

## N.B.

- 1) Attempt **ANY FOUR** questions from section I and **ANY TWO** questions from Section II.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Both the sections should be written in the **SAME** answer book.

## SECTION – I

- Q.1** a) What are system calls? Explain various categories of system calls with examples. (10)  
b) Explain the concept of multiprocessing operating systems. (05)
- Q.2** a) What do you mean by process? Explain various process states. (10)  
b) Describe various relationships among processes. (05)
- Q.3** What is page table? Explain the process of conversion of virtual addresses into physical addresses with the help of example. (15)
- Q.4** What is semaphore? Explain solution to the producer-consumer problem using semaphore. (15)
- Q.5** Explain the concept of segmentation in detail. (15)
- Q.6** Explain the following terms: (15)  
a) Directories  
b) File attributes  
c) Swapping
- Q.7** Write short notes on the following: (15)  
a) Operating systems view of processes  
b) Demand paging  
c) Mutual-exclusion

## SECTION – II

- Q.8** Consider the following case. (20)

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P1	0	0	1	2	0	0	1	2	1	5	2	0
P2	1	0	0	0	1	7	5	0				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following questions using the Banker's algorithms:

- a) What will be the contents of matrix Need?
- b) Draw the safe sequence?
- c) If the request from P1 arrives for (0, 4, 2, 0), can the request be granted immediately.

- Q.9** Suppose the head of moving-head disk with 100 tracks, numbered 0 to 99 and is currently serving a request at track 47 and moving inside, Following is the queue of requests kept in the FIFO order. (20)  
 86, 14, 19, 77, 94, 10, 46, 94, 70, 35, 68  
 Calculate total time required to move all these tracks using following disk scheduling algorithms. Consider Seek time = 0.40 sec.  
 a) FCFS b) SSTF

- Q.10** Consider the following case. (20)

Processes	In time (am)	Burst Time (min.)
P1	10.00	7
P2	10.03	2
P3	10.05	3
P4	10.06	1

Explain the algorithms and Calculate average waiting time and turnaround time in case of : a) FIFO b) SRTN

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160419-e-mgt-kolhapur

**B.C.A. SEM-III (2014 Course) CBCS : SUMMER - 2019**  
**SUBJECT: SOFTWARE ENGINEERING**

Day : **Saturday**  
Date : **20/04/2019**

**S-2019-2068**

Time : **02.00 PM TO 05.00 PM**  
Max. Marks :100

**N.B.:**

- 1) Attempt any **FOUR** questions from Section –I and any **TWO** questions from Section- II.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in *SAME* answer book.

**SECTION – I**

- Q.1** What is software maintenance? Explain corrective, adaptive and preventive maintenance. (15)
- Q.2** What is software process model? Explain with neat diagram Spiral model and advantages of it. (15)
- Q.3** Explain the concept of software quality, quality control and quality assurance in brief. (15)
- Q.4** Explain various project management activities in brief. (15)
- Q.5** What is software design process? Explain in detail. (15)
- Q.6** Explain cost benefit analysis with example. (15)
- Q.7** Write short notes on any **THREE** of the following: (15)
- a) Taute's Model.
  - b) PERT.
  - c) Feasibility study.
  - d) Black Box testing.

**SECTION – II**

- Q.8** Draw DFD and ERD for Hostel Management System by considering your own assumptions. (20)
- Q.9** ABC Transport company has decided to develop software for their company. You are called for studying the operations of the firm. Suppose you have done the complete study of the firm with its functions. (20)
- Now suggest an appropriate software development model for the same. Also justify the advantages and disadvantages of the software model selected by you.
- Q.10** Draw following diagram for Hostel Management System: (10)
- a) Use Case Diagram. (10)
  - b) Class Diagram. (10)

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**B.C.A. SEM-III (2014 Course) CBCS : SUMMER - 2019**

**SUBJECT: DATA STRUCTURES**

Day : Thursday  
Date : 02/05/2019

**S-2019-2069**

Time 02.00 PM TO 05.00 PM  
Max. Marks : 100

**N.B.:**

- 1) Attempt any **FOUR** questions from Section – I and any **TWO** questions from Section– II.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SAME** answer book.

