2017

M.Sc.

3RD SEMESTER EXAMINATION

COMPUTER SCIENCE

PAPER—COS-301

Full Marks : 50

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

(Advanced Operating System)

Answer any *four* questions : 4×10

1. (a) What do you mean by CPU scheduling ? 1

(b) Compare and contrast among Long-Term Scheduler, Short-Term Scheduler, Medium-Term Scheduler. 3

(c) What are the advantages and disadvantages of SJF scheduling ? 2

(d) Consider the following set of processes. CPU burst time of them are given in milliseconds : 4

Process	*Arrival time*	*Execute time*	*Service Time*
P_0	0	5	0
P_1	1	3	5
P_2	2	8	8
P_3	3	6	16

Draw the Gantt chart of R.R. scheduling where time quantum q = 3 milliseconds. Calculate the average waiting time.

2. (a) Why thread is called "Light weight process" ? Discuss. 2

(b) Write the differences between Thread and Process. 2

(c) Describe the Kernal level thread. 3

(d) What is a critical section ? Write any of the possible solutions for the critical section problem. 1+2

3. (a) What is a Deadlock ? Describe the criteria for deadlock. 2+2

(b) How to avoid Deadlocks ? 3

(c) Write any of strategies to remove deadlock after its occurrence. 3

4. (a) Write Banker's Algorithm for finding out whether or not a system is in a safe state. 4

(b) *Consider the following snapshot :* 6

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
P_1	2	0	0	3	2	2			
P_2	3	0	2	9	0	2			
P_3	2	1	1	2	2	2			
P_4	0	0	2	4	3	3			

Anser the following questions using the Banker's algorithm

(i) What is the content of the Need matrix ?

(ii) Is the system in a safe state ?

(iii) If a request from process P I arrives for (1, 0, 2), can the request be granted immediately ?

5. (a) Explain the difference between internal fragmentation and external fragmentation. Which one occurs in paging system ? How the problem of external fragmentation be solved ? 3+2+2

(b) State the advantages and disadvantages of single contiguous memory allocation. 3

6. (a) What is thrashing ? 2

(b) Explain Belady's anomaly. 3

(c) Why are page sizes always power of 2 ? 1

(d) Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. 4

(i) How many bits are there in the logical address ?

(ii) How many bits are there in the physical address ?

[*Internal Assessment — 10 Marks*]
