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1					Previet	No
-			First Revis	sion Examination	2025	50 C
me., 3.00 Hrs		114 98	STNESS MALL	HEMATICS AND	STATISTICS	Marks 90
				PART		
Answer all th	e quest	One Choose	the correct and	W/ #5 1		20 x 1 = 20
If A =	sine	Pres (24) la		20 bid #12 di 1		
[-sinA	0080	1000 [2A] 18	edna to al acos	and of the of the		
		5	5' 5'		State Barriel	
The value of t	the deter	minant 5 ²	5 5 10	a) 5 b) 25 c) 0 d	51	
	ine creater	5*	5 ⁵ 5 ⁶	a) 5 D) 25 C) 6 G	15	
Thirteen gues	its has pr	articipated in a	a dinner The num	nber of handshakes hap	opened in the dinner is a)	715 b) 78 c) 286 11 13
The term cont	taining x	in the expans	sion of $(x - 2y)^2$ is	a) 3" b) 4" d) 5" d) 6*	0
5120 c) 0 d	Value of	the objective	function z = x + 3	y subject to the constrain	ints $2x + y \le 20$, $x + 2y \le 20$), × > 0 and y > 0 is a) 10
The objective	of netwo	ork analysis is	to a) minimize t	total project cost b) mi	nimize total project duration	c) minimize production
delays, interru	uption an	d conflicts d)) all the above	ional project cost of th	inimize total project ouration	of mannade production
From the follo	wing dat	$a, N = 11, \Sigma x$	= 17, Σy = 260, Σ	x ² = 1313, Σy ² = 6580, 3	$\Sigma xy = 2827$ the correlation of	oefficient is
a) 0 3566 b)	-0.3566	c) 0 d) 0.4	4566			
If regression (co-efficie	int of y on x is	2, then the regres	ssion co-efficient of x or	1 - 1	d) 1
If median = 4	5 and its	coefficient is f	0.25, then the me	an deviation about med	dian is a) 11.25 b) 180 c)	0.0056 d) 45
Probability the	at both e	vents A and B	occur is	$P(A \cup B) \rightarrow P(A \cap B)$	c) $P(A B)$ d) $P(A \cap \overline{B})$	
The circle tou	iches x-s		d the line $x = 6$ the	on the length of the rad	ius of the circle is a) 6 b	(3, c) 12 d) 4
The locus of t	the point	'p' which mov	use such that n is	at equidistance from th	eir coordinate axes is	10 0) (L 0) 4
1	and point		1	at equidistance nem ta		
$\mathbf{a})\mathbf{y} = -\mathbf{b})\mathbf{y}$	y=x c	:) y = x d) y =				
. (.3	3)	3	5 4 5		A Contraction of the second	
sin cos	is	a) - b)	$(\frac{1}{2} c) = d) \frac{1}{4}$		COSE	
The value of	secA sir	n(270° + A) is	a) -1 b) cos ² A	c) sec ² A d) 1	Seca KCOSA	
x ² -	– 4 x if x	$i \geq 2$				
If $f(x) = \int_{x} f(x) dx$	+ 2 if x	, then f	f(5) is a) –1 b) 2	c) 5 d) 7	cø>	
	-2			0 4		
If $y = e^{2x}$, then	$\frac{d^2y}{d^2y}$	at $x = 0$ is a)	4 b)9 c)2 d)0	0 V. V		
If demand an	dx ²	st function of a	a firm are $p = 2 -$	- x and C = $-2x^2 + 2x + $	7 then its profit function is	and the second sec
a) $x^2 + 7$ b)	$x^2 - 7$ c	$(x) - x^2 + 7 d) - (x^2 + 7 $	$-x^2 - 7$	1/10	and the second se	
If the average	e revenu	e of a certain	firm is ₹50 and i	its elasticity of demand	is 2, then their marginal rev	venue is
a) ₹50 b) ₹2	5 c)₹1	00 d)₹75		200	12 Annas	
If a man source	eived a	total dividend	of ₹25,000 at 1	0% dividend rate on a	stock of face value ₹100,	then the number of shares
a man rece			2500 d) 300	Sector Sector	welly good 100/ stock he m	and another about worth
purchased a	a) 3500	b) 4500 c) 2		wants to invest in an ec	ually good 12% stock, he m	IUSI purchase a Stock worth
