TIT-501   **288**   **Printed Pages : 8**

Paper Code & Roll No. to be filled in your Answer Book

Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Odd Semester Examination-2016

B.Tech. (Semester-V)

OPERATING SYSTEM

[Time : 3 Hours]   [Maximum Marks :100]

Note : Attempt **all** questions.

1.   Attempt **any four** questions :   [5×4=20]

     (a)   What is spooling and what is the use of it in Batch operating system? Explain with the help of examples.

     (b)   What do you mean by operating system? Also discuss functions of an operating system.

     (c)   Write down the major difference between the Batch System, Real Time System, and Time Sharing System.

     (d)   What is threading? What are the advantages of multithreading? Explain with the help of example.

(e) What are CPU schedulers? Describe various types of schedulers.

(f) Describe FCFS scheduling algorithm with a suitable example.

Attempt **any four** questions : [5×4=20]

(a) What is kernel ? Describe various operations performed by the kernel.

(b) What do you mean by virtual machines? List their advantage and disadvantage.

(c) Define the following terms. Program, Procedure, Processor, Process, User, Task, and Job.

(d) Write down the steps of memory management and process management functions of an operating system.

(e) What are the four services provided by the operating system? Explain in detail.

(f) Compare and contrast system calls and system programs.

Attempt **any two** questions : [10×2=20]

(a) Consider the following processes with their CPU burst time and arrival time.

Process	Arrival Time	Burst Time
P_1	0.0 ms	6 ms
P_2	0.5 ms	4 ms
P_3	1.0 ms	2 ms

Find the average waiting time and turn around time for FCFS, SJF & Priority Scheduling algorithms.

(b) Describe following with the help of suitable example: SJF, Multilevel Feedback Queue scheduling.

(c) Describe Readers Writer problem with its solution with the help of suitable examples.

(d) Explain Synchronous and Asynchronous message passing system with the help of example.

4. Attempt **any two** questions: [10×2=20]

(a) What is deadlock? Describe with the help of examples four necessary conditions for the occurrence of deadlock.

(b) Considering a system with 5 processes P_0 through P_4 and three resources types A, B, C. Resources type A has 5 instances, B has 2 and C has 6 instances. Suppose at t_0 time we have following state :

Processes	Allocation				Max.				Avai.		
	A	B	C	D	A	B	C	D	A	B	D
P_0	0	0	1	2	0	0	1	2	1	5	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			

Answer the following questions using Barr's algo:

(i)   What is the content of the Need Matl

(ii)   Is the system in safe state?

(iii)   If a request can be process P_1 arrivfor [0, 4, 2, 0] can the request be gited immediately.

(c)   Apply deadlock detection algorithm the following and show the results :

```
Available =   2    1    0    0
Allocation =  0    0    1    0
              2    0    0    1
              0    1    2    0
Request =     2    0    0    1
              1    0    1    0
              2    1    0    0
```

(d) Consider a system consisting four resources of same type that are shared by three jobs, each of which needs at most two resources. Show that the system is in safe state.

5. Attempt **any two** questions : [10×2=20]

(a) Explain the difference between Internal Fragmentation and External fragmentation. Also explain how is sharing possible with segmentation.

(b) Suppose the moving hard disk with 200 tracks is currently serving a request for track 143 and has just finished a request for track 125. If the queue of requests is kept in FIFO order.

86, 147, 91, 177, 94, 150.

What is total head movement for the following scheduling schemes :

(i) FCFS,

(ii) SSTF and,

(iii) C-Scan

(c) Write Short Notes on any of two :

    (i)   Protection and Security

    (ii)   Virtual Memory

    (iii)   Paging

    (iv)   Deadlock Prevention

(d) Describe the following allocation algorithms with help of examples :

    (i)   First Fit

    (ii)   Best Fit

    (iii)   Worst Fit

    (iv)   Next Fit

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