

**SOM-LALIT INSTITUTE OF COMPUTER APPLICATIONS**  
**B.C.A. SEM III**

**Semester End Examination**  
**Computer Organization & Advanced Microprocessor (CC-201)**

**Date: 3/10/2017**

**Time: 2:15pm TO 3:45pm**

**Marks: 50**

**Instruction:** Figures to the right indicate full marks.

**Q.1 (A) Do as directed (Any 2)**

**[4]**

1. Explain CPU registers.
2. What is RTL? Explain with explain.
3. What is device controller? Draw diagram showing five sections of device controller.

**(B) Answer the following (Any 2)**

**[6]**

1. Explain interrupt with its types.
2. Differentiate between primary memory and secondary memory.
3. Explain instruction execution cycle with diagram.

**Q.2 (A) Do as directed (Any 2)**

**[4]**

1. Draw the block diagram and truth table of NOT and X-OR gate.
2. Draw circuit and write truth table for following.
  - a. 1×4 Demultiplexer
  - b. Half Adder
3. Explain normalization of floating point number with example.

**(B) Answer the following (Any 2)**

**[6]**

1. Draw the block diagram, circuit diagram and write truth table for JK flip-flop.
2. Explain IEEE representation for floating point number.
3. Draw the block diagram, circuit diagram and write truth table for 2-4 line decoder.

**Q.3 (A) Do as directed (Any 2)**

**[4]**

1. Explain two write policy of cache.
2. Define the term cache hit and cache miss.
3. Explain memory hierarchy with diagram.

**(B) Answer the following (Any 2)**

**[6]**

1. Explain set associative mapping.
2. Explain cache replacement algorithms.
3. A computer has main memory 24 bit and cache memory 16 bit. Each block size is 16 words.
  - a. How many bits in main memory and cache memory address?
  - b. Show the memory address format for direct and associative mapping.
  - c. Show the memory address format if the computer follows 2-way Set-associative mapping.



[4]

- [6]

[6]

- [10]

[10]

- 2



Semester End Examination  
Data Structures (CC-202)

Date: 04/10/2017

Time: 2:15pm TO 3:45pm

Marks: 50

Q.1)

- A) Attempt the following. [4]
- 1) Explain two categories of non-primitive data structures.
  - 2) Draw the node structure of singly and doubly linked list.
- B) Attempt the following. (Any Two) [6]
- 1) Write an algorithm for binary search.
  - 2) Show the tracing of following numbers with insertion sort.  
89    35    64    9    23    76    11
  - 3) Consider a 20 \* 5 two-dimensional array score which has its base address=1000 and the size of an element= 2 bytes. Compute the address of the element score[18][5] assuming the elements are stored in row major order.

Q.2)

- A) Attempt the following. [4]
- 1) Write an algorithm for pop operation.
  - 2) What is the limitation of simple queue? How it is overcome?
- B) Attempt the following. (Any Two) [6]
- 1) Convert  $(a-b)*c-d/e$  to postfix using algorithm and show tracing.
  - 2) Explain recursion with example.
  - 3) Draw the queue structure in each case when the following operations are performed on an empty circular queue of length 4.
    - a) Add A,B,C
    - b) Delete
    - c) Add D
    - d) Add E
    - e) Delete
    - f) Delete

Q.3)

- A) Explain following with example. [4]  
Expression tree, Internal nodes of a tree
- B) Attempt the following. (Any Two) [6]
- 1) Create B-tree of order 3 for following data.  
22    41    30    50    62    71    32
  - 2) Explain LL and RR rotation of AVL tree with example.
  - 3) Create a BST for the data: F,D,M,P,C,A,R,N  
Also show the output of pre-order and in-order traversal.



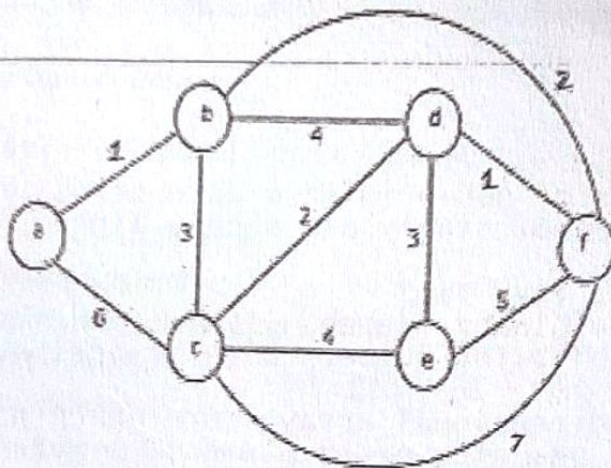
Q.4)

- A) Explain following.  
BFS and DFS traversal of graph with suitable example.  
(Algorithms not required)

[4]

- B) Attempt the following. (Any Two)

[6]



For the above graph find out minimum spanning tree using prim's algorithm with start node 'c'.

- 2) In the above graph find out shortest distance between 'a' and 'f' using Dijkstra's algorithm.
- 3) Explain adjacency list representation of the graph with example.