purchased a A invested so	a) 3500 ome mor	b) 4500 c) 2 ney in 10% sto	OCK at 290. IT B	40		· · · ·
A invested so	a) 3500 ome mor a) ₹80	b) 4500 c) 2 ney in 10% sto b) ₹115.20 c	ock at ₹96. If B (c) ₹120 d) ₹125.	.40 PART - B		i t
Answer any	a) 3500 ome mor a) ₹80	b) 4500 c) 2 ney in 10% sto b) ₹115.20 c	ock at ₹96. If BY c) ₹120 d) ₹125. Q.No.30 is com	PART - B		7 x 2 = 14
A invested so of	a) 3500 ome mor a) ₹80 seven(7	b) 4500 c) 2 ney in 10% sto b) ₹115.20 c 7) questions.	ock at ₹90. If B t c) ₹120 d) ₹125. Q.No.30 is com	.40 PART - B Ipulsory.		5 ⁺ 7 x 2 = 14
Answer any	a) 3500 ome mor a) ₹80 seven(7 1 a bc	b) 4500 c) 2 ney in 10% str b) ₹115.20 c 7) questions. b+c	ock at ₹90. If B 1 c) ₹120 d) ₹125. Q.No.30 is com	A0 PART - B pulsory.	1. 12	7 x 2 = 14
Answer any	a) 3500 pme mor a) ₹80 seven(7 1 bc 1 0	b) 4500 c) 2 ney in 10% sta b) ₹115.20 c 7) questions. b+c	ock at ₹90. If B t c) ₹120 d) ₹125. Q.No.30 is com	A0 PART - B pulsory.	3 m / t	7 x 2 = 14
Answer any	a) 3500 ome mor a) ₹80 <u>seven(7</u> <u>1</u> bc <u>1</u> ca	b) 4500 c) 2 mey in 10% sta b) ₹115.20 c 7) questions. b+c c+a = 0	ock at ₹90. If B t c) ₹120 d) ₹125. Q.No.30 is com	A0 PART - B Ipulsory.	13 m for m	$7 \times 2 = 14$
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A invested sc of Answer any Prove that From a class	a) 3500 ome moi a) ₹80 <u>seven(i</u> <u>1</u> bc <u>1</u> ca <u>1</u> ca <u>1</u> ab i of 32 st	b) $4500 ext{ c}$ (c) 2 ney in 10% str b) $₹115.20 ext{ c}$ c + a a + b udents, 4 stud	dents are to be ch	hosen for a competition	h. In how many ways can the $x + 2y + 2 = 0$ then find the y	T x 2 = 14 T x 2 = 14 his be done? alue of 'a'.
A invested at A invested at of	a) 3500 ome moi a) ₹80 seven(i $\frac{1}{a}$ bc $\frac{1}{b}$ ca $\frac{1}{c}$ ab i of 32 st of the circle	b) 4500 c) 2 mey in 10% str b) ₹115.20 c 7) questions. b+c c+a a+b udents, 4 structure rcle x ² + y ² + 2	dents are to be ch 2x - 6y + 1 = 0 lie	PART - B pulsory.	n. In how many ways can the transformed to the find the vertex of the second s	T x 2 = 14 T x 2 = 14
Prove that From a class If the centre of Evaluate	a) 3500 ome moi a) ₹80 seven(î 1/a bc 1/b ca 1/c ab cof 32 st of the cir cos sin	b) 4500 c) 2 mey in 10% str b) ₹115.20 c 7) questions. b + c c + a a + b tudents, 4 structure rcle x ² + y ² + 2	dents are to be ch 2x - 6y + 1 = 0 lie	A0 PART - B pulsory.	n. In how many ways can the transformed to the find the vertice of the second	T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2
Answer any Prove that From a class If the centre of Evaluate = 0	a) 3500 ome moi a) ₹80 seven(7 1 bc 1 ca 1 ca	b) 4500 c) 2 mey in 10% str b) ₹115.20 c 7) questions. b+c c+a a+b tudents, 4 students, 4 students, 4 students, 4 students, 4 students, $\frac{1}{5}$ $\frac{1}{13}$	dents are to be ch 2x - 6y + 1 = 0 lie	hosen for a competition bour (L) if $P = 8L - 2K$	n. In how many ways can the table 2^{3} and 2^{3} by 2^{3}	T x 2 = 14 T x 2
