

**Subject : Operating Systems**

Day : Friday  
Date : 20/11/2015



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) 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 Vs Real time operating system.
  - b) Memory management with bitmap Vs Memory management with linked list.
  - c) Implicit tasking and Explicit tasking.
- Q.2** Explain the following terms: (15)
- a) Process control block
  - b) File access methods
  - c) Process relationships.
- Q.3** What is segmentation? Explain the concept of pure segmentation in detail. (15)
- Q.4** What is semaphore? Why it is necessary? Discuss the implementation of semaphore. (15)
- Q.5** What is deadlock? Explain conditions for deadlock occurrence. How to detect and recover the system from deadlock. (15)
- Q.6** Explain the concepts of file. Discuss various file protection mechanisms in detail. (15)
- Q.7** Write short notes on: (15)
- a) Disk scheduling
  - b) Reusable and consumable resources
  - c) System programs

**SECTION-II**

- Q.8** Consider the memory with six page frames (0-5). R bit values are given below for each page. (20)
- R bit value at clock tick 0 : 010010  
 R bit value at clock tick 1 : 011011  
 R bit value at clock tick 2 : 110110  
 R bit value at clock tick 3 : 010101  
 R bit value at clock tick 4 : 111110  
 R bit value at clock tick 5 : 110011  
 R bit value at clock tick 6 : 110001  
 R bit value at clock tick 7 : 101010
- By using LRU with aging (simulation of LRU in software) Find out page to be replaced at end. Also explain the algorithm in detail.
- Q.9** Consider the following case: (20)

Process	Arrival time	Execution time (in ms)
P1	10.00	6
P2	10.03	2
P3	10.04	1
P4	10.07	5

- Calculate average waiting and turnaround time in case of
- a) First come first served
  - b) Shortest job first
  - c) Round Robin
- Q.10**
- a) What are the operations performed by the operating system on a process right from its creation to termination. Explain each of them. (10)
  - b) Explain the concept and need of multiprocessing operating system. (10)

**Subject : Software Engineering**

Day : Monday  
Date : 23/11/2015



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 are Principles of Software Engineering? Explain in brief Program and Software. (15)
- Q.2** Explain Waterfall Model with stages in Waterfall Model of Software Process. Explain each stage in brief. (15)
- Q.3** Why Feasibility Study is required? Explain types of Feasibility Study in Software Development Process. (15)
- Q.4** Explain concept of PERT and GANTT charts for Software Project Management. Explain Planning and Execution phase in Software Project Management. (15)
- Q.5** Write detail note on Function Oriented and Object Oriented Modeling with respect to Constructing Solution to a Problem. (Assume any Business Problem) (15)
- Q.6** What is Software Testing? Explain different Software Testing Techniques in brief. (15)
- Q.7** Write short notes on the following: (15)
- a) Quality Control and Quality Assurance
  - b) Categories of Software Maintenance
  - c) Software Development Life Cycle

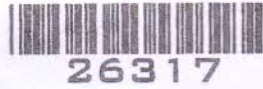
**SECTION – II**

- Q.8** Draw the Entity Relationship Diagram and Context Level Data flow Diagram for Hospital Management System. (Assume appropriate processes in Hospital Management System) (20)
- Q.9** Explain Requirement Engineering in detail with respect to types of Requirements. (20)
- Q.10** a) What are Characteristics of SRS (Software Requirement Specification) ? Explain need of SRS document. (10)
- b) Explain Cost Benefit Analysis in Brief. (10)

**Subject : Data Structures**

Day : Thursday

Date : 26/11/2015



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** Explain the applications of stack with example. (15)
- Q.2** Explain in detail any three sorting techniques. (15)
- Q.3** Explain Advantages and disadvantages of Linked list. (15)
- Q.4** What is Data structure? Explain types of data structures. (15)
- Q.5** What is Queues? Explain types of queues. (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** Explain the terms: (15)
- i) Inorder Traversal
  - ii) Preorder Traversal
  - iii) Postorder Traversal

**SECTION-II**

- Q.8** Write a program to implement depth first search algorithm. (20)
- Q.9** Write a program to sort 20, 35, 40, 100, 3, 10, 15 using insertion sort. (20)
- Q.10** Write program to find specific element from the array using binary search. (20)

Day : Saturday  
Date : 28/11/2015



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)** Find  $AXBXC = ?$  **(08)**

If  $A = \begin{bmatrix} -1 & 2 & 3 \\ 1 & -1 & 5 \\ 6 & 2 & 3 \end{bmatrix}$   $B = \begin{bmatrix} 5 & 2 & 3 \\ 0 & 1 & 0 \\ -1 & -2 & -3 \end{bmatrix}$

and  $C = \begin{bmatrix} 6 & 5 & 4 \\ 5 & 4 & -2 \\ 4 & -3 & 1 \end{bmatrix}$ .

