Roll No: Image: Construction of the second state of the seco

General Instructions:

1.

- All questions are compulsory. Answers should be brief and to the point.
- > This Question paper consists of 03 pages & 8 questions.
- > It comprises of three Sections, A, B, and C. You are to attempt all the sections.
- Section A Question No- 1 is objective type questions carrying 1 mark each, Question No- 2 is very short answer type carrying 2 mark each. You are expected to answer them as directed.
- Section B Question No-3 is Long answer type -I question with external choice carrying 6 marks each. You need to attempt any five out of seven questions given.
- Section C Question No. 4-8 are Long answer type -II (within unit choice) questions carrying 10 marks ______each. You need to attempt any one part <u>a or b.</u>
- Students are instructed to cross the blank sheets before handing over the answer sheet to the invigilator.
- No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION – A

Atte	empt all the parts.	[10×1=10]	CO
a.	Choose the right answer:	(1)	CO1
	The range of a sample gives an indication of the :		
	(A) Way in which the values cluster about a particular point		
	(B) Number of observations bearing the same value		
	(C) Maximum variation in the sample		
	(D) Degree to which the mean value differs from its expected value.		
b.	The observation which occurs most frequently in a sample is the	(1)	CO1
	(A) median		
	(B) mean deviation		
	(C) standard deviation		
	(D) mode		
c.	attempts to determine the degree of relationship between	(1)	CO2
	Variables.		
	a. Regression analysis		
	b. Correlation analysis		
	c. Inferential analysis		
	d. None of these		
d.	Karl Pearson's correlation coefficient if denoted by the symbol	(1)	CO2
	a. K		
	b. r		
	c. R		

d. None of these

										Su	ıbjec	t Code: AM	BA0103
	e.	Whet	her the	stateme	nt is true	or false:						(1)	CO3
		Norm mean	al dist, media	tribution in, and r	is are syr node are a	nmetric, all equal	unin	nodal, a	nd asymp	totic, and	the		
	f.	The b	inomia	l is a typ	pe of distr	ibution 1	that ha	as p	oossible ou	itcomes		(1)	CO3
	g.	A	is a	sequenc	e of nume	rical dat	a poin	its in suc	cessive or	der.		(1)	CO4
	h.	Index	numbe	ers are e	xpressed	in terms	of					(1)	CO4
	i.	When	these	probabi	ilities are	known	or ca	n be esti	mated, the	e choice of	an	(1)	CO5
		optim	al actio	on, base	d on these	e probabi	ilities,	is terme	d as				
	j.	An	is t	he piece	of a com	puting s	ystem	designe	d to simula	ate the way	the	(1)	CO5
		huma	n brain	analyse	es and pro	cesses ir	nforma	ation.					
2.	Atte	empt all	the pa	rts.								[5×2=10]	CO
	a.	Giver	n the fo	llowing	informati	on, find	the po	opulatior	variance.			(2)	C01
				Me	asure				Value				
				μ	l				50				
				σ	-				4				
	b.	Is the opinion	ere any	relation relation	nship bet	ween Re	egress	ion and	Correlatio	on? State y	our	(2)	CO2
	c.	Expla	in brie	fly the E	Bayes' the	orem						(2)	CO3
	d.	Why	least so	uares m	ethod is u	ised?						(2)	CO4
	e.	What	is maii	n applic	ation of I	Decision	tree a	pproach				(2)	CO5
					<u>SEC</u>	FION – 1	<u>B</u>						CO
3.	Ans	swer an	y <u>five</u>	of the fo	ollowing-							[5×6=30]	
	a.	Calcu	late va	riance a	nd standa	rd deviat	tion fo	or the fol	lowing dat	ta:		(6)	CO1
		х	2	4	6	8	10						
		f	3	5	9	5	3						
	b.	When exam	ı Rank ple.	Metho	d of corr	elation i	is use	d. Expla	ain formul	a with giv	ring	(6)	CO2
	c.	What Poiss	is Pois on's di	sson's d	istributio	n? Write	e a foi	rmula fo	r probabil	ity function	n of	(6)	CO3
	d.	A cor	npanv	had the	following	net sale	es and	operatin	g income	for each of	the	(6)	CO4
		past f	ive yea	rs (in m	illions):	, inter suite		- r - r ann				(0)	201
					2019	2018	2	2017	2016	2015]		

	2019	2018	2017	2016	2015
Net sales	\$35,119	\$30,990	\$31,944	\$28,857	\$24,088
Operating income	\$ 8,449	\$ 8,231	\$ 8,446	\$ 7,252	\$ 6,308

Assuming 2015 is the base year, find out trend percentage.

e. Explain main application of AI and machine learning in business decisions. (6) CO5

(6)

CO1

- **f.** Compare skewness and kurtosis with an example.
- g. What is the probability of drawing either a king or a queen in a single draw (6) CO3 from a well shuffled pack of 52 cards?

