

**322513(22)**

**B. E. (Fifth Semester) Examination,**

**Nov.-Dec. 2021**

**(CSE/IT Branch)**

**OPERATING SYSTEM**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note :*** Attempt all questions. Part (a) is compulsory and attempt any **two** from (b), (c) and (d) parts of each question. Part (a) is carry 02 marks each and part (b), (c) and (d) carry 07 marks each. Assume if any data is missing.

**Unit-I**

1. (a) Write down the difference between multitasking and multiprograming operating system. 2
- (b) Briefly explain objectives and functions of operating system. 7

[ 2 ]

- (c) Explain the real time operating system with its advantages and disadvantages. 7
- (d) Explain Various System Components of OS. 7

**Unit-II**

2. (a) What is PCB? 2
- (b) Explain Short Term, Long Term and Medium Term Scheduler. 7
- (c) Write down the different CPU scheduling criterias. 7
- (d) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds : 7

Process	Burst time
P <sub>1</sub>	24
P <sub>2</sub>	3
P <sub>3</sub>	3

The process are assumed to have arrived in the order P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub> all at time 0 (zero) :

- (i) Draw a Gantt-chart illustrating the execution of these processes using FCFS.

[ 3 ]

- (ii) Compute waiting times for the processes and average waiting time. 7
- (iii) What if the processes arrive in the order P<sub>2</sub>, P<sub>3</sub>, P<sub>1</sub>?

**Unit-III**

3. (a) Write the conditions for a deadlock. 2
- (b) What is deadlock? Give the various methods to avoid the deadlock. 7
- (c) Write down the two methods for handling deadlocks. 7
- (d) Consider the following snapshot of a system : 7

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P <sub>0</sub>	0	0	1	2	0	0	1	2	1	5	2	0
P <sub>1</sub>	1	0	0	0	1	7	5	0				
P <sub>2</sub>	1	3	5	4	2	3	5	6				
P <sub>3</sub>	0	6	3	2	0	6	5	2				
P <sub>4</sub>	0	0	1	4	0	6	5	6				

[ 4 ]

Using Banker's algorithm, answer the following questions :

- (i) What is the content of matrix NEED?
- (ii) Is the system in a safe state?
- (iii) If a request from process  $P_1$  arrives for (0, 4, 2, 0) can the request be granted immediately?

**Unit-IV**

- 4. (a) Define logical and physical address space. 2
- (b) Define Fragmentation. Explain Internal and External Fragmentation. 7
- (c) Explain demand paging with an example. 7
- (d) For the partitions of 100 K, 500 K, 200 K, 300 K and 600 K (in-order)  
Place the processes of size 212 K, 417 K, 112 K, 426 K (in-order) according to best fit algorithm, 200 K is reserve for OS. Also make PDT? 7

**Unit-V**

- 5. (a) What is file? Write down the different file attributes. 2

[ 5 ]

- (b) Explain buffering mechanism with its type. 7
- (c) Write a short notes on : 7
  - (i) Single-level Directory
  - (ii) Tree-level Directory
- (d) Explain any one file allocation method with proper example. 7