Q.5) Fill in the blanks. (Write answers only)

[10]

- 1) An \_\_\_\_\_ is the way we look at a data structure, focusing on what it does and ignoring how it does its job.
- 2) Quick sort is also called \_\_\_\_\_ sort.
- 3) Result of evaluation of postfix expression  $2, 3, *, 4, 2, +, -$  is \_\_\_\_\_.
- 4) \_\_\_\_\_ allows insertion and deletion from both ends.
- 5) Prefix expression of  $(a + b) * (c - d)$  is \_\_\_\_\_.
- 6) Leaf node is also called \_\_\_\_\_ node.
- 7) Maximum number of total nodes in binary tree with height 4 is \_\_\_\_\_.
- 8) In \_\_\_\_\_ traversal of tree, root node is traversed last.
- 9) \_\_\_\_\_ traversal algorithm of graph uses queue.
- 10) Sequential representation of storing graph uses \_\_\_\_\_ matrix.

----- ALL THE BEST -----



**SOM-LALIT INSTITUTE OF COMPUTER APPLICATIONS**  
**B.C.A. SEM III**

**Semester End Examination**  
**Object Oriented Concepts and Programming (CC-203)**

Date: 05/10/2017

Time: 2:15 TO 3:45 pm

Marks: 50

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions whenever necessary.
3. Figures to the right indicate full marks.

**Q.1 (A) Do as directed (Any 2)****[4]**

1. Differentiate between C and C++Discuss the demerit of inline function.
2. Distinguish between console input and output.
3. Define and explain default arguments

**(B) Answer the following (Any 2)****[6]**

1. Define function overloading and explain the rules of it.
2. List all access specifiers and explain the characteristics of it.
3. Explain arrow and this pointer by giving example.

**Q.2 (A) Do as directed (Any 2)****[4]**

1. Define and explain Namespaces.
2. Define and explain Dynamic memory deallocation.
3. List the characteristics of constructor.

**(B) Answer the following (Any 2)****[6]**

1. Define Friend function and explain function friend to more than one class.
2. Explain the concept of copy constructor.
3. What are destructors? Why do we need it?

**Q.3 (A) Do as directed (Any 2):****[4]**

1. Differentiate between function overloading and overriding.
2. What is virtual base class? And why do we need it?
3. List the operators that cannot be overloaded.

**(B) Answer the following: (Any 2)****[6]**

1. Discuss virtual destructor.
2. Draw the hierarchy of polymorphism and explain typecasting by pointer.
3. Explain Diamond problem.



Q.4 (A) Do as directed

14

1. List the rules of operator overloading.
2. Write a program to demonstrate the calling sequence constructor and destructor.

(B) Answer the following (Any 2)

[6]

1. Explain class templates and list the necessary condition for it.
2. What are three types of type conversion? How is it done?
3. Discuss overloading of binary operators using friend functions.

Q.5 Do as directed:

[10]

Fill in the blanks

1. A reference variable is a \_\_\_\_\_ pointer.
2. \_\_\_\_\_ is used to avoid memory leakage problem.
3. Default values to the argument must be assigned starting from the \_\_\_\_\_.
4. The can be \_\_\_\_\_ number of private, protected and public section inside the class.
5. \_\_\_\_\_ data members should be used to modify the value const member function.

True or False:

1. Object oriented programming is data centric.
2. Private section of a class can only have data members.
3. A destructor can be static and const.
4. VTBL contains the address of new virtual function.
5. Only one copy of static data member is created for a class that can be accessed by all the objects of that class.

=====ALL THE BEST=====



Roll No. \_\_\_\_\_

**SOM-LALIT INSTITUTE OF COMPUTER APPLICATIONS**  
**B.C.A. SEM - III**

**Semester End Examination**  
**Statistical Computing (CC-205)**

Date: 06/10/2017

Time: 2:15pm TO 3:45pm

Mark: 50

**Q.1) Do as directed**

- 1) Give the relation among the measures of the central tendency
- 2) Define Harmonic mean.
- 3) Give an example where GM is used
- 4) What is positional average? why it is so called?
- 5) State the different measures of variation.
- 6) What is percentile?
- 7) State the properties of regression coefficients.
- 8) What is least squares method? explain it
- 9) Define : Exclusive events
- 10) State the multiplication rule for the probability

[10]

**Q.2) Attempt any two of the following**

[10]

- 1) Find the arithmetic median and mode of the following frequency distribution:

Class interval	30- 40	40- 50	50- 60	60- 70	70- 80	80- 90	90-100
No. persons	14	26	40	33	50	37	25

- 2) The arithmetic mean and standard deviation of a series of 20 items were calculated as 20 and 5 respectively. But while calculating them an item 13 was read as 30. Find correct arithmetic mean and standard deviation.

- 3) Find  $Q_3$ ,  $D_7$  and  $P_{20}$  for the following frequency distribution

Class	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Frequency	3	5	12	18	14	6	2

**Q.3) Attempt any two of the following**

[10]

- 1) In a survey, data on daily wages paid to workers of two factories A and B are as follows

Daily wages	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Factory A :	15	30	44	60	30	14	7
Factory B :	25	40	60	35	20	15	5

Find out wages of which factory has greater variability.



