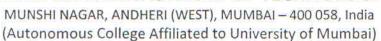


BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL INSTITUTE OF TECHNOLOGY





Mid Semester Examination

Max. Marks: 30

Class: FYMCA

Course Code: MCA25

Subject: Probability and Statistics

Duration: 1hr 30 min

Semester: II

Date: 16/3/2018 Time: 9:30 to 11

Instructions:

(1) All questions are compulsory.

(2) Use of scientific calculator is allowed.

(3) Assume any necessary data but justify the same.

Q. No.	Question					Max. Marks	СО	
Q.1 A	State and prove Baye's theorem of probability.					5	CO3	
Q. 1 B	The probability that a certain film gets award for its story is 0.23, it will get award for its music is 0.15 and it will get award for both is 0.07. What is the probability that film will get award for (a) at least one of the two. (b) exactly one of the two.						5	CO3
	OR							
	What is the probability that 4 S's come consecutively in the arrangement of the letters in the word 'MISSISSIPPI'.							
Q. 2A	The joint distribution function (CDF) of X and Y is given by						5	CO4
	$F_{XY}(x,y)=1-e^{-x}-e^{-y}+e^{-(x+y)}$, $x\geq 0$, $y\geq 0$							
	=0, otherwise							
	Find the marginal density functions of X and Y. Are X and Y							
	independent?							
Q. 2B	Let X be a random variable with probability distribution as follows.						5	CO4
	X	0	1	2	3			
	f(x)	1/3	1/2	0	1/6			
	Find the expectation value of $Y=(x-1)^2$.							
Q. 3A	It is given that 2% of the electric bulbs manufactured by a company are defective. Using Poisson distribution, find the probability that a sample of 200 bulbs will contain (i) no defective bulbs (ii) at least 3 defective bulbs.						5	CO5

Q. 3B	If 'm' things are distributed among 'a' men and 'b' women, show that the	5	CO5
	probability that the number of things received by men is odd, is		
	$\frac{1}{2} \left[\frac{(b+a)^m - (b-a)^m}{(b+a)^m} \right]$		
	OR		
	Prove that Geometric distribution is memoryless.		