	DR.	BABASAI	HEB AM	BEDKA	RTEC	CHNOL	GICAL U	JNIVERSI	TY, LC	NERE	
	Course: SY			Sumr	ner Ex	ambadio	n - 2023	l Engineeri		Semester	
	:IV Subject Cod	le & Name	: Probal	oility an	d Stati	istics	BTBSC40	4 Dura	ition: 3	Hrs.	
	Max Marks	:: 60		Date	:26/07	/2023		Dura			
	Instructions to the Students: 1. All the questions are compulsory. 2. The level of question/expected answer as per OBE or the Course Outcome (CO) question is based is mentioned in () in front of the question. 3. Use of non-programmable scientific calculators is allowed.) on which the	
	3. Use	of non-prog ıme suitable	grammabi 2 data whi	le scientij erever ne	fic calo ecessar	culators is v and me	ntion it cle	arly.	1 11	(Level/CO)	Mark
X 42 _ 27	4. ASS	ane sundone	1771			And Asset			7	C01	1
Q. 1	Solve Any	Two of the	following	•		4		* * * * * * * * * * * * * * * * * * * *			
A)	State and Pr	ove "Addit	ion theor	rem of F	Probak	bility".					
B)	If A & B ar	e two possil	ble outcor	mes of a	randon	n experim	ent such th	nat			7
	$P(\bar{A}) = 0.6$	$P(A \cup B)$	= 0.7 an	d P(B)	= k, th	en find v	alue of "k	" if			
	(i) A & B at				(ii) A	& B are	ndepender	nt			- W. 1
	The factory F_1 produces 1000 articles,20 of them being defective; the factory F_2 produces 4000 articles,40 of them being defective and the F_3 produces 5000 articles,50 of them being defective. If one article is chosen from all these articles put in one stockpile and is found to be defective, find the probability that it is from the									W 1	
C)	the factory I 5000 article put in one s	7 ₂ produces	4000 artic	cles,40 o	t them	being dei	hosen fron				
C)	the factory	7 ₂ produces	4000 artic	cles,40 o	t them	being dei	hosen fron			CO2	and the second second
C) Q.2	the factory F_1 . Solve Any	F ₂ produces s,50 of them cockpile and	4000 artion being delis found	cles,40 of efective. It to be def	If one a certive,	find the	hosen fron			CO2	12
	the factory F_1 . Solve Any	F ₂ produces s,50 of them tockpile and	4000 artion being delis found	cles,40 of efective. It to be def	If one a certive,	being del find the side of the	chosen from	that it is fro		CO2	12
Q.2	the factory F_1 . Solve Any	F ₂ produces s,50 of them cockpile and	4000 artion being delis found	cles,40 of efective. It to be def	If one a certive,	being denricle is of find the public ibution:	chosen from probability	that it is from		CO2	12
Q.2	the factory F_1 . Solve Any A rando	F ₂ produces s,50 of them tockpile and Fwo of the m variable 1 2k	4000 artion being delated is found following X has the	cles,40 of efective. It to be def	f them If one a Sective,	being definition is of the plant in the plan	chosen from	that it is fro		CO2	12
Q.2	solve Any A rando X: P(X):	F ₂ produces s,50 of them tockpile and Fwo of the m variable 1 2k	4000 articles to being deleted is found following X has the	cles,40 of efective. It to be def	f them If one a Sective,	being denricle is of find the public ibution:	chosen from probability	that it is from		CO2	12
Q.2 A)	the factory F_1 . Solve Any F_2 . A rando F_3 : F_4 : F_4 : F_5 : F_5 : F_5 : F_5 : F_5 :	F ₂ produces s,50 of them tockpile and Fwo of the m variable 1 2k ine (i) k (i	following X has the 4k 4k	followin 6 6 6 6 6 6 6 6 6 6 6 6 6	i) P(2≤	being definition being defined the problem of the	chosen from probability	that it is from		CO2	12
Q.2	solve Any A rando X: P(X): Determ	F ₂ produces s,50 of them cockpile and Fwo of the mariable 2k ine (i) k (imial Distribution of the mariable ine (i) k (imial Distribution of the mariable ine (ii) k (iiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	following X has the 4k 4k	followin 6 6 6 6 6 6 6 6 6 6 6 6 6	i) P(2≤	being definition being defined the problem of the	chosen from probability	that it is from		CO2	12
