Graphic Era HILL UNIVERSITY
Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

End Term (Even) Semester Examination May-June 2025

Roll no.....

Name of the Program and semester: BCA - II Sem
Name of the Course: Introduction to Operating Systems
Course Code: TBC-203
Time: 3 hour Maximum Marks: 100

Note:
(i) All the questions are compulsory.
(ii) Answer any two sub questions from a, b and c in each main question.
(iii) Total marks for each question is 20 (twenty).
(iv) Each sub-question carries 10 marks.

Q1. (2X10=20 Marks)

a. What is process scheduling? Why it is needed? Define any two types of preemptive scheduling algorithms in short.

b. Discuss the Bakery Algorithm for the critical section with its working for critical section.

c. What is the situation of Deadlock? Define the necessary conditions of deadlock with the help of an example.

Q2. (2X10=20 Marks)

a. Consider the following page reference string: 2,3,1,2,5,6,7,7,1,0,5,4,6,2,3,0,1. Assuming demand paging with three frames, how many page faults would occur for the **FCFS page replacement algorithm.**

b. What is the need of "Multi-Level Feedback Queue Algorithm". Define in detail.

c. What is Page Fault? Explain the process with the help of a diagram. Also, define swapping. define with the help of a diagram.

Q3. (2X10=20 Marks)

a. Define the following in short :

I. Multi level queue scheduling algorithm

II. Critical Section

III. Hypervisor

IV. Paging

V. Thrashing

b. What is the need of disk scheduling algorithm? Define C-SCAN disk scheduling algorithm with example.

c. Differentiate "kernel" and Shell" in at least 10 points.

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Q4. (2X10=20 Marks)

a. What is the average waiting time and average turn around time of all processes for FCFS, SJF algorithm? CO2

Processes	Burst Time	Arrival
P1	10	3
P2	1	1
P3	2	0
P4	1	4
P5	5	2

b. Define How "UNIX" operating system works. Define in detail.

c. Define Starvation. Which algorithm works with minimum starvation in OS Process Scheduling Algorithms.

Q5. (2X10=20 Marks)

a. What are threads? Discuss different types of threads. What resources are used when a thread is created? How do they differ from those used when a process is created?

b. Define the following :

I. Process Control Block

II. Dual Mode Operating

III. System Call

IV. Semaphore

V. UNIX

c. Define how memory management works in an operating system.