B.Sc./3rd Sem (G)/COMP/22(CBCS)

# 2022

# COMPUTER SCIENCE (General)

## Paper : DSC 1C/2C/3C-T

## (Operating Systems)

[CBCS]

Full Marks : 40 Time : Two Hours

*The figures in the margin indicate full marks.*
*Candidates are required to give their answers in their own words as far as practicable.*

### Group - A

Answer any *five* questions : 2×5=10

1. (a) What is Multilevel Queue scheduling? 2

   (b) What happens if time quantum is too large in Round Robin algorithm? 2

   (c) Why page replacement algorithm is used in virtual memory? 2

   (d) What is critical section? 2

   (e) Why OS is called system software? 2

   (f) What is pure demand paging? 2

   (g) What is context switching? 2

   (h) What is throughput and waiting time? 2

P.T.O.

## Group - B

Answer any ***four*** questions : 5×4=20

2. (a) (i) Compare preemptive and non-preemptive time scheduling.

(ii) What are the differences between virtual address space and physical address space? 3+2

(b) (i) Consider the following page-reference string

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

How many page faults would occur for the optimal page replacement algorithm, assuming 3 frames?

(ii) What is process? 4+1

(c) (i) Write short note on Thrashing.

(ii) What is time sharing OS? 3+2

(d) Given memory partitions of 100k, 500k, 200k, 300k and 600k (in order), how would each of the First-fit, Best-fit and Worst-fit algorithms place processes of 212k, 417k and 112k (in order)?

(e) Apply Round Robin scheduling algorithm to the following processes :

| Process | Burst time (ms) |
|---|---|
| P1 | 10 |
| P2 | 4 |
| P3 | 5 |

Assume that all the processes have arrived in the order P1 to P3, Time Quantum = 5 ms. Compute turnaround time and waiting time for each process.

(f) Differentiate between SCAN and C-SCAN scheduling with examples.

## Group - C

Answer any *one* question : 10×1=10

3. (a) Write short notes on : 5+5

(i) Process Control Block

(ii) Deadlock Prevention

(b) (i) Suppose that the following processes arrive for execution at time indicated

| Process | Arrival time | Execution time |
|---|---|---|
| P1 | 0.0 | 8 |
| P2 | 0.4 | 4 |
| P3 | 1.0 | 1 |

What is the average TAT for these processes with FCFS scheduling algorithm? What is the AWT for those processes with FCFS algorithm?

(ii) Explain different states of process with the help of state diagram. (3+3)+4

P.T.O.