No. of Printed Pages—2

1014 (M3OPS)

[21–HRPD3SN–22J]

MScIT 3rd Semester (New) Exam., 2021 (W)

OPERATING SYSTEM

[MScIT S3–03]

Full Marks : 70/80

Time : 3 hours

The figures in the margin indicate full marks for the questions

Note : *(a)* Learners admitted in 2020 and 2021 are to answer *70* Marks (Question Nos. **1** to **4**).

(b) Learners admitted in and before 2019 are to answer all the questions (Question Nos. **1** to **5**), i.e., for *80* Marks.

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

(a) What are the key factors that affect memory hierarchy?

(b) What are the three objectives of operating system?

(c) What is a page fault?

(d) What is an intrusion detection system?

(e) What is a distributed operating system?

(f) What is virtual memory?

2. Answer any *four* from the following : 3×4=12

(a) What is mutual exclusion? What are sleep and wakeup?

(b) Mention any three advantages of multiprocessor system.

(c) What is a real-time operating system? What are the two types of real-time system?

(d) What are the different states a process can have?

(e) What are internal and external fragmentations?

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3. Answer any *four* from the following : 6×4=24

(a) Consider there to be four frames in the physical memory. Find the number of page faults for FIFO and LRU page replacement algorithms for the following page references : 3+3=6

[X, Y, Z, P, R, X, Y, R, Y, X]

(b) What is a process? How can a process be created? 2+4=6

(c) What are interrupt and interrupt handler? Why is interrupt necessary in computer system? (2+2)+2=6

(d) Explain the tree-structured directory structure.

(e) What is an access matrix? What are the different forms of accidental and malicious security violations? 2+4=6

4. Answer any *three* from the following : 8×3=24

(a) What are the different mapping techniques used in cache organization? Describe how associative mapping works. 2+6=8

(b) Explain the conditions that must be held for a deadlock to occur. What are the different ways that are used for handling a deadlock? 4+4=8

(c) Describe the working of FCFS scheduling algorithm using an example. Differentiate between preemptive scheduling and non-preemptive scheduling. 6+2=8

(d) Explain the functional units of a computer system.

The following question is *NOT* for the learners admitted in 2020 and 2021 batches :

5. Answer any *one* from the following : 10

(a) Explain the distributed processing. Mention the advantages of distributed operating systems. 7+3=10

(b) *(i)* Explain the process of swapping in memory management. 5

(ii) Describe briefly about termination of process. 5

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