BACHELOR OF COMPUTER APPLICATIONS (C.B.C.S.) (2014 COURSE)
B.C.A. Sem-III : WINTER : 2021
SUBJECT: OPERATING SYSTEMS

Day : Saturday   Time : 10:00 AM-01:00 PM
Date : 15-01-2022   **W-11036-2021**   Max. Marks: 100

N.B.:

1) Attempt any **FOUR** questions from Section –I and any **TWO** questions from Section–II.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SAME** answer book.

SECTION-I

Q.1 Explain the concept of Online operating system and Real time operating **(15)** system with example.

Q.2 What is process? Explain various process states with help of diagram. Also **(15)** give the content of process control block.

Q.3 Discuss memory management with bitmap and linked list with their merits **(15)** and demerits.

Q.4 Explain the terms: **(15)**
i) Race condition   ii) Critical section   iii) Semaphore

Q.5 What is file? Discuss file system structure in detail. **(15)**

Q.6 What is deadlock? Explain deadlock detection with multiple resources of each **(15)** type in detail.

Q.7 Write short notes on any **TWO** of the following: **(15)**

   a) Disk structure
   b) Distributed operating system
   c) Conditional critical region

SECTION-II

Q.8 Explain the procedure-consumer problem in detail. Discuss possible solution **(20)** to above problem with help of semaphore.

Q.9 Consider the following page reference string: **(20)**
1, 2,3,4,2, 1,5, 6,2,1,2,3,7,6, 3,2,1,2,3,6,
How many page faults would occur for the following page replacement algorithms? Consider physical memory with four page frames which are initially empty.
a) FIFO   b) LRU

Q.10 Consider the following case: **(20)**

Processes	Run time (min.)
P1	5
P2	10
P3	2
P4	1
P5	5

All processes arrived in order P1, P2, P3, P4 and P5 at same time. Draw Gantt charts and calculate average waiting time and average turnaround time for the following algorithm. (Consider time quantum =1 min.)
a) FCFS   b) SJF   c) RR

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