Code No: 154BR **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year II Semester Examinations, February - 2024
OPERATING SYSTEMS
(Common to CSE, IT, CSBS, CSIT, ITE, CE(SE), CSE(CS), CSE(AI&ML), CSE(DS), CSE(IOT), CSE(N), AI&ML, CSD)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	What is a hard real time system?	[2]
b)	What is symmetric multiprocessor system? List out its characteristics.	[3]
c)	Why do processes need to communicate?	[2]
d)	What is the use of waitpid() system call?	[3]
e)	What is a binary semaphore?	[2]
f)	What is resource allocation graph? Why it is used?	[3]
g)	What is internal fragmentation?	[2]
h)	Distinguish between logical address and physical address.	[3]
i)	What is a bit vector?	[2]
j)	Explain acyclic graph directory structure.	[3]

PART – B

(50 Marks)

2.a) Distinguish between parallel and distributed systems.
b) Write down the features of multi programmed and Time shared systems. [5+5]

OR

3.a) Summarize the evolution of Operating system in detail.
b) Write down the services provided by an operating systems with respect to device management. [5+5]

4.a) What is a process? Distinguish between a process and a program.
b) Explain the preemptive and non-preemptive scheduling criteria. [5+5]

OR

5.a) Simulate preemptive SJF(SRTF) and non-preemptive SJF scheduling algorithms on following data and compute average waiting time:

pid	Arrival time	Burst time
P01	0	8
P02	2	5
P03	4	2
P04	5	1
P05	6	6

b) Briefly discuss about various operations performed on processes. [6+4]

6. What is a deadlock? Explain various deadlock prevention strategies with brief illustrations. [10]

OR

7. What is process synchronization? How can it be achieved through monitors? Explain. [10]

8. Simulate FIFO, LRU and optimal page replacement algorithms on the following reference string and find number of page faults(number of frames = 4)
1,2,3,2,1,2,3,4,5,6,7,3,4,5,6,3 [10]

OR

9. Explain segmentation memory management scheme with neat diagrams. [10]

10. List and explain various file allocation methods with their relative merits and demerits. [10]

OR

11.a) How file protection is achieved by operating system?
b) Explain about lseek(), open() and read() system calls. [4+6]

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