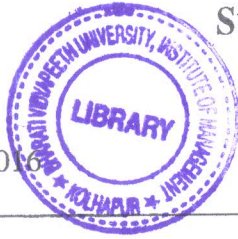


B.C.A. I / II / III
Subject : Operating Systems



Day : Tuesday

Date : 08/11/2016



Time : 02.00 PM TO 05.00 PM

Max Marks : 100 Total Pages : 1

N.B.:

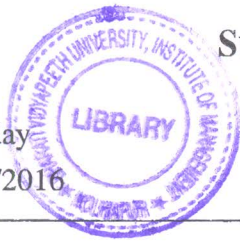
- 1) Solve any **FOUR** questions from Section-I and any **TWO** questions from Section-II.
- 2) Both the sections should be written in the **SAME** answer book.
- 3) Figures to the **RIGHT** indicate full marks.

SECTION-I

- Q.1** Differentiate between: (15)
- a) Online operating system and Real time operating system.
 - b) Multilevel queue scheduling and Multilevel queue with feedback scheduling.
 - c) Shortest job first and Shortest remaining time next.
- Q.2** What is a file? Explain different file protection mechanisms. (15)
- Q.3** What is virtual memory? Explain the process of converting logical addresses into physical addresses with the help of page table. (15)
- Q.4** Discuss the process concept and explain the process state transition in detail. (15)
- Q.5** What do you mean by reusable and consumable resources? Discuss the process of resource management. (15)
- Q.6** Explain the following terms: (15)
- a) Command interpreter
 - b) System calls
 - c) Demand paging
 - d) Pre paging
 - e) Distributed system.
- Q.7** Write short notes on any **TWO** of the following: (15)
- a) Input-output systems
 - b) Disk space management
 - c) Semaphore

SECTION-II

- Q.8** a) What do you mean by deadlock? Give the conditions for occurrence of it. (10)
- b) "Operating system acts as a resource manager." Justify with example. (10)
- Q.9** System refers the pages in the following sequence. (20)
- 0, 3, 2, 0, 2, 1, 3, 2, 1, 2, 0, 3
- Explain the LRU algorithm in detail and find page to be replaced at the end using LRU with matrix.
- Q.10** Consider the disk with 50 tracks. The system refers the tracks in the following sequence. (20)
- 25, 37, 15, 9, 24, 37, 39, 47, 13, 25, 15
- Currently head is on track number 20 and moving outside. Calculate total track movements and time required to move all these tracks.
- (Consider seek time = 0.15 ms) in case of :
- a) First come first served.
 - b) Shortest seek time first.



Subject : Software Engineering

Day : Thursday

Date : 10/11/2016



Time : 02.00 PM TO 05.00 PM

Max Marks : 100 Total Pages : 1

N.B.

- 1) Answer 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

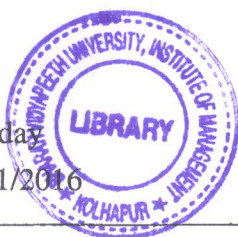
- Q.1** What is Software Engineering? Explain basic concepts of Software Engineering with importance of Software Engineering in Software Development. (15)
- Q.2** Explain Software Project Management in brief. What are applications of PERT and GANTT charts? (15)
- Q.3** What are the stages in Software Development Life Cycle? Explain in brief Feasibility study and its benefits. (15)
- Q.4** Explain Requirement Engineering concepts with types of Requirements in Software Development Process. (15)
- Q.5** What are characteristics of (SRS) Software Requirement Specification? Explain in brief why SRS is required? (15)
- Q.6** Write detail note on Function Oriented Modeling and Object Oriented Modeling with respect to software development. (15)
- Q.7** Write short notes on the following: (15)
- a) Testing Techniques
 - b) Quality Concepts
 - c) Software Maintenance

SECTION – II

- Q.8** Explain Formal Technical Reviews for Software Quality Assurance Plan for any business application Software. Assume appropriate real business documents in Review Meeting and Review guidelines for business Software development. (20)
- Q.9** Write detail note on Maintenance Process and Models. Explain in brief Reuse Oriented Model. (20)
- Q.10** Draw the Entity Relationship Diagram and Context Level Data Flow Diagram for your College Library Management System. (Assume appropriate processes in the Library Management System) (20)

