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Set P

M.C.A. (Semester - I) (CBCS) Examination Mar/Apr-2018
Science
INTRODUCTION TO COMPUTERS

Time: 2½ Hours

Max. Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

B)	State True or False.	04
1)	One megabyte is equivalent to 1024 Byte	
2)	A system that can process two or more programs is called Multiprogramming.	
3)	The overall functions of the O.S. are to manage I/O, files and memory.	
4)	A group of 8 bits is called a Nibble	
Q.2	A) Write short notes on the following.	08
a)	Assembler	
b)	Plotter	
B)	Solve the following.	06
a)	Convert Binary to decimal $(10010)_2$	
b)	Convert Decimal to Octal $(684)_{10}$	
Q.3	Attempt the following questions:-	
a)	Explain following Linux commands with suitable examples : i) adduser ii) in iii) talk iv) wall	08
b)	Explain the difference between machine language & assembly language.	06
Q.4	Attempt the following questions:-	
a)	What is computer network? Explain different network models.	07
b)	Explain classification of computers according to size.	07
Q.5	Attempt the following questions:-	
a)	Explain following DOS commands with suitable examples : i) TREE ii) DOSKEY iii) FORMAT iv) RECOVER	08
b)	Explain working of digitizer.	06
Q.6	Attempt the following questions:-	
a)	Describe the features of MS-Power point.	07
b)	What is software? Explain different types of software with example.	07
Q.7	Attempt the following questions:-	
a)	What is pointing device? Explain any two pointing devices with advantages and disadvantages?	07
b)	Write a short note on evolution of computers.	07

M.C.A. (Semester - I) (CBCS) Examination Mar/Apr-2018
Science
PROGRAMMING USING - C

Time: 2½ Hours

Max. Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.

- 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

- 2) What is the output of the following program?

```
#include <stdio.h>
void main()
{
    float a = 5, b = 2;
    int c;
    c = a % b;
    printf("%d", c);
```


- ### 3) The statement

char ch = 'Z';

would store in ch _____.

- a) The character Z
 - b) ASCII value of Z
 - c) Z along with the single inverted commas
 - d) Both a and b

- 4) If a is an integer variable, a = 5 / 2; will return a value _____.

- a) 2.5
 - b) 3
 - c) 2
 - d) 0

- 5) Consider the declaration,

```
int i = 3;
```

This declaration tells the C compiler to :

- a) Reserve space in memory to hold the integer value.
 - b) Associate the name *i* with this memory location.
 - c) Store the value 3 at this location.
 - d) All of these a, b, c

- ## 6) Function declaration specifies

- a) Function name
 - b) The return type of the function
 - c) The types of parameters it accepts
 - d) All a, b, c

- 7) A float occupies _____ in memory

- A float occupies _____ in memory

 - a) 4 bits
 - b) 2 bytes
 - c) 32 bits
 - d) 16 bits

- 8) Which of the following is not the storage class in C

 - a) Register
 - b) Static
 - c) Recursion
 - d) External

9) Which of the following is not feature of a variable defined to have an automatic storage class?

 - a) Storage – CPU registers.
 - b) Default initial value – An unpredictable value
 - c) Scope – Local to the block in which the variable is defined.
 - d) Life – Till the control remains within the block in which the variable is defined.

10) All macro substitutions in a program are done _____.

 - a) Before compilation of the program
 - b) After compilation
 - c) During execution
 - d) None of these

B) State whether following statements are True or False

04

- State whether following statements are True or False

 - 1) `&&` is a binary operator, whereas, `!` is a unary operator.
 - 2) The three types of loops available in C are `for`, `while`, and `switch`.
 - 3) In `switch` statement multiple cases can use same expression.
 - 4) There is no limit on the number of functions that might be present in a C program.

Q.2 A) Write short notes on the following.

08

- 1) Algorithm
 - 2) Increment and Decrement operators.

B) Explain the following terms.

06

- 1) Draw a flow chart to check whether the number is even or odd.
 - 2) Describe the ternary operator.

Q.3 Answer the following

- A)** If the ages of Ram, Shyam and Ajay are input through the keyboard, write a program to determine the youngest of the three.

B) Explain switch statement

06

- ## **Answer the following**

A) Write a program to

08

- B) If the sum of cubes of each digit of the number is equal to the number itself, then the number is called an Armstrong number.

B) Explain the difference between the parameter passing mechanism “call by value” and “call by reference”. Which is more efficient?

Q.5 Answer the following.

- A)** What is a pointer? What are the advantages of using pointer? Explain pointer to array with example.

B) What are preprocessor directives?

Q 6 Answer the following

- A)** Write a program to read data from keyboard, write it to a file called INPUT, and read the same data from the INPUT file and display it on the screen.

B) Explain the different kinds of loops available in C with examples.

Q 3 Answer the following:

1

- Answer the following.**

A) What does a storage class mean? Mention different storage classes available in C

B) How do you pass parameters to main() function?

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M.C.A. (Semester - I) (CBCS) Examination Mar/Apr-2018
Science
DISCRETE MATHAMATICAL STRUCTURES

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) A relation R on set A is called as poset if

a) Reflexive	b) Symmetric
c) Transitive	d) All of these
 - 2) A vertex of degree 1 is called as _____

a) One vertex	b) Pendent
c) Isolated	d) None of these
 - 3) Let L be the lattice then for any $a, b \in L$, $a \wedge b = a$ if & only if

a) $a \vee b = b$	b) $a \vee b = a$
c) $a \wedge b = a$	d) $a \wedge b = b$
 - 4) A graph in which does not exist multiple edges & loop is called as

a) Planer graph	b) Simple graph
c) Singular	d) None of these
 - 5) If all the inters in last column of given statement pattern are neither T nor F then it is called as

a) Tautology	b) Contradiction
c) Contingency	d) Valid
 - 6) In combination ${}^nC_r =$

a) $\frac{(n-1)!}{(n-r)!}$	b) $\frac{n!}{r!(n-r)!}$
c) $\frac{n!}{(n-1)!}$	d) $\frac{n!}{(r-n)!}$
 - 7) If $A = \begin{bmatrix} 1 & 2 & -3 \\ 5 & 0 & 1 \\ 1 & 2 & -3 \end{bmatrix}$ then $|A| =$

a) 0	b) 1
c) -1	d) -2
 - 8) In set theory $(A \oplus B) =$

a) $(A - B) \cap (B - A)$	b) $(B - A) \cap (A - B)$
c) $(A - B) \cup (B - A)$	d) $(A - B) \cup (A - B)$
 - 9) If matrix A is singular if

a) $ A = 0$	b) $ A \neq 0$
c) $ A = 1$	d) $ A = -1$
 - 10) In group G which of the following law is called as commutative

a) $a * b = b * a$	b) $a * e = e = e * a$
c) $a * a^{-1} = a^{-1} * a = e$	d) None of these

B)	Fill in the blanks	04
1)	A single vertex with loop is a path of length _____	
2)	In set $A \cap U =$ _____	
3)	If p is true, q is false then $p \rightarrow q =$ _____	
4)	${}^n P_r =$ _____	
Q.2	A) Write short notes on the following.	08
1)	Eulerian graph	
2)	Contradiction	
B)	Answer the following.	06
1)	Define symmetric matrix, skew symmetric & give its examples.	
2)	Explain the normal forms	
Q.3	Answer the following	
a)	Define $(G, *)$ be a group & show that each element in group has only one inverse in G	07
b)	Solve the following system by reduction method	07
	$x + 3y + 3z = 12$	
	$x + 4y + 4z = 15$	
	$x + 3y + 4z = 13$	
Q.4	Answer the following	
a)	Prove using truth tables	07
1)	$\sim(p \wedge q) \equiv \sim p \vee \sim q$	
2)	$\sim(p \vee q) \equiv \sim p \wedge \sim q$	
b)	Define walk, path, cycle & trial with examples	07
Q.5	Answer the following.	
a)	Explain bipartite graph with example	06
b)	Explain Warshall's algorithm & using it find transitive closure of relation $A = \{1, 2, 3, 4\}$ & $R = \{(1, 1), (1, 4), (2, 1), (2, 3), (3, 1), (3, 3), (3, 4), (4, 1), (4, 2)\}$	08
Q.6	Answer the following.	
a)	Explain the Application of residue Arithmetic's to computers	07
b)	Show that ${}^{n+1} C_r = {}^n C_{r-1} + {}^n C_r$	07
Q.7	Answer the following.	
a)	Explain the group code with example.	07
b)	A family of three sisters & 5 brothers to be arranged for photograph, In how many ways they can be sited if, 1) No condition 2) All the sisters sit together	07

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M.C.A. (Semester - I) (CBCS) Examination Mar/Apr-2018
Science
DIGITAL CIRCUITS AND MICROPROCESSORS

Time: 2½ Hours

Max. Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.

2) Attempt any 3 questions from Q. no. 3 to Q. no. 7

3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

B)	State True or False	04
1)	In sequential circuit memory are used to store the last condition result.	
2)	OR gate is a complimentary gate.	
3)	The data bus for 8085 is a 8 bit.	
4)	HLT is data transfer instruction.	
Q.2	a) Define counter? Explain combined 3 bit asynchronous Counter.	08
	b) Explain universal adder/ subtractor.	06
Q.3	a) Explain all types of gates with its logic symbol, logical expression and truth table.	08
	b) State and explain different type of addressing mode in 8085 microprocessor	06
Q.4	a) Define Shift register? Give different types. Explain any two types in brief.	08
	b) Explain maximum mode for 8086 microprocessor.	06
Q.5	a) Give different type of instruction of 8085. Explain each type with suitable example.	08
	b) Explain flag registers in 8086.	06
Q.6	a) Draw the internal architecture of 8086. Explain BIU section in brief.	08
	b) Explain different types of K map with suitable example.	06
Q.7	a) Define F/F. Explain RS, T and D F/F.	08
	b) Explain decoder.	06

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M.C.A. (Semester - I) (CBCS) Examination Mar/Apr-2018
Science
MANAGEMENT

Time: 2½ Hours

Max. Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.

2) Attempt any 3 questions from Q. no. 3 to Q. no. 7.

3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

- B) State True or False.** 04
- 1) Budgets are action plan.
 - 2) Plant & Machinery is a Current Asset.
 - 3) Bank overdraft means amount payable to the Bank.
 - 4) EOQ technique is used for HRD Department.
- Q.2 A) Write short notes on the following.** 08
- 1) Going Concern Concept.
 - 2) Subsidiary Books in accounting process.
- B) Explain the following.** 06
- 1) Types of Budget.
 - 2) Cost classification according to function.
- Q.3 Following Balances are extracted from the books of the M/s. Anand & Co.** 14

	₹		₹
Cash in hand	6,000	Closing Stock	21,000
Sundry Debtors	23,300	Bank Long Term Loan	20,000
Bills Receivable	10,000	Sundry Creditors	15,000
Machinery A/C	36,000	Bills Payable A/C	8,000
Furniture A/C	7,600	Outstanding Expenses	1,500
Prepaid Insurance	300		
Net Profit	7,200		

From the above

- a) Prepare the Balance Sheet of the firm & ascertain the amount of capital.
- b) Compute i) Current Ratio &
ii) Liquid Ratio

- Q.4 Following transactions are extracted from the books of shri Ashok.**

2017	
April 1	Started business with Cash ₹ 71,000.
2	Purchased goods from Mahesh Rs. 20,000 on Credit.
5	Deposited cash in to Bank of India Rs.30,000.
9	Sold goods to Dhanraj Rs.25,000 on credit.
12	Purchase furniture of Rs.10,000 for cash.
15	Paid to Mahesh by cheque of Bank of India Rs.10,000.
18	Paid Salary by cheque Rs.4,000.

- 1) Journalise the above transactions in the books of Shri Ashok. 07
- 2) Prepare Ledger Accounts for the above in the books of Shri Ashok. 07

- Q.5 A) Debit EOQ.** 07
- From the following data, work out the EOQ of a component 'x' 07

Annual Demand	15000 units.
Ordering cost per order	Rs.180/-
Carrying cost	20% on inventory
Price per unit	Rs.300

- B) From the following information prepare production budget for the month of August 2017.** 07

Product	Estimated Stock on 1 st Aug. 2017	Estimated stock on 31 st Aug. 2017	Estimated sales as per Budget
A	60,000	50,000	3,80,000
B	40,000	30,000	2,40,000

SLR-SQ-6

Q.6 Answer the following.

- A)** What is communication? Explain the various methods of communication. **07**
- B)** Explain the need for supply chain Management. **07**

Q.7 Answer the following.

- A)** Explain the activities in Management control system. **07**
- B)** Explain the concept of Key Success Variables. **07**

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M.C.A. (Semester - II) (CBCS) Examination Mar/Apr-2018
Science
OBJECT ORIENTED PROGRAMMING USING C++

Time: 2½ Hours

Max Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

10) Pointers are _____	
a) integer data type	b) character data type
c) unsigned integer data types	d) None of these
B) State True or False.	04
1) In C++, only one catch block can handle all the exceptions.	
2) A class object passed to a function template must overload any operators used on the class object by the template.	
3) %≡ is not a operator in C++.	
4) Constructors can be virtual like virtual destructors.	
Q.2 A) Write short notes on the following.	08
1) Access Specifiers	
2) Manipulators in C++	
B) Answer the following.	06
1) What are the applications of void data-type in C++?	
2) Can we assign a void pointer to an int type pointer? If not, why? How can we achieve this?	
Q.3 Answer the following	14
a) What is virtual function? Explain how it supports to implement dynamic binding.	
b) Explain multiple Inheritances with one example.	
Q.4 Answer the following	14
a) Explain dynamic memory allocation in C++. State the difference between malloc and new.	
b) Write a program in C++ to find whether entered number is divisible by 8, 9 or 11.	
Q.5 Answer the following.	14
a) Write an OOP in C++ to check whether entered number is Armstrong or not.	
b) Do you think friend function violates encapsulation? Explain.	
Q.6 Answer the following.	14
a) Explain multiple catch statement with one example.	
b) Write a note on parameterized constructor.	
Q.7 Answer the following.	14
a) Explain Exception Handling mechanism with one example.	
b) Explain dynamic memory allocation in C++.	

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M.C.A. (Semester - II) (CBCS) Examination Mar/Apr-2018
Science
DATA STRUCTURES

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) The process of arranging data in alphabetical or numerical order is called _____

a) Sorting	b) Searching
c) Traversal	d) Merging
 - 2) The most useful applications of queues, Priority Queues and Linked Lists is in _____

a) Networks	b) Simulations
c) Refinery	d) None of these
 - 3) Linked List can be _____

a) Single	b) Double
c) Circular	d) All of these
 - 4) A 'C' data structure called a structure is a group of items in which each item is identified by its own identifier, each of which is known as a member of the structure. Member is also known as _____

a) Record	b) File
c) Field	d) Table
 - 5) A strictly binary tree with 'n' leaves always contains _____ nodes.

a) $n * n$	b) $2n$
c) $2n-1$	d) $n^2 - 1$
 - 6) Representation of two dimensional array in memory is _____

a) Row-Major	b) Column – Major
c) Both (a) and (b)	d) None of these
 - 7) Stack is _____

a) Dynamic data Structure	b) An ordered collection of items
c) Constantly changing object	d) All of the above
 - 8) Stack is sometimes called a _____

a) Push Down List	b) Push Down Array
c) Pop Down List	d) Pop up Array
 - 9) Priority Queue can be

a) Ascending	b) Descending
c) Both (a) and (b)	d) None of these
 - 10) The address of the first element of an array is called _____

a) First Address	b) Base Address
c) Initial Address	d) Location Address

B)	State True or False.	04
1)	All leaf nodes are called internal nodes.	
2)	An array is a static data structure.	
3)	The number of sub trees of a node is called its degree	
4)	An empty tree is height balanced.	
Q.2	A) Write short notes on the following.	
1)	Sparse Matrix	04
2)	Circular linked list	04
B)	Answer the following.	06
1)	What do you mean by Primitive Data Type?	
2)	What do you mean by Queue? State its different types.	
Q.3	Answer the following	14
a)	Convert the following infix expression into postfix using stack. Infix Expression: $((a + b) + c^* (d + e) + f)^*(g+h)$.	
b)	Write a program in C to implement stack data structure.	
Q.4	Answer the following	14
a)	What do you mean by sorting? Perform Bubble sort on following series. Series : 44, 55, 12, 42, 94, 18, 06, 67, 35, 89 and 15	
b)	Write a function for adding and deleting elements from a queue.	
Q.5	Answer the following.	14
a)	What do you mean by Backtracking? Discuss in detail mechanism of Backtracking with suitable example.	
b)	Explain binary search algorithm with example.	
Q.6	Answer the following.	14
a)	Differentiate between Stack and Queue	
b)	Differentiate between Array and Linked List	
Q.7	Answer the following.	14
a)	Implement singly Linked List in C.	
b)	Define Array. Discuss representations and applications of single and multidimensional array with suitable examples.	