Q.2 A)	the factory F_1 . Solve Any F_2 . A rando F_3 : Determ Fit the Bino	F ₂ produces s,50 of them tockpile and Fwo of the material are a second and a second are a sec	4000 articles a being description of the following the fo	cles,40 of efective. It to be defined by the following by	i) P(2≤ ving da 3 10	being definitions defined the particle is of find the particle is of find the particle is $X < 5$ being defined to $X < 5$ being defined as $X < $	bhosen from probability 5 10k	that it is from 6 12k		CO2	12
Q.2 A)	the factory F_1 . Solve Any F_2 . A rando F_3 : Determ Fit the Bino F_3 : F_4 : F_5 :	F ₂ produces s,50 of them tockpile and Fwo of the materials and the materials and the materials are sensitive and the materia	4000 articles a being described by the following X has the A and A are A are A and A are A and A are A are A are A and A are A are A and A are A are A are A and A are A are A and A are A are A are A and A are A and A are A are A and A are A are A and A are A and A are A are A and A are A are A and A are A and A are A are A are A are A and A are A and A are A are A and A are A are A and A are A and A are A are A are A and A are A are A and A are A and A are A are A and A are A are A and A are A and A are A are A are A and A are A are A and A are A are A are A are A and A are A are A are A are A and A are A are A are A and A are A are A are A and A are A are	cles,40 of efective. It to be defined as the following series and following series are series as the following series are series are series as the following series are series as the series are series are series are series as the series are series are series as the series are series are series are series are se	i) P(2≤ ving da 3 10	being definitions defined the problem of the probl	bhosen from probability 5 10k	that it is from 6 12k	om the		12
Q.2 A)	the factory F_1 solve Any F_2 A rando F_3 Determine F_4 Tit the Bino F_4 X:	Fy produces s,50 of them tockpile and Two of the mariable and 1 Two of the mariable and 1 2k ine (i) k (i) 28 of 1000 student the number 2 and 15,(ii) a S.N.V. z a = 0 to z = 0	following X has the 2 4k ii) P(X < oution to the standard of students, the standard of students in a cert of students in a cert of students in a cert of students. iii) Bove 1 irea betwee 0.8 is 0.2	followin 3	g distri	being definitions defined the problem of the probl	5 10k	that it is from the first state of the first state	on to be		6
Q.2 A)	Solve Any A rando X: P(X): Determ Fit the Bino X: F: In a sample Obtained by normal find (i)between 1 [Given:Fore between 2]	Fy produces s,50 of them tockpile and Two of the mariable and 1 Two of the mariable and 1 2k ine (i) k (i) 28 of 1000 student the number 2 and 15,(ii) a S.N.V. z a = 0 to z = 0	following X has the 2 4k ii) P(X < oution to the standard of students, the standard of students in a cert of students in a cert of students in a cert of students. iii) Bove 1 irea betwee 0.8 is 0.2	followin 3	g distri	being definitions defined the problem of the probl	5 10k	that it is from the first state of the first state	on to be		6

	Define	"Karl Po	earson's	Correl	ntion Co	etticie	nt". Also	show t	that—1	< r < +	·1.		
B)	For the	followin	ng data,										
,	X:	6	8	12	15	18	20	24	28	31			
			.12	15	15	18	25	22	26	28	E WINE		
	Y:	10				- Art		14.00		1			
	Calculate (i) Karl Pearson's coefficient of correlation												
	(ii)Sta	ndard E	rror (S.E	E)								and the second s	Satistic and same
	(iii)Pro	obable E	rror(P.E)				-	TARL.				
