Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
(Autonomous)
End Semester Examination: OCT/NOV 2024
Faculty: Science & Technology

Program: BCA Code: BCASc08 **Semester: V** **SET: A**
Program (Specific): BCA(Science) **Course Type: DSE**
Class: TYBCA **Max. Marks: 70**
Name of the Course: Operating System
Course Code: 24-BCA-353 **Time: 3Hr**
Paper: III

Instructions to the candidate:

1) *There are 4 sections in the question paper. Write each section on separate page.*
2) *All Sections are compulsory.*
3) *Figures to the right indicate full marks.*
4) *Draw a well labeled diagram wherever necessary.*

SECTION: A

Q1) Attempt the following: **[5 × 1 = 5]**

A) Choose the correct option:

i) What is an operating system?

a) interface between the hardware and application programs

b) collection of programs that manages hardware resources

c) system service provider to the application programs

d) all of the mentioned

ii) CPU scheduling is the basis of _____

a) multiprogramming operating systems

b) larger memory sized systems

c) multiprocessor systems

d) none of the mentioned

iii) When a process is in a "Blocked" state waiting for some I/O service. When the service is completed, it goes to the _____

a) Terminated state

b) Suspended state

c) Running state

d) Ready state

iv) For an effective operating system, when to check for deadlock?

a) every time a resource request is made at fixed time intervals

b) at fixed time intervals

c) every time a resource request is made

d) none of the mentioned

v) The operating system maintains a _____ table that keeps track of how many frames have been allocated, how many are there, and how many are available.

a) memory

b) mapping

c) page

d) frame

B) Attempt the following: [5 × 1 = 5]

i) Define dispatcher.

ii) How External fragmentation occurs?

iii) What is logical address?

iv) Write about process.

v) Explain the concept mutual exclusion.

SECTION: B

Q2) Answer the following (Any five): **[5 × 3 = 15]**

a) Write different types of schedulers.

b) Explain disk scheduling with its types.

c) Write note on physical address and virtual address of a process.

d) State different scheduling criteria.

e) Write a short note on overlays.

f) Define paging, page fault and page hit.

SECTION: C

Q3) Answer the following (Any five): **[5 × 4 = 20]**

a) Write about Process termination and resource pre-emption.

b) Explain Resource allocation with example.

c) Write a short note bounded buffer problem.

d) Explain in short second chance algorithm.

e) Which are different file access methods?

f) Explain memory mapping and its types.

g) Explain the acyclic and general graph directory.

SECTION: D

Q4) Answer the following (Any five): **[5 × 5 = 25]**

a) Which are file attributes?

b) 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 FIFO.

c) Consider a system that contains five processes P0, P1, P2 and the three resource types X,Y and Z. Following are the resources types: X has 5, Y has 5 and the resource type Z has 5 instances.

	Alloc			Request		
	X	**Y**	**Z**	**X**	**Y**	**Z**
P0	1	2	1	1	0	3
P1	2	0	1	0	1	2
P2	2	2	1	1	2	0

Answer the following question using Banker's Algorithm : i) What is the contents of matrix need? ii) Is the system in safe state?

d) Consider the given table below and find Completion time (CT), Turn-around time (TAT), Waiting time (WT), Response time (RT), Average Turn-around time and Average Waiting time. Draw Gnatt chart.

Process ID	**Arrival time**	**Burst time**
P1	2	2
P2	5	6
P3	0	4
P4	0	7
P5	7	4

e) How memory protection can be done? Explain.

f) Describe in short different page replacement strategies.

g) Write note on thrashing and its causes.