B.C.A. -I/ II/III

Subject : Data Structures



Day : Saturday
Date : 12/11/2016



Time : 02.00 PM TO 05.00 PM
Max Marks : 100 Total Pages : 1

N.B.:

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

SECTION-I

- Q.1** Write a program to add new node to the ascending order linked list. (15)
- Q.2** What is stack? Explain Array Implementation of stack. (15)
- Q.3** Explain ADT with example. (15)
- Q.4** What is queue? Explain types of queues? (15)
- Q.5** Explain the operations performed on Binary Search Tree. (15)
- Q.6** Write a program to allocate memory dynamically for string and store their addresses in array of pointers to string. (15)
- Q.7** Write short notes on: (15)
- a) Quick sort
 - b) Atomic data
 - c) Structures

SECTION-II

- Q.8** Write a program to sort 20, 35, 40, 100, 3, 10, 15 using bubble sort. (20)
- Q.9** Write a program to implement depth first search algorithm. (20)
- Q.10** Write a program for multiplication two matrices. (20)

B.C.A. - I / II / III
Subject : Mathematics

Day : Wednesday

Date : 16/11/2016



Time : 02.00 PM TO 05.00 PM

Max Marks : 100 Total Pages : 2

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) Verify: $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ (07)

using the sets

$$A = \{1, 2, 3, 5\}$$

$$B = \{2, 3, 4, 6\}$$

$$C = \{1, 2, 4, 5, 7\}$$

- b)** In a class of 25 students, 12 students have taken Economics, 8 students have taken Economics but not Politics. Find the number of students who have taken Economics and Politics. Also find the number of students who have taken Politics but not Economics. Draw Venn diagram also. (08)

Q.2 Given: $A = \{1, 4\}$, $B = \{2, 3\}$, $C = \{3, 5\}$ (15)

Prove that: $A \times B \neq B \times A$

Also find $(A \times B) \cap (A \times C)$

and $(A \times C) \cup (B \times C)$

Q.3 a) Let $R = \{(a, a), (a, b), (b, b), (c, c), (c, b)\}$ on (07)

$$A = \{a, b, c\}.$$

Find the symmetric closure of R.

- b)** Show that: $p \rightarrow (q \rightarrow r) \equiv p(\sim q \vee r) \equiv (p \wedge q) \rightarrow r.$ (08)

Q.4 Construct a combinatorial circuit from the following input/ output table: (15)

Input		Output
x_1	x_2	$f(x_1, x_2)$
1	1	1
1	0	0
0	1	0
0	0	1

Q.5 Prove that: $A^3 - 4A^2 - 3A + 11I = 0$ (15)

Where $A = \begin{bmatrix} 1 & 3 & 2 \\ 2 & 0 & -1 \\ 1 & 2 & 3 \end{bmatrix}$ and I is the

unit matrix of order 3.

P. T. O.

Q.6 a) Define 'Transitive relation'. Give an example of a transitive relation. Give an example of a relation that is not transitive. (07)

b) Use the principle of mathematical induction to verify: (08)

$$P(n): 1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$$

Q.7 Write short notes on the following: (15)

- a) Euclidean algorithm
- b) Minimal Boolean Expressions
- c) n-ary relations

SECTION-II

Q.8 Find the g.c.d. of (20)

a) 45, 34

b) 77, 128

c) 258, 60

d) 152, 80

Using Euclidean algorithm.

Q.9 Construct the truth tables for: (20)

a) $P \wedge (\sim q)$

b) $(p \wedge q) \vee (q \wedge r) \vee (r \wedge p)$

c) $(p \vee q) \vee (r \vee s)$

d) $(\sim p) \vee (\sim q)$

Q.10 a) Define 'Singular Matrix' and find the value of 'x' if $|A| = 0$ (10)

$$\text{Where } A = \begin{bmatrix} 3 & -2 & -4 \\ 9 & 2 & x \\ 5 & 2 & 3 \end{bmatrix}$$

b) Explain the concept of Contradiction and verify given compound statement is Tautology (10)

$$p \vee [\sim (p \wedge q)]$$

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