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M.C.A. (Semester - II) (CBCS) Examination Mar/Apr-2018
Science
OPERATING SYSTEM

Time: 2½ Hours

Max. Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.

- 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
- 3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

- 1) A vulnerability of firewalls is ___, in which an unauthorized host pretends to be an authorized host by meeting some authorization criterion.

a) Mail attack	b) Tunnel
c) Spoofing	d) Scheduler
- 2) The _____ such as word processors, spreadsheets, compilers, and web browsers and also define the ways in which these resources are used to solve users computing problems.

a) Hardware	b) User
c) Microsoft Package	d) Application programs
- 3) Time sharing requires _____ computer system, which provides direct communication between the user and the system.

a) Non-interactive	b) Interactive
c) Disk-less	d) Disk-full
- 4) A_____, which consists of all processes in the system.

a) Ready queue	b) Device queue
c) Job queue	d) Run queue
- 5) _____ processes require an inter-process communication mechanism that will allow them to exchange data and information.

a) Independent	b) Cooperative
c) Non-cooperative	d) Real time
- 6) Under _____ scheduling, once the CPU has been allocated to a process, the process keeps the CPU until it releases the CPU either by terminating or switching to the waiting state.

a) Preemptive	b) Page replacement
c) Non-preemptive	d) CPU
- 7) A _____ control block contains information about the _____, including ownership, permissions, and location of the _____ contents.

a) Disk	b) Process
c) File	d) Memory
- 8) _____ provides a set of methods for ensuring that at least one of the necessary conditions cannot hold.

a) Deadlock tolerance	b) Deadlock detection
c) Deadlock prevention	d) Deadlock avoidance
- 9) _____ involves breaking physical memory into fixed sized blocks called frames.

a) Fragmentation	b) Segmentation
c) Monitor	d) Paging

- 10) _____ scheduling algorithm can leave some low priority processes waiting indefinitely.
- First Come First Serve
 - Shortest Job First
 - Priority Scheduling
 - Most Recently used
- B) State True or False.** 04
- A nonvolatile storage loses its contents when the power to the device is removed.
 - The sequence of directories searched when a file is named, this operation is called search path.
 - The main advantage of the virtual memory scheme is that it enables users to run programs that are larger than actual physical memory.
 - A program is passive entity, such as the contents of a file stored on the disk.
- Q.2 A) Write short notes on the following.** 08
- Threads
 - Swapping
- B) Answer the following.** 06
- What do you mean by File?
 - Briefly state the meaning of PCB.
- Q.3 Answer the following.** 07
- Explain in detail concept of fragmentation with suitable example?
 - What do you mean by safe state? Discuss in detail various mechanism of deadlock detection?
- Q.4 Answer the following.** 07
- Discuss in detail working of Round Robin for scheduling of processes given below-
- | PID | Name | Burst time | Time Quantum |
|-----|------|------------|--------------|
| 101 | ABC | 12 minute | 3 minute |
| 102 | XYZ | 15 minute | |
| 103 | PQR | 6 minute | |
| 104 | MNO | 9 minute | |
| 105 | STU | 3 minute | |
- Discuss in detail different types of allocation methods as a part of file system implementation.
- Q.5 Answer the following.** 07
- What do you mean by Demand paging? Discuss in detail how to handle a page fault?
 - What do you mean by Attack? Enlist and discuss in detail different kinds of system program threats.
- Q.6 Answer the following.** 07
- Discuss in detail working of shortest seek time first algorithm when a Disk head is positioned at 38.
Queue – 86, 55, 49, 64, 95, 63, 72, 38, 81, 102, 61
 - State the concept of process synchronization by explaining readers-writers problem in detail.
- Q.7 Answer the following.** 07
- What do you mean by Network OS? Differentiate between Distributed OS and Multiprocessor time sharing systems?
 - Explain in detail working of First In First Out page replacement algorithm for given below reference string having 03 frames for allocation.
Reference string – 5, 3, 6, 4, 3, 8, 3, 9, 4, 8, 3, 8, 4, 6, 4, 3, 6, 5, 3, 6

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M.C.A. (Semester - II) (CBCS) Examination Mar/Apr-2018
Science
SOFTWARE ENGINEERING

Time: 2½ Hours

Max. Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

B)	State whether following statements are True or False.	04
1)	Beta testing is done at developers end.	
2)	Requirements analysis is critical to the success of a development project.	
3)	Requirements analysis is an Iterative process.	
4)	A function-oriented design focuses on the entities in the system rather than the data processing activities.	
Q.2	A) Write short notes on the following.	08
1)	Management myths	
2)	Process Metrics and Software Process Improvement	
B)	Explain the following terms.	06
1)	Explain why Software doesn't "wear out".	
2)	Explain loops testing.	
Q.3	Answer the following.	
A)	Explain the Software measurement in detail.	08
B)	Explain metrics for software quality.	06
Q.4	Answer the following.	
A)	Explain design and software quality and the evolution of software design.	07
B)	Explain analysis principles in detail.	07
Q.5	Answer the following.	06
A)	Explain prototyping model with its advantages.	08
B)	What is testing? Explain software testing strategies.	
Q.6	Answer the following.	
A)	Explain data modeling in detail.	07
B)	Explain the mechanics of structured analysis.	07
Q.7	Answer the following.	
A)	Explain Control Structure testing in detail.	08
B)	Explain how to manage the object-oriented software projects.	06

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M.C.A. (Semester - III) (New) (CBCS) Examination Mar/Apr-2018
Science
SYSTEM SOFTWARE

Time: 2½ Hours

Max. Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.

- 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

B)	State True or False.	04
1)	Macro processors are machine dependant.	
2)	A Bootstrap loader is responsible for loading the operating system.	
3)	SIC machines do not support floating point data format.	
4)	UltraSparc are CISC machine.	
Q.2	A) Write short notes on the following.	08
1)	Absolute loader	
2)	Conditional macro expansion.	
B)	Answer the following.	06
1)	Explain lexical analysis.	
2)	Explain program blocks.	
Q.3	Answer the following.	
A)	Explain relocation and program linking in detail.	08
B)	What are machine independent compiler features?	06
Q.4	Answer the following	
A)	Explain compiler design options in detail	08
B)	Explain different types of loader in detail.	06
Q.5	Answer the following.	
A)	Explain SIC and SIC/XE architecture in detail.	08
B)	Explain in brief basic macro processor function.	06
Q.6	Answer the following.	
A)	Explain machine dependant assembler features.	08
B)	What are macro processor design options?	06
Q.7	Answer the following.	
A)	What are the algorithm and data structures used for assembler? Explain in detail.	08
B)	Explain UltraSPARC architecture for RISC machine.	06

Seat No.	
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Set P

M.C.A. (Semester - III) (New) (CBCS) Examination Mar/Apr-2018
Science
DBMS

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) In a relational schema, each tuple is divided into fields called
 - a) Relations
 - b) Domains
 - c) Queries
 - d) All of the above
 - 2) _____ command can be used to modify a column in a table
 - a) Alter
 - b) Update
 - c) Set
 - d) Create
 - 3) Grant and revoke are _____ statements.
 - a) DDL
 - b) TCL
 - c) DCL
 - d) DML
 - 4) The key to represent relationship between tables is called _____
 - a) Primary key
 - b) Secondary key
 - c) Foreign key
 - d) None of the above
 - 5) A _____ is used to define overall design of the database
 - a) Schema
 - b) Application program
 - c) Data definition language
 - d) Code
 - 6) Data independence means
 - a) Data is defined separately and not included in programs.
 - b) Programs are not dependent on the physical attributes of data
 - c) Programs are not dependent on the logical attributes of data
 - d) Both B and C
 - 7) The collection of information stored in a database at a particular moment is called as _____
 - a) Schema
 - b) Instance of the database
 - c) Data domain
 - d) Independence
 - 8) _____ keyword is used to find the number of values in a column.
 - a) TOTAL
 - b) COUNT
 - c) ADD
 - d) SUM
 - 9) A relational database developer refers to a record as
 - a) A criteria
 - b) A relation
 - c) A tuple
 - d) An attribute
 - 10) _____ is a full form of SQL.
 - a) Standard query language
 - b) Sequential query language
 - c) Structured query language
 - d) Server side query language

B)	State True or False.	04
1)	The number of tuples in a relation is called its cardinality.	
2)	Data elements in the database can be modified by changing the data dictionary.	
3)	The relational model feature is that there is much more data independence than some other database models.	
4)	The non procedural language that requires a user to specify the data to be retrieved without specifying exactly how to get it is.	
Q.2	A) Write short notes on the following.	06
a)	Views	
b)	% ROW type	
B)	Answer the following.	08
a)	What are strong and weak entities?	
b)	Explain ER model.	
Q.3	Answer the following	
a)	Explain Generalization and Specialization with suitable example.	07
b)	Explain different types of data models.	07
Q.4	Answer the following	
a)	What is cursor? Explain its types.	07
b)	Explain two phase commit protocol.	07
Q.5	Answer the following.	
a)	Explain log based recovery in details.	07
b)	Explain database architecture.	07
Q.6	Answer the following.	
a)	Describe different DML commands with example.	07
b)	Explain different functions of DBMS.	07
Q.7	Answer the following.	
a)	Explain Boyce Codd's normal form with suitable example.	07
b)	Differentiate between primary key and unique constraint with example.	07

Seat No.	
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Set P

M.C.A. (Semester - III) (New) (CBCS) Examination Mar/Apr-2018
Science
JAVA PROGRAMMING

Time: 2½ Hours

Max. Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

14

- 1) Which of the following is the feature of Java?
 - a) Robust
 - b) Platform independent
 - c) Multithreaded
 - d) All of these
 - 2) Which of the following is the component of JVM?
 - a) Stack
 - b) Registers
 - c) Garbage collection heap
 - d) All of these
 - 3) Finalize () method is used to garbage collect an object
 - a) True
 - b) False
 - 4) The this reference is used in conjunction with _____ methods.
 - a) Static
 - b) Non-static
 - c) Both a and b
 - d) None of these
 - 5) Any user-defined exception class is a subclass of the _____ class.
 - a) Exception
 - b) SystemException
 - c) ExceptionSystem
 - d) UserException
 - 6) _____ is not the method available in the Thread class.
 - a) Join()
 - b) Alive()
 - c) Sleep()
 - d) Destroy()
 - 7) _____ package does define String and StringBuffer classes.
 - a) java.lang
 - b) java.IO
 - c) java.mysql
 - d) java.net
 - 8) Which of the following is the highest class in the event-delegation model?
 - a) java.util.EventListener
 - b) java.util.EventObject
 - c) java.awt.AWTEvent
 - d) java.awt.event.AWTEvent
 - 9) The drawImage() method of the Graphics class is used to draw an image on an applet.
 - a) True
 - b) False
 - 10) _____ method is used to register a keyboard event listener.
 - a) KeyListener()
 - b) addKistener()
 - c) addKeyListener()
 - d) eventKeyboardListener()
 - 11) The prepared Statement object allows you to execute parameterized queries.
 - a) True
 - b) False

Q.2 A) Write short notes on the following.

- 1) Differentiate between interface and an abstract class.
 - 2) Package & its uses

B) Answer the following.

- 1) Explain the use of final keyword with example
 - 2) List the advantages of StringBuffer class.

Q.3 Answer the following

- a)** Create a windows application to add a new record using stored procedure.
b) What is polymorphism? Explain run-time polymorphism.

Q.4 Answer the following

- a)** Explain different methods used for Inter-thread communication
b) Define Object class. Explain different methods of Object class.

Q-5 Answer the following-

- ANSWER THE FOLLOWING:**

 - a)** What is the significance of Layout managers? Discuss briefly various layout managers
 - b)** What is applet? Explain the steps involved in Applet development.

Q.6 Answer the following.

- a) Describe the need of thread synchronization. How is it achieved in Java Programming? Explain with a suitable program
 - b) Write a program to handle mouse events and mouse motion events.

Q.7 Answer the following.

- a) What is stream? What is the difference between byte streams and characters streams? How are they used to capture input from the user?
 - b) Explain with suitable example how to create a new thread using the Runnable interface.

Seat No.	
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Set P

M.C.A. (Semester - III) (New) (CBCS) Examination Mar/Apr-2018
Science

COMPUTER COMMUNICATION NETWORK

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) When 2 or more bits in a data unit has been changed during the transmission, the error is called
 - a) burst error
 - b) random error
 - c) inverted error
 - d) none of these
 - 2) Error detection at the data link layer is achieved by?
 - a) Bit stuffing
 - b) Cyclic redundancy codes
 - c) Hamming codes
 - d) Equalization
 - 3) If there are N routers from source to destination, total end to end delay in sending packet P($L \rightarrow$ number of bits in the packet $R \rightarrow$ transmission rate)
 - a) N
 - b) $(N^*L)/R$
 - c) $(2N^*L)/R$
 - d) L/R
 - 4) The resources needed for communication between end systems are reserved for the duration of session between end systems in _____.
 - a) Packet switching
 - b) Frequency switching
 - c) Line switching
 - d) Circuit switching
 - 5) The time taken by a packet to travel from client to server and then back to the client is called _____.
 - a) STT
 - b) RTT
 - c) PTT
 - d) None of the mentioned
 - 6) FTP server listens for connection on port number
 - a) 20
 - b) 21
 - c) 22
 - d) 23
 - 7) The file transfer protocol is built on
 - a) data centric architecture
 - b) service oriented architecture
 - c) client server architecture
 - d) none of the mentioned
 - 8) DHCP is used for
 - a) IPv6
 - b) IPv4
 - c) Both (a) and (b)
 - d) None of the mentioned
 - 9) The DHCP server can provide the _____ of the IP addresses.
 - a) dynamic allocation
 - b) automatic allocation
 - c) static allocation
 - d) all of the mentioned

10) What is the maximum number of IP addresses that can be assigned to hosts on a local subnet that uses the 255.255.255.224 subnet mask?	
a) 14	b) 15
c) 16	d) 30
B) State True or False.	04
1) Ethernet II type of Ethernet framing is used for TCP/IP and DEC net.	
2) Physical, data link and network layers are network support layers and session, presentation and application layers are user support layers.	
3) User datagram protocol is called connectionless because all TCP packets are treated independently by transport layer.	
4) The domain name system translates Internet domain and host names to IP address.	
Q.2 A) Write short notes on the following.	08
a) Interior Gateway Routing Protocol	
b) Architecture of Email	
B) Explain the following terms:	06
a) Humming Code	
b) User agent message format	
Q.3 Answer the following	07
a) What is computer communication network? Explain uses for mobile users.	07
b) Explain the term Home and wireless network with example.	
Q.4 Answer the following	
a) How many ways error controlled in data link layer? Explain one method with example.	07
b) Explain simplex protocol for a Noisy channel with diagram and example.	07
Q.5 Answer the following.	
a) What are the design issues in Network Layer? Explain service provided to the Transport Layer.	07
b) What are the functions of router in network layer? Explain distance vector routing algorithm with suitable example.	07
Q.6 Answer the following.	
a) How to prevent congestion in network layer? Explain the one method with example.	07
b) Describe the Leaky bucket algorithm with diagram and example.	07
Q.7 Answer the following.	
a) What are the Elements of transport layers in computer network? Explain the any one elements in details	07
b) Explain the architecture and services of electronic mail.	07

Seat No.	
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Set	P
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M.C.A. (Semester - III) (New) (CBCS) Examination Mar/Apr-2018
Science
PROGRAMMING WITH PHP

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives. 10

- 1) What is the correct way to add 1 to the \$count variable?

a) \$count + +;	b) count + +;
c) + + count	d) \$count = +1
- 2) What is the correct way to end a PHP statement?

a) .	b) New line
c) ;	d) </php>
- 3) Which of the functions is used to sort an array in descending order?

a) sort()	b) asort()
c) rsort()	d) dsort()
- 4) What will be the output of the following PHP code?

```
<?php
$fruits = array ("apple", "orange", array ("pear", "mango"),
"banana");
echo (count($fruits, 1));
?>
```

a) 3	b) 4
c) 5	d) 6
- 5) What will be the output of the following PHP code?

```
<?php
$state = array ("Karnataka", "Goa", "Maharashtra",
"Andhra Pradesh");
echo (array _ search ("Goa", $state));
?>
```

a) True	b) 1
c) False	d) 2
- 6) What will be the output of the following php code?

```
<?php
$states = array ("karnataka" => array
("population" => "11,35,000", "capital" => "Bangalore"),
"Maharashtra" => array ("population"=>"17,90,000",
"capital" => "Mumbai"));
echo $states["karnataka"]["population"];
?>
```

a) karnataka 11,35,000	b) 11,35,000
c) population 11,35,000	d) karnataka population

- 7) The practice of separating the user from the true inner workings of an application through well-known interfaces is known as.
- Polymorphism
 - Inheritance
 - Encapsulation
 - Abstraction
- 8) Which of the following is/are a PHP code editor?
- Notepad
 - Notepad++
 - Adobe Dreamweaver
 - PDT
- Only iv)
 - i), ii) and iii)
 - All of the mentioned
 - Only iii)
- 9) PHP files have a default file extensions of _____
- .html
 - .xml
 - .php
 - .ph
- 10) We can use _____ to comment in php?
- /?
 - //
 - #
 - /* */
- Only ii)
 - i), iii) and iv)
 - ii), iii) and iv)
 - Both ii) and iv)

B) State whether following statements are True or False **04**

- The variable name is case – sensitive in PHP.
- PHP is a client – side scripting language.
- The die () and exit () functions do the exact same things.
- PHP can be run on Microsoft Windows IIS (Internet Information Server)

Q.2 A) Write short notes on the following. **08**

- Foreach statement
- Cookies

B) Answer the following **06**

- Explain echo () and print () function with example
- What is sticky form? Explain with example

Q.3 Answer the following **14**

- Explain different types of arrays with example.
- Write a PHP script to check how many times the webpage accessed by using cookies.