	Chadin	Rank Co	arrolatio	n Coeff	icient (p), for th	ne follow	ing dat	а,		mestic - to	1 N - 1 1 1	7
(C)	X	68	64	75	50	64				55	64	1	
	Y	62	58	68	45	81	60	68	48	50	70	3.727	
1									, -		1, 6		が ちむ
							The second				r: 6	CO4	1
Q.4	Solve A	Any Two	o of the	followi	ng.		1,75					46	- 17
A)	Obtain	the equ	ation of	the reg	ression	lines fo	124	ollowin 51	g data, 73	111	57		
	X	91	97	108	121	67 70 ^	124	39	61	80	47	7 Jet	
	Y	71 time of e	75	69	97	70 ·	ations	f the tw					
B)							ations	1 1110 1111	O Turino		A survey		
,		ng result						700				Option to	
	Tonowi	ng resur	- 2							Table Total			
	1 - 70			(2(0	2 .	- 2060	Try:	= 3900	where	x and y	are the		A STATE OF THE PARTY
	y = n); n = 10	$0; \sum x^2 =$	= 6360	$\sum y^2 =$	= 2860	$\sum xy$	= 3900	, where	x and y	are the		7
	deviation	ons from	the resp	ective 1	neans. (Obtain t	he equat	tions.		A L	are the		3
<u>C)</u>	deviation	ons from	the resp	ective r	neans. (Obtain t	he equategression	tions.		A L	are the		27
C)	deviation $\frac{1}{4x-5}$	ons from ine which	the resp ch one of = 0; 20x	f the fole $x - 9y - $	neans. (Obtain t	he equategression	tions.		A L	are the		
C)	deviation $\frac{1}{4x-5}$	ons from	the resp ch one of = 0; 20x	f the fole $x - 9y - $	neans. (Obtain t	he equategression	tions.		A L	are the		
C)	deviation $\frac{1}{4x-5}$	ons from ine which	the resp ch one of = 0; 20x	f the fole $x - 9y - $	neans. (Obtain t	he equategression	tions.		4 1	are the	COS	1
	Determ $4x - 5$ find r_{xy}	ons from the ine which $y + 30 = 0$, and $\sigma_y = 0$	the respect one of the contract of the contra	f the fol x - 9y - 3y	neans. (lowing to 107 =	Obtain t	he equategression	tions.		4 1	are the	CO5	1
Q. 5	deviation devia	ons from tine which $y + 30 = 0$, and $\sigma_y = 0$	the respect one of the following the respect to the r	f the folion $x - 9y - 3$	neans. (lowing - 107 =	Obtain t is the re = 0. Als	egression o,	tions.	<i>y</i> on <i>x</i> ;			CO5	
Q. 5	deviation $ \begin{array}{c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A	ons from time which $y + 30 = 0$, and σ_y was tosse	the respect to one of the following the respect to the following the fo	f the folice $x - 9y - 2y - 2y - 2y - 2y - 2y - 2y - 2y$	lowing 1 - 107 =	Obtain t is the re = 0. Als	egression o,	tions.	<i>y</i> on <i>x</i> ;		nesis that	CO5	
Q. 5	deviation $ \begin{array}{c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A	ons from the which $y + 30 = 0$, and $\sigma_y = 0$. Any Two was tossonic unbiases.	the respect one of the second	f the folic $x - 9y - 3$ f following imes an % level	neans. (lowing - 107 = dthe he of sign.	Obtain t is the re = 0. Als and turn	he equal egression o, ed up 10 e.	tions. I line of	y on x;	e hypoth	nesis that	C05	
Q. 5	deviation $ \begin{array}{c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A	ons from the which $y + 30 = 0$, and $\sigma_y = 0$. Any Two was tossonic unbiases.	the respect one of the second	f the folic $x - 9y - 3$ f following imes an % level	neans. (lowing - 107 = dthe he of sign.	Obtain t is the re = 0. Als and turn	he equal egression o, ed up 10 e.	tions. I line of	y on x;	e hypoth	nesis that	CO5	
Q. 5 A)	deviation $ \begin{array}{c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A $ \begin{array}{c} \text{A coin } v \\ \text{the coin} \end{array} $	ons from the which $y + 30 = 0$, and $\sigma_y = 0$. Any Two was tosso is unbiage of 100.	the respect one of the following the second of the second	f the fol x - 9y - 3 Following imes an % level	lowing - 107 = Ig. d the he of sign	Obtain t is the re 0. Als ad turn ificance d by ma	ed up 10	line of 8 times	y on x; Test the	e hypotl	nesis that	CO5	
Q. 5 A) B)	deviation $ \begin{array}{c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A A coin with the coin	ons from the which $y + 30 = 0$ and σ_y was tossed is unbiase of 100 and σ_y and σ_y was tossed as σ_y and σ_y are and σ_y and σ_y and σ_y are and σ_y and σ_y are and σ_y and σ_y are and σ_y and σ_y are all σ_y are and σ_y are all σ_y and σ_y are all σ_y are al	the respect to one of the following the second of the second of the following the second of the sec	f the fol z - 9y - 3 following imes an % level c bulbs pred device	neans. (lowing - 107 = 107 - 107	Obtain t is the re is the re ion Als ad turne ifficance d by ma	ed up 10	line of 8 times	Test the lowed a 75 bulbs	e hypoth	nesis that fe time of led by	C05	
