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32521/E210

Reg. No. | | | | | | | | |

V Semester B.C.A. 3 Theory Examination, September - 2020

Operating System

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(Repeater/Regular)

Time : 3 Hours **Maximum Marks : 80**

Instructions to Candidates:

1. Answer the questions of all three Sections as per the instructions.
2. Draw the diagrams wherever necessary.

SECTION - A

1. Answer any **10** of the following. **(10×2=20)**

a) What is multiprogramming?

b) Mention any two applications real time systems.

c) Define CPU scheduling.

d) What is binary semaphore? Mention its use.

e) What is deadlock?

f) Differentiate between fragmentation & compaction.

g) Mention the two instructions used for the implementation of mutual exclusion in critical section.

h) What is logical address?

i) What is boot block?

j) What is the use of an overlay?

k) List different approaches to authenticate a user.

l) What is thrashing?

[P.T.O.

SECTION - B

Answer any 4 questions. (4×5=2

2. What is critical section problem? Explain.
3. Explain access matrix method of system protection.
4. Explain various file operations.
5. Explain different states of a process with neat diagram.
6. Explain swapping process with neat diagram.
7. Explain the method of deadlock prevention.

SECTION - C

Answer any 4 of the following. (4×10=40

8. Consider the following set of processes with CPU burst time given in milliseconds.

Process	Burst time
P_1	10 ms
P_2	1 ms
P_3	2 ms
P_4	1 ms
P_5	5 ms

Processes are arrived in P_1, P_2, P_3, P_4, P_5 order of all at time 0 (zero).

1) Draw Gantt charts to show execution using SJF and Round Robin (Quantum time=1ms) Scheduling.
2) Calculate average waiting time for SJF and Round Robin Scheduling.
3) Calculate average turn around time for SJF and Round Robin Scheduling. (2+4+4)

9. a) Explain optimal page replacement and least recently used (LRU) page replacement algorithms considering the following reference string.

(7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1)

b) Explain SCAN & LOOK Disk Scheduling Algorithm with an example. (5+5)

10. Consider the following snapshot of the system

	Allocation				Maximum				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

Using the bankers algorithm, answer the following

i) What is the content of NEED Matrix?

ii) Is the system in safe state? If yes, give the SAFE state

iii) If a request from process P_1 arrives for (0 4 2 0), can the request be granted immediately? **(2+6+2)**

11. a) Explain contiguous allocation of disk space with neat diagram.

b) Explain paging with an example. **(5+5)**

12. a) What are real time systems? Explain.

b) Explain Dining Philosophers problem of Synchronization. **(5+5)**