2016

MCA 3rd Seme. Examination

OPERATING SYSTEM

PAPER—MCA-305

Full Marks : 100

Time : 3 Hours

The figures in the margin indicate full marks.

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

Illustrate the answers wherever necessary.

Answer Q. No. *1* and any *four* from the rest.

1. Answer any *five* questions : 5×2

(a) Define the essential properties of Batch operating system.

(b) What are the two models of interprocess communication ?

(c) What do you mean by bounded waiting ?

(d) What is Pthreads ?

(e) State throughout of a system.

(f) List some of the features of real time system.

(g) Define system call.

2. (a) Describe the differences among short-term medium-term and long-term scheduling.

   (b) Distinguish between the client-server and peer-to-peer models of distributed systems.

   (c) What is the use of fisk ( ) and exec ( ) ? 6+6+3

3. (a) With the help of diagram, illustrate the different states of a process.

   (b) What are the basic differences between Remote Procedure Calls and Remote Method Invocation ?

   (c) State the benefits of multithreaded programming. 6+5+4

4. Consider the following set of processes with the length of the CPU burst given in milliseconds :

Process	Burst Time	Priority
P_1	10	3
P_2	1	1
P_3	2	3
P_4	1	4
P_5	5	2

The processes are assumed to have arrived is the order P_1, P_2, P_3, P_4, P_5 all at time 0.

(a) Draw Gantt charts that illustrate the execution of these processes using the following scheduling algorithms :

FCFS, SJF and RR (quantum-1)

(b) What is the waiting time of each process for each of the scheduling algorithm in (a).

(c) What is the turn around time of each process for each of the scheduling algorithms in (a). 6+6+3

5. (a) Discuss Peterson's solution for process synchronization. What is the limitation of this solution ?

(b) What is a semaphore ? Illustrate wait ( ) and signal ( ).

(c) Differentiate between preemptive kernel and nonpreemptive kernel. (4+2)+6+3

6. (a) How can we ensure that Hold and Wait condition never occurs in order to present deadlock ?

(b) State the Bankers Algorithm.

(c) Consider the following snapshot of the system :

	Allocation				Max.				Available			
	A	B	C	D	A	B	C	D	A_0	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

(i) Is the system in a safe state ?

(ii) If a request from process P_1 arrives for (0, 4, 2, 0) can the request be granted immediately ?

3+4+(4+4)

7. Write short notes (any *five*) : 5×3

(a) Swapping ;

(b) Pragmentation ;

(c) Resource Allocation Graph ;

(d) Producer Consumer Problem ;

(e) Layered Approach in Operating System ;

(f) Dual Mode Operation ;

(g) Multilevel Feedback Queue Scheduling.

[Internal Assessment : 30]

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