## Course Code:MTH302 Course Title: PROBABILITY AND STATISTICS

Time Allowed: 01:30hrs.

Max Marks: 30

Read the following instructions carefully before attempting the question paper

- 1. Match the Paper Code shaded on the OMR Sheet with the Paper code muntioned on the question paper and ensure that both are the same.
- 2. This question paper contains 30 questions of 1 mark each. 0.25 marks will be deducted for each wrong answer.
- 3. All questions are compulsory.
- 4. Do not write or mark anything on the question paper and/or on rough sheet(s) which could be heights to any student in copying, except your registration number on the designated space.
- 5. Submit the question paper and the rough sheet(s) along with the OMR sheet to the invigilator before leaving the examination half.

## Q(1) A random variable 'X' has the following proability function:

Xux	0	1	2	3
$P(X \sim x)$	2/6	1/6	1/3	k

Than 4 = 7

(a) 2/3

(b) 5/6

(d) 1

CO2.12

Q(2) A random variable 'X' has the following proability function:

-	9	1	2	3
P(X+x)	1/6	1/1	3/3	1/6

Then F(Xx3)=?

(a) 2/3

(b) 5/8

(c) 1/3

(d) 1

CO2.L2

Q(3) A coin is tossed three times. Let the r.v. 'X' denotes the number of the heads. Then P[X=2]=?

(a) 1/4

(b) 3/4

(d) 3/8

CO2.L2

Q(4) A probability density function is given by:  $f(x) = \begin{cases} kx^{-x/4} \\ 0 \end{cases}$ 1>0

a) -

b) 4

c) -

0)-4

Q(5) A probability density function is given by:  $f(x) = \begin{bmatrix} 2(1-x), & 0 < x < 5 \\ 0, & \text{otherwise} \end{bmatrix}$  Then  $F(x < \frac{1}{x})$  at

CO2.12

(a) 2/3

(b) 1/3

(c) 4/9

(d) 5/9

CO2 L2

A probability density function is given by:  $f(x) = {2(1-x), 0 < x < 1}$ Q(6)

Then for 0 < x < 1, the cumulative distribution function is given by:

d) None of these

This vertices of a random vertable X is given by:

CO2.L2

Q(8) A random variable "A" has the following probability functions

X=x	-3	6	2
P(X=x)	1/6	1/2	1/3

(a) 5/2

(b) 11/2

(c) 13/2

(d) 9/2

 $Q(\theta) E(4X - 3) = 7$ 

n) 4E(X)

b) 4E(X) + 3

c) 4E(X)-3

d) E(X) - 3

Q(10)

CO1,L1

CO1.L1

A random variable X has a mean n=8, a variance  $\sigma^2=9$ . Then the least value of P(-7 < X < 23) is:

CO1,L1

Q(11) Six coins are tossed 6400 times. Using the Poisson distribution, the approximate probability to get six heads zero time is

CO3.L3

Q(12) In a book of 520 pages, 390 typographical error occur. Assuming Poisson law for the number of errors per page, then the probability of a page has no error is

a) 0.75

CO3.13

Q(13) A and B play a game in which their chances to winning are in the ratio 3:2. If p be the probability that A wins then probability that A wins x times out of 5 times is given by

(A) 
$$P(X = x) = C_x^3 \left(\frac{x}{5}\right)^x \left(\frac{x}{5}\right)^x$$

(8) 
$$f(X-x) = C_x^2 \left(\frac{x}{x}\right)^n \left(\frac{x}{x}\right)^{n-n}$$

(C) 
$$P(X = x) = C_x^{3-x} {1 \choose x}^x {1 \choose x}^x$$

(D) 
$$P(X = x) = Q_x^2 \left(\frac{x}{2}\right)^2 \left(\frac{x}{2}\right)^2$$

CO3,L3

Q(14) With the usual notations, if n=6 and 9P(X=4)=P(X=2), then probability of success 'p' for a binomial distribution is given by

$$(A) 8 p^2 - 2p + 1 = 0$$

$$(p) \otimes p^2 - 2p - 1 = 0$$

$$(0)8p^3 + 2p - 1 = 0$$

CO3,L3

Q(15)

if  $X \sim B(n,p)$  a binomial distribution and E denotes the expectation (mean) then

