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[18–HRGPKAC–M3S]

MCA/MSc IT 3rd Semester Exam., 2018

OPERATING SYSTEM

[MCA/MSc IT (S3) 10]

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer any *five* questions from the following : 2×5=10

(a) Explain the term 'efficient allocation of resources'.

(b) Define Process Control Block (PCB).

(c) In which situation, race condition occurs?

(d) Write the difference between short-term scheduling and medium-term scheduling.

(e) Define deadlock with example.

(f) In which situation, external fragmentation occurs?

2. Answer any *three* from the followng questions : 4×3=12

(a) Explain the concept of parallel processing with block diagram.

(b) Explain thread. Write the difference between thread and process. 3+1

(c) Explain the concept of critical section with example. 3+1

(d) Explain the encryption-decryption process with a block diagram.

3. Answer any *three* from the following questions : 6×3=18

(a) Define DMA. Write the steps in DMA. 2+4

(b) What is page fault? How is page fault handled? 2+4

(c) Write the necessary condition for deadlock.

(d) Explain the process control block with block diagram.

4. Answer any *four* questions from the following : 10×4=40

(a) Consider the following set of processes, with the length of CPU-burst time given in mlliseconds :

Process	*Burst time*	*Priority*
P1	16	3
P2	1	1
P3	6	2
P4	2	3
P5	5	4

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

(i) Draw Gantt charts illustrating the execution of these processes using FCFS, SJF, Priority and Round-Robin (quantum=4) scheduling.

(ii) What is the turnaround time of each process for each of the scheduling algorithms in *(i)*?

(Continued)

(iii) What is the waiting time of each process for each of the scheduling algorithms in *(i)*?

(iv) Which of the schedules in part *(i)* results in the minimal average waiting time (over all processes)?

(b) Write an algorithm with example for deadlock avoidance. 6+4

(c) What is semaphore? Explain how critical section problem can be solved using semaphore. 3+7

(d) Explain the techniques of different file organizations. 10

(e) Explain the following terms : 10

(i) Device drivers

(ii) Spooling

(iii) Operating system services

(iv) System call

(v) Authentication

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