University of Mumbai

Examination Second Half 2021 (Lead College: BVIMIT)

Program: MCA

Curriculum Scheme: MCA (2year – 2020 Course)

Examination: M.C.A Semester I

Course Code: MCA11 and Course Name: Mathematical Foundations for Computer Science1 Time: 2 hour 30 minutes Max. Marks: 80

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01	Choose the correct option for following questions. All the Questions are								
QI.	compulsory and carry	y equal mar	·ks		[20	Marks]			
1.	If $V(X) = 2$ then, $V(2X)$	(+5) = ?							
Option A:	9								
Option B:	8								
Option C:	12								
Option D:	32								
2.	In a manufacturing pro	cess of a ce	rtain compo	onent, two ty	ypes of defe	ct are likely			
	to occur with respectiv	e probabilit	ies 0.05 and	d 0.1. What	is the proba	bility that a			
	randomly chosen comp	onent is def	ective?						
Option A:	0.145								
Option B:	0.15								
Option C:	0.005								
Option D:	0.5								
3.	A fair coin is tossed 7 t	times. Find t	he probabil	ities of obtai	ining one he	ad			
Option A:	1/128								
Option B:	7/128								
Option C:	21/128								
Option D:	35/128								
	X								
4.	For the following what	is bivariate	probability	distribution	of X and Y	,			
	Find $P(X \le 1, y=2)$								
		2	3	4	5	6			
	X								
	0 0	0	1/32	2/32	2/32	3/32			
	1 1/16	1/16	1/8	1/8	1/8	1/8			
	2 1/32	1/32	1/64	1/64	0	2/64			
Option A:	1/16								
Option B:	7/8								
Option C:	1/64								
Option D:	1/32								
5	The z-test is best used for	r							
Option A	greater-than-100 samples	L							
Option B:	less-than 10 samples	,							
Option C:	greater-than-30 samples								
Option D:	less-than 20 samples								
6.	If $\overline{Q1=10}$, $Q2 = 20$ and	Q3=40 Fine	d Bowley's	coefficient o	of skewness.				

Option A:	0.4
Option B:	0.5
Option C:	0.33
Option D:	-0.5
7.	Find the probability of constructing a two digit even number using the digits 1,2,3,4,5,6,7,8,9 if repetition of digits is allowed
Option A:	0.5
Option B:	0.4444
Option C:	0.66
Option D:	0.1
8.	Suppose A and B are events with $P(A)=0.6$, $P(B)=0.3$ and $P(A \cap B)=0.2$ find the
	probability that A or B occurs
Option A:	0.3
Option B:	0.7
Option C:	0.1
Option D:	0.6
9.	Which formula is used for Karl Pearson's Coefficient of skewness calculation
	where mode is ill-defined?
Option A:	(Mean-Mode)/Std.Dev.
Option B:	3(Mean - Mode)/ Std.Dev.
Option C:	3(Mean- Median)/ Std.Dev.
Option D:	3Mean - Mode/ Std.Dev.
10.	Two regression lines are given by the equations $x + 2y - 5 = 0$ and $2x + 3y - 8 = 0$.
	Find the values of \bar{x} , \bar{y}
Option A:	$\bar{x} = 1, \bar{y} = 2$
Option B:	$\overline{x} = 2, \overline{y} = 1$
Option C:	$\bar{x} = 4, \bar{y} = 1$
Option D:	$\bar{x} = 1, \bar{y} = 4$
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Q2	Solve any Tw	o Questions	out of Th	ree (10 m	arks each	1)	[20 M	[arks]	
	From the follo skewness	wing data on	age of em	ployee, ca	lculate the	e Karl Pea	rson's coe	fficient of	•
А	Age (years)	20-25	25-30	30-35	35-40	40-45	45-50	50-55	
	No. of employees	8	12	20	25	15	12	8	
в	The super mark (35%), Glow gl Bright light's g faulty. A customer buy choice. When s well's globe?	ket buy light g lobe (20%) and globes are faul ys a globe with he gets home,	globes (ligh d Shine we ty, and tha nout looking she finds th	tt bulbs) fro 11 (45%). Ir t 1.5% of o g at the man- he globe is	om three d the past, t each Glow nufacturer's faulty. Wh	ifferent ma the superma globe's an s name- in at is the pro	anufacturers arket has fo ad Shine wo other word obability sh	- Bright und that 19 ell's globes s, it's a ran e chose a s	light % of 3 are .dom
С	The probabilit At these point C > 0 1. Determ	y mass funct s it has the vanime the value	ion of a rat alues P(0) e of C	ndom varia = $3C^2$, P(able X is z 1) = $4C -$	zero excep 10C ² and	t at points P(2)= 5C	x=0, 1, 2. - 1 , for se	ome

