BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)
B.Tech.Sem - IV Computer Science & Engineering : WINTER- 2022
SUBJECT : SYSTEM PROGRAMMING & OPERATING SYSTEM

Day : Friday
Time : 02:30 PM-05:30 PM
Date : 25-11-2022
W-24304-2022
Max. Marks : 60

N.B.:
1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw diagrams wherever necessary.
4) Use of Scientific Calculator is allowed

Q.1 **a)** Differentiate between literal and immediate operand. How assembler handles them? Give examples. How pass-1 of an Assembler works explain with example. **(10)**

OR

Q.1 **a)** Differentiate between compiler and interpreter. **(05)**

b) Explain in brief imperative statements, declarative statements and assembler directives with example for assembly language programming. **(05)**

Q.2 **a)** Give complete design of absolute loader with suitable example. **(05)**

b) Differentiate static and dynamic link libraries. **(05)**

OR

Q.2 Explain phases of compiler in detail. Consider input X= y+z*30 and show the output of each phase of complier. **(10)**

Q.3 What is operating system? Explain various services offered by operating system. What is real time OS? Explain its types with suitable example. **(10)**

OR

Q.3 Draw Gantt chart and calculate Avg. Turnaround time, Avg. waiting time for the following processes using, priority based (non-preemptive) scheduling and SJF(preemptive) scheduling polities (consider low number as high priority) **(10)**

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

Q.4 Explain Banker's algorithm in detail. Find out the safe sequence for execution of 3 processes using Banker's algorithm maximum resources **(10)**

R1=7, R2= 7, & R3= 10

Allocation Matrix

	*R*1	*R*2	*R*3
*P*1	2	2	3
*P*2	2	0	3
*P*3	1	2	4

Maximum Requirement Matrix

	*R*1	*R*2	*R*3
*P*1	3	6	8
*P*2	4	3	3
*P*3	3	4	4

OR

Q.4 Write a note on **(10)**

i) Producer consumer problem

ii) Reader writer problem

Q.5 Consider page sequence 2,3,2,1,5,2,4,5,3,2,5,2 and discuss working of the following page, replacement policies. Also count page faults. (Use no. of frames = 3) **(10)**

i) FIFO

ii) LRU

iii) Optimal

OR

Q.5 Explain **(10)**

i) Memory management techniques with its types.

ii) Internal and external fragmentation.

Q.6 Write note on **(10)**

i) Directory Structure with its types.

ii) Types of File organization.

OR

Q.6 Explain the following concepts in detail. **(10)**

i) File Access methods.

ii) File management under UNIX.

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