Q.4 Answer the following **14**

- Discuss any five file handling functions available in PHP.
- Assume a suitable structure of employee table having salary as a column and write a program in PHP to increase salary of employee by Rs.2,000

Q.5 Answer the following.

- Explain following string functions with example. **08**
- Strrev()
 - Str_repeat()
 - Str_pad()
 - Explode()
- Explain use of session variable in state management with example. **06**

- Q.6 Answer the following.** 14
- a) What is a data validation? Explain server-side data validations.
 - b) Write a PHP Script to display first 20 prime numbers.
- Q.7 Answer the following.** 14
- a) What is difference between Get and Post Method?
 - b) Write PHP application to accept faculty details and insert it into faculty database (assume suitable table structure).

Seat No.	
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M.C.A. (Semester - III) (Old) (CBCS) Examination Mar/Apr-2018
Science
SYSTEM SOFTWARE

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives. 10

- 1) A macro processor is _____.
a) Machine dependant b) Machine independent
c) Syntax dependant d) Software dependant
- 2) Bootstrap loader is loaded at the address _____.
a) 0 b) 80
c) Depends on machine d) None of the these
- 3) Loader that allows program relocation is _____.
a) Relocation loader b) Absolute loader
c) Bootstrap Loader d) Linking Loader
- 4) Which of the following is not a type of assembler?
a) One pass b) Two pass
c) Three pass d) Load and go
- 5) The task of scanning the source statement, recognizing and classifying the various tokens, is known as _____.
a) Lexical analysis b) Syntax analysis
c) Semantic analysis d) None of these
- 6) _____ names symbols that are defined in this section but may be used by other control sections.
a) EXTDEF b) EXTREF
c) EXTERN d) None of these
- 7) The dynamic linking postpones linking function until _____ time.
a) Load b) Execution
c) Compile d) None of these
- 8) This process, called syntactic analysis is performed by _____.
a) Parser b) Scanner
c) Lexical analyser d) None of the these
- 9) The main data structures involved in a one-pass macro processors are _____.
a) DEFTAB b) NAMTAB
c) ARGTAB d) All of these
- 10) What are the activities are performed by pass-I of multi-pass assembler?
a) Assign address to all the statements
b) Saves addresses assigned to be used in Pass-2
c) Defines the symbols in the symbol table
d) All of these

B)	State True or False.	04
1)	Macro processors are machine dependant.	
2)	A Bootstrap loader is responsible for loading the operating system.	
3)	SIC machines do not support floating point data format.	
4)	UltraSparc are CISC machine.	
Q.2	A) Write short notes on the following.	08
1)	Absolute loader	
2)	Conditional macro expansion.	
B)	Answer the following.	06
1)	Explain lexical analysis.	
2)	Explain program blocks.	
Q.3	Answer the following.	
A)	Explain relocation and program linking in detail.	08
B)	What are machine independent compiler features?	06
Q.4	Answer the following	
A)	Explain compiler design options in detail	08
B)	Explain different types of loader in detail.	06
Q.5	Answer the following.	
A)	Explain SIC and SIC/XE architecture in detail.	08
B)	Explain in brief basic macro processor function.	06
Q.6	Answer the following.	
A)	Explain machine dependant assembler features.	08
B)	What are macro processor design options?	06
Q.7	Answer the following.	
A)	What are the algorithm and data structures used for assembler? Explain in detail.	08
B)	Explain UltraSPARC architecture for RISC machine.	06

Seat No.	
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Set P

M.C.A. (Semester - III) (Old) (CBCS) Examination Mar/Apr-2018
Science
DBMS

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) In a relational schema, each tuple is divided into fields called
 - a) Relations
 - b) Domains
 - c) Queries
 - d) All of the above
 - 2) _____ command can be used to modify a column in a table
 - a) Alter
 - b) Update
 - c) Set
 - d) Create
 - 3) Grant and revoke are _____ statements.
 - a) DDL
 - b) TCL
 - c) DCL
 - d) DML
 - 4) The key to represent relationship between tables is called _____
 - a) Primary key
 - b) Secondary key
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 - 5) A _____ is used to define overall design of the database
 - a) Schema
 - b) Application program
 - c) Data definition language
 - d) Code
 - 6) Data independence means
 - a) Data is defined separately and not included in programs.
 - b) Programs are not dependent on the physical attributes of data
 - c) Programs are not dependent on the logical attributes of data
 - d) Both B and C
 - 7) The collection of information stored in a database at a particular moment is called as _____
 - a) Schema
 - b) Instance of the database
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 - 8) _____ keyword is used to find the number of values in a column.
 - a) TOTAL
 - b) COUNT
 - c) ADD
 - d) SUM
 - 9) A relational database developer refers to a record as
 - a) A criteria
 - b) A relation
 - c) A tuple
 - d) An attribute
 - 10) _____ is a full form of SQL.
 - a) Standard query language
 - b) Sequential query language
 - c) Structured query language
 - d) Server side query language

B)	State True or False.	04
1)	The number of tuples in a relation is called its cardinality.	
2)	Data elements in the database can be modified by changing the data dictionary.	
3)	The relational model feature is that there is much more data independence than some other database models.	
4)	The non procedural language that requires a user to specify the data to be retrieved without specifying exactly how to get it is.	
Q.2	A) Write short notes on the following.	06
a)	Views	
b)	% ROW type	
B)	Answer the following.	08
a)	What are strong and weak entities?	
b)	Explain ER model.	
Q.3	Answer the following	
a)	Explain Generalization and Specialization with suitable example.	07
b)	Explain different types of data models.	07
Q.4	Answer the following	
a)	What is cursor? Explain its types.	07
b)	Explain two phase commit protocol.	07
Q.5	Answer the following.	
a)	Explain log based recovery in details.	07
b)	Explain database architecture.	07
Q.6	Answer the following.	
a)	Describe different DML commands with example.	07
b)	Explain different functions of DBMS.	07
Q.7	Answer the following.	
a)	Explain Boyce Codd's normal form with suitable example.	07
b)	Differentiate between primary key and unique constraint with example.	07

Seat No.	
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Set P

M.C.A. (Semester - III) (Old) (CBCS) Examination Mar/Apr-2018
Science
JAVA PROGRAMMING

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 14**
- 1) Which of the following is the feature of Java?
 - a) Robust
 - b) Platform independent
 - c) Multithreaded
 - d) All of these
 - 2) Which of the following is the component of JVM?
 - a) Stack
 - b) Registers
 - c) Garbage collection heap
 - d) All of these
 - 3) Finalize () method is used to garbage collect an object
 - a) True
 - b) False
 - 4) The this reference is used in conjunction with _____ methods.
 - a) Static
 - b) Non-static
 - c) Both a and b
 - d) None of these
 - 5) Any user-defined exception class is a subclass of the _____ class.
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 - b) SystemException
 - c) ExceptionSystem
 - d) UserException
 - 6) _____ is not the method available in the Thread class.
 - a) Join()
 - b) Alive()
 - c) Sleep()
 - d) Destroy()
 - 7) _____ package does define String and StringBuffer classes.
 - a) java.lang
 - b) java.IO
 - c) java.mysql
 - d) java.net
 - 8) Which of the following is the highest class in the event-delegation model?
 - a) java.util.EventListener
 - b) java.util.EventObject
 - c) java.awt.AWTEvent
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 - 9) The drawImage() method of the Graphics class is used to draw an image on an applet.
 - a) True
 - b) False
 - 10) _____ method is used to register a keyboard event listener.
 - a) KeyListener()
 - b) addKistener()
 - c) addKeyListener()
 - d) eventKeyboardListener()
 - 11) The prepared Statement object allows you to execute parameterized queries.
 - a) True
 - b) False

- 12) The _____ class is used to read characters from the file
a) FileReader b) ReaderFile
c) ReadFile d) FileRead

- 13) An interface is a pure abstract class.
a) True b) False

- 14) The suspend() method is used to terminate a thread?
a) True b) False

Q.2 A) Write short notes on the following. 08

- 1) Differentiate between interface and an abstract class.
2) Package & its uses

B) Answer the following. 06

- 1) Explain the use of final keyword with example
2) List the advantages of StringBuffer class.

Q.3 Answer the following 14

- a) Create a windows application to add a new record using stored procedure.
b) What is polymorphism? Explain run-time polymorphism.

Q.4 Answer the following 14

- a) Explain different methods used for Inter-thread communication
b) Define Object class. Explain different methods of Object class.

Q.5 Answer the following. 14

- a) What is the significance of Layout managers? Discuss briefly various layout managers
b) What is applet? Explain the steps involved in Applet development.

Q.6 Answer the following. 14

- a) Describe the need of thread synchronization. How is it achieved in Java Programming? Explain with a suitable program
b) Write a program to handle mouse events and mouse motion events.

Q.7 Answer the following. 14

- a) What is stream? What is the difference between byte streams and characters streams? How are they used to capture input from the user?
b) Explain with suitable example how to create a new thread using the Runnable interface.

Seat No.	
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Set**P**

M.C.A. (Semester - III) (Old) (CBCS) Examination Mar/Apr-2018
Science
COMPUTER COMMUNICATION NETWORK

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
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- 1) When 2 or more bits in a data unit has been changed during the transmission, the error is called
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 - a) N
 - b) $(N^*L)/R$
 - c) $(2N^*L)/R$
 - d) L/R
 - 4) The resources needed for communication between end systems are reserved for the duration of session between end systems in _____.
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c) 16	d) 30
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a) What are the design issues in Network Layer? Explain service provided to the Transport Layer.	07
b) What are the functions of router in network layer? Explain distance vector routing algorithm with suitable example.	07
Q.6 Answer the following.	
a) How to prevent congestion in network layer? Explain the one method with example.	07
b) Describe the Leaky bucket algorithm with diagram and example.	07
Q.7 Answer the following.	
a) What are the Elements of transport layers in computer network? Explain the any one elements in details	07
b) Explain the architecture and services of electronic mail.	07

Seat No.	
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M.C.A. (Semester - III) (Old) (CBCS) Examination Mar/Apr-2018
Science
COMPUTER ORIENTED STATISTICS

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Questions No.1 and 2 are Compulsory.
 2) Attempt any three questions from Q.No.3 to Q.No.7
 3) Figures to the right indicate full marks.

Q.1 A) Select most correct alternative:

05

- 1) The sum of all observations divided by total number of observations is called as _____.
 a) Mean b) Variance
 c) Range d) Mode
- 2) If two sets do not have any common point between them, then the sets are called as _____.
 a) Exclusive b) Exhaustive
 c) Simple d) Complex
- 3) Bernoulli random variable takes only _____ value/ values.
 a) One b) Two
 c) Three d) None of these
- 4) If a r.v. X is symmetric about zero, then the median of X is _____.
 a) 1 b) 0
 c) 0.5 d) None of these
- 5) If $P(x)$ is a probability mass function, then _____
 a) $P(x) \geq 0$ for all X b) $\sum_x P(x) = 1$
 c) Both a) and b) d) None of the above

B) Fill in the blanks:

05

- 1) Mean of binomial distribution $B(n,p)$ is _____.
- 2) For _____ distribution, mean is same as variance.
- 3) If X follows Poisson distribution with parameter λ , then its variance is _____.
- 4) For a Binomial distribution with $n=4$ and the mean is 2, then its other parameter $p=$ _____.
- 5) The _____ distribution is a particular case of binomial distribution when number of trials is 1.

C) State whether the following statements are true or false:

04

- 1) Negative binomial distribution is a particular case of binomial distribution.
- 2) Range of the data is always non-negative.
- 3) Correlation coefficient always lies in between 0 and 1.
- 4) The mean of the data is always positive.

Q.2	A) Answer the following:	06
	1) Define skewness and kurtosis	
	2) State Baye's theorem	
B)	Write short notes on the following:	08
	1) Conditional Probability	
	2) Correlation	
Q.3	A) Define a random variable. Also describe Bernoulli and Binomial random variables.	07
B)	Define geometric distribution. Also find its mean.	07
Q.4	A) Define probability density function (pdf). Also give pdf of exponential and normal random variables.	07
B)	Find mean and variance of exponential distribution.	07
Q.5	A) Describe the technique of obtaining random numbers from (0,1).	07
B)	Describe the concept of regression.	07
Q.6	A) Define the following:	07
	1) Sample space	
	2) Exhaustive events	
	3) Equally likely outcomes	
B)	What do you mean by dispersion? Describe measures of dispersion.	07
Q.7	A) State and explain addition and multiplication theorems of probability.	07
B)	Describe graphical representation of data.	07

Seat No.	
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Set P

M.C.A. (Semester - IV) (New) (CBCS) Examination Mar/Apr-2018
Science
.NET

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) Which of these exceptions will occur if we try to access the index of an array beyond its length?
a) ArithmeticException b) ArrayException
c) ArrayArgumentException d) IndexOutOfRangeException
 - 2) Which of the following is a type of stream in C#?
a) Integer stream b) Character stream
c) Bytes stream d) Long stream
 - 3) Which of the following keywords is used by the calling function to guard against the exception that is thrown by called function?
a) Try b) Throw
c) Throws d) Catch
 - 4) Which of the following is not a namespace in the .NET Framework Class Library?
a) System.Process b) System.Security
c) System.Threading d) Systgem.xml
 - 5) Which of the following are parts of the .NET Framework?
 1. The Common Language Runtime (CLR)
 2. The Framework Class Libraries (FCL)
 3. Microsoft Published Web Services
 4. Applications deployed on IIS
 5. Mobile Applications
a) Only 1, 2, 3 b) Only 1, 2
c) Only 1, 2, 4 d) Only 4, 5
 - 6) Which of these is a method used to clear all the data present in output buffers?
a) clear() b) flush()
c) fflush() d) close()
 - 7) Which of the following is used to perform all input & output operations in C#?
a) Streams b) Variables
c) Classes d) Methods
 - 8) Which of the following is not a namespace in the .NET Framework Class Library?
a) System.Process b) System.Security
c) System.Threading d) System.xml

9) What is the value of double constant 'E' defined in Math class?	
a) Approximately 3	b) Approximately 3.14
c) Approximately 2.72	d) Approximately 0
10) What is the use of try & catch?	
a) It is used to manually handle the exception	
b) It helps to fix the errors	
c) It prevents automatic terminating of the program in cases when an exception occurs	
d) All of the mentioned	
B) State True or False.	04
1) Boolean is the data type return in IsPostBack property.	
2) Load is first method that is fired during the page load.	
3) JAVASCRIPT is default scripting language in ASP.	
4) Text is a property common to every validation control.	
Q.2 A) Write short notes on the following.	08
1) Exception Handling	
2) Cross page posting	
B) Answer the following.	06
1) What is use of validation groups? Explain in detail.	
2) What is the use of AutoPostBack properties explain with example?	
Q.3 Answer the following.	14
a) What is namespace? Explain how to create namespace with example.	
b) Design a windows application and write code to inserts a student record.	
Q.4 Answer the following.	14
a) Explain components of .NET Framework.	
b) What is inheritance? Explain with example.	
Q.5 Answer the following.	14
a) What is master page? Write stepwise process of creating master page.	
b) Explain App-Global Resources and App-Local Resources with example.	
Q.6 Answer the following.	14
a) What is preprocessor? Describe different preprocessors in C#.	
b) Differentiate in between ASP and ASP.NET	
Q.7 Answer the following.	14
a) What is State management? Explain Cookies in ASP.NET?	
b) What is validation? Explain Compare Validator, RegularExpression Validator.	