	2. Compute 3 Find the l	the follow	wing pro	obabilit t F(x) <	ties $P[x < 2]$	2] and P	$[1 < x \leq$	2]		
	4. Find the	smallest x	such the	hat $F(x)$	$\geq 1/3$					
03.	Solve any Two	Question	s out of	Three	(10 mark	vs each)		[20	Mark	sl
200	In a certain indu	strial faci	lity, acc	cidents of	occur infre	equently	. It is kn	iown tha	t the p	robability
А	of an accident on (i). What is th on one da (ii). What is th	h any give he probab hy? he probab	en day is ility tha ility tha	s 0.005, at in any at there	and accid given per are at mos	lents are riod of 40 st three d	indepen 00 days, lays with	dent of o there with an acci	each ot ill be a ident?	her. n accident
	The incidence of	robbery	and mu	rder per	: 100000 p	opulatio	ns in sir	nple of s	seven n	nedium
	size cities is give	n below.		-		-				
	City	А	В	C	D	E	F	G	Tota	al
В	Robbery(x)	4	6	10	5	1	2	3	31	
	Murder(y)	16	29	43	20	<u> </u>	4	0 under	12.	1
	Filla Kall Featso			oneiau	ion betwee		ry and n	luidei.		
	The following da	ata gives t	he num	ber of c	car accider	nts in the	city du	ring a ra	ndom	time
	period. Calculate	Bowley'	s coeffi	cient of	f skewness	s for the	followin	ng distril	oution	
С	Class	5-10	10-	15	15-20	20-25	25-30	0 30	-35	35-40
	Fraguancy	7	0		16	22	1 /	1		3
	Trequency	1	9	,	10	22	14		2	3
	Trequency	/	9	/	10		14		2	
04.	Solve any Two	/ Ouestions	s out of	' Three	(10 mark	zz ks each)	14	[20	Mark	
Q4. A	Solve any Two Find Spearman's	Questions	s out of relation	Three for the	(10 mark following	xs each)	14	[20	Mark	 [[]]
Q4. A	Solve any Two Find Spearman's Student	Questions	s out of relation A	Three for the B	(10 mark following C	s each) data D	E 14	[20 F	Mark G	 [KS]
Q4. A	Solve any Two Find Spearman's Student Marks in Test1	Questions	s out of relation A 52	Three for the B 34	(10 mark following C 47	xs each) g data D 65	E 43	[20 F 34	Mark G 54	[KS]
Q4. A	Solve any Two Find Spearman's Student Marks in Test1 Marks in Test2	Questions rank corr	s out of relation A 52 65	Three for the B 34 59	Image: 10 (10 mark following C 47 65	22 xs each) g data D 65 68	E 43 82	[20 F 34 60	Mark G 54 57	KS] H 65 58
Q4. A B	Solve any Two Find Spearman's Student Marks in Test1 Marks in Test2 The observed and	Questions rank corr d expecte	s out of relation A 52 65 d freque	Three for the B 34 59 encies i	(10 mark following C 47 65 n rolling a	22 (xs each) (5 data D (65 (68) (68) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7	E 43 82) times a	F 34 60 re given	G 54 57 below	xs] H 65 58 7. Test the
Q4. A B	Solve any Two Find Spearman's Student Marks in Test1 Marks in Test2 The observed and hypothesis that t	Questions a rank corr d expecte he die is	s out of relation A 52 65 d freque fair (Gi	Three for the B 34 59 encies i vven lev	(10 mark following C 47 65 in rolling a vel of sign	xs each) g data D 65 68 a die 120 ificance	E 43 82) times a =0.01 ,	[20 F 34 60 re given 5 degre	G 54 57 below es of f	Image: state stat
Q4. A B	Solve any Two Find Spearman's Student Marks in Test1 Marks in Test2 The observed and hypothesis that t 15.086)	Questions rank corr d expecte he die is	s out of relation A 52 65 d freque fair (Gi	Three for the B 34 59 encies i iven lev	(10 mark following C 47 65 in rolling a rel of sign	xs each) data D 65 68 a die 120 ificance	E 43 82) times a =0.01,	[20 F 34 60 re given 5 degre	G 54 57 below es of f	H 65 58 7. Test the reedom is