**SECTION-I**

- Q.1** Explain the Queue as data structure. Explain its any one application. **(15)**
- Q.2** What is One-dimensional array? Write C program applying Binary search method to search an element in array. **(15)**
- Q.3** Explain working of Stack. Explain recursion as application of stack. **(15)**
- Q.4** Write a C program to sort a given list of integers using Bubble sort. **(15)**
- Q.5** Discuss any one application of Queue. **(15)**
- Q.6** Describe the working of Circular Linked list with neat diagram. **(15)**
- Q.7** Write short notes on any **THREE** of the following: **(15)**
- a) Atomic data with example
  - b) Depth First search
  - c) Infix and postfix arithmetic expression
  - d) Structure
  - e) Data types

**SECTION-II**

- Q.8** Illustrate the process of in-order, Pre-order traversal in a binary tree. **(20)**
- Q.9** Write a C program to accept two matrices and implement matrix multiplication. **(20)**
- Q.10** Explain with neat diagram the operations on Doubly linked list. **(20)**

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**B.C.A. SEM-III (2014 Course) CBCS : SUMMER - 2019**

**SUBJECT : MATHEMATICS**

Day : Thursday  
Date : 25/04/2019

**S-2019-2070**

Time 02.00 PM TO 05.00 PM  
Max. Marks : 100

**N.B.**

- 1) Attempt any **FOUR** questions from Section – I and any **TWO** questions from Section – II.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SAME** answer book.

**SECTION – I**

- Q.1** a) Determine the validity of the following argument: (08)  
If 7 is less than 4, then 7 is not a prime number.  
7 is not less than 4.  
7 is a prime number
- b) Negate each of the following statements: (07)  
i)  $\exists x \forall y, p(x, y)$ ; ii)  $\exists x \forall y, p(x, y)$ ; iii)  $\exists y \exists x \forall z, p(x, y, z)$
- Q.2** What is composition of relation. When R and S are two relations such that (15)  
 $R = \{(1,2), (1,3), (2,5), (3,4), (5,5)\}$  and  $S = \{(1,1), (2,2), (3,5), (4,1), (5,3)\}$ .  
Define ROS and SOR.
- Q.3** a) State division algorithm. By applying division algorithm find q (quotient) (08)  
and r(remainder) for  $a = -262$  and  $b = 3$ .
- b) Using mathematical induction prove  $1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$ . (07)
- Q.4** Let the functions  $f : A \rightarrow B$  and  $g : B \rightarrow C$  (15)  
defined as  $f = \{(a, y), (b, x), (c, y)\}$ ,  $g = \{(x, r), (y, t), (z, r)\}$   
where  $A = \{a, b, c\}$ ,  $B = \{x, y, z\}$ ,  $C = \{r, s, t\}$  then define fog, gof, fof, gog.
- Q.5** a) Define 'power set'. Find power set of  $A = \{1, 2, 3, 4\}$ . (08)
- b) Find all partitions of  $S = \{a, b, c, d\}$ . (07)
- Q.6** Let  $E = xy' + xyz' + x'yz'$ . Find (15)  
a) the prime implicants of E; b) a minimal sum for E.
- Q.7** Write short notes (Any two) (15)  
a) Mathematical induction  
b) Partitions of set  
c) Types of relations

P.T.O.

## SECTION – II

- Q.8** Prove right distributive law  $(B+A)C=BC+AC$  with reference to following matrices. (20)

$$A = \begin{bmatrix} 1 & 5 \\ 7 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 4 & 0 \\ 8 & 6 \end{bmatrix} \quad C = \begin{bmatrix} 2 & 9 \\ 3 & 5 \end{bmatrix}$$

- Q.9** Check if the given relation  $R$  on set  $A = \{1,2,3,4,5\}$  such that  $R=\{(a,b)|a>b\}$  (20)  
is reflexive, symmetric and transitive relation. If not find its closures.

- Q.10** Write algorithm for find sum-of-products form. Express (20)  
 $E = ((xy)'z)'((x'+z)(y'+z'))'$  in sum of products form.

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