Q. 5 A) B)	deviation $ \begin{array}{c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A $ \begin{array}{c} \text{A coin } v \\ \text{the coin} \\ \text{A sample} \end{array} $ 1190 hor	ons from the which $y + 30 = 0$ and σ_y was tossed is unbiase of 100 turns and σ_y and σ_y was tossed in the way and σ_y was tossed in the way are also as σ_y and σ_y was tossed in the way are also as σ_y and σ_y was tossed in the way are also as σ_y and σ_y was to say and σ_y and σ_y was to say an σ_y where σ_y was to say an σ_y where σ_y was the σ_y was to say an σ_y where σ_y was the σ_y	the respect one of the following set of the follow	f the fole $x - 9y - 3$ following times an $\frac{1}{2}$ level $\frac{1}{2}$ bulbs pred deviations a mean $\frac{1}{2}$	lowing - 107 = dthe he of sign produce attion of life tim	Obtain t is the re is the re is 0. Als ad turn ificance d by ma 90 hour e of 12:	ed up 10 e. nnufacturs. A san 30 hours	8 times	Test the nowed a 75 bulbs e standar	e hypoth mean life produce ard devia	nesis that fe time of led by tion of	CO5	
Q. 5 A) B)	deviation $ \begin{array}{c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A $ \begin{array}{c} \text{A coin } v \\ \text{the coin} \\ \text{A sample} \end{array} $ 1190 hor	ons from the which $y + 30 = 0$ and σ_y was tossed is unbiase of 100 turns and σ_y and σ_y was tossed in the way and σ_y was tossed in the way are also as σ_y and σ_y was tossed in the way are also as σ_y and σ_y was tossed in the way are also as σ_y and σ_y was to say and σ_y and σ_y was to say an σ_y where σ_y was to say an σ_y where σ_y was the σ_y was to say an σ_y where σ_y was the σ_y	the respect one of the following set of the follow	f the fole $x - 9y - 3$ following times an $\frac{1}{2}$ level $\frac{1}{2}$ bulbs pred deviations a mean $\frac{1}{2}$	lowing - 107 = dthe he of sign produce attion of life tim	Obtain t is the re is the re is 0. Als ad turn ificance d by ma 90 hour e of 12:	ed up 10 e. nnufacturs. A san 30 hours	8 times	Test the nowed a 75 bulbs e standar	e hypoth mean life produce ard devia	nesis that fe time of led by tion of	CO5	
Q. 5 A) B)	deviation $ \begin{array}{c c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A A coin where the coin A sample 1190 hours are constant and coin where the coin manufaction is a second constant and coin the coin t	ons from the which $y + 30 = 0$, and $\sigma_y = 0$. Any Two was tosso is unbiase of 100 turns and a turer B s. Is the	the respect one of the following standars a different and the following standars and the following standars are a different and the following standars are a different following standars are a different following standars are a different following standars.	f the fol x - 9y - 3 following imes an % level bulbs produced device a mean cerence	lowing - 107 = dthe he of sign produce attion of life tim	Obtain t is the re is the re is 0. Als ad turn ificance d by ma 90 hour e of 12:	ed up 10 e. nnufacturs. A san 30 hours	8 times	Test the nowed a 75 bulbs e standar	e hypoth mean life produce ard devia	nesis that fe time of led by	CO5	
Q. 5 A) B)	deviation $4x - 5$ find r_{xy} Solve A A coin with the coin A sample 1190 hours and 120 hours i) at 5%	ons from the which $y + 30 = 0$ and σ_y was tossed is unbiase of 100 turns and a turer B seen seen seen seen seen seen seen se	the respect of the respect of the second of	f the fole $x - 9y - 3$ following an expectation of the following and deviation are an expectation of the following and deviation are an expectation of the following and deviation of th	lowing - 107 = dthe he of sign produce attion of life tim	Obtain t is the re is the re is 0. Als ad turn ificance d by ma 90 hour e of 12:	ed up 10 e. nnufacturs. A san 30 hours	8 times	Test the nowed a 75 bulbs e standar	e hypoth mean life produce ard devia	nesis that fe time of led by tion of	CO5	