- 2) In a correlation research study, the equations to the two regression lines were to be  $2X - Y + 1 = 0$  and  $3X - 2Y + 7 = 0$ . Find the means of X and Y. Also work out the values of the regression coefficients and the coefficient of correlation between the two variables X and Y.
- 3) Explain the terms measures of central tendency and dispersion.

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

[10]

- 1) Explain the fitting of a straight line.
- 2) From the following data find two lines of the regression

X	16	20	17	21	15
Y	50	60	58	60	55

- (i) Estimate value of Y when  $X=25$   
(ii) Estimate value of X when  $Y=50$
- 3) Find the co-efficient of the correlation between sales and expanses of the following 10 firms.  
(Figures in '000 Rs.)

Firms	1	2	3	4	5	6	7	8	9	10
Sales	50	50	55	60	65	65	65	60	60	50
Expenses	11	13	14	16	16	15	15	14	13	13

**Q.5) Attempt any two of the following**

[10]

- 1) There are two boxes A and B containing 4 white, 3 red and 3 white, 7 red balls respectively. A box is chosen at random and a ball is selected from it, if the ball is white, find the probability that probability that it is from the box B.
- 2) Two problems assigns to a student, the probability that the student can solve the first problem is 0.75 and that of second problem is 0.45 and probability that he can solve the both is 0.20
- (i) What is the probability that a student solves the first problem, given that he has solved the second?
- (ii) What is the probability that a student solves the second problem, given that he has solved the first?
- 3) Prove that (i)  $A'$  and B (ii) A and  $B'$  (iii)  $A'$  and  $B'$  are independent events, if A and B are independent events.

----- ALL THE BEST -----



SOM-LALIT INSTITUTE OF COMPUTER APPLICATIONS

B.C.A. SEM III

Semester End Examination

Mass Communication (FC – 201)

Date: 7/10/2017

Time: 2:15 to 3:45 pm

Marks: 50

Q-1 Attempt any two short notes:

(20)

1. Functions of Mass Media
2. Effects of Media on children
3. Projection of women in Mass Media
4. Media Ethics

Q-2 Attempt any two Short notes:

(20)

1. News
2. Making of Newspaper
3. Straight news reports
4. Investigative/interpretative reports

Q-3 State whether the given statements are TRUE or FALSE:

(10)

1. Feedback in mass communication is prompt.
2. Media has control over the content of the message.
3. Folk culture is completely outdated now.
4. Basically news is a forecast of future events.
5. Mass media does not have any social obligation.
6. Editor is the creative organ of newspaper.
7. Indian press is obsessed with politics, cricket, crime and Bollywood.
8. The right to privacy is fundamental and legal.
9. Media now focuses more on interpretative journalism.
10. In India the reach of Media is unlimited.

\*\*\*\*\* ALL THE BEST \*\*\*\*\*



**Semester End Examination  
Fundamentals of Operating System (CC-204)**

Date: 09/10/2017

Time: 2:15pm TO 3:45pm

Marks: 50

Do as directed

[10]

1. Fixed head disk is cheaper than movable head disk. (T/F)
2. \_\_\_\_\_ is an I/O technique that allows a control unit to directly access main memory.
3. List four conditions of deadlock.
4. There are two page frames and pages are demanded in this sequence A, B, B, A, C, B. \_\_\_\_\_ page fault will occur by LRU page replacement policy.
5. Level 1 in RAID uses \_\_\_\_\_ error correction method.
6. \_\_\_\_\_ scheduling policy is widely used in time-sharing environment.
7. Process moves from \_\_\_\_\_ state to \_\_\_\_\_ when I/O request is made and process is being executed.
8. \_\_\_\_\_ is stored immediately after the volume descriptor.
9. \_\_\_\_\_ is a security threat that relies on clear text transmission whereby the assailant falsifies the IP address
10. In movable head disk access time is sum of which three components.

Attempt the following [Any Seven]

[28]

1. What is parallel processing? Explain process synchronization softwares.
2. What is operating system? Explain different managers of operating system.
3. Explain starvation with example. How can it be overcome?
4. Given that it takes 3 ms to travel from one track to the next, and that the arm is positioned at track 16 moving toward the low-numbered tracks, compute how long it will take to satisfy the following requests – 30,14,28,42,19,26,17 using SSTF and FIFO scheduling policy
5. Explain Segment demand paged memory allocation with example.
6. Explain access control verification module.
7. What are variable length records? Explain indexed storage with example.
8. Give difference between fixed partition and variable partition. Explain memory reallocation.

Define the following [Any Six]

[12]

- |                      |                       |
|----------------------|-----------------------|
| 1. Time quantum      | 5. Page fault         |
| 2. Deadlock          | 6. Associative memory |
| 3. Boot sector virus | 7. Busy waiting       |
| 4. Logic bomb        |                       |

\*\*\*\* ALL THE BEST \*\*\*\*