4D pa/m

		Registration No.			
Q(16)	Con	ider the statements:		Marie Care Care Care Care Care Care Care Car	CONTA
	(1)				CD3,L3
	m	For a binomial distribution variance is a	lways less than mean.		
156		For a geometric distribution variance is	always less than mean.		
(A) State	ment (	) is correct but not (iQ.			
(C) Both	the st	Hemony	M) Statement (a) is corre	and been made \$5.	
		etements (i) and (ii) are correct	(C) Book in	(I) and (II) are real security.	
Q(17) T	he re	lation between a			003,63
10	HX-	lation between Gamma and norm $N(0,1)$ then $\binom{A^*}{s} \sim y(\frac{t}{s})$ .	nal distributions is given b	y	
(11)	W.X.	$N(\mu, \sigma^2)$ then $\frac{1}{4} \left(\frac{\mu_{-\mu}}{\sigma}\right)^2 \sim y(\frac{1}{2})$ .		100000000000000000000000000000000000000	
(a) State	men	(i) is correct but not (ii).	1		
(c) Both	the s	tatements (i) and (ii) are correct.	(b) Cantago	11.11.11	
		ty and (ii) are correct.	(d) Both the states	s correct but not (i). ments (i) and (ii) are o	ormet
Q(18)			and the second	nenus (i) and (ii) are s	CO3,L3
Stateme	ent 1:	The exponential duty to a to	all the last		Transfer to the second
Garnina	Distri	The exponential dutribution may be a furtion.	egarded as a special case of		
Stateme	int 2±	$fX \sim e^{\theta}$ then $X \sim y(\theta, 1)$ .			
(a) The s	taten	nents 1 and 2 both are correct.	(b) The statement	ts 1 and 2 both are no	ot correct
	1790,000	atements 1 is correct	(d) Only the state	ments 2 is correct.	(A. 1881) (1895)
Q(19)					CO3;L3
Let X be a	normi	d variate with mean 30 and standard de	relation & then the		
standard r	orma	variate Z lies in the set if $26 \le x \le 40$	A STATE OF THE STATE OF		
8) [0.8,2]		b) (-0.8,2)	c) (0.8,2)		
		TA P. HILLIAN	C/ (0.0.2)	d) (-0.8,2)	with the same of
2(20)					CO3,L3
LetXbea	пости	d variate with mean 30 and standard de	eviation 5. If the probability		
		nel variate is $P(0 \le Z \le 1) = 0.3413$ t	hen the probability		
P(1X - 30	155		The state of the s		
0.6826		b) 0.2358	c) 0.8991	d) 0.0012	100
				0) 0.0012	CO3,L3
Q(21)			The second second		000,60
		and $C$ are three mutually exclusive $P(C)$ . Then the probability of ev		$p(A) = \frac{1}{3}P(B)$	
1.1		b) 1/2	c) 2	d) None of the	50
1) 13		0/1	41	9/110/10 0/ 0/0	CO1,L1
2(22)					Interestable.
A coin is	weigh	ted so that heads is twice as likely	to appear as talls, then the	probability of	
appearing	riging		c) 1	d) 2	
a) ½		b) 2	13	d) 4	COLLE
			The state of the state of		CO1,L1

