4624   *Your Roll No.* ....

B.Sc. (Prog.)/III   AS

CS-301 – Operating System and Networks

(Admissions of 2005 & onwards)

Time : 3 Hours   *Maximum Marks : 75*

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

Attempt **all** *questions.*
Questions in a section should be answered together.
Parts of a question must be answered together.

SECTION A (Operating System)

1. (a) What are the three main services provided by the
        operating system ? Explain it from the user point
        of view.   (3)

    (b) Differentiate between :

        (i) Multiprogramming and multitasking

        (ii) Distributed and Parallel systems   (2+2)

    (c) What is a system call ? How is it different from
        system program ?   (3)

2. (a) CPU bursts for 5 processes are given below :

P1   10

P2   2

P3   5

P4   3

P5   8

Draw Gantt Chart for SJF and RR (time quantum = 3) algorithms. Calculate average turnaround time and average wait time of processes for both algorithms.   (6)

(b) Describe the actions taken by a kernel to switch context between processes.   (3)

(c) Write down the requirements for solving the critical section problem.   (3)

3. (a) What is address binding in context of memory management ? What are the various stages at which binding can be carried out ?   (2+2)

(b) Consider a logical address space of 8 pages of 1024 words each mapped onto physical memory of 32 frames. How many bits are required in each of the following ?

(i) logical address

(ii) physical address   (3)

(c) How is sharing of pages accomplished in paging environment ? Explain using diagram. (3)

4. (a) What are the advantages and disadvantages of two level directory structure. (3)

(b) Explain the difference between internal and external fragmentation. (3)

SECTION B (Computer Networks)

5. (a) In which layer of OSI model, do the following devices operate ?

   (i) Repeater   (ii) Roster

   (iii) Ethernet switch   (iv) Bridge   (2)

(b) What is a robust physical medium for data transmission ? What are its advantages and disadvantages. (2+2)

(c) What is multicasting ? When is it required ? (2+2)

6. (a) Write short notes on the following : (3×2)

   (i) Framing in Data Link Layer

   (ii) Cryptography

(b) What is the difference between virtual circuit and datagram subnets ? (4)

P.T.O.

(c) What do the classes in IP address indicate ? Explain with the help of diagram. (4)

7. (a) Explain the following terms :

(i) WWW

(ii) iv. PPP (4)

(b) Explain store and forward packet switching in the context of Network layer. (4)

(c) Name the layers of TCP/IP reference model. Highlight the functionality of each layer. (5)