Seat No.	
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Set	P
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M.C.A. (Semester - IV) (New) (CBCS) Examination Mar/Apr-2018
Science
DATA MINING AND WAREHOUSE

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) An _____ system typically adopts either a star or a snowflake model.

a) OLAP	b) OLTP
c) OLEP	d) None of these
 - 2) A _____ is a set of views over operational databases.

a) Data mart	b) Virtual warehouse
c) Enterprise warehouse	d) None of these
 - 3) _____, which converts data from legacy or host format to warehouse format.

a) Data extraction	b) Data cleaning
c) Data Transformation	d) Refresh
 - 4) This kind of schema can be viewed as a collection of stars, and hence is called a galaxy schema.

a) Fact constellation	b) Snowflake
c) Star	d) None of these
 - 5) _____ is a visualization operation that rotates the data axes in view to provide an alternative data presentation.

a) Slice	b) Dice
c) Rotate	d) Pivot
 - 6) The process of finding a model that describes and distinguishes data classes or concepts.

a) Data Characterization	b) Data Classification
c) Data Discrimination	d) Data Selection
 - 7) The full form of OLAP is _____

a) Online Analytical Processing	b) Online Advanced Processing
c) Online Advanced Preparation	d) Online Analytical Performance
 - 8) The type of relationship in star schema is _____

a) Many to many	b) One to one
c) One to many	d) Many to one
 - 9) _____ defines the structure of the data held in operational databases and used by operational applications.

a) User-level metadata	b) Data warehouse metadata
c) Operational metadata	d) Data mining metadata
 - 10) Classification rules are extracted from _____

a) Root node	b) Decision tree
c) Siblings	d) Branches

B)	State True or False.	04
1)	The kind of knowledge to be mined specifies the data mining functions to be performed, such as characterization, association, classification, clustering or revolution analysis.	
2)	An OLTP system typically adopts either a star or a snowflake model.	
3)	A centroid-based partitioning technique uses the centroid of a cluster, C_i , to represent that cluster.	
4)	An agglomerative hierarchical clustering method uses a top-down strategy.	
Q.2	A) Write short notes on the following.	08
a)	Slice and dice operation	
b)	Data transformation	
B)	Answer the following.	06
a)	Explain divisive hierarchical clustering method with example	
b)	What is noise? Explain the binning technique in short.	
Q.3	Answer the following	14
a)	What is Data warehouse? Explain the architecture of data warehouse.	
b)	Explain various OLAP operations.	
Q.4	Answer the following	14
a)	What is association rule? How associations rules generated in single dimensional Databases? Explain with example.	
b)	State and explain data mining primitives with suitable example.	
Q.5	Answer the following.	14
a)	Explain the procedure of Back propagation method in detail.	
b)	State and explain the steps in k-means algorithm.	
Q.6	Answer the following.	14
a)	What is classification? Explain the steps in decision tree induction method.	
b)	Explain various new trends in data mining.	
Q.7	Answer the following.	14
a)	What is Cluster analysis? Explain Density-based clustering method with example.	
b)	Explain the features of data mining query language.	

Seat No.	
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Set P

M.C.A. (Semester - IV) (New) (CBCS) Examination Mar/Apr-2018
Science
UML

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives. 10

- 1) An object symbol is divided into what parts?
 - a) Top compartment
 - b) Bottom compartment
 - c) All of the above
 - d) None of the above
- 2) Which among these are the rules to be considered to form class diagram?
 - a) Class symbols must have at least a name compartment.
 - b) Compartment can be in a random order
 - c) Attributes and operations can be listed at any suitable place
 - d) None of the above.
- 3) Which of the following states about concurrent region?
 - a) It is concurrent composite state contain two or more concurrent state diagrams separated by dashed lines.
 - b) The concurrent state diagrams specify finite automata that execute in parallel
 - c) All of the above
 - d) None of the above
- 4) What does a deployment diagram consists of?
 - a) Computational resource
 - b) Communication path between resource.
 - c) Artifacts that execute resource.
 - d) All of the above.
- 5) Which of the following is not element of UML diagram notation?
 - a) Icons
 - b) Vertex
 - c) String
 - d) None of the above
- 6) Abstraction is classified into _____ types.
 - a) 4
 - b) 3
 - c) 2
 - d) 1
- 7) Which of these are parts of class operation specification format?
 - a) Name
 - b) Parameter List
 - c) Return type list
 - d) All of the above
- 8) An attribute is a data item held by which of following?
 - a) Class
 - b) Object
 - c) All of the above
 - d) None of the above
- 9) Which of the following are composite states?
 - a) A sequential Composite state
 - b) A concurrent Composite state
 - c) All of the above
 - d) None of the above

10) Which among the following are not the valid notations for package & component diagram?	
a) Notes	b) Box
c) Extension mechanisms	d) Packages
B) State True or False.	04
1) A node is a computational resource.	
2) A property is a characteristic of the entity designated by a model element.	
3) A stereotype is a UML model element given more specific meaning.	
4) Use case can last for more than one session.	
Q.2 A) Write short notes on the following.	08
1) Activity diagrams.	
2) Relationships in structural modeling.	
B) Explain the following terms.	06
1) State Machines	
2) Priority call back Mechanism.	
Q.3 Answer the following.	14
a) What is UML? Explain conceptual model of UML.	
b) Explain the difference between interaction diagram and collaboration diagram.	
Q.4 Answer the following.	14
a) What is a package? How it is represented in UML? Describe importing and exporting of packages.	
b) Draw the use case diagram for online digital library system.	
Q.5 Answer the following.	14
a) Explain various notations used in UML.	
b) What are the modeling techniques for component diagram?	
Q.6 Answer the following.	14
a) Explain object oriented design methodology with Grady Booch's approach.	
b) Explain in detail in common mechanism used in structural modeling.	
Q.7 Answer the following.	14
a) Describe the various steps in constructing object model?	
b) Explain the terms and concepts used in deployment diagram?	

Seat No.	
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Set	P
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M.C.A. (Semester - IV) (New) (CBCS) Examination Mar/Apr-2018
Science
FINITE AUTOMATA

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) There are _____ tuples in Pushdown Automata.

a) 5	b) 6
c) 7	d) None of the above
 - 2) Regular languages are closed under _____

a) Intersection	b) Homomorphism
c) Difference	d) All of the these
 - 3) Number of states in finite automata that will accept all the strings ending with ab over {a,b} is _____

a) 3	b) 2
c) 4	d) 5
 - 4) The machine that uses stack as memory is _____

a) PDA	b) DFA
c) NFA	d) Turing Machine
 - 5) Which of the following language is not context free?

a) $L = \{a^m b^m c^m \mid m \geq 1\}$	b) $L = \{a^m b^n c^{m+n} \mid n, m \geq 1\}$
c) $L = \{a^n b^n \mid n \geq 1\}$	d) None of the above
 - 6) According to Chomsky hierarchy the language accepted by finite automata is _____

a) Regular	b) Non-regular
c) Context free	d) None of the above
 - 7) If L_1 and L_2 are regular then $L_1 - L_2$ is _____

a) Regular	b) Non Regular
c) Context Free	d) None of the above
 - 8) Regular expression for a language accepting all the strings having exactly two 0's over {0,1} is _____

a) $1^* 0 1^* 0 1^*$	b) $00 (0+1)^*$
c) $0 (0+1)^*$	d) $0 1^* 0$
 - 9) In Push Down Automata Γ represents _____

a) Set of stack symbols	b) Set of input alphabet
c) Set of states	d) None of the above
 - 10) The Chomsky Normal form converts the parser tree of the grammar into _____

a) Binary tree	b) AVL tree
c) General tree	d) None of the above

- B) State True or False.** 04
- 1) Type 0 languages are context free languages.
 - 2) In Greibach Normal Form there is single terminal in the right hand side of the production rule.
 - 3) Regular languages are also accepted by Turing machine.
 - 4) Regular languages are not closed under Kleene closure.
- Q.2 A) Write short notes on the following.** 08
- a) What is GNF? Explain with example
 - b) Explain Context Free Languages Regular Languages.
- B) Write a short note on** 06
- a) Deterministic Push Down Automata.
 - b) Derivation tree or parser tree.
- Q.3 a)** What is leftmost and rightmost derivation? Produce the string “id+id*id” using leftmost and rightmost derivation and also construct parser tree for following grammar G (E, {id, +,*}, P, E) where P is given by 08

$$E \rightarrow E+E \mid E^*E \mid id$$
- b)** Construct ϵ -NFA for following regular expression. 06

$$(01 + 10)^* + 1. 1^*$$
- Q.4 a)** Construct PDA for following language $L=\{wcw^R \mid w \in \{a, b\}^*\}$ 08
b) Explain closure properties of regular languages. 06
- Q.5 a)** Construct DFA equivalent to following DFA. 08
- | | | | |
|-------------------|----------------|-------------|----------------|
| | 0 | 1 | 2 |
| $\rightarrow q_0$ | $\{q_1, q_4\}$ | q_4 | $\{q_2, q_3\}$ |
| q_1 | \emptyset | q_4 | \emptyset |
| q_2 | \emptyset | \emptyset | $\{q_2, q_3\}$ |
| q_3 | \emptyset | q_4 | \emptyset |
| $*q_4$ | \emptyset | \emptyset | \emptyset |
- b)** What is ambiguous grammar? Check whether following grammar is ambiguous or not to generate the string “ibtiaeae”, if found remove the ambiguity from following grammar. 06
- $$S \rightarrow iCtS \mid iCtSeS \mid a$$
- $$C \rightarrow b$$
- Q.6 a)** Construct Turing machine for following language. 08
 $L = \{a^n b^n \mid n \geq 1\}$
- b)** Construct DFA for $L = L_1 \cap L_2$ over {a, b} where, 06
 L₁=Set of all strings of even length
 L₂=Set of all strings starting with b
- Q.7 a)** Convert following grammar into CNF. 08
- $$S \rightarrow BBB \mid A$$
- $$A \rightarrow \epsilon$$
- $$B \rightarrow bB \mid A$$
- b)** Prove that the language $L = \{a^n b^{n+1} \mid n \geq 1\}$ is not regular. 06

Seat No.	
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Set	P
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M.C.A. (Semester - IV) (New) (CBCS) Examination Mar/Apr-2018
Science
Distributed Operating System

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

- 1) In the token passing of distributed system, processes are organized in a ring structure.

a) Logically	b) Physically
c) Both a and b	d) None of the above
- 2) If timestamp of two events are same then the events are

a) Concurrent	b) non-concurrent
c) monotonic	d) blocked
- 3) If one site fails in distributed system

a) All the site will stop working	b) The remaining sites can continue operating
c) Directly connected site will stop working	d) All of the above
- 4) _____ of the distributed file system are dispersed among various machines of distributed system.

a) Client	b) Server
c) Storage devices	d) All of the above
- 5) _____ is not possible in distributed file system.

a) File replication	b) Migration
c) Client interface	d) Remote access
- 6) Network operating system runs on_____

a) Server	b) Every system in the server
c) Both (a) and (b)	d) None of the above
- 7) RPC provides (an) _____ on the client side, a separate one for each remote procedure.

a) Stub	b) Identifier
c) Name	d) Process identifier
- 8) In a distributed system, link and site failure is detected by

a) Polling	b) Handshaking
c) Token passing	d) Socket
- 9) Mutual exclusion can be provided by the _____

a) Mutex locks	b) Binary semaphore
c) Both(a) and (b)	d) None of the above
- 10) Logical extension of computational migration is

a) System migration	b) Process migration
c) Thread migration	d) Data migration

B)	State True or False.	04
1)	According to the ring algorithm, links between processes are unidirectional	
2)	A collection of instruction that perform a single logical function is called transaction.	
3)	Data replication is favored where most process requests are read-only and where the data are relatively static.	
4)	Remote procedure calls are used for communication between two processes on separate machine.	
Q.2	A) Write short notes on the following.	08
1)	File Replication	
2)	Message switching	
B)	Answer the following.	06
1)	Explain domain name system	
2)	What is virtual memory?	
Q.3	Answer the following	
a)	Which are the different techniques to avoid deadlock in distributed operating system?	07
b)	Discuss the communication protocol used in RPC.	07
Q.4	Answer the following	
a)	Explain client-server model in detail	07
b)	Explain clock synchronization in detail.	07
Q.5	Answer the following.	
a)	Discuss message forwarding mechanism in process migration	07
b)	Why do we use election algorithm. Explain Bully algorithm.	07
Q.6	Answer the following.	
a)	Describe distributed approach for implementing mutual exclusion in distributed system.	07
b)	Discuss about the distributed file system.	07
Q.7	Answer the following.	
a)	What are the main difference between a network and distributed operating system?	07
b)	Explain resource sharing in distribute environment.	07

Seat No.	
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Set

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M.C.A. (Semester - IV) (New) (CBCS) Examination Mar/Apr-2018
Science
COMPUTER GRAPHICS

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives. 10

- 1) Each screen point is referred to as _____.
 a) Resolution b) Pixel
 c) Persistence d) Dot Pitch
- 2) _____ is the number of points per centimeter that can be plotted horizontally and vertically.
 a) Aspect Ratio b) Pixel Depth
 c) Resolution d) Dot Pitch
- 3) The purpose of refreshing a CRT is _____.
 a) To avoid flickering b) To maintain steady picture
 c) To avoid fading of pixels d) All of these
- 4) Identify the odd one out.
 a) Mouse b) Keyboard
 c) Trackball d) Space ball
- 5) The refresh rate below which a picture flicker is _____.
 a) 25 b) 30
 c) 35 d) 60
- 6) The transformation in which an object is moved in a minimum distance path from one position to another is called _____.
 a) Rotation b) Replacement
 c) Translation d) Scaling
- 7) In graphics applications, a rectangular area in which text or graphics can appear is known as _____.
 a) Circle b) Ellipse
 c) Frame d) Box
- 8) PHIGS stands for _____.
 a) Parallel Hierarchical Interactive Graphics Standard
 b) Programmers Hierarchical Interactive Graphics Standard
 c) Plain Hierarchical Interactive Graphics Software
 d) Programmers High Internal Graphics Standard
- 9) The display area of the part selected or the form in which the selected part is viewed is known as _____.
 a) Window b) View port
 c) Resolution d) DDA

10) Which of the following are the steps involved in 3D transformation?

- i. Modeling Transformation
 - ii. Viewing Transformation
 - iii. Projection Transformation
 - iv. Workstation Transformation
- a) Only i) and ii)
 - b) Only iii) and iv)
 - c) Only i) and iii)
 - d) All i), ii) iii) and iv)

B) State whether True or False.

04

- 1) The Raster scan system is a scanning technique in which the electrons sweep from top to bottom and from left to right.
- 2) The shearing transformation actually slants the object along the X direction or the Y direction as required.
- 3) The projection transforms 3D objects into a 2D projection plane.
- 4) Coordinates of window are known as Cartesian coordinates.

Q.2 A) Write short notes on the following.

08

- 1) Raster Scan Display
- 2) Point and line clipping

B) Answer the following.

06

- 1) Describe working of any one input device.
- 2) What is view port?

Q.3 Answer the following.

14

- a) Explain DDA line generation algorithm.
- b) What is projection? Explain in detail.

Q.4 Answer the following.

14

- a) Describe Sutherland Hodgmen polygon clipping procedure.
- b) Describe various applications of computer graphics.

Q.5 Answer the following.

14

- a) Distinguish between random scan display and raster scan display.
- b) What are the steps involved in 3D transformation?

Q.6 Answer the following.

14

- a) Explain the concept of segments and segment table in computer graphics.
- b) Explain line and area fill attributes of output primitives.

Q.7 Answer the following.

14

- a) Describe the midpoint method for line generation.
- b) Explain Cohen Sutherland line clipping procedure.

