**2017**

**COMPUTER SCIENCE**

**[HONOURS]**

**Paper : II**

**(Group–A)**

**Theory**

Full Marks : 50                Time : 2 Hours

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

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

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

1.  Answer any **four** questions:                2×4=8

    a)  Differentiate between multitasking and multi-programming.

    b)  What is spooling?

    c)  What do you mean by swapping?

    d)  What is dispatcher?

    e)  State the names of process scheduling steps.

    f)  What is busy waiting?

    g)  Differentiate between preemptive and non-preemptive scheduling.

2.  a)  Describe different states of a process.

    b)  What is PCB? Explain briefly.

    c)  What is context switching?        5+5+4=14

3.  a)  Consider the following process, with the CPU burst time given in milliseconds.

| Process | Burst Time | Priority |
|---------|------------|----------|
| $P_1$   | 8          | 3        |
| $P_2$   | 2          | 1        |
| $P_3$   | 2          | 3        |
| $P_4$   | 4          | 4        |
| $P_5$   | 6          | 2        |

Processes are arrived in $P_1$, $P_2$, $P_3$, $P_4$, $P_5$ order of all at time O.

    i)  Draw the Gantt charts to show the execution using FCFS, SJF, non-preemptive priority and RR (quantam=2) scheduling.

    ii)  Calculate the average waiting time of each scheduling algorithm.

    iii)  Also calculate the average turn around time for each scheduling algorithm.

    b)  Discuss multilevel queue scheduling and multilevel feedback queue scheduling.

                        (3+3+3)+5=14

4. a) What is demand pagging?

b) Write short notes on:

i) Real time operating system.

ii) Virtual memory

iii) Semaphore              5+[3+3+3]=14

5. a) What is deadlock?

b) What are the necessary conditions of a deadlock?

c) Describe briefly resource allocation graph.

d) What is synchronization? Why it is important?              2+5+3+4=14

6. a) The operating system contain 3 resources, the number of instance of each resource types are 7,7, 10.

The current resource allocation state is as shown below.

| Process | Current allocation | | | Maximum need | | |
|---------|-------|-------|-------|-------|-------|-------|
|         | $R_1$ | $R_2$ | $R_3$ | $R_1$ | $R_2$ | $R_3$ |
| $P_1$   | 2     | 2     | 3     | 3     | 6     | 8     |
| $P_2$   | 2     | 0     | 3     | 4     | 3     | 3     |
| $P_3$   | 1     | 2     | 4     | 3     | 4     | 4     |

i) What is the content of the matrix need?

ii) Is the system in a safe state?

iii) Can the request made by process (1,1,0) be granted?

b) Compare between compiler and linker.

c) What is system call?      (2+4+2)+4+2=14

7. a) What is segmentation?

b) Consider the following reference string.

0 1 2 3 0 1 2 3 0 1 2 3 4 5 6 7

How many page faults will occur for 3 page frames for each of the following algorithm? FIFO, LRU and Optimal Page Replacement.

c) The requested cylinders in the order received are :

55, 58, 39, 18, 90, 160, 150, 38, 184

The disk consist of total 200 cylinders calculate total head movement by Applying the following disk scheduling algorithms starting cylinders at 100

i) FCFS      ii) SCAN

2+(2+2+2)+(3+3)=14

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