OCCURS NO		(P(A)+P(B) =	one probability that both
a) 0.35	b) 0.55	41.00	
		c) 0.75	(i) None of these
Q(24)			COLLI
Twenty five b	cooks are placed at random in	a shelf. Then the pro	Chaliffer et
pair of books	shall always be together		and that a particular
	b) 27 +	41	
a) 22	9/3	C) 1/25	d) =
			001,11
Q(25)			
la a randon s	createment of the letters of the war	MATHEMATICS", th	e probability that
all south care	a superior is		The state of the s
25 145	b) 103	92	d) None of these
-			COLLI
Q(26)			
Let A and B as	re two independent events ruch to	hat $P(\hat{A}) = 0.7$ , $P(\hat{B})$	= k and PlAURI = 0 s
then the value	dks		7-1,000,-03
a) 1/2	20.5	100	
77	b) 1	c) =	d) None of these
0000			C01,L1
Q(27)			
The probability	that A hit the target is 1/4 and th	e probability that B hit	the target is 2/3.
AL COME STOOK SE	targes independently. The probab	skry that target is hitte	
a) 11		shiry that target is bitte	
a) 11/12	b) 11		91
a) 11 0(28)	b) ==	92	0 1 001,L1
3) 11 0(28) Let A and B	b) =	92	0 1 001,L1
O(28)  Let A and B the value of P	b) =	92	0 1 001,L1
3) 11 0(28) Let A and B	are the events such that $F(A)$ .	c) $\frac{13}{12}$ = 3/8, $P(B) = 5/10$	$O_{11}$ $CO1,L1$ and $P(B A) = 2/3$ , then
O(28)  Let A and B the value of P	b) =	92	CO1,L1 col $P(B A) = 2/3$ , then d) None of these
O(28)  Let A and B the value of P	are the events such that $F(A)$ .	c) $\frac{13}{12}$ = 3/8, $P(B) = 5/10$	$O_{11}$ $CO1,L1$ and $P(B A) = 2/3$ , then
a) 11/12  O(28)  Let A and B the value of P  a) 2/3  O(29)	are the events such that $F(A)$ .  (A \cap B) is  b) $\frac{2}{4}$	c) $\frac{13}{14}$ = 3/8, $P(B) = 5/10$ (c) $\frac{1}{4}$	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these  CO1,L1
a) 11/12  O(28)  Let A and B the value of P  a) 2/3  O(29)	are the events such that $F(A)$ .  (A $\cap$ B) is  b) $\frac{3}{4}$	c) $\frac{13}{14}$ = 3/8, $P(B) = 5/10$ (c) $\frac{1}{4}$	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these  CO1,L1
O(28)  Let A and B the value of P  a) $\frac{2}{3}$ O(29)  Two six faced to is 7 or product	are the events such that $F(A)$ is $b)^{\frac{2}{4}}$ unbiased dice are thrown. Then is 12, is	c) $\frac{13}{16}$ $= 3/8, P(B) = 5/10$ c) $\frac{1}{4}$ the probability that $=$	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these  CO1,L1  am of numbers shows
O(28)  Let A and B the value of P  a) $\frac{2}{3}$ O(29)  Two six faced to	are the events such that $F(A)$ .  (A $\cap$ B) is  b) $\frac{3}{4}$	c) $\frac{13}{14}$ = 3/8, $P(B) = 5/10$ (c) $\frac{1}{4}$	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these  CO1,L1
O(28)  Let A and B the value of P  a) $\frac{2}{3}$ O(29)  Two six faced to is 7 or product.  a) $\frac{2}{6}$	are the events such that $F(A)$ is $b)^{\frac{2}{4}}$ unbiased dice are thrown. Then is 12, is	c) $\frac{13}{16}$ $= 3/8, P(B) = 5/10$ c) $\frac{1}{4}$ the probability that $=$	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these  CO1,L1  am of numbers shows
O(28)  Let A and B the value of P  a) $\frac{1}{3}$ O(29)  Two six faced to strong for product a) $\frac{1}{4}$ O(30)	are the events such that $F(A)$ : $(A \cap B) \text{ is}$ $b) \frac{3}{4}$ ambiased dice are thrown. Then is 12, is $b) \frac{2}{34}$	c) $\frac{13}{18}$ $= 3/8, P(B) = 5/10$ c) $\frac{1}{4}$ the probability that $=$	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these  CO1,L1  am of numbers shows  d) $\frac{2}{3}$
O(28)  Let A and B the value of P  a) $\frac{1}{3}$ O(29)  Two six faced to st 7 or product  a) $\frac{3}{4}$ O(30)  Suppose a stude	are the events such that $P(A)$ .  (A \( B \)) is  b) $\frac{2}{4}$ ambiased dice are thrown. Then is 12, is  b) $\frac{2}{36}$	c) $\frac{13}{18}$ $= 3/8, P(B) = 5/10 \text{ is }$ c) $\frac{1}{4}$ the probability that $=$ c) $\frac{1}{18}$	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these CO1,L1  am of numbers shows $0)^{\frac{3}{4}}$