Seat No.	
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Set P

M.C.A. (Semester - IV) (Old) (CBCS) Examination Mar/Apr-2018
Science
.NET

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) Which of these exceptions will occur if we try to access the index of an array beyond its length?
a) ArithmeticException b) ArrayException
c) ArrayArgumentException d) IndexOutOfRangeException
 - 2) Which of the following is a type of stream in C#?
a) Integer stream b) Character stream
c) Bytes stream d) Long stream
 - 3) Which of the following keywords is used by the calling function to guard against the exception that is thrown by called function?
a) Try b) Throw
c) Throws d) Catch
 - 4) Which of the following is not a namespace in the .NET Framework Class Library?
a) System.Process b) System.Security
c) System.Threading d) Systgem.xml
 - 5) Which of the following are parts of the .NET Framework?
 1. The Common Language Runtime (CLR)
 2. The Framework Class Libraries (FCL)
 3. Microsoft Published Web Services
 4. Applications deployed on IIS
 5. Mobile Applications
a) Only 1, 2, 3 b) Only 1, 2
c) Only 1, 2, 4 d) Only 4, 5
 - 6) Which of these is a method used to clear all the data present in output buffers?
a) clear() b) flush()
c) fflush() d) close()
 - 7) Which of the following is used to perform all input & output operations in C#?
a) Streams b) Variables
c) Classes d) Methods
 - 8) Which of the following is not a namespace in the .NET Framework Class Library?
a) System.Process b) System.Security
c) System.Threading d) System.xml

- 9) What is the value of double constant 'E' defined in Math class?
a) Approximately 3 b) Approximately 3.14
c) Approximately 2.72 d) Approximately 0
- 10) What is the use of try & catch?
a) It is used to manually handle the exception
b) It helps to fix the errors
c) It prevents automatic terminating of the program in cases when an exception occurs
d) All of the mentioned

B) State True or False. 04

- 1) Boolean is the data type return in IsPostBack property.
- 2) Load is first method that is fired during the page load.
- 3) JAVASCRIPT is default scripting language in ASP.
- 4) Text is a property common to every validation control.

Q.2 A) Write short notes on the following. 08

- 1) Exception Handling
- 2) Cross page posting

B) Answer the following. 06

- 1) What is use of validation groups? Explain in detail.
- 2) What is the use of AutoPostBack properties explain with example?

Q.3 Answer the following. 14

- a) What is namespace? Explain how to create namespace with example.
- b) Design a windows application and write code to inserts a student record.

Q.4 Answer the following. 14

- a) Explain components of .NET Framework.
- b) What is inheritance? Explain with example.

Q.5 Answer the following. 14

- a) What is master page? Write stepwise process of creating master page.
- b) Explain App-Global Resources and App-Local Resources with example.

Q.6 Answer the following. 14

- a) What is preprocessor? Describe different preprocessors in C#.
- b) Differentiate in between ASP and ASP.NET

Q.7 Answer the following. 14

- a) What is State management? Explain Cookies in ASP.NET?
- b) What is validation? Explain Compare Validator, RegularExpression Validator.

Seat No.	
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Set P

M.C.A. (Semester - IV) (Old) (CBCS) Examination Mar/Apr-2018
Science
DATA MINING AND WAREHOUSE

Time: 2½ Hours

Max. Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives. 10

- 1) An _____ system typically adopts either a star or a snowflake model.
a) OLAP b) OLTP
c) OLEP d) None of these
- 2) A _____ is a set of views over operational databases.
a) Data mart b) Virtual warehouse
c) Enterprise warehouse d) None of these
- 3) _____, which converts data from legacy or host format to warehouse format.
a) Data extraction b) Data cleaning
c) Data Transformation d) Refresh
- 4) This kind of schema can be viewed as a collection of stars, and hence is called a galaxy schema.
a) Fact constellation b) Snowflake
c) Star d) None of these
- 5) _____ is a visualization operation that rotates the data axes in view to provide an alternative data presentation.
a) Slice b) Dice
c) Rotate d) Pivot
- 6) The process of finding a model that describes and distinguishes data classes or concepts.
a) Data Characterization b) Data Classification
c) Data Discrimination d) Data Selection
- 7) The full form of OLAP is _____
a) Online Analytical Processing b) Online Advanced Processing
c) Online Advanced Preparation d) Online Analytical Performance
- 8) The type of relationship in star schema is _____
a) Many to many b) One to one
c) One to many d) Many to one
- 9) _____ defines the structure of the data held in operational databases and used by operational applications.
a) User-level metadata b) Data warehouse metadata
c) Operational metadata d) Data mining metadata
- 10) Classification rules are extracted from _____
a) Root node b) Decision tree
c) Siblings d) Branches

B)	State True or False.	04
1)	The kind of knowledge to be mined specifies the data mining functions to be performed, such as characterization, association, classification, clustering or revolution analysis.	
2)	An OLTP system typically adopts either a star or a snowflake model.	
3)	A centroid-based partitioning technique uses the centroid of a cluster, C_i , to represent that cluster.	
4)	An agglomerative hierarchical clustering method uses a top-down strategy.	
Q.2	A) Write short notes on the following.	08
a)	Slice and dice operation	
b)	Data transformation	
B)	Answer the following.	06
a)	Explain divisive hierarchical clustering method with example	
b)	What is noise? Explain the binning technique in short.	
Q.3	Answer the following	14
a)	What is Data warehouse? Explain the architecture of data warehouse.	
b)	Explain various OLAP operations.	
Q.4	Answer the following	14
a)	What is association rule? How associations rules generated in single dimensional Databases? Explain with example.	
b)	State and explain data mining primitives with suitable example.	
Q.5	Answer the following.	14
a)	Explain the procedure of Back propagation method in detail.	
b)	State and explain the steps in k-means algorithm.	
Q.6	Answer the following.	14
a)	What is classification? Explain the steps in decision tree induction method.	
b)	Explain various new trends in data mining.	
Q.7	Answer the following.	14
a)	What is Cluster analysis? Explain Density-based clustering method with example.	
b)	Explain the features of data mining query language.	

Seat No.	
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Set P

M.C.A. (Semester - IV) (Old) (CBCS) Examination Mar/Apr-2018
Science
UML

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
2) Attempt any 3 questions from Q. no. 3 to Q. no. 7.
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives. 10

- 1) An object symbol is divided into what parts?
 - a) Top compartment
 - b) Bottom compartment
 - c) All of the above
 - d) None of the above
- 2) Which among these are the rules to be considered to form class diagram?
 - a) Class symbols must have at least a name compartment.
 - b) Compartment can be in a random order
 - c) Attributes and operations can be listed at any suitable place
 - d) None of the above.
- 3) Which of the following states about concurrent region?
 - a) It is concurrent composite state contain two or more concurrent state diagrams separated by dashed lines.
 - b) The concurrent state diagrams specify finite automata that execute in parallel
 - c) All of the above
 - d) None of the above
- 4) What does a deployment diagram consists of?
 - a) Computational resource
 - b) Communication path between resource.
 - c) Artifacts that execute resource.
 - d) All of the above.
- 5) Which of the following is not element of UML diagram notation?
 - a) Icons
 - b) Vertex
 - c) String
 - d) None of the above
- 6) Abstraction is classified into _____ types.
 - a) 4
 - b) 3
 - c) 2
 - d) 1
- 7) Which of these are parts of class operation specification format?
 - a) Name
 - b) Parameter List
 - c) Return type list
 - d) All of the above
- 8) An attribute is a data item held by which of following?
 - a) Class
 - b) Object
 - c) All of the above
 - d) None of the above
- 9) Which of the following are composite states?
 - a) A sequential Composite state
 - b) A concurrent Composite state
 - c) All of the above
 - d) None of the above

10) Which among the following are not the valid notations for package & component diagram?	
a) Notes	b) Box
c) Extension mechanisms	d) Packages
B) State True or False.	04
1) A node is a computational resource.	
2) A property is a characteristic of the entity designated by a model element.	
3) A stereotype is a UML model element given more specific meaning.	
4) Use case can last for more than one session.	
Q.2 A) Write short notes on the following.	08
1) Activity diagrams.	
2) Relationships in structural modeling.	
B) Explain the following terms.	06
1) State Machines	
2) Priority call back Mechanism.	
Q.3 Answer the following.	14
a) What is UML? Explain conceptual model of UML.	
b) Explain the difference between interaction diagram and collaboration diagram.	
Q.4 Answer the following.	14
a) What is a package? How it is represented in UML? Describe importing and exporting of packages.	
b) Draw the use case diagram for online digital library system.	
Q.5 Answer the following.	14
a) Explain various notations used in UML.	
b) What are the modeling techniques for component diagram?	
Q.6 Answer the following.	14
a) Explain object oriented design methodology with Grady Booch's approach.	
b) Explain in detail in common mechanism used in structural modeling.	
Q.7 Answer the following.	14
a) Describe the various steps in constructing object model?	
b) Explain the terms and concepts used in deployment diagram?	

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M.C.A. (Semester - IV) (Old) (CBCS) Examination Mar/Apr-2018
Science
FINITE AUTOMATA

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) There are _____ tuples in Pushdown Automata.

a) 5	b) 6
c) 7	d) None of the above
 - 2) Regular languages are closed under _____

a) Intersection	b) Homomorphism
c) Difference	d) All of the these
 - 3) Number of states in finite automata that will accept all the strings ending with ab over {a,b} is _____

a) 3	b) 2
c) 4	d) 5
 - 4) The machine that uses stack as memory is _____

a) PDA	b) DFA
c) NFA	d) Turing Machine
 - 5) Which of the following language is not context free?

a) $L = \{a^m b^m c^m \mid m \geq 1\}$	b) $L = \{a^m b^n c^{m+n} \mid n, m \geq 1\}$
c) $L = \{a^n b^n \mid n \geq 1\}$	d) None of the above
 - 6) According to Chomsky hierarchy the language accepted by finite automata is _____

a) Regular	b) Non-regular
c) Context free	d) None of the above
 - 7) If L_1 and L_2 are regular then $L_1 - L_2$ is _____

a) Regular	b) Non Regular
c) Context Free	d) None of the above
 - 8) Regular expression for a language accepting all the strings having exactly two 0's over {0,1} is _____

a) $1^* 0 1^* 0 1^*$	b) $00 (0+1)^*$
c) $0 (0+1)^*$	d) $0 1^* 0$
 - 9) In Push Down Automata Γ represents _____

a) Set of stack symbols	b) Set of input alphabet
c) Set of states	d) None of the above
 - 10) The Chomsky Normal form converts the parser tree of the grammar into _____

a) Binary tree	b) AVL tree
c) General tree	d) None of the above

- B) State True or False.** 04
- 1) Type 0 languages are context free languages.
 - 2) In Greibach Normal Form there is single terminal in the right hand side of the production rule.
 - 3) Regular languages are also accepted by Turing machine.
 - 4) Regular languages are not closed under Kleene closure.
- Q.2 A) Write short notes on the following.** 08
- a) What is GNF? Explain with example
 - b) Explain Context Free Languages Regular Languages.
- B) Write a short note on** 06
- a) Deterministic Push Down Automata.
 - b) Derivation tree or parser tree.
- Q.3 a)** What is leftmost and rightmost derivation? Produce the string “id+id*id” using leftmost and rightmost derivation and also construct parser tree for following grammar G (E, {id, +,*}, P, E) where P is given by 08

$$E \rightarrow E+E \mid E^*E \mid id$$
- b)** Construct ϵ -NFA for following regular expression. 06

$$(01 + 10)^* + 1. 1^*$$
- Q.4 a)** Construct PDA for following language $L=\{wcw^R \mid w \in \{a, b\}^*\}$ 08
b) Explain closure properties of regular languages. 06
- Q.5 a)** Construct DFA equivalent to following DFA. 08
- | | | | |
|-------------------|----------------|-------------|----------------|
| | 0 | 1 | 2 |
| $\rightarrow q_0$ | $\{q_1, q_4\}$ | q_4 | $\{q_2, q_3\}$ |
| q_1 | \emptyset | q_4 | \emptyset |
| q_2 | \emptyset | \emptyset | $\{q_2, q_3\}$ |
| q_3 | \emptyset | q_4 | \emptyset |
| $*q_4$ | \emptyset | \emptyset | \emptyset |
- b)** What is ambiguous grammar? Check whether following grammar is ambiguous or not to generate the string “ibtiaeae”, if found remove the ambiguity from following grammar. 06
- $$S \rightarrow iCtS \mid iCtSeS \mid a$$
- $$C \rightarrow b$$
- Q.6 a)** Construct Turing machine for following language. 08
 $L = \{a^n b^n \mid n \geq 1\}$
- b)** Construct DFA for $L = L_1 \cap L_2$ over {a, b} where, 06
 L₁=Set of all strings of even length
 L₂=Set of all strings starting with b
- Q.7 a)** Convert following grammar into CNF. 08
- $$S \rightarrow BBB \mid A$$
- $$A \rightarrow \epsilon$$
- $$B \rightarrow bB \mid A$$
- b)** Prove that the language $L = \{a^n b^{n+1} \mid n \geq 1\}$ is not regular. 06

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M.C.A. (Semester - IV) (Old) (CBCS) Examination Mar/Apr-2018
Science
Distributed Operating System

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

- 1) In the token passing of distributed system, processes are organized in a ring structure.

a) Logically	b) Physically
c) Both a and b	d) None of the above
- 2) If timestamp of two events are same then the events are

a) Concurrent	b) non-concurrent
c) monotonic	d) blocked
- 3) If one site fails in distributed system

a) All the site will stop working	b) The remaining sites can continue operating
c) Directly connected site will stop working	d) All of the above
- 4) _____ of the distributed file system are dispersed among various machines of distributed system.

a) Client	b) Server
c) Storage devices	d) All of the above
- 5) _____ is not possible in distributed file system.

a) File replication	b) Migration
c) client interface	d) remote access
- 6) Network operating system runs on_____

a) Server	b) Every system in the server
c) Both (a) and (b)	d) None of the above
- 7) RPC provides (an) _____ on the client side, a separate one for each remote procedure.

a) Stub	b) Identifier
c) Name	d) Process identifier
- 8) In a distributed system, link and site failure is detected by

a) Polling	b) Handshaking
c) Token passing	d) Socket
- 9) Mutual exclusion can be provided by the _____

a) Mutex locks	b) Binary semaphore
c) Both(a) and (b)	d) None of the above
- 10) Logical extension of computational migration is

a) System migration	b) Process migration
c) Thread migration	d) Data migration

B)	State True or False.	04
1)	According to the ring algorithm, links between processes are unidirectional.	
2)	A collection of instruction that perform a single logical function is called transaction.	
3)	Data replication is favored where most process requests are read-only and where the data are relatively static.	
4)	Remote procedure calls are used for communication between two processes on separate machine.	
Q.2	A) Write short notes on the following.	08
1)	File Replication	
2)	Message switching	
B)	Answer the following.	06
1)	Explain domain name system.	
2)	What is virtual memory?	
Q.3	Answer the following.	
a)	Which are the different techniques to avoid deadlock in distributed operating system?	07
b)	Discuss the communication protocol used in RPC.	07
Q.4	Answer the following.	
a)	Explain client-server model in detail.	07
b)	Explain clock synchronization in detail.	07
Q.5	Answer the following.	
a)	Discuss message forwarding mechanism in process migration.	07
b)	Why do we use election algorithm. Explain Bully algorithm.	07
Q.6	Answer the following.	
a)	Describe distributed approach for implementing mutual exclusion in distributed system.	07
b)	Discuss about the distributed file system.	07
Q.7	Answer the following.	
a)	What are the main difference between a network and distributed operating system?	07
b)	Explain resource sharing in distribute environment.	07

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M.C.A. (Semester - V) (Old) (CGPA) Examination Mar/Apr-2018
Science
ARTIFICAL INTELLIGENCE

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

- 1) _____ begin with the start symbol and apply the grammar rules forward until symbols at the terminals of the tree correspond to the components of the sentence being parsed.

a) Top-Down parsing	b) Bottom-Up parsing
c) Reverse parsing	d) Object Oriented parsing
- 2) _____ measures the strength of the evidence in favour of a set of propositions.

a) Disbelief	b) Means-Ends Analysis
c) Belief	d) Production system
- 3) _____ is an act to represent building of new information out of old.

a) INGEST	b) ATTEND
c) MBUILD	d) GRASP
- 4) _____ reasoning suggest to generate the next level by taking each node generated at the previous level and applying to it all of the rules whose left sides match it.

