510403/510903/511603

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B. Tech. V - Sem. (Main/Back) Exam., (Academic Session 2021- 2022)

Computer Science & Engineering

5CS4 – 03/5IT4-03/5ML4-03 Operating System

Common to CSE/IT/MLC

Time: 3 Hours **Maximum Marks: 120**

Min. Passing Marks:

Instructions to Candidates:

Part – A: *Short answer questions (up to 25 words) 10 × 2 marks = 20 marks. All **ten** questions are compulsory.*

Part – B: *Analytical/Problem solving questions 5 × 8 marks = 40 marks. Candidates have to answer **five** questions out of **seven**.*

Part – C: *Descriptive/Analytical/Problem Solving questions 4 ×15 marks = 60 marks. Candidates have to answer **four** questions out of **five**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

Q.1 What is the difference between multitasking and multiprocessing? [2]

Q.2 Define spooling with example. [2]

Q.3 What are the different components of the operating system? [2]

Q.4 What is the difference between process and threads? [2]

Q.5 Write a short note on inter-process communication. [2]

Q.6 What is context switching? [2]

Q.7 What is the race condition? Explain with an example. [2]

Q.8 What is the difference between concurrency and parallelism? [2]

Q.9 What is virtual memory? [2]

Q.10 What is demand paging? [2]

PART – B

Q.1 Consider a reference string: 4, 7, 6, 1, 7, 6, 1, 2, 7, 2 the number of frames in the memory is 3. Find out the number of page faults respective to –

(a) Optimal Page Replacement Algorithm [4]

(b) FIFO Page Replacement Algorithm [4]

Q.2 What is process scheduling? What is the difference between short term and long-term scheduler? [8]

Q.3 Define following with a suitable example –

(a) Linker [4]

(b) Loader [4]

Q.4 What is deadlock? What are the characteristics of deadlock? [8]

Q.5 What are the different security problem faced in the OS? What are the different levels at which security measure can be used? [8]

Q.6 What is the use of semaphores in concurrency control? Explain with a suitable example. [8]

Q.7 Write a short note on –

(a) File Protection [4]

(b) Free space management [4]

PART – C

Q.1 What is an operating system? What are the advantages of the operating system? What are the different types of operating system? [15]

Q.2 Consider the following set of processes. Assume the length of arrival time and burst time is given in milliseconds. Draw Gantt chart representing the execution of the process using FCFS and Shortest Job First algorithms. Also, calculate the average waiting time and an average turnaround time for both the algorithms. [15]

Process	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

Q.3 Describe the disk structure. What is disk scheduling? What are the advantages of using disk scheduling? Explain any one algorithm of disk scheduling with example. [15]

Q.4 What is an operating system and what are the advantages of the operating system? What are the different types of operating system? [15]

Q.5 (a) Define the concept of files in the operating system. What are the different access methods for files? [7.5]

(b) What is the principle of protection? What are the goals of protection in the OS? [7.5]