(10)

CO5

			SE	СТІО	<u>N – C</u>							
Ans	wer any <u>one</u> o	f the fo	llowing	5-							[5×10=50]	CO
a.	A student ha	(10)	CO1									
	wants an 85											
	last test in or											
b.	Find out mis	1:	(10)	CO1								
	Class Interval			0	10-20	20-	30	30-40	4()-50		
	Frequency		3		_	20		12	_			
	The value of	mediar	and m	ode a	re 27 and	26 re	spectiv	ely.				
Ans	wer any <u>one</u> o	f the fo	llowing	5-								
a.	The values o below	f y and	their co	orresp	onding va	alues	of y are	e shown	in the	table	(10)	CO2
	Х		0		1			2		3		
	У		2		3			5		4		
i) Find the least square regression line $y = a x + b$. ii) Estimate the value of y when $x = 10$.												
b. Calculate Karl Pearson's coefficient of correlation from the following da									g data-	(10)	CO2	
	X 18	20	21	22	27	27	28	29	29	29		
	Y 23	37	29	28	28	31	35	30	36	33		
Ans	wer anv one o	f the fo	llowing	[-								
a.	A card is dra	wn fror	n a pac	, k of 5	2 cards. H	Find the	he prot	ability	of getti	ng	(10)	CO3
	a king or a h	eart or a	n red ca	rd.			•	•	C	C		
b.	Prove that st	atement	: The p	robab	ility of si	multa	neous	occurre	nce of	two	(10)	CO3
	events is equ	ne										
	conditional p											
	$P(A \cap B) = P(A \cap B)$	$A) \times P(B)$	A).									
Ansv	$P(A \cap B) = P(A \cap B) $	A)×P(B/ f the fo	'A). llowing	;-						_		
Ansv a.	P(A∩B)=P(A wer any <u>one</u> o Explain Qua	A)×P(B/ f the fo ntity ind	A). llowing lex by :	;- fisher	's method	1? Wh	y this	method	is calle	ed	(10)	CO4
Ansv a.	P(A∩B)=P(A wer any <u>one</u> o Explain Qua Ideal?	A)×P(B/ f the fo ntity ind	A). Ilowing lex by :	g- fisher	's method	1? Wh	y this	method	is calle	ed	(10)	CO4
Ansv a. b.	$P(A \cap B) = P(A)$ wer any <u>one</u> or Explain Qua Ideal? Calculate the (i) Laspayre'	A)×P(B/ f the fo ntity ind index :	A). Ilowing dex by : number	;- fisher` rs fron	's methoc n the follo	l? Wh owing	y this 1 data u	method sing:	is calle	ed	(10) (10)	CO4 CO4
Ansv a. b.	P(A∩B)=P(A wer any <u>one</u> o Explain Qua Ideal? Calculate the (i) Laspeyre'	A)×P(B/ f the fo ntity ind index : s metho	A). llowing lex by : number d, d	g - fisher [*] rs fron	's methoo n the follo	l? Wh owing	y this r data u	method sing:	is calle	ed	(10) (10)	CO4 CO4
	Ans ^v a. b. Ans ^v a. b. Ans ^v a. b.	Answer any <u>one</u> of a. A student ha wants an 85 last test in or b. Find out mis Class Interv Frequency The value of Answer any <u>one</u> of a. The values of below x y i) Find the le ii) Estimate th b. Calculate Ka X 18 Y 23 Answer any <u>one</u> of a. A card is dra a king or a ha b. Prove that sta events is equ conditional r	Answer any one of the for a.A student has gotten wants an 85 or better last test in order to a b.b.Find out missing freeClass IntervalFrequencyFrequencyThe value of mediant Answer any one of the for a.Answer any one of the for belowXyi) Find the least squati ii) Estimate the valueb.Calculate Karl Pears X 18 20 Y 23 37Answer any one of the for a.A card is drawn from a king or a heart or a b.b.Prove that statement events is equal to the conditional probabil	Answer any <u>one</u> of the following a. A student has gotten the fol- wants an 85 or better overal last test in order to achieve b. Find out missing frequencies Class Interval 0-1 Frequency 3 The value of median and m Answer any <u>one</u> of the following a. The values of y and their con- below x 0 y 2 i) Find the least square regrini) Estimate the value of y v b. Calculate Karl Pearson's con- X 18 20 21 Y 23 37 29 Answer any <u>one</u> of the following a. A card is drawn from a pac- a king or a heart or a red ca b. Prove that statement: The p- events is equal to the proba- conditional probability of the statement of	Answer any <u>one</u> of the following- a. A student has gotten the following- wants an 85 or better overall. When the last test in order to achieve that at a b. Find out missing frequencies in the state of the following frequency is the value of median and mode and the following- a. The value of median and mode and the following- a. The values of y and their correspondence of y is the value of y is the state of y when y is the value of y is the value of y when y is the value of y is	Answer any <u>one</u> of the following- a. A student has gotten the following grades wants an 85 or better overall. What is the last test in order to achieve that average? b. Find out missing frequencies in the follow $ \frac{Class Interval}{} 0-10 10-20 \\ \hline Frequency 3 \\ - \\ \hline The