Reg. No.					

MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL

(A constituent unit of MAHE, Manipal)

IV SEMESTER B.TECH. (Industrial & Production) END SEMESTER EXAMINATIONS, APRIL 2018

SUBJECT: ENGINEERING MATHEMATICS IV [MAT-2209]

REVISED CREDIT SYSTEM

(19/04/2018)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data may be suitable assumed.

1A.	The scores obtained by two batsmen A and B in 10 matches are given below. Calculating mean standard deviation and coefficient of variation for each batsmen, determine who is more efficient and who is more consistent.										04						
	А	74	75	78	72	78	77	7 7	9	81	,	79	76	72	2	71	
	В	87	84	80	88	89	85	8	6	82		82	79	86)	80	
1R	Find the mean deviation from the mode for the following data													03			
10.	Class		0 - 10		10 - 20		20-3	30	30 - 40		40 - 50		50 - 60		60		
	f		3		7		15		12			8		5			
	Find the standard deviation for the following data												02				
1C.	Class		0 - 5		0 - 10			0 - 15		0-20			0-25			US	
	f		6	·	16			28			38			46			
	If a two dimensional random variable (X, Y) is uniformly distributed over the region													04			
2A.	with vertices $(0, 0)$, $(1, 0)$, $(2, 1)$ $(1, 1)$, find ρ_{xy} .																
	Comp	Compute the skewness based on third moment for the following data															
2B.	Class 3 - 7		7 8-	/ 8 - 12		18	8 - 22	23	27 28		- 37) (33 - 37		7 38-4		03
	F	2	$\frac{7}{10}$	8	580	17	75 75	80	21	32	52		8	,,	5		
	Fit a st	raight	line to	the f	ollowing	data	<u>a</u>	00		0-							
2C.	C.										03						
	X		0	0		1		2			3				4		
	У		1		1.8			3.3			4.5	5		6.5			
3A.	Show that $E[(X - \mu)^{2n}] = (1.3.5 \dots (2n - 1))\sigma^{2n}$ for the normal distribution													04			
•/ •	with mean μ and variance σ^2 .																
3B.	Find th	ne mea	in and v	varian	nce of G	mm	a dist	ributi	on								03
00.																	

3C.	Let X is a Poisson distributed random variable and it is found that the probability that $X = 2$ is two third of the probability that $X = 1$. Find the probability that X exceeds 3?							
4A.	Two independent random variable X & Y having pdf $f(x) = e^{-x}$ & $g(y) = 2e^{-2y}, 0 \le x, y \le \infty$. Find pdf of X + Y using the transformation $z = x + y, w = y$.							
4B.	Let X be discreet random variable taking values $1, 2, 3 \dots \infty$. and $P(X = j) = \frac{1}{2^{j}}$, where $j = 1, 2, \dots \infty$. Find i) Probability of X is even ii) Probability of X is odd iii) Probability of X is divisible by 3.							
4C.	Suppose the continuous random variable has joint PDF given by $f(x,y) = \begin{cases} k(x^2 + \frac{xy}{3}) , 0 \le x \le 1; 0 \le y \le 2\\ 0, & otherwise \end{cases} \text{ find i) } k \text{ (ii) } P(X + Y \ge 1)$	03						
5A.	Compute approximate probability that mean of random sample of size 15 from distribution having pdf $f(x) = \begin{cases} 3x^2, 0 \le x \le 1\\ 0, 0 \text{ therwise} \end{cases}$ in between $\frac{3}{5} \& \frac{4}{5}$.	04						
5B.	Chances that the doctors diagnose disease 60% correctly. The chance that the patient will die after correct diagnosis is 40%. The chance of death by wrong diagnosis is 70%. If patient has died then what is the probability that his disease was diagnosed correctly?	03						
5C.	Find the pdf of $Y = 8X^3$ if X has pdf $f(x) = \begin{cases} 2x, 0 \le x \le 1\\ 0, \text{ otherwise} \end{cases}$.	03						

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