Q4. A B	Solve any TwoFind Spearman'sStudentMarks in Test1Marks in Test2The observed and hypothesis that t15.086)No. observed	Questions rank corr d expecte he die is ved	s out of relation A 52 65 d freque fair (Gi	Three for the B 34 59 encies i iven lev 2	Image: Number of the second state of the second s	22 xs each) data D 65 68 a die 120 ificance 4 17		F 34 60 F 34	G 54 57 below es of f	Image: style="text-align: center;">Image: style="text-align: center;"/>Image: style="text-align: style="text-align: center;"/>Image: style
Q4. A B	Solve any Two Find Spearman's Student Marks in Test1 Marks in Test2 The observed and hypothesis that t 15.086) No. observed Frequence At 0.01 level of s	Questions rank cor a rank cor d expecte he die is ved	s out of relation A 52 65 d freque fair (Gi 1 17 ce deter	Three for the B 34 59 encies i ven lev 2 14 mine w	Image: Number of the second state of the second s	xs each) data D 65 68 a die 120 ificance 4 17 c die is tr		[20 F 34 60 re given 5 degre 6 15	G 54 57 below es of f	xs] H 65 58 7. Test the reedom is
Q4. А В	Solve any TwoFind Spearman'sStudentMarks in Test1Marks in Test2The observed andhypothesis that t15.086)No. observedFrequenceAt 0.01 level of s	Questions rank corr rank corr d expecte he die is ved cy significan	s out of relation A 52 65 d freque fair (Gi 1 17 ce deter	Three for the B 34 59 encies i iven lev 2 14 rmine w	Image: Number of the second	22 xs each) g data D 65 68 a die 120 ificance 4 17 e die is tr		F 34 60 re given 5 degre 6 15 niform)	G 54 57 below es of f	KS] H 65 58 V. Test the reedom is
Q4. А В	Solve any TwoFind Spearman'sStudentMarks in Test1Marks in Test2The observed and hypothesis that t 15.086)No. observed FrequenceAt 0.01 level of sSuppose that the	Questions rank corr rank corr d expecte he die is ved cy significan error in t	s out of relation A 52 65 d freque fair (Gi 1 17 ce deter he react	Three for the B 34 59 encies i iven lev 2 14 rmine w ion tem	Image: Number of the second	$\begin{array}{c c} \hline 22 \\ \hline xs each) \\ \hline g data \\ \hline D \\ \hline 65 \\ \hline 68 \\ \hline a die 120 \\ \hline ificance \\ \hline 4 \\ \hline 17 \\ \hline e die is tr \\ \hline n {}^{0}C, for \\ \hline \end{array}$	$ \begin{array}{c c} 14 \\ \hline E \\ 43 \\ \hline 82 \\ \hline 0 times a \\ =0.01 , \\ \hline 5 \\ \hline 17 \\ \hline rue (or u \\ \hline a control$	F 34 60 rre given 5 degre 6 11 niform) olled exp	G 54 57 below es of f	Image: style="text-align: center;">Image: style="text-align: center;"/>Image: style="text-align: center;"////Image: style="text-align: center;"///////////////////////
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Q4. А В	Solve any Two Find Spearman's Student Marks in Test1 Marks in Test2 The observed and hypothesis that t 15.086) No. observed Frequence At 0.01 level of s Suppose that the continuous rando	Questions rank corrections rank corrections d expecte he die is ved cy significan error in the ow variab x) = $x^2/3$	s out of relation A 52 65 d freque fair (Gi 1 17 ce deter he react le X hav -1<	Three for the B 34 59 encies i iven lev 2 14 mine w ion tem ving the x < 2	Image: Number of the second	$\begin{array}{r} 22 \\ \hline \textbf{xs each)} \\ \hline \textbf{g} data \\ \hline \textbf{D} \\ \hline \textbf{65} \\ \hline \textbf{68} \\ \hline \textbf{68} \\ \hline \textbf{a} die 120 \\ \hline \textbf{ificance} \\ \hline \textbf{4} \\ \hline 17 \\ \hline \textbf{e} die is tr \\ \hline \textbf{n} {}^{0}\textbf{C}, for ity function of the second sec$	E 43 82 $0 times a$ $=0.01 ,$ 5 17 17 17 $10 curve (or u)$ $a control$	F 34 60 re given 5 degre 6 15 niform)	G 54 57 below es of f	KS] H 65 58 V. Test the reedom is nt is a
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