a) Backward	b) Forward
c) Certainty	d) Declarative Knowledge
- 5) The average branching factor Chess game is _____

a) 50	b) 35
c) 60	d) 100
- 6) The real-world facts would be represented as logical propositions written as _____ in propositional logic.

a) Well designed formulas	b) Well formed formulas
c) Well connected formulas	d) Well clausal formulas
- 7) _____ is a program that provides advice on mineral exploration.

a) DESIGN ADVISOR	b) PROSPECTOR
c) R1	d) MOLE
- 8) _____ is the ability to acquire new information easily.

a) Inquisition Efficiency	b) Investigation Efficiency
c) Adequate Efficiency	d) Acquisition Efficiency
- 9) A two list *OPEN* and *CLOSED* are used in the _____ algorithm.

a) AO*	b) A*
c) AND-OR	d) Hill climbing
- 10) The first requirement of a good _____ is that it causes motion.

a) Iterative deepening	b) Control strategy
c) Problem obstruction	d) Conceptual dependency

- B) State True or False.** 04
- 1) Abstraction provides a way of solving problems for which no more direct approach is available.
 - 2) Recoverable problems are those in which solution steps cannot be undone.
 - 3) DENDRAL is a program that infers the structure of organic compounds using mass spectrogram and nuclear magnetic resonance data.
 - 4) Matching is a collection of attributes and associated values that describes some entity in the word.
- Q.2 A) Write short notes on the following.** 08
- a) AI Technique
 - b) Semantic Net
- B) Answer the following.** 06
- a) What do you mean by Best first search?
 - b) State Bayes Theorem in brief.
- Q.3 Answer the following** 14
- a) What do you mean by Game Playing? Consider the following game tree having static score from player I points of view, suppose player I is maximizing player. What move should be chosen?
- ```

graph TD
 A[A] --- B[B]
 A --- C[C]
 A --- D[D]
 B --- E[E]
 B --- F[F]
 B --- G[G]
 C --- H[H]
 C --- I[I]
 D --- J[J]
 D --- K[K]
 E --- L[L]
 E --- M[M]
 F --- N[N]
 F --- O[O]
 G --- P[P]
 G --- Q[Q]
 H --- R[R]
 H --- S[S]
 H --- T[T]
 I --- U[U]
 J --- V[V]
 J --- W[W]
 K --- X[X]
 K --- Y[Y]

```

(7) (6) (8) (5) (2) (3) (0) (-2) (6) (2) (5) (8) (9) (2)
- b) What do you mean by Resolution? Explain in detail concept of conversion to clause form with suitable example?
- Q.4 Answer the following** 07
- a) What do you mean by Artificial Intelligence? Explain in detail task domains of it.
  - b) What do you mean by knowledge representation? Explain in detail approaches of knowledge representation?
- Q.5 Answer the following.** 07
- a) What do you mean by Heuristic search technique? Discuss concept of constraint satisfaction to solve following crypt-arithmetic problem.  
CROSS  
+ROADS  
DANGER
  - b) What do you mean by production system? Discuss in detail production system characteristics with suitable example.

**Q.6 Answer the following.**

- a) Define the term Matching. Discuss in detail various ways to do Matching with example. 07
- b) What do you mean by Natural Language Processing? Discuss various step of it in detail. 07

**Q.7 Answer the following.**

- a) Define the term expert system? Explain the knowledge acquisition activities in detail. 07
- b) What do you mean by Script? Write a College Canteen script with a story: "*Hemant went to Canteen. He ordered Bread and Butter. He ate food and ordered tea. He paid bill and left for class.*" 07

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**M.C.A. (Semester - V) (Old) (CGPA) Examination Mar/Apr-2018**  
**Science**  
**WEB DESIGN TECHNIQUES**

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.  
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7.  
 3) Figures to the right indicate full marks.

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

- 1) Choose the correct HTML element for the largest heading:
  - a) <heading>
  - b) <head>
  - c) <h6>
  - d) <h1>
- 2) What is the correct HTML for creating a hyperlink?
  - a) <a href =“http://www.w3schools.com”>W3Schools </a>
  - b) <a name=“http://www.w3schools.com”> W3Schools.com </a>
  - c) <a url=“http://www.w3schools.com”>W3Schools.com</a>
  - d) <a>http://www.w3schools.com</a>
- 3) What is the correct HTML for making a checkbox?
  - a) <checkbox>
  - b) <input type=“checkbox”>
  - c) <check>
  - d) <input type=“check”>
- 4) \_\_\_\_\_ JavaScript statements embedded in an HTML page can respond to user events such as mouse-clicks, form input, and page navigation.
  - a) Client-side
  - b) Server-side
  - c) Local
  - d) Native
- 5) Which of the following is not a valid JavaScript variable name?
  - a) 2names
  - b) \_first\_and\_last\_names
  - c) FirstAndLast
  - d) None of the above
- 6) What makes Ajax unique?
  - a) It works as a stand-alone Web-development tool.
  - b) It works the same with all Web browsers.
  - c) It uses C++ as its programming language.
  - d) It makes data requests asynchronously.
- 7) AJAX based on \_\_\_\_\_.
  - a) JavaScript and XML
  - b) JavaScript and Java
  - c) VBScript and XML
  - d) JavaScript and HTTP requests
- 8) What does XML stand for?
  - a) eXtensible Markup Language
  - b) X-Markup Language
  - c) eXtra Modern Link
  - d) Example Markup Language
- 9) Which statement is true?
  - a) All XML elements must be lower case
  - b) All XML elements must be properly closed
  - c) All XML documents must have a DTD
  - d) All the statements are true

|                                                                                                                                                                                |                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 10) Which is not a correct name for an XML element?                                                                                                                            |                                                                                                                                                |
| a) <Note>                                                                                                                                                                      | b) <h1>                                                                                                                                        |
| c) <4dollar>                                                                                                                                                                   | d) All 3 names are incorrect                                                                                                                   |
| <b>B) State True or False.</b>                                                                                                                                                 | <b>04</b>                                                                                                                                      |
| 1) HTML comments start with <!-- and end with -->                                                                                                                              |                                                                                                                                                |
| 2) The external JavaScript file must contain the <script> tag.                                                                                                                 |                                                                                                                                                |
| 3) Ajax is a programming language.                                                                                                                                             |                                                                                                                                                |
| 4) This is a well formed XML document.                                                                                                                                         |                                                                                                                                                |
|                                                                                                                                                                                | <?xml version="1.0"?><br><to>Tove</to><br><from>Jani</from><br><heading>Reminder</heading><br><message>Don't forget me this weekend!</message> |
| <b>Q.2 A) Write short notes on the following.</b>                                                                                                                              | <b>08</b>                                                                                                                                      |
| 1) XSLT                                                                                                                                                                        |                                                                                                                                                |
| 2) DOM                                                                                                                                                                         |                                                                                                                                                |
| <b>B) Answer the following.</b>                                                                                                                                                | <b>06</b>                                                                                                                                      |
| 1) Explain any 3 text formatting tags with suitable example.                                                                                                                   |                                                                                                                                                |
| 2) How to access value of form controls in JavaScript? Explain with example.                                                                                                   |                                                                                                                                                |
| <b>Q.3 Answer the following.</b>                                                                                                                                               | <b>14</b>                                                                                                                                      |
| A) Explain form attributes and any 3 form controls with example.                                                                                                               |                                                                                                                                                |
| B) What is DOM? Explain navigator object properties with example.                                                                                                              |                                                                                                                                                |
| <b>Q.4 Answer the following.</b>                                                                                                                                               |                                                                                                                                                |
| A) What is DOM? Explain following methods with example                                                                                                                         | <b>08</b>                                                                                                                                      |
| 1) after()                                                                                                                                                                     |                                                                                                                                                |
| 2) append()                                                                                                                                                                    |                                                                                                                                                |
| 3) html()                                                                                                                                                                      |                                                                                                                                                |
| 4) remove()                                                                                                                                                                    |                                                                                                                                                |
| B) Design a student registration webpage using all types of CSS.                                                                                                               | <b>06</b>                                                                                                                                      |
| <b>Q.5 Answer the following.</b>                                                                                                                                               |                                                                                                                                                |
| A) Explain the following HTML tags with attributes.                                                                                                                            | <b>08</b>                                                                                                                                      |
| 1) <frame>                                                                                                                                                                     |                                                                                                                                                |
| 2) <select>                                                                                                                                                                    |                                                                                                                                                |
| 3) <image>                                                                                                                                                                     |                                                                                                                                                |
| 4) <table>                                                                                                                                                                     |                                                                                                                                                |
| B) What is XML? Explain internal and external DTD with example                                                                                                                 | <b>06</b>                                                                                                                                      |
| <b>Q.6 Answer the following.</b>                                                                                                                                               |                                                                                                                                                |
| A) What is AJAX? Explain how AJAX works?                                                                                                                                       |                                                                                                                                                |
| B) Write a JavaScript program to print prime numbers between 1 and 100.                                                                                                        |                                                                                                                                                |
| <b>Q.7 Answer the following.</b>                                                                                                                                               | <b>14</b>                                                                                                                                      |
| A) Explain form attributes and any 3 form controls with example.                                                                                                               |                                                                                                                                                |
| B) Write XML file with 5 student records, Write XSLT file to display student record in table format (xml file of student record must contain roll no, student name, dept, div) |                                                                                                                                                |

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**M.C.A. (Semester - V) (Old) (CGPA) Examination Mar/Apr-2018**  
**Science**  
**NETWORK SECURITY**

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.  
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7  
 3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) The \_\_\_\_\_ prevents or inhibits the normal use or management of communications facilities.
 

|                 |                      |
|-----------------|----------------------|
| a) Reply        | b) Denial of service |
| c) Modification | d) Masquerade        |
  - 2) A \_\_\_\_\_ Processes the input elements continuously, producing output one element at a time, as it goes along.
 

|                  |                  |
|------------------|------------------|
| a) Random cipher | b) Block cipher  |
| c) Stream cipher | d) None of these |
  - 3) \_\_\_\_\_ is the original message or data that is fed into the algorithm as input.
 

|               |                  |
|---------------|------------------|
| a) Plaintext  | b) Ciphertext    |
| c) ASCII text | d) None of these |
  - 4) RFC means
 

|                           |                        |
|---------------------------|------------------------|
| a) Response From Customer | b) Request For Common  |
| c) Response From Client   | d) Request For Comment |
  - 5) Pretty good privacy (PGP) is used in
 

|                     |                   |
|---------------------|-------------------|
| a) Browser security | b) Email security |
| c) FTP security     | d) None of these  |
  - 6) One of protocols to provide security at application layer is
 

|                        |                       |
|------------------------|-----------------------|
| a) Pretty good privacy | b) Handshake protocol |
| c) Alert protocol      | d) Record protocol    |
  - 7) A hash function guarantees integrity of a message. It guarantees that message has not been
 

|             |              |
|-------------|--------------|
| a) Replaced | b) Over view |
| c) Changed  | d) Left      |
  - 8) The RSA signature uses which hash algorithm?
 

|                  |                  |
|------------------|------------------|
| a) MD5           | b) SHA-1         |
| c) MD5 and SHA-1 | d) None of these |
  - 9) Which protocol is used to convey SSL related alerts to the peer entity?
 

|                         |                                |
|-------------------------|--------------------------------|
| a) Alert Protocol       | b) Handshake Protocol          |
| c) Upper-Layer Protocol | d) Change Cipher Spec Protocol |
  - 10) The full form of SSL is
 

|                         |                        |
|-------------------------|------------------------|
| a) Serial Session Layer | b) Series Socket Layer |
| c) Session Secure Layer | d) Secure Socket Layer |

|            |                                                                                                                                     |           |
|------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>B)</b>  | <b>State True or False.</b>                                                                                                         | <b>04</b> |
| 1)         | Tunnel mode ESP is used to encrypt an entire IP packet.                                                                             |           |
| 2)         | Passive attack attempts to alter system resources or affect their operation.                                                        |           |
| 3)         | AH covers the packet format and general issues related to the use of the ESP for packet encryption and, optionally, authentication. |           |
| 4)         | The Handshake Protocol is used before any application data is transmitted.                                                          |           |
| <b>Q.2</b> | <b>A) Write short notes on the following.</b>                                                                                       | <b>08</b> |
| a)         | Non-Repudiation                                                                                                                     |           |
| b)         | Passwords                                                                                                                           |           |
| <b>B)</b>  | <b>Answer the following.</b>                                                                                                        | <b>06</b> |
| a)         | What is Authentication Header (AH)? Explain various fields containing AH.                                                           |           |
| b)         | What is Cryptanalysis? Explain various cryptanalytic attacks.                                                                       |           |
| <b>Q.3</b> | <b>Answer the following</b>                                                                                                         |           |
| a)         | What is IPSec Document? Explain IPSec Document overview with well labeled diagram.                                                  | <b>07</b> |
| b)         | What is SSL? Explain SSL Record Protocol.                                                                                           | <b>07</b> |
| <b>Q.4</b> | <b>Answer the following</b>                                                                                                         |           |
| a)         | What is intruder? Explain different types of intrusion techniques.                                                                  | <b>07</b> |
| b)         | State and explain various security services in detail.                                                                              | <b>07</b> |
| <b>Q.5</b> | <b>Answer the following.</b>                                                                                                        |           |
| a)         | What is Attack? Explain different types of Active attack.                                                                           | <b>07</b> |
| b)         | Explain in detail Bell-LaPadula Model with its importance.                                                                          | <b>07</b> |
| <b>Q.6</b> | <b>Answer the following.</b>                                                                                                        |           |
| a)         | What is Access control list? Explain capability list with example.                                                                  | <b>07</b> |
| b)         | What is Authentication? Explain the procedure for Password Authentication Protocol.                                                 | <b>07</b> |
| <b>Q.7</b> | <b>Answer the following.</b>                                                                                                        |           |
| a)         | What is the difference between Block cipher and Stream cipher? Explain with example.                                                | <b>07</b> |
| b)         | What are the different steps in RSA algorithm? Explain with suitable example.                                                       | <b>07</b> |

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**M.C.A. (Semester - V) (Old) (CGPA) Examination Mar/Apr-2018**  
**Science**  
**DIGITAL IMAGE PROCESSING**

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.  
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7  
 3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) Geological exploration uses \_\_\_\_\_
 

|                            |                           |
|----------------------------|---------------------------|
| a) Electromagnetic imaging | b) Microwave band imaging |
| c) Gamma ray imaging       | d) Acoustic imaging       |
  - 2) Size of a binary image is 8 bytes. How many pixels are there in the image?
 

|        |        |
|--------|--------|
| a) 8   | b) 64  |
| c) 128 | d) 512 |
  - 3) Which of the following is *incorrect* statement?
 

|                                                                                              |
|----------------------------------------------------------------------------------------------|
| a) second order derivative must be zero along ramps of constant slope                        |
| b) first order derivative must be zero in flat segments                                      |
| c) second order derivative must be nonzero at the onset and end of a gray-level step or ramp |
| d) first order derivative must be zero along ramps of constant slope                         |
  - 4) Which of the following statement is false related to Fourier transformed image?
 

|                                                       |
|-------------------------------------------------------|
| a) origin will be shifted at the centre               |
| b) spectrum is symmetric about origin                 |
| c) brighter than the original image                   |
| d) at the center average value of image will be there |
  - 5) Which of the following statements is false?
 

|                                                                                    |
|------------------------------------------------------------------------------------|
| a) notch filters must appear in symmetric pairs about the origin                   |
| b) only one pair of notch filter can be implemented at a time                      |
| c) notch filter can be of any shape                                                |
| d) if only one filter appears for notch filter, then the filter must be at origin. |
  - 6) Extraction of outer boundary of an object uses which of the following operations?
 

|                                     |
|-------------------------------------|
| a) dilation followed by subtraction |
| b) erosion followed by subtraction  |
| c) subtraction followed by dilation |
| d) subtraction followed by erosion  |
  - 7) Region filling
    - i. Require multiple types of structuring elements
    - ii. Requires multiple iterations
    - iii. Uses union operation once

|                   |                        |
|-------------------|------------------------|
| a) (i) and (ii)   | b) (i) and (iii)       |
| c) (ii) and (iii) | d) (i), (ii) and (iii) |

- 8) The mask used for line detection is \_\_\_\_\_

  - a) Gaussian
  - b) Laplacian
  - c) Ideal
  - d) Butterworth

9) If shape number of a shape is 03313303, its 4 chain code is \_\_\_\_\_

  - a) 00323211
  - b) 03322101
  - c) 03032211
  - d) 00332121

10) Which of the following statements is false regarding font used to print cheque numbers?

