



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500 043

MECHANICAL ENGINEERING

ASSIGNMENT

Course Name	:	PROBABILITY & STATISTICS
Course Code	:	A30008
Class	:	II B. Tech I Semester
Branch	:	MECH
Year	:	2016 – 2017
Course Coordinator	:	Mrs. L. Indira, Associate Professor.
Course Faculty	:	Mrs. L. Indira, Associate Professor.

OBJECTIVES:

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

S No	QUESTION	Blooms taxonomy level	Course Outcomes
ASSIGNMENT - I			
1	Let X denotes the minimum of the two numbers that appear when a pair of fair dice is thrown once. Determine the (i) Discrete probability distribution (ii) Expectation (iii) Variance	Understand & Evaluate	3
2	If the masses of 300 students are normally distributed with mean 68 kg and standard deviation 3 kg how many students have masses: greater than 72 kg (ii) less than or equal to 64 kg (iii) between 65 and 71 kg inclusive	Analyze	5
3	Two independent variable X and Y have means 5 and 10 and variances 4 and 9 respectively. Find the coefficient of correlation between U and V where $U=3x+4y$, $V=3x-y$	Understand & Evaluate	7
4	Let X and Y random variables have the joint density function $f(x, y)=2, 0 < x < y < 1$ then find marginal density function	Evaluate	6
5	An ambulance service claims that it takes on the average 8.9 minutes to reach its destination In emergency calls. To check on this claim the agency which issues license to Ambulance service has then timed on fifty emergency calls getting a mean of 9.2 minutes with 1.6 minutes. What can they conclude at 5% level of significance?	Apply	9
ASSIGNMENT-II			
1	A sample of 26 bulbs gives a mean life of 990 hrs. With S.D. of 20 hours. The manufacture claims that the mean life bulb is 1000 hrs. is the sample not up to the standard	Apply	10
2	A car park contains five cars .The arrival of cars in Poisson with a	Evaluate	12

	mean rate of 10 per/hour. The length of time each car spends in the car park has negative exponential distribution with mean of two hours. how many cars are in the car park on average and what is the probability of newly arriving costumer finding the car park full and having to park his car else where		
3	A fast food restaurant has one drive window. Cars arrive according to a Poisson process. Cars arrive at the rate of 2 per 5 minutes. The service time per customer is 1.5 minutes. Determine i) The Expected number of customers waiting to be served. ii) The probability that the waiting line exceeds 10 iii) Average waiting time until a customer reaches the window to place an order. iv) The probability that the facility is idle	Apply	12
4	Define the stochastic matrixes which of the following stochastic matrices are regular. (a) $\begin{bmatrix} 1/2 & 1/4 & 1/4 \\ 0 & 1 & 0 \\ 1/2 & 0 & 1/2 \end{bmatrix}$ (b) $\begin{bmatrix} 2 & 1/2 & 0 \\ 1/2 & 1/2 & 0 \\ 1/4 & 1/4 & 1/2 \end{bmatrix}$	Remember & Evaluate	13
5	A gambler has Rs.2. He bets Rs.1 at a time and wins Rs.1 with probability 0.5. He stops Playing if he loses Rs.2 or wins Rs.4.i)What is the Transition probability matrix of the related markov chain? (b) What is the probability that he has lost his money at the end of 5 plays	Understand & Apply	14

Prepared By: Mrs. L. Indira, Associate Professor

HOD, MECHANICAL ENGINEERING