O(28)  Let A and B the value of P  a) \( \frac{2}{3} \)  O(29)  Two six faced to in 7 or product  a) \( \frac{2}{4} \)  O(30)  Suppose a stude 20 are taking che	are the events such that $F(A)$ .  (A \cap B) is  b) $\frac{2}{4}$ unbiased dice are thrown. Then is 12, is  b) $\frac{\pi}{36}$	c) $\frac{13}{18}$ = 3/8, $P(B) = 5/10$ (c) $\frac{1}{4}$ the probability that moderate where 30 are notice and should be a	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these CO1,L1  am of numbers shows $0)^{\frac{3}{4}}$
O(28)  Let A and B the value of P  a) \( \frac{2}{3} \)  O(29)  Two six faced to in 7 or product  a) \( \frac{2}{4} \)  O(30)  Suppose a student in that a student in	are the events such that $F(A)$ .  (A \cap B) is  b) $\frac{2}{4}$ unbiased dice are thrown. Then is 12, is  b) $\frac{2}{36}$ int is selected at random from 80 emistry, and 10 are taken mather taking mathematics or chemistry	c) $\frac{13}{18}$ = 3/8, $P(B) = 5/10$ s c) $\frac{1}{4}$ the probability that $m$ c) $\frac{1}{18}$ students where 30 are natics and chemistry by is	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these CO1,L1  am of numbers shows $0)^{\frac{3}{4}}$
O(28)  Let A and B the value of P  a) \( \frac{2}{3} \)  O(29)  Two six faced to in 7 or product  a) \( \frac{2}{4} \)  O(30)  Suppose a stude 20 are taking the	are the events such that $F(A)$ .  (A \cap B) is  b) $\frac{2}{4}$ unbiased dice are thrown. Then is 12, is  b) $\frac{\pi}{36}$	c) $\frac{13}{18}$ = 3/8, $P(B) = 5/10$ (c) $\frac{1}{4}$ the probability that moderate where 30 are notice and should be a	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these CO1,L1  am of numbers shows $0)^{\frac{3}{4}}$
O(28)  Let A and B the value of P  a) \( \frac{2}{3} \)  O(29)  Two six faced to in 7 or product  a) \( \frac{2}{4} \)  O(30)  Suppose a student in that a student in	are the events such that $F(A)$ .  (A \cap B) is  b) $\frac{2}{4}$ unbiased dice are thrown. Then is 12, is  b) $\frac{2}{36}$ int is selected at random from 80 emistry, and 10 are taken mather taking mathematics or chemistry b) $\frac{1}{4}$	c) $\frac{13}{2}$ = 3/8, $P(B) = 5/10$ s c) $\frac{1}{4}$ the probability that we chartes where 30 are matics and chemistry be by is c) $\frac{1}{2}$	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these  CO1,L1  am of numbers shows  d) $\frac{2}{3}$ CO1,L1  taking mathematics, oth. The probability
O(28)  Let A and B the value of P  a) \( \frac{2}{3} \)  O(29)  Two six faced to in 7 or product  a) \( \frac{2}{4} \)  O(30)  Suppose a student in that a student in	are the events such that $F(A)$ .  (A \cap B) is  b) $\frac{2}{4}$ unbiased dice are thrown. Then is 12, is  b) $\frac{2}{36}$ int is selected at random from 80 emistry, and 10 are taken mather taking mathematics or chemistry b) $\frac{1}{4}$	c) $\frac{13}{18}$ = 3/8, $P(B) = 5/10$ s c) $\frac{1}{4}$ the probability that $m$ c) $\frac{1}{18}$ students where 30 are natics and chemistry by is	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these  CO1,L1  am of numbers shows  d) $\frac{2}{3}$ CO1,L1  taking mathematics, oth. The probability  d) None of these
O(28)  Let A and B the value of P  a) \( \frac{2}{3} \)  O(29)  Two six faced to in 7 or product  a) \( \frac{2}{4} \)  O(30)  Suppose a student in that a student in	are the events such that $F(A)$ .  (A \cap B) is  b) $\frac{2}{4}$ unbiased dice are thrown. Then is 12, is  b) $\frac{2}{36}$ int is selected at random from 80 emistry, and 10 are taken mather taking mathematics or chemistry b) $\frac{1}{4}$	c) $\frac{13}{2}$ = 3/8, $P(B) = 5/10$ s c) $\frac{1}{4}$ the probability that we chartes where 30 are matics and chemistry be by is c) $\frac{1}{2}$	CO1,L1  and $P(B A) = 2/3$ , then  d) None of these  CO1,L1  am of numbers shows  d) $\frac{2}{3}$ CO1,L1  taking mathematics, oth. The probability  d) None of these