - 5) Explain the features of Proxy servers.

**B) Write Notes on (Any Two)**

06

- 1) Access matrix**
  - 2) Symmetric key**
  - 3) Internet Standards and the Internet Society**

**Q.3 A) Answer the following (Any Two)**

08

- 1) What is Attack? Explain different types of passive attack.
  - 2) Explain working of Clark-Wilson Model with Example.
  - 3) Explain IP Security Architecture with well labelled diagram.

**B) Answer the Following (Any One).**

06

- 1) Explain the working of IDEA algorithm with suitable example.
  - 2) Explain the use of IP encapsulating Security Protocol in detail.

**Q.4 A) Answer the following (Any Two)**

10

- 1) What is mean by smart card? Explain types of smart cards.
  - 2) What is Secure Socket Layer Protocol? Explain the use of Handshake protocol.
  - 3) What is Biometric? Explain the applications of biometrics in different field.

**B) Answer the Following (Any One)**

04

- 1) What is Key Escrow? Explain the importance of Key Escrow.
  - 2) Explain how Role Based Model works.

**Q.5 Answer the following (Any Two)**

14

- a) Explain the procedure of DES algorithm with suitable example.
  - b) What is intruder? Explain Audit Record as a Intrusion detection tool.
  - c) What is Firewall? Explain the types of firewall.

<b>Seat No.</b>	
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**Set P**

**M.C.A. (Science) (Semester - III) (Old) (CBCS) Examination**  
**March/April-2019**  
**COMPUTER ORIENTED STATISTICS**

Day &amp; Date: Wednesday, 08-05-2019

Max. Marks: 70

Time: 12:00 PM To 02:30 PM

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

**Q.1 Choose the most correct alternative. 14**

- 1) If A and B are two exclusive events, then  $P(A \cup B) =$   
a)  $P(A) + P(B)$       b)  $P(A) - P(B)$   
c)  $P(A) + P(B) - P(A).P(B)$       d) all of these
- 2) If A is subset of B, then  $P(A) \underline{\quad} P(B)$ .  
a)  $\leq$       b)  $\geq$   
c)  $=$       d) none of these
- 3) For binomial distribution, the relation between mean and variance is \_\_\_\_\_.  
a) mean  $<$  variance      b) mean  $>$  variance  
c) mean = variance      d) None of these
- 4) The number of parameters for geometric distribution is/are \_\_\_\_\_.  
a) 1      b) 2  
c) 3      d) 4
- 5) The normal distribution is symmetric around \_\_\_\_\_.  
a) Mean      b) Median  
c) Mode      d) All of these
- 6) Which of the following is a particular case of binomial distribution?  
a) Bernoulli      b) Poisson  
c) Geometric      d) none of these
- 7) The number of failures before  $r^{\text{th}}$  success follows \_\_\_\_\_.  
a) geometric distribution      b) Poisson distribution  
c) negative binomial distribution      d) None of these
- 8) If A and B are exclusive and exhaustive events, then  $P(A \cup B) =$  \_\_\_\_\_.  
a) 1      b) 0  
c) 0.5      d) 0.67
- 9) If for an exponential distribution, mean = 2, then variance = \_\_\_\_\_.  
a) 2.2      b) 0.5  
c) 3      d) None of these
- 10) For drawing histogram, classes must be of \_\_\_\_ type.  
a) Inclusive      b) Exclusive  
c) either inclusive or exclusive      d) None of these
- 11) A coin is tossed two times, then the number of elements in corresponding sample space is \_\_\_\_\_.  
a) 3      b) 4  
c) 2      d) 1

- 12) If P is a probability function and A is any subset of sample space, then

  - a)  $P(A) \geq 1$
  - b)  $P(A) \leq 0$
  - c) both (a) and (b)
  - d) none of these

13) Which of the following distribution is not discrete?

  - a) Binomial
  - b) Poisson
  - c) Exponential
  - d) None of these

14) The number of accidents at a particular place follows \_\_\_\_\_.  
a) binomial distribution      b) Poisson distribution  
c) geometric distribution      d) none of these

**Q.2 a) Answer the following (Any Four)**

08

- 1) Define and illustrate Sample space.
  - 2) Define exhaustive events
  - 3) Define a random variable
  - 4) Define Poisson distribution
  - 5) Define Hypergeometric distribution

**b) Write Notes on (Any two)**

06

- 1) Skewness of the data
  - 2) Kurtosis of the data
  - 3) Baye's theorem

**Q.3 a) Answer the following (Any Two)**

08

- 1) Define Binomial distribution. Also compute its mean
  - 2) State and prove addition theorem of probability
  - 3) What is meant by dispersion? Also describe various measures of dispersion.

**b) Answer the following (Any One)**

06

- 1) Obtain the frequency distribution for the following data considering classes of width 10, starting from 0. Also draw histogram.  
Data: 40, 41, 18, 15, 16, 57, 25, 25, 29, 20, 8, 15, 9, 18, 36, 7, 16, 49, 15, 24, 3, 25, 29, 36, 27

2) Discuss:

  - Correlation
  - Regression

**Q.4 a) Answer the following (Any Two)**

10

- 1) Define exponential distribution. Also find its mean and variance.
  - 2) Explain techniques for generating random numbers.
  - 3) Explain what is meant by measures of central tendency.

**b) Answer the following {Any One}**

04

- 1) Define
    - i) Probability mass function
    - ii) Probability density function
  - 2) Show that mean and parameter are the same for Poisson distribution.

**Q.5 Answer the following (Any two)**

14

- a) Define negative binomial distribution, Compute its mean.

b) Explain the following:

  - i) Equally likely outcomes
  - ii) Exclusive outcomes
  - iii) Conditional probability

c) Explain various types of data.