**b)**  $A^2 + BI - C.$  **(07)**

**Q.2** What is proposition and truth table? Construct truth table for  $\sim(p \wedge q) \vee (\sim q \vee r).$  **(15)**

**Q.3** Let  $V = \{1, 2, 3, 4\}$  and **(15)**

$f = \{(1,3), (2,1), (3,4), (4,3)\}$  and

$g = \{(1,2), (2,3), (3,1), (4,1)\}.$

Find: i)  $f \circ g$                       ii)  $g \circ f$                       iii)  $f \circ f$

**Q.4** For each pair of integers a and b, find integers q and r such that  $a = bq + r$  and  $0 \leq r < |b|$  **(15)**

- i)  $a = 258$  and  $b = 12$                       ii)  $a = 573$  and  $b = -16$

**Q.5** Prove that: **(15)**

i)  $(A \cup B)' = A' \cap B'$  For any A and B for universal set U.

ii) prove above expression by venn diagram.

**Q.6** Define 'Symmetric relation'. Give an example of a symmetric relation. Give an example of a relation that is not symmetric. **(15)**

P. T. O.

Q.7 Write short notes on the following:

(15)

- a) Counting principle
- b) Minimal Boolean expressions
- c) Closure properties

### SECTION-II

Q.8 a) Draw logic circuit for output Y  
Here  $Y = A'BC + AB'C' + AB'$ .

(10)

- b) Write note on (Any TWO)
  - i) NAND gate
  - ii) NOR gate
  - iii) Prime implicate

(10)

Q.9 In a class of 80 students, 50 students know English, 55 know French and 46 know German languages. 37 students know English and French, 28 students know French and German, 25 students know English and German. 7 students know non of these languages. Find out.

(20)

- i) How many students know all 3 languages?
- ii) How many know only one language?

Q.10 Find the g.c.d. of

- a) 45, 34
- c) 258, 60

- b) 77, 128
- d) 152, 80

using Euclidean algorithm.

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(20)

**Subject : Operating Systems**

Day : Tuesday



Date : 12/04/2016

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) Both the sections should be written in the **SAME** answer book.
- 3) Figures to the **RIGHT** indicate full marks.

**SECTION-I**

- Q.1 Explain various operating system structures with their merits and demerits. (15)
- Q.2 Explain the following: (15)
- a) Multilevel scheduling
  - b) Multilevel feedback scheduling
  - c) Process control block
- Q.3 What is page table? Give the structure of page table entry. Explain the process of converting virtual addresses into physical addresses with suitable example. (15)
- Q.4 Explain the file system structure in detail. (15)
- Q.5 What is semaphore? Discuss characteristics and queuing implementation of semaphore. (15)
- Q.6 What is deadlock? Describe deadlock detection methods with example. (15)
- Q.7 Write short notes on: (15)
- a) Fragmentation
  - b) Disk structure
  - c) Segmentation with paging

**SECTION-II**

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

Process	Arrival time	Execution time (min)
P1	10.00	08
P2	10.01	03
P3	10.07	02
P4	10.10	04

Calculate average waiting and turnaround time in case of.

- a) First come first served
  - b) Shortest job first
  - c) Round robin
- Q.9 Consider the following page reference string. (20)
- 1,2,3,4,0,2,3,2,1,0,4,3,2,4,3,0,1
- Find out the page to be replaced at end using LRU with matrix. Also explain the algorithm.
- Q.10 Explain the following: (20)
- a) Distributed operating system.
  - b) Input Output interface.
  - c) Conditional critical region.
  - d) Operating system services.

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**Subject : Software Engineering**

Day : Saturday

Date : 16/04/2016



Time : 02.00 PM TO 05.00 PM

Max Marks : 100 Total Pages : 1

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**N. B. :**

- 1) Attempt **ANY FOUR** questions from Section –I. Each question carries **15**marks.
  - 2) Attempt **ANY TWO** questions from Section –II. Each question carries **20** marks.
  - 3) Answers to both the sections should be written in the **SAME** answer book.
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**SECTION - I**

- Q. 1** What are software engineering concepts? Explain principles and importance of software engineering. (15)
- Q. 2** What is software project management? Explain software configuration in brief. (15)
- Q. 3** Explain software development life cycle in brief. What are stages in SDLC? (15)
- Q. 4** What is need of feasibility study? Explain in brief types of feasibility. (15)
- Q. 5** What is requirement engineering? Explain in brief types of requirements. (15)
- Q. 6** What are characteristics of SRS? Explain function oriented modeling in brief. (15)
- Q. 7** Explain ERD concepts with example. What are benefits of flow charts? (15)

**SECTION - II**

- Q. 8** What are concepts of Testing? Explain different testing techniques with example. (20)
- Q. 9** What are quality concepts with respect to software? Explain in brief software quality assurance and software reviews. (20)
- Q.10** Write short notes on **ANY TWO** of the following: (20)
- a) Software maintenance
  - b) Object oriented design
  - c) Waterfall model

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