  - a) font name is B-13E
  - b) magnetized ink used for printing
  - c) signal generated based rate of change of characters area
  - d) four special characters are found in the font

**B) Fill in the blanks or true / false**

04

- 1) The chessboard distance between  $(3, 7, -2)$  and  $(5, 4, 3)$  is \_\_\_\_\_
  - 2) The PDF for exponential noise is given as \_\_\_\_\_
  - 3) Expression for hit or miss transform is \_\_\_\_\_
  - 4) The minimum distance classifier gives best performance when the distribution of each class about its mean is in the form of a \_\_\_\_\_ hypercloud in  $n$ -dimensional pattern space.

**Q.2 A) Write short notes on the following.**

08

- a) Zooming techniques
  - b) Basic Formulations of region

**B) Answer the following.**

06

- a) Find shortest m-path between P and Q and give path length for the following:

|   |    |    |   |   |
|---|----|----|---|---|
| 1 | 1P | 1  | 0 | 1 |
| 1 | 0  | 0  | 1 | 0 |
| 1 | 0  | 1  | 0 | 1 |
| 1 | 1  | 0  | 1 | 0 |
| 0 | 1  | 1Q | 1 | 1 |

- b) If the threshold is 250, check whether a line with - 45 degree inclination exists in the following image segment?

|    |     |     |
|----|-----|-----|
| 71 | 30  | 89  |
| 62 | 136 | 90  |
| 1  | 17  | 110 |

### **Q.3 Answer the following**

14

- a) How image can be enhanced using arithmetic/logic operations? What is use of each technique? Discuss.
  - b) For the following image information perform histogram equalization:

| Intensity     | 0 | 1 | 2   | 3   | 4   | 5   | 6  | 7 |
|---------------|---|---|-----|-----|-----|-----|----|---|
| No. of pixels | 0 | 0 | 180 | 400 | 300 | 250 | 80 | 0 |

#### **Q.4 Answer the following**

14

- a)** Derive one and two dimensional Fourier transform and its inverse in continuous domain.

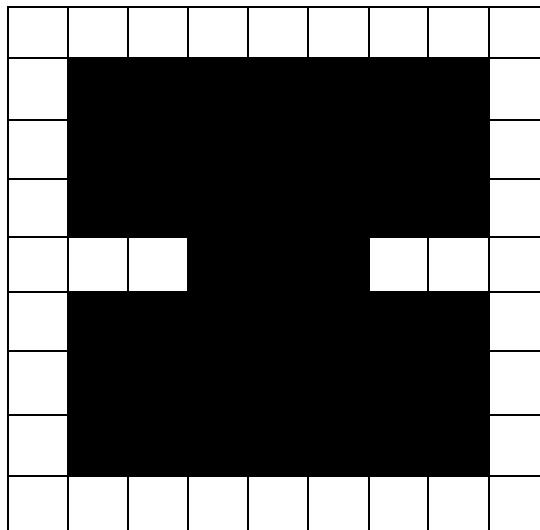
**b)** Perform AND operation between following 8bit image segments.

|     |     |     |     |
|-----|-----|-----|-----|
| A = | 39  | 42  | 63  |
|     | 183 | 201 | 21  |
|     | 143 | 9   | 221 |

|    |    |    |     |
|----|----|----|-----|
| B= | 58 | 35 | 132 |
|    | 29 | 84 | 244 |
|    | 3  | 86 | 125 |

**Q.5 Answer the following.**

- a) Explain design of adaptive filter for noise reduction.  
 b) Extract internal and external boundaries for the following image.

**Q.6 Answer the following.**

- a) What are different relational descriptors? Briefly explain few of them.  
 b) Threshold the following image using Global thresholding algorithm. The initial threshold may be selected using the median filter on entire image and the algorithm iteration must stop when difference of threshold is less than 0.1

|    |    |    |    |
|----|----|----|----|
| 60 | 12 | 33 | 46 |
| 18 | 29 | 45 | 62 |
| 41 | 39 | 12 | 7  |
| 59 | 25 | 26 | 14 |

**Q.7 Answer the following.**

- a) Explain the construction and working of E-13B font character reading system.  
 b) Given the value of pixels in a row of an image, find first and second order derivatives and possible appearance of location of an edge using second order derivatives

10, 10, 10, 10, 40, 70, 80, 90, 100, 110, 120, 120, 120

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**M.C.A. (Semester - V) (Old) (CGPA) Examination Mar/Apr-2018**  
**Science**  
**MOBILE COMPUTING**

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.  
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7  
 3) Figures to the right indicate full marks.

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

- 1) \_\_\_\_\_ allows subscribers to operate in mobile phone service areas other than the service area where the service is subscribed.
 

|                 |                      |
|-----------------|----------------------|
| a) Roaming      | b) Grade of service  |
| c) Both a and b | d) None of the above |
- 2) In cellular technology the concept used is \_\_\_\_\_.
 

|                    |                  |
|--------------------|------------------|
| a) Time Reuse      | b) Code Reuse    |
| c) Frequency Reuse | d) None of these |
- 3) A small division of a given geographical area is known as \_\_\_\_\_.
 

|          |           |
|----------|-----------|
| a) Shell | b) Cell   |
| c) Core  | d) Kernel |
- 4) \_\_\_\_\_ in FDMA is assigned between the spectrum of two adjacent users.
 

|                      |                   |
|----------------------|-------------------|
| a) Interference band | b) Co-inter band  |
| c) Guard band        | d) Inference band |
- 5) The uplink frequency of P-GSM system is \_\_\_\_\_.
 

|                  |                  |
|------------------|------------------|
| a) 1850-1910 MHz | b) 1710-1785 MHz |
| c) 890-915 MHz   | d) None of these |
- 6) The type of access technology used in GSM technology is \_\_\_\_\_.
 

|                |                      |
|----------------|----------------------|
| a) FDMA / TDMA | b) CDMA              |
| c) OFDMA       | d) None of the above |
- 7) A television broadcast is an example of \_\_\_\_\_ transmission.
 

|                |                |
|----------------|----------------|
| a) Simplex     | b) Half-duplex |
| c) Full-duplex | d) Automatic   |
- 8) The \_\_\_\_\_ protocol solves the problem of hidden and exposed terminal.
 

|         |         |
|---------|---------|
| a) PRMA | b) DAMA |
| c) TDMA | d) MACA |
- 9) PSTN stands for \_\_\_\_\_.
 

|                                       |                                     |
|---------------------------------------|-------------------------------------|
| a) Pakistan Service Telephone Network | b) Police Station Telephone Network |
| c) Public Switch Telephone Network    | d) None of the above                |
- 10) The \_\_\_\_\_ xml file that contains all the text that your application uses.
 

|              |               |
|--------------|---------------|
| a) stack.xml | b) string.xml |
| c) text.xml  | d) app.xml    |

|            |                                                                                                                       |           |
|------------|-----------------------------------------------------------------------------------------------------------------------|-----------|
| <b>B)</b>  | <b>State True or False.</b>                                                                                           | <b>04</b> |
| 1)         | EIR is a database that contains information about the identity of mobile equipment.                                   |           |
| 2)         | Fading of the received radio signals in a mobile communication environment occurs because of single path propagation. |           |
| 3)         | The R.java file is where you edit the resources of android project.                                                   |           |
| 4)         | In android there can be only one activity at given time.                                                              |           |
| <b>Q.2</b> | <b>A) Write short notes on the following.</b>                                                                         | <b>08</b> |
| 1)         | Frequency regulations.                                                                                                |           |
| 2)         | Security in GSM system.                                                                                               |           |
| <b>B)</b>  | <b>Answer the following.</b>                                                                                          | <b>06</b> |
| 1)         | What are the applications of mobile computing?                                                                        |           |
| 2)         | Explain the term Medium Access Control.                                                                               |           |
| <b>Q.3</b> | <b>Answer the following.</b>                                                                                          | <b>14</b> |
| <b>A)</b>  | What is multiplexing? Explain time division multiplexing scheme.                                                      |           |
| <b>B)</b>  | Explain how the classic aloha and slotted aloha schemes are implemented.                                              |           |
| <b>Q.4</b> | <b>Answer the following.</b>                                                                                          | <b>14</b> |
| <b>A)</b>  | Name the main elements of GSM system and describe their functions.                                                    |           |
| <b>B)</b>  | Explain the data transfer from mobile node to a correspondent node and vice versa.                                    |           |
| <b>Q.5</b> | <b>Answer the following.</b>                                                                                          | <b>14</b> |
| <b>A)</b>  | Explain the scheme MACA with example.                                                                                 |           |
| <b>B)</b>  | Explain the functional architecture of IEEE802.11.                                                                    |           |
| <b>Q.6</b> | <b>Answer the following.</b>                                                                                          | <b>14</b> |
| <b>A)</b>  | Explain the direct sequence spread spectrum.                                                                          |           |
| <b>B)</b>  | What is congestion control? Explain the mechanism slow start and fast recovery.                                       |           |
| <b>Q.7</b> | <b>Answer the following.</b>                                                                                          | <b>14</b> |
| <b>A)</b>  | Explain android system architecture.                                                                                  |           |
| <b>B)</b>  | How to manage your Wi-Fi using WifiManager android Wi-Fi connectivity service? Explain in brief.                      |           |

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**M.C.A. (Semester - V) (New) (CBCS) Examination Mar/Apr-2018**  
**Science**  
**ARTIFICAL INTELLIGENCE**

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.  
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7  
 3) Figures to the right indicate full marks.

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

10

- 1) \_\_\_\_\_ begin with the start symbol and apply the grammar rules forward until symbols at the terminals of the tree correspond to the components of the sentence being parsed.
 

|                     |                            |
|---------------------|----------------------------|
| a) Top-Down parsing | b) Bottom-Up parsing       |
| c) Reverse parsing  | d) Object Oriented parsing |
- 2) \_\_\_\_\_ measures the strength of the evidence in favour of a set of propositions.
 

|              |                        |
|--------------|------------------------|
| a) Disbelief | b) Means-Ends Analysis |
| c) Belief    | d) Production system   |
- 3) \_\_\_\_\_ is an act to represent building of new information out of old.
 

|           |           |
|-----------|-----------|
| a) INGEST | b) ATTEND |
| c) MBUILD | d) GRASP  |
- 4) \_\_\_\_\_ reasoning suggest to generate the next level by taking each node generated at the previous level and applying to it all of the rules whose left sides match it.
 

|              |                          |
|--------------|--------------------------|
| a) Backward  | b) Forward               |
| c) Certainty | d) Declarative Knowledge |
- 5) The average branching factor Chess game is \_\_\_\_\_
 

|       |        |
|-------|--------|
| a) 50 | b) 35  |
| c) 60 | d) 100 |
- 6) The real-world facts would be represented as logical propositions written as \_\_\_\_\_ in propositional logic.
 

|                            |                          |
|----------------------------|--------------------------|
| a) Well designed formulas  | b) Well formed formulas  |
| c) Well connected formulas | d) Well clausal formulas |
- 7) \_\_\_\_\_ is a program that provides advice on mineral exploration.
 

|                   |               |
|-------------------|---------------|
| a) DESIGN ADVISOR | b) PROSPECTOR |
| c) R1             | d) MOLE       |
- 8) \_\_\_\_\_ is the ability to acquire new information easily.
 

|                           |                             |
|---------------------------|-----------------------------|
| a) Inquisition Efficiency | b) Investigation Efficiency |
| c) Adequate Efficiency    | d) Acquisition Efficiency   |
- 9) A two list *OPEN* and *CLOSED* are used in the \_\_\_\_\_ algorithm.
 

|           |                  |
|-----------|------------------|
| a) AO*    | b) A*            |
| c) AND-OR | d) Hill climbing |
- 10) The first requirement of a good \_\_\_\_\_ is that it causes motion.
 

|                        |                          |
|------------------------|--------------------------|
| a) Iterative deepening | b) Control strategy      |
| c) Problem obstruction | d) Conceptual dependency |

- B) State True or False.** 04
- 1) Abstraction provides a way of solving problems for which no more direct approach is available.
  - 2) Recoverable problems are those in which solution steps cannot be undone.
  - 3) DENDRAL is a program that infers the structure of organic compounds using mass spectrogram and nuclear magnetic resonance data.
  - 4) Matching is a collection of attributes and associated values that describes some entity in the word.
- Q.2 A) Write short notes on the following.** 08
- a) AI Technique
  - b) Semantic Net
- B) Answer the following.** 06
- a) What do you mean by Best first search?
  - b) State Bayes Theorem in brief.
- Q.3 Answer the following** 14
- a) What do you mean by Game Playing? Consider the following game tree having static score from player I points of view, suppose player I is maximizing player. What move should be chosen?
- ```

graph TD
    A[A] --- B[B]
    A --- C[C]
    A --- D[D]
    B --- E[E]
    B --- F[F]
    B --- G[G]
    C --- H[H]
    C --- I[I]
    D --- J[J]
    D --- K[K]
    E --- L[L]
    E --- M[M]
    F --- N[N]
    F --- O[O]
    G --- P[P]
    G --- Q[Q]
    H --- R[R]
    H --- S[S]
    H --- T[T]
    I --- U[U]
    J --- V[V]
    J --- W[W]
    K --- X[X]
    K --- Y[Y]
    
```

(7) (6) (8) (5) (2) (3) (0) (-2) (6) (2) (5) (8) (9) (2)
- b) What do you mean by Resolution? Explain in detail concept of conversion to clause form with suitable example?
- Q.4 Answer the following** 07
- a) What do you mean by Artificial Intelligence? Explain in detail task domains of it.
 - b) What do you mean by knowledge representation? Explain in detail approaches of knowledge representation?
- Q.5 Answer the following.** 07
- a) What do you mean by Heuristic search technique? Discuss concept of constraint satisfaction to solve following crypt-arithmetic problem.
CROSS
+ROADS

DANGER
 - b) What do you mean by production system? Discuss in detail production system characteristics with suitable example.

Q.6 Answer the following.

- a) Define the term Matching. Discuss in detail various ways to do Matching with example. 07
- b) What do you mean by Natural Language Processing? Discuss various step of it in detail. 07

Q.7 Answer the following.

- a) Define the term expert system? Explain the knowledge acquisition activities in detail. 07
- b) What do you mean by Script? Write a College Canteen script with a story: "*Hemant went to Canteen. He ordered Bread and Butter. He ate food and ordered tea. He paid bill and left for class.*" 07

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M.C.A. (Semester - V) (New) (CBCS) Examination Mar/Apr-2018
Science
WEB DESIGN TECHNIQUES

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7.
 3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives. 10

- 1) Choose the correct HTML element for the largest heading:
 - a) <heading>
 - b) <head>
 - c) <h6>
 - d) <h1>
- 2) What is the correct HTML for creating a hyperlink?
 - a) W3Schools
 - b) W3Schools.com
 - c) W3Schools.com
 - d) <a>http://www.w3schools.com
- 3) What is the correct HTML for making a checkbox?
 - a) <checkbox>
 - b) <input type=“checkbox”>
 - c) <check>
 - d) <input type=“check”>
- 4) _____ JavaScript statements embedded in an HTML page can respond to user events such as mouse-clicks, form input, and page navigation.
 - a) Client-side
 - b) Server-side
 - c) Local
 - d) Native
- 5) Which of the following is not a valid JavaScript variable name?
 - a) 2names
 - b) _first_and_last_names
 - c) FirstAndLast
 - d) None of the above
- 6) What makes Ajax unique?
 - a) It works as a stand-alone Web-development tool.
 - b) It works the same with all Web browsers.
 - c) It uses C++ as its programming language.
 - d) It makes data requests asynchronously.
- 7) AJAX based on _____.
 - a) JavaScript and XML
 - b) JavaScript and Java
 - c) VBScript and XML
 - d) JavaScript and HTTP requests
- 8) What does XML stand for?
 - a) eXtensible Markup Language
 - b) X-Markup Language
 - c) eXtra Modern Link
 - d) Example Markup Language
- 9) Which statement is true?
 - a) All XML elements must be lower case
 - b) All XML elements must be properly closed
 - c) All XML documents must have a DTD
 - d) All the statements are true

10) Which is not a correct name for an XML element?	
a) <Note>	b) <h1>
c) <4dollar>	d) All 3 names are incorrect
B) State True or False.	04
1) HTML comments start with <!-- and end with -->	
2) The external JavaScript file must contain the <script> tag.	
3) Ajax is a programming language.	
4) This is a well formed XML document.	
	<?xml version="1.0"?> <to>Tove</to> <from>Jani</from> <heading>Reminder</heading> <message>Don't forget me this weekend!</message>
Q.2 A) Write short notes on the following.	08
1) XSLT	
2) DOM	
B) Answer the following.	06
1) Explain any 3 text formatting tags with suitable example.	
2) How to access value of form controls in JavaScript? Explain with example.	
Q.3 Answer the following.	14
A) Explain form attributes and any 3 form controls with example.	
B) What is DOM? Explain navigator object properties with example.	
Q.4 Answer the following.	
A) What is DOM? Explain following methods with example	08
1) after()	
2) append()	
3) html()	
4) remove()	
B) Design a student registration webpage using all types of CSS.	06
Q.5 Answer the following.	
A) Explain the following HTML tags with attributes.	08
1) <frame>	
2) <select>	
3) <image>	
4) <table>	
B) What is XML? Explain internal and external DTD with example	06
Q.6 Answer the following.	
A) What is AJAX? Explain how AJAX works?	
B) Write a JavaScript program to print prime numbers between 1 and 100.	
Q.7 Answer the following.	14
A) Explain form attributes and any 3 form controls with example.	
B) Write XML file with 5 student records, Write XSLT file to display student record in table format (xml file of student record must contain roll no, student name, dept, div)	

Seat No.	
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Set P

M.C.A. (Semester - V) (New) (CBCS) Examination Mar/Apr-2018
Science
NETWORK SECURITY

Time: 2½ Hours

Max. Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.