value of median and mode are 27 and Answer any one of the following- a. The values of y and their corresponding va- below $	Answer any <u>one</u> of the following- a. A student has gotten the following grades on hi wants an 85 or better overall. What is the minin last test in order to achieve that average? b. Find out missing frequencies in the following in $ \frac{Class Interval}{Class Interval} = \frac{0-10}{10-20} = \frac{10}{20} $ Frequency 3 20 The value of median and mode are 27 and 26 re Answer any <u>one</u> of the following- a. The values of y and their corresponding values of below x 0 1 y 2 3 i) Find the least square regression line y = a x + ii) Estimate the value of y when x = 10. b. Calculate Karl Pearson's coefficient of correlati $ \frac{X 18 20 21 22 27 27}{Y 23 37 29 28 28 31} $ Answer any <u>one</u> of the following- a. A card is drawn from a pack of 52 cards. Find the a king or a heart or a red card. b. Prove that statement: The probability of simultate events is equal to the probability of one of the econditional probability of the other i.e. for two	Answer any <u>one</u> of the following- a. A student has gotten the following grades on his tests: wants an 85 or better overall. What is the minimum gr last test in order to achieve that average? b. Find out missing frequencies in the following incomple $ \frac{\boxed{\text{Class Interval}} 0-10 10-20 20-30 \\ \hline{\text{Frequency}} 3 \\ - 20 \\ \hline{\text{The value of median and mode are 27 and 26 respective}} \\ Answer any one of the following- a. The values of y and their corresponding values of y are below $	Answer any <u>one</u> of the following- a. A student has gotten the following grades on his tests: 87, 95, wants an 85 or better overall. What is the minimum grade here last test in order to achieve that average? b. Find out missing frequencies in the following incomplete distributed Class Interval 0-10 10-20 20-30 30-40 Frequency 3 20 12 The value of median and mode are 27 and 26 respectively. Answer any <u>one</u> of the following- a. The values of y and their corresponding values of y are shown below x 0 1 2 y 2 3 5 i) Find the least square regression line y = a x + b. ii) Estimate the value of y when x = 10. b. Calculate Karl Pearson's coefficient of correlation from the following- a. A card is drawn from a pack of 52 cards. Find the probability of a king or a heart or a red card. b. Prove that statement: The probability of simultaneous occurrer events is equal to the probability of the other i e, for two events A & B	Answer any one of the following- a. A student has gotten the following grades on his tests: 87, 95, 76, an wants an 85 or better overall. What is the minimum grade he must ge last test in order to achieve that average?b.Find out missing frequencies in the following incomplete distribution	Answer any <u>one</u> of the following- a. A student has gotten the following grades on his tests: 87, 95, 76, and 88. He wants an 85 or better overall. What is the minimum grade he must get on the last test in order to achieve that average? b. Find out missing frequencies in the following incomplete distribution: $ \frac{\boxed{\text{Class Interval}} 0-10 10-20 20-30 30-40 40-50}{\boxed{\text{Frequency}} 3 - 20 12 \\ $ The value of median and mode are 27 and 26 respectively. Answer any <u>one</u> of the following- a. The values of y and their corresponding values of y are shown in the table below	Answer any <u>one</u> of the following- a. A student has gotten the following grades on his tests: 87, 95, 76, and 88. He wants an 85 or better overall. What is the minimum grade he must get on the last test in order to achieve that average? b. Find out missing frequencies in the following incomplete distribution: (10) $ \frac{10}{10} = \frac{10 - 10}{10 - 10} = \frac{10 - 20}{20 - 30} = \frac{30 - 40}{30 - 40} = \frac{40 - 50}{40 - 50} $ The value of median and mode are 27 and 26 respectively. Answer any <u>one</u> of the following- a. The values of y and their corresponding values of y are shown in the table below

	Ba	ise year	Current year			
Commodity	Price Quantity		Price	Quantity		
	p0	q0	p1	q1		
Α	8	100	10	120		
В	4	60	5	80		
С	10	20	12	25		
D	12	25	15	30		
Ε	3	5	4	6		

8. Answer any <u>one of the following-</u>

- **a.** Explain Artificial Neural Networks and deep learning in detail.
- b. Explain with imaginary data Decision-making under certainty, uncertainty (10) CO5 and risk situations.