

# 17512

**21718**

**3 Hours / 100 Marks**

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
  - (2) Answer each next main Question on a new page.
  - (3) Illustrate your answers with neat sketches wherever necessary.
  - (4) Figures to the right indicate full marks.
  - (5) Assume suitable data, if necessary.
  - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

- 1. a) Attempt any THREE of the following: **12****
- (i) List and draw a neat labelled diagram of four components of a computer system.
  - (ii) List three main levels of data storage and explain cache storage.
  - (iii) List and draw a neat labelled diagram of process state.
  - (iv) List merits of I/O scheduling (Four points) and Demerits of I/O scheduling.

P.T.O.

b) Attempt any ONE of the following:

6

- (i) Explain the working of Inter-process communication considering.
  - 1) Shared memory
  - 2) Message passing
- (ii) List four Deadlock prevention condition and explain the following terms.
  - 1) Removal of “No preemption” condition.
  - 2) Elimination of “Circular wait” related to deadlock prevention condition.

2. Attempt any FOUR of the following:

16

- a) Define clustered systems? List four characteristics of clustered systems.
- b) Explain following two services of operating systems.
  - (i) File system manipulation
  - (ii) Resource Allocation
- c) Define synchronization  
Explain
  - (i) Blocking
  - (ii) Non Blocking in message passing
- d) List four process scheduling criteria and explain the term Turnaround in detail.
- e) Explain Deadlock Avoidance with example.
- f) Explain “Bitmap” method in free space management technique.

**3. Attempt any FOUR of the following:****16**

- a) Explain Time sharing OS in detail.
- b) List types of system call and explain the system call – “Information Maintenance”.
- c) Differentiate between long term scheduling and medium term scheduling.
- d) The Jobs are scheduled for execution as follows – solve the problem by using preemptive SJF (Shortest Job First). Find average waiting time using Gantt chart.

Process	Arrival Time	Burst Time
P1	0	10
P2	1	04
P3	2	14
P4	3	08

- e) Explain the working of Two-level directory structure with neat labelled diagram.

**4. a) Attempt any THREE of the following:****12**

- (i) List Advantages and Disadvantages of Batch Monitoring functions. (Four points)
- (ii) Explain major activities of memory management component of an operating system.
- (iii) Define the following with respect to resources.
  - 1) A preemptable resource
  - 2) A non-preemptable resource
- (iv) List four types of UNIX files and draw Unix file system.

**b) Attempt any ONE of the following:****6**

- (i) Explain working of CPU switch from process to process with diagram.
- (ii) Explain CPU and I/O burst cycle with the help of diagram.

- 5. Attempt any TWO of the following:** **16**
- a) Describe concept of file, its types and operations on file attributes in detail.
  - b) Explain swapping in operating system with diagram and example.
  - c) Comparison between Linux and UNIX. (Four points)
    - (i) User interface
    - (ii) Name of provider
    - (iii) Processing speed
    - (iv) Security
- 6. Attempt any FOUR of the following:** **16**
- a) List characteristics of operating system for smooth functioning of a computer – system. (Eight points)
  - b) With neat labelled diagram explain the working of Booting process.
  - c) With neat labelled diagram explain Unix layered structure.
  - d) Explain the working of semaphores.
  - e) Give difference between External fragmentation and Internal fragmentation (four points)
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