

17512

16172

3 Hours / 100 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) 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) With neat diagram, explain real time system. List its any four application.
- (ii) State any four types of system calls provided by an operating system.
- (iii) Explain Bit map free-space management technique.
- (iv) Describe first generation of operating system with its advantages and disadvantages.
- b) **Attempt any ONE of the following:** **6**
- (i) Differentiate between paging and segmentation. (any six points)
- (ii) State and describe services provided by an operating system.

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- 2. Attempt any FOUR of the following:** **16**
- a) With neat diagram, explain structure of unix operating system.
 - b) Explain multiprocessor system and its two types.
 - c) Explain file structure with example.
 - d) Describe stepwise booting process of unix along with diagram.
 - e) Describe the following:
 - (i) Schedulers
 - (ii) Context switch
 - f) State and explain four scheduling criteria.
- 3. Attempt any FOUR of the following:** **16**
- a) Describe activities of I/O system and secondary storage management. (four each)
 - b) With neat diagram, explain file access methods.
 - c) Describe the critical-section problem.
 - d) State and describe necessary conditions for dead lock.
 - e) With neat diagram, explain multilevel queue scheduling.
- 4. a) Attempt any THREE of the following:** **12**
- (i) With neat diagram, Explain Monolithic structure of operating system.
 - (ii) Describe Process Control Block (PCB) with suitable diagram.
 - (iii) Write use of following system calls.
 - 1) fork()
 - 2) exec()
 - 3) abort()
 - 4) end()
 - (iv) Write benefits of using threads.

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

- (i) With neat diagram, explain many to one and many to many multithreading model with its advantages and disadvantages.
- (ii) Explain any two file allocation methods with the help of diagram.

5. **Attempt any TWO of the following:** 16

- a) With neat diagram, explain Message passing system. Also describe the following:
 - (i) Naming
 - (ii) Synchronization
 - (iii) Buffering
- b) Consider the following set of processes, with the length of the CPU burst given in milliseconds.

Process	Burst Time	Priority
P ₁	10	3
P ₂	1	1
P ₃	2	3
P ₄	1	4
P ₅	5	2

Find out average waiting time by using

- (i) nonpreemptive priority
- (ii) Round-Robin (RR) (quantum = 1)
- c) Write steps for Banker's Algorithm to avoid dead lock. Also give one example showing working of Banker's Algorithm.

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

- a) What is system call? With the help of diagram explain open() system call.
- b) Compare UNIX and LINUX.
- c) Explain multiprogrammed O.S. with suitable diagram.
- d) Explain two level Directory Structure with suitable diagram.
- e) Describe Process in memory with diagram.