Code: 1G441

II B.Tech. II Semester Supplementary Examinations December 2017

Operating Systems

(Information Technology)

Max. Marks: 70   Time: 3 Hours

Answer any **five** questions
All Questions carry equal marks (**14 Marks each**)
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1. a) What is operating system? List out the Operating System services.   7M

    b) Illustrate the working of a system call. How it differs from an interrupt?   7M

2. a) What is thread? Illustrate various thread models   4M

    b) Consider the set of processes – P0, P1, P2, and P3.

Process	Arrival Time (ms)	Burst Time (ms)	Priority
P0	0.0	8	3
P1	0.5	4	1
P2	1.0	2	4
P3	1.5	1	2

    i. Draw four Gantt charts illustrating the execution of these processes using
        FCFS, SJF, Priority (a smaller priority number implies a higher priority),
        and RR (quantum = 1) scheduling.
    ii. Find out Waiting Time for each process and Average Waiting Time.   10M

3. a) Design an algorithm for solving 2-process critical section problem.   7M

    b) Implement a monitor using Semaphores   7M

4. a) Write about deadlock prevention mechanism.   7M

    b) Design an algorithm to verify the state of the system   7M

5. a) Explore the mechanism of demand paging?   4M

    b) Briefly write about page replacement algorithms with an example.   10M

6. a) List out various File operations. Give an example of application in which data in a file
        should be accessed in the following order: (i) Sequentially (ii) Randomly   7M

    b) Explain various file allocation methods.   7M

7. a) Describe different Disk Scheduling Algorithms   10M

    b) Explain Briefly Stable Storage   4M

8. a) Explain Domain Structure and Access Matrix mechanisms for OS protection   7M

    b) Briefly write about Program Threats and System Threats.   7M

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II B.Tech. II Semester Supplementary Examinations December 2017
Probability & Statistics
(Common to CE, ME and IT)

Max. Marks: 70   Time: 3 Hours
Answer any **Five** questions
All Questions carry equal marks (**14 Marks** each)
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1. a) Find the mean, median, mode and standard deviation for the following distribution.

x	1	3	5	7	9	11	13	15
y	3	3	4	14	7	4	3	4

8M

   b) Obtain the rank correlation coefficient for the following data.

x	68	64	75	50	64	80	75	40	55	64
y	62	58	68	45	81	60	68	48	50	70

6M

2. a) Box A contains 5 red and 3 white marbles and box B contains 2 red and 6 white marbles. If a marble is drawn from each box, what is the probability that they are both of same colours?   7M

   b) A business man goes to hotels X, Y, Z, 20%, 50%, 30% of the time respectively. It is known that 5%, 4%, 8% of the rooms in X, Y, Z hotels have faulty plumbings. What is the probability that business man's room having faulty plumbing is assigned to hotel Z?   7M

3. a) Two dice are thrown. Let X assign to each point (a, b) in S the maximum of its numbers. i.e., X (a, b) = max. (a, b). Find the probability distribution. X is a random variable with X(S) = {1,2,3,4,5,6}. Also find the mean and variance of the distribution.   10M

   b) If X is a continuous random variable with probability density function
   $f(x) = \begin{cases} x^2, & 0 \le x \le 1 \\ 0, & \text{else where} \end{cases}$ If $P(a \le x \le 1) = \dfrac{19}{81}$, find the value of 'a'.   4M

4. a) The mean of Binomial distribution is 3 and the variance is $\dfrac{9}{4}$.

   Find (i) the value of n (ii) $P(X \ge 7)$ (iii) $P(1 \le X < 6)$ 7M

   b) If X is a poisson variate such that $3P(x=4) = \dfrac{1}{2}P(x=2) + P(x=0)$,

   Find (i) the mean of x (ii) $P(x \le 2)$ 7M

5.   Samples of size 2 are taken from the population 3, 6, 9, 15, 27 with replacement. Find
        a) The mean of the population
        b) The standard deviation of the population
        c) Mean of the sampling distribution of means
        d) The standard deviation of the sampling distribution of means.   14M

6. a) What is the size of the smallest sample required to estimate an unknown proportion to with in a maximum error of 0.06 with at least 95% confidence.   7M

   b) A random sample of 500 points on a heated plate resulted in an average temperature of 73.54 degrees Fahrenheit with a standard deviation of 2.79 degree Fahrenheit. Find a 99% confidence interval for the average temperature of the plate.   7M

7.   To compare two kinds of bumper guards, 6 of each kind were mounted on a car and then the car was run into a concrete wall. The following are the costs of repairs.

Guard 1	107	148	123	165	102	119
Guard 2	134	115	112	151	133	129

        Use the 0.01 level of significance to test whether the difference between two sample means is significant.   14M

8.   In an investigation on the machine performance, the following results are obtained.

	No. of units inspected	No. of defectives
Machine 1	375	17
Machine 2	450	22

        Test whether there is any significant performance of two machines at   = 0.05.   14M
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