Q. 5 A) B)	deviation $4x - 5$ find r_{xy} Solve A A coin with the coin A sample 1190 hours and 120 hours i) at 5%	ons from the which $y + 30 = 0$ and σ_y was tossed is unbiase of 100 turns and a turer B seed turns. Is the level of level of the well	the respect of the respect of the second of	f the fole $x - 9y - 3$ following an expective in the following and deviation a mean expectation of the following and deviation and the following and deviation and devia	neans. (lowing 107 = 107 = 107 107 = 107 1	Obtain t is the re = 0. Als ad turno ificance d by may 90 hours e of 12.	ed up 10 c. anufacturs. A san 30 hours	8 times rer A sh with th	Test the lowed a 75 bulbs e standa wo hand	mean life produced and deviated is significant.	nesis that fe time of ed by tion of nificance	CO5	
Q. 5 A) B)	deviation $ \begin{array}{c c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A A coin where the coin A sample and the coin and the	ons from the which $y + 30 = 0$ and σ_y was tossed is unbiase of 100 turns and a turer B seek. Is the level of $\frac{1}{4}$ and	the respect of the respect of the respect of the respect of the respect to the r	f the fole $x - 9y - 3$ following imes an which will be bulby a mean ference cance cance and on s	lowing - 107 = 107 = 109. Ig. d the he of signification of life time between 109 =	Obtain t is the re = 0. Als add turn if icance d by ma 90 hour e of 12. In the me	ed up 10 c. anufacturs. A san 30 hours ean life t	8 times rer A shaple of with thime of t	Test the lowed a 75 bulbs e standa wo hand	e hypoth mean life produce rd devia ls is sig	nesis that fe time of ed by tion of nificance t physical	CO5	
Q. 5 A) B)	deviation $ \begin{array}{c c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A A coin where the coin A sample and the coin and the	ons from the which $y + 30 = 0$ and σ_y was tossed is unbiase of 100 turns and a turer B seek. Is the level of $\frac{1}{4}$ and	the respect of the respect of the respect of the respect of the respect to the r	f the fole $x - 9y - 3$ following imes an which will be bulby a mean ference cance cance and on s	lowing - 107 = 107 = 109. Ig. d the he of signification of life time between 109 =	Obtain t is the re = 0. Als add turn if icance d by ma 90 hour e of 12. In the me	ed up 10 c. anufacturs. A san 30 hours ean life t	8 times rer A shaple of with thime of t	Test the lowed a 75 bulbs e standa wo hand	e hypoth mean life produce rd devia ls is sig	nesis that fe time of ed by tion of nificance t physical	CO5	
Q. 5 A) B) C)	deviation $ \begin{array}{c c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A A coin where the coin A sample of the coin annufactor of the coin a	ons from the which $y + 30 = 0$ and σ_y was tossed is unbiase of 100 turns and a turer B seek. Is the level of A, 20% another another another turns and the seek of the see	the respect of the r	f the folicy $-9y-$ = 3 following simes and which we have a mean and the concess of the conces	lowing - 107 = 107 = 109. Ig. d the he of signification of life time between 109 arangle of a range of a rang	Obtain t is the re = 0. Als add turn if icance d by ma 90 hour e of 12. In the me of 900 s dom sa	ed up 10 c. anufacturs. A san 30 hours ean life t	8 times rer A shaple of with the ime of the oys had	Test the lowed a 75 bulbs e standa wo hand	e hypoth mean life produce rd devia ls is sig	nesis that fe time of ed by tion of nificance	CO5	1
Q. 5 A) B) C)	deviation $ \begin{array}{c c} \text{Determ} \\ 4x - 5 \\ \text{find } r_{xy} \end{array} $ Solve A A coin where the coin A sample and the coin and the	ons from the which $y + 30 = 0$ and σ_y was tossed is unbiase of 100 turns and a turer B seek. Is the level of A, 20% another another another turns and the seek of the see	the respect of the r	f the folicy $-9y-$ = 3 following simes and which we have a mean and the concess of the conces	lowing - 107 = 107 = 109. Ig. d the he of signification of life time between 109 arangle of a range of a rang	of 900 saportion	ed up 10 c. anufacturs. A san 30 hours ean life t	8 times rer A shaple of with thime of t	Test the lowed a 75 bulbs e standa wo hand	e hypoth mean life produce rd devia ls is sig	nesis that fe time of ed by tion of nificance t physical	CO5	

The grid and the borders of the table will be hidden before final printing.