This question paper contains 4 printed pages]

Your Roll No .. ..

5192

B.Sc. (Prog.)/III   J

CS-301—Operating Systems 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)

Question paper contains two Sections

Questions in a Section should be answered together

Attempt *All* questions Draw diagrams wherever necessary

Section I

(Operating Systems)

1. (a)   What is an Operating System ?   2

(b)   Differentiate between the following types of operating systems ·   6

   (i)   Time sharing and Multiprocessor

   (ii)   Hard Real time and Soft Real time systems.

(c)   What is the purpose of system programs ?   2

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2. (a) Giving the notion of process and process states briefly, explain the process state transitions with the help of a neat diagram. 4

(b) Define the terms mutual exclusion and critical section 3

(c) Five jobs A through E arrive at a computer centre at almost the same time They have estimated running times of 10, 6, 2, 4 and 8 minutes. There priorities are 3, 5, 2, 1 and 4 respectively, with 5 being the highest. Draw the Gantt chart and determine the average waiting time for each of the following scheduling algorithms

(i) Priority scheduling

(ii) FCFS. 6

3. (a) Explain the steps in handling a page fault 5

(b) List at least *six* file attributes with brief description of each. 3

(c) Compare contiguous and indexed file allocation methods 4

(*d*) Consider a swapping system in which memory consists of the following hole sizes in memory order   600, 400, 1000, 2200, 1600, 1050 bytes .

    (*i*) What block will be selected to honor a request for 1603 bytes using best-fit policy ?

    (*ii*) What block will be selected to honor a request for 349 bytes using first-fit policy ?

    (*iii*) What block will be selected to honor a request for 949 bytes using worst-fit policy ?   3

Section II

(Computer Networks)

4. (*a*) Differentiate between broadcasting and multicasting   3

   (*b*) Write a short note on wireless LANs and challenges posed by them   4

   (*c*) What are the main functions of the session layer of OSI reference model ? Why is it not present in TCP/IP reference model ?   3

5. (a) Briefly explain bit stuffing with the help of an example.   3

   (b) List the advantages of optical fibre over copper wire as data transmission medium.   3

   (c) Explain the implementation of connectionless service by network layer.   4

   (d) How many hosts per network each IP address class A and B can have ?   2

6. (a) What is the purpose of the time-to-live field in the IP datagram header ?   2

   (b) What is the function of SMTP ? How does MIME enhance SMTP ?   5

   (c) How are HTTP and WWW related to the internet ?   4

   (d) Define the term cryptography What is the difference between a cipher and a code ?   4