7236

BOARD DIPLOMA EXAMINATION, (C-20)
JUNE/JULY—2022

DCME - THIRD SEMESTER EXAMINATION

OPERATING SYSTEMS

Time : 3 hours]   [*Total Marks* : 80

PART—A   3×10=30

Instructions : (1) Answer all questions.

(2) Each question carries three marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define the term booting process.

2. Write any two disadvantages of single-user OS.

3. Define the terms process and thread.

4. Write the differences between I/O bound process and CPU bound process.

5. List necessary conditions for arising deadlocks.

6. Define the term process synchronization.

7. Write any differences between external and internal fragmentation.

8. Define the term overlay.

9. List any six disk performance characteristics.

10. List any three operations on directory structures.

PART—B   8×5=40

Instructions : (1) Answer all questions.

(2) Each question carries eight marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. *(a)* Describe advantages of multiprocessor systems with respect to web browsers.

(OR)

(b) Explain the security related problems in a multiprogramming and time-sharing environment.

12. *(a)* Apply priority (non-preemptive) scheduling algorithm to calculate the response time for processes given below. A higher priority number has higher priority.

Process	Burst Time	Arrival Time	Priority
P1	6	0	2
P2	4	4	3
P3	8	2	1
P4	2	3	4

(OR)

(b) Compare single level thread with multi-level threading for web based application.

13. *(a)* Compare two kernel data structures in which race conditions are possible. Be sure to include a description of how a race condition   can   occur.

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(OR)

(b) Make use of resource allocation graph to check the system is in safe state or not. Draw the reduced resource allocation graph. Given processes resource usage and availability as described in the following table :

Process	Current Allocation R1 R2 R3	Requests R1 R2 R3	Resource Available R1 R2 R3
P0	100	120	
P1	011	100	
P2	120	101	111
P3	011	010	

14. *(a)* Given six memory partitions of 300 KB, 600 KB, 350 KB, 200 KB, 750 KB and 125 KB (in order), how would the first-fit, best-fit, and worst-fit algorithms place processes of size 115 KB, 500 KB, 358 KB, 200 KB and 375 KB (in order). Rank the algorithms in terms of how efficiently they use memory.

(OR)

(b) Consider the following page reference string :

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults would occur for the optimal replacement algorithm? Assume frame size is four.

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15. *(a)* Compare absolute path and relative path with respect to UNIX operating systems.

(OR)

(b) A disk queue with requests for I/O to blocks on cylinders 98, 183, 41, 122, 14, 124, 65, 67. The head is initially at cylinder number 53. The cylinders are numbered from 0 to 199. Starting from the current head position, calculate the total distance (in number of cylinders) that the disk arm moves to satisfy all the pending requests by applying FIFO disk scheduling policy.

PART—C   10×1=10

Instructions : (1) Answer the following question.

(2) The question carries ten marks.

(3) Answer should be comprehensive and criterion for valuation is the content but not the length of the answer.

16. Why multilevel queue scheduling algorithm is better than Round Robin scheduling algorithm. Justify your answer through any two real time scenarios.

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