- 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternatives.

10

- 1) The _____ prevents or inhibits the normal use or management of communications facilities.
 - a) Reply
 - b) Denial of service
 - c) Modification
 - d) Masquerade
 - 2) A _____ Processes the input elements continuously, producing output one element at a time, as it goes along.
 - a) Random cipher
 - b) Block cipher
 - c) Stream cipher
 - d) None of these
 - 3) _____ is the original message or data that is fed into the algorithm as input.
 - a) Plaintext
 - b) Ciphertext
 - c) ASCII text
 - d) None of these
 - 4) RFC means
 - a) Response From Customer
 - b) Request For Common
 - c) Response From Client
 - d) Request For Comment
 - 5) Pretty good privacy (PGP) is used in
 - a) Browser security
 - b) Email security
 - c) FTP security
 - d) None of these
 - 6) One of protocols to provide security at application layer is
 - a) Pretty good privacy
 - b) Handshake protocol
 - c) Alert protocol
 - d) Record protocol
 - 7) A hash function guarantees integrity of a message. It guarantees that message has not been
 - a) Replaced
 - b) Over view
 - c) Changed
 - d) Left
 - 8) The RSA signature uses which hash algorithm?
 - a) MD5
 - b) SHA-1
 - c) MD5 and SHA-1
 - d) None of these
 - 9) Which protocol is used to convey SSL related alerts to the peer entity?
 - a) Alert Protocol
 - b) Handshake Protocol
 - c) Upper-Layer Protocol
 - d) Change Cipher Spec Protocol
 - 10) The full form of SSL is
 - a) Serial Session Layer
 - b) Series Socket Layer
 - c) Session Secure Layer
 - d) Secure Socket Layer

B)	State True or False.	04
1)	Tunnel mode ESP is used to encrypt an entire IP packet.	
2)	Passive attack attempts to alter system resources or affect their operation.	
3)	AH covers the packet format and general issues related to the use of the ESP for packet encryption and, optionally, authentication.	
4)	The Handshake Protocol is used before any application data is transmitted.	
Q.2	A) Write short notes on the following.	08
a)	Non-Repudiation	
b)	Passwords	
B)	Answer the following.	06
a)	What is Authentication Header (AH)? Explain various fields containing AH.	
b)	What is Cryptanalysis? Explain various cryptanalytic attacks.	
Q.3	Answer the following	
a)	What is IPSec Document? Explain IPSec Document overview with well labeled diagram.	07
b)	What is SSL? Explain SSL Record Protocol.	07
Q.4	Answer the following	
a)	What is intruder? Explain different types of intrusion techniques.	07
b)	State and explain various security services in detail.	07
Q.5	Answer the following.	
a)	What is Attack? Explain different types of Active attack.	07
b)	Explain in detail Bell-LaPadula Model with its importance.	07
Q.6	Answer the following.	
a)	What is Access control list? Explain capability list with example.	07
b)	What is Authentication? Explain the procedure for Password Authentication Protocol.	07
Q.7	Answer the following.	
a)	What is the difference between Block cipher and Stream cipher? Explain with example.	07
b)	What are the different steps in RSA algorithm? Explain with suitable example.	07

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M.C.A. (Semester - V) (New) (CBCS) Examination Mar/Apr-2018
Science
DIGITAL IMAGE PROCESSING

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

- Q.1 A) Choose correct alternatives. 10**
- 1) Geological exploration uses _____

a) Electromagnetic imaging	b) Microwave band imaging
c) Gamma ray imaging	d) Acoustic imaging
 - 2) Size of a binary image is 8 bytes. How many pixels are there in the image?

a) 8	b) 64
c) 128	d) 512
 - 3) Which of the following is *incorrect* statement?

a) second order derivative must be zero along ramps of constant slope
b) first order derivative must be zero in flat segments
c) second order derivative must be nonzero at the onset and end of a gray-level step or ramp
d) first order derivative must be zero along ramps of constant slope
 - 4) Which of the following statement is false related to Fourier transformed image?

a) origin will be shifted at the centre
b) spectrum is symmetric about origin
c) brighter than the original image
d) at the center average value of image will be there
 - 5) Which of the following statements is false?

a) notch filters must appear in symmetric pairs about the origin
b) only one pair of notch filter can be implemented at a time
c) notch filter can be of any shape
d) if only one filter appears for notch filter, then the filter must be at origin.
 - 6) Extraction of outer boundary of an object uses which of the following operations?

a) dilation followed by subtraction
b) erosion followed by subtraction
c) subtraction followed by dilation
d) subtraction followed by erosion
 - 7) Region filling
 - i. Require multiple types of structuring elements
 - ii. Requires multiple iterations
 - iii. Uses union operation once

a) (i) and (ii)	b) (i) and (iii)
c) (ii) and (iii)	d) (i), (ii) and (iii)

- 8) The mask used for line detection is _____
 a) Gaussian b) Laplacian
 c) Ideal d) Butterworth
- 9) If shape number of a shape is 03313303, its 4 chain code is _____
 a) 00323211 b) 03322101
 c) 03032211 d) 00332121
- 10) Which of the following statements is false regarding font used to print cheque numbers?
 a) font name is B-13E
 b) magnetized ink used for printing
 c) signal generated based rate of change of characters area
 d) four special characters are found in the font

B) Fill in the blanks or true / false

04

- 1) The chessboard distance between (3, 7, -2) and (5, 4, 3) is _____
 2) The PDF for exponential noise is given as _____
 3) Expression for hit or miss transform is _____
 4) The minimum distance classifier gives best performance when the distribution of each class about its mean is in the form of a _____ hypercloud in n -dimensional pattern space.

Q.2 A) Write short notes on the following.

08

- a) Zooming techniques
 b) Basic Formulations of region

B) Answer the following.

06

- a) Find shortest m-path between P and Q and give path length for the following:

1	1P	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	1	0
0	1	1Q	1	1

- b) If the threshold is 250, check whether a line with – 45 degree inclination exists in the following image segment?

71	30	89
62	136	90
1	17	110

Q.3 Answer the following

14

- a) How image can be enhanced using arithmetic/logic operations? What is use of each technique? Discuss.
 b) For the following image information perform histogram equalization:

Intensity	0	1	2	3	4	5	6	7
No. of pixels	0	0	180	400	300	250	80	0

Q.4 Answer the following

14

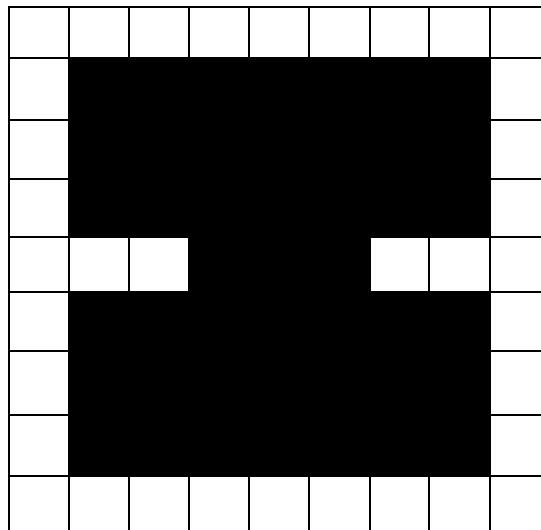
- a) Derive one and two dimensional Fourier transform and its inverse in continuous domain.
 b) Perform AND operation between following 8bit image segments.

A=	39	42	63
	183	201	21
	143	9	221

B=	58	35	132
	29	84	244
	3	86	125

Q.5 Answer the following.

- a) Explain design of adaptive filter for noise reduction.
 b) Extract internal and external boundaries for the following image.

**Q.6 Answer the following.**

- a) What are different relational descriptors? Briefly explain few of them.
 b) Threshold the following image using Global thresholding algorithm. The initial threshold may be selected using the median filter on entire image and the algorithm iteration must stop when difference of threshold is less than 0.1

60	12	33	46
18	29	45	62
41	39	12	7
59	25	26	14

Q.7 Answer the following.

- a) Explain the construction and working of E-13B font character reading system.
 b) Given the value of pixels in a row of an image, find first and second order derivatives and possible appearance of location of an edge using second order derivatives

10, 10, 10, 10, 40, 70, 80, 90, 100, 110, 120, 120, 120

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M.C.A. (Semester - V) (New) (CBCS) Examination Mar/Apr-2018
Science
MOBILE COMPUTING

Time: 2½ Hours

Max. Marks: 70

- Instructions:** 1) Question No. 1 and 2 are compulsory.
 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
 3) Figures to the right indicate full marks.

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

- 1) _____ allows subscribers to operate in mobile phone service areas other than the service area where the service is subscribed.

a) Roaming	b) Grade of service
c) Both a and b	d) None of the above
- 2) In cellular technology the concept used is _____.

a) Time Reuse	b) Code Reuse
c) Frequency Reuse	d) None of these
- 3) A small division of a given geographical area is known as _____.

a) Shell	b) Cell
c) Core	d) Kernel
- 4) _____ in FDMA is assigned between the spectrum of two adjacent users.

a) Interference band	b) Co-inter band
c) Guard band	d) Inference band
- 5) The uplink frequency of P-GSM system is _____.

a) 1850-1910 MHz	b) 1710-1785 MHz
c) 890-915 MHz	d) None of these
- 6) The type of access technology used in GSM technology is _____.

a) FDMA / TDMA	b) CDMA
c) OFDMA	d) None of the above
- 7) A television broadcast is an example of _____ transmission.

a) Simplex	b) Half-duplex
c) Full-duplex	d) Automatic
- 8) The _____ protocol solves the problem of hidden and exposed terminal.

a) PRMA	b) DAMA
c) TDMA	d) MACA
- 9) PSTN stands for _____.

a) Pakistan Service Telephone Network	b) Police Station Telephone Network
c) Public Switch Telephone Network	d) None of the above
- 10) The _____ xml file that contains all the text that your application uses.

a) stack.xml	b) string.xml
c) text.xml	d) app.xml

B)	State True or False.	04
1)	EIR is a database that contains information about the identity of mobile equipment.	
2)	Fading of the received radio signal in a mobile communication environment occurs because of single path propagation.	
3)	The R.java file is where you edit the resources of android project.	
4)	In android there can be only one activity at given time.	
Q.2	A) Write short notes on the following.	08
1)	Frequency regulations.	
2)	Security in GSM system.	
B)	Answer the following.	06
1)	What are the applications of mobile computing?	
2)	Explain the term Medium Access Control.	
Q.3	Answer the following.	14
A)	What is multiplexing? Explain time division multiplexing scheme.	
B)	Explain how the classic aloha and slotted aloha schemes are implemented.	
Q.4	Answer the following.	14
A)	Name the main elements of GSM system and describe their functions.	
B)	Explain the data transfer from mobile node to a correspondent node and vice versa.	
Q.5	Answer the following.	14
A)	Explain the scheme MACA with example.	
B)	Explain the functional architecture of IEEE802.11.	
Q.6	Answer the following.	14
A)	Explain the direct sequence spread spectrum.	
B)	What is congestion control? Explain the mechanism slow start and fast recovery.	
Q.7	Answer the following.	14
A)	Explain android system architecture.	
B)	How to manage your Wi-Fi using WifiManager android Wi-Fi connectivity service? Explain in brief.	

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M.C.A. (Semester - II) (Old) (CBCS) Examination Mar/Apr-2018
Science
NUMERICAL ANALYSIS

Time: 2½ Hours

Max. Marks: 70

Instructions: 1) Question No. 1 and 2 are compulsory.

- 2) Attempt any 3 questions from Q. no. 3 to Q. no. 7
- 3) Figures to the right indicate full marks.
- 4) Use of calculator is allowed.

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

- 1) The process of computing the value of the function inside the given range is called _____.
- 2) The effect of error _____ with the order of the differences.
- 3) If $f(0) = 1$ and $f(1)=3$ then the unique polynomial of degree one is _____.
- 4) Trapezoidal rule is given by the formula _____.
- 5) The central difference operator $\delta_{3/2}$ is defined by the relation _____.
- 6) Taylors series for $y(x)$ around $x = x_0$ is given by _____.
- 7) The relation between ∇ and E is given by _____.
- 8) In Newton Raphson method the iterative formula to find $\frac{1}{N}$ is given by _____.
- 9) Newton's backward difference interpolation formula is given by _____.
- 10) If A is upper triangular then A^{-1} is _____.

B) Choose the correct alternative. (one mark each)**04**

- 1) First approximation to the root of the equation $x^3 - 2x - 5 = 0$ using method of false position is _____.

a) 2.05882	b) 2.5882
c) 2.15882	d) 2.882
- 2) Which of the following is correct

a) $\nabla - \Delta = \Delta \nabla$	b) $\nabla - \Delta = -\Delta \nabla$
c) $\nabla + \Delta = -\Delta \nabla$	d) $\nabla + \Delta = \Delta \nabla$
- 3) While applying Simpsons 1/3 rule the number of subintervals should be

a) Multiples of 5	b) Odd
c) Multiples of 3	d) Even
- 4) If $f(x)=\frac{1}{x^2}$ then the value of first divided difference of the argument 2 and 3 is equal to

a) -3/4	b) 5/36
c) -5/36	d) 2/3

Q.2 A) Write a note on absolute, relative and percentage error.**03****B) Determine the value of y using Modified Euler method when $x=0.1$ given that $y(0)=1$, $h=0.05$ and $y'=x^2+y$** **04****C) Prove that $e^x \left(u_0 + x\Delta u_0 + \frac{x^2}{2!} \Delta^2 u_0 + \dots \right) = u_0 + u_1 x + u_2 \frac{x^2}{2!} + \dots$** **03****D) Explain Bisection method.****04****Q.3 A) Solve the system $2x+y+z=10$, $3x+2y+3z=18$, $x+4y+9z=16$ using Gauss elimination method.****07****B) Evaluate $\int_4^{16} \ln x \, dx$ by Simpsons 1/3 rule by dividing the interval into six parts.****07**

- Q.4 A)** Derive Newton's forward difference interpolation formula. 07
B) Reduce the matrix 07

$$A = \begin{bmatrix} 1 & 3 & 4 \\ 3 & 2 & -1 \\ 4 & -1 & 1 \end{bmatrix}$$

to traditional form using Householder's method.

- Q.5 A)** Derive Newton's general interpolation formula with divided differences. 07
B) The function $y=\sin x$ is tabulated as 07

X	0	$\pi/4$	$\pi/2$
$Y = \sin x$	0	0.70711	1.0

Using Lagrange's interpolation formula, find the value of $\sin(\pi/6)$

- Q.6 A)** Show that Newton Raphson method converges quadratically. 07
B) Determine the value of y using Modified Euler method when $x=0.1$ given that $y(0)=1$, $h=0.05$ and $y' = x^2+y$ 07

- Q.7 A)** Show that 07

1. $\mu = \sqrt{1 + (1/4)\delta^2}$
2. $\delta = \nabla(1 - \nabla)^{-1/2}$

- B)** Solve $I = \int_0^1 \frac{1}{1+x} dx$ correct to three decimal places by the trapezoidal rule with $h=0.125$. 07