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Prove that From a class of Evaluate C Find the mar How much w	a) 3500 ome moi a) ₹80 seven(i 1/a bc 1/a bc 1/a bc 1/a ab c of 32 st of the cir cos sin rginal pro- vill be re-	b) 4500 c) 2 mey in 10% str b) ₹115.20 c 7) questions. b+c c+a a+b udents, 4 structures of the structure of the struc	dents are to be ch c) \neq 120 d) \neq 125 Q.No.30 is comp dents are to be ch 2x - 6y + 1 = 0 lie capital (k) and la 125 of \neq 25 share plain to hill statio	PART - B pulsory. hosen for a competition as on a straight line ax bour (L) if P = 8L - 2K as at a discount of ₹7. In 100 km distance at a	n. In how many ways can the + 2y + 2 = 0, then find the v + $3K^2 - 2L^2 + 7KL$ when K = an average speed of 30km p	T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2
Prove that From a class of Evaluate C Find the mar How much w An automob return trip at	a) 3500 ome moi a) ₹80 seven(î 1/a bc 1/b ca 1/c ab a of 32 st of the cir cos sin rginal pro vill be rep ille driver	b) 4500 c) 2 ney in 10% str b) ₹115.20 c 7) questions. b + c c + a a + b tudents, 4 students, 5 students,	dents are to be ch c) \neq 120 d) \neq 125 Q.No.30 is comp dents are to be ch 2x - 6y + 1 = 0 lie capital (k) and la 125 of \neq 25 share plain to hill statio km per hour what	hosen for a competition about (L) if $P = 8L - 2K$ is at a discount of $₹7$. in 100 km distance at at t is his average speed of	n. In how many ways can the + 2y + 2 = 0, then find the v + $3K^2 - 2L^2 + 7KL$ when K = an average speed of 30km p pover the entire distance (200 Syd = 200, Syd = 200, Syd	T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2
Prove that From a class of Evaluate C Find the mar How much w An automob return trip at Calculate the	a) 3500 ome moi a) ₹80 seven(7 1 bc a 1 ca 1 ca 1 ca 1 ca 1 ca cof 32 st of the cir cos sin rginal proviil be remited tiverage e coeffici	b) 4500 c) 2 mey in 10% str b) ₹115.20 c 7) questions. b + c c + a a + b tudents, 4 students,	ock at $(90, 11 \text{ B V})$ c) $(7120, d) (7125)$ Q.No.30 is comp dents are to be ch 2x - 6y + 1 = 0 lie capital (k) and la 125 of (25 share plain to hill statio km per hour what ation from the data	hosen for a competition boom (L) if $P = 8L - 2K$ boom (L) if $P = 8L$	n. In how many ways can the + 2y + 2 = 0, then find the v + $3K^2 - 2L^2 + 7KL$ when K = an average speed of 30km p over the entire distance (200 $\Sigma x^2 = 290$, $\Sigma y^2 = 300 \Sigma xy$	T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2
Prove that From a class If the centre of Evaluate : C Find the mar How much w An automob return trip at Calculate the If a polygon	a) 3500 ome moi a) ₹80 seven(1 1 a bc 1 c a 1 c a c a a c c a c c a c c a c c c a c c c c c c c c c c c c c	b) 4500 c) 2 mey in 10% str b) ₹115.20 c 7) questions. b + c c + a a + b tudents, 4 stud rcle x ² + y ² + 2 $\frac{1}{5}$ poductivities of quired to buy r travels from a speed of 200 ient of correla diagonals, find	dents are to be ch Q.No.30 is com dents are to be ch 2x - 6y + 1 = 0 lie capital (k) and la 125 of ₹25 share plain to hill statio km per hour what ation from the date d the number of it	PART - B pulsory. hosen for a competition a son a straight line ax abour (L) if P = 8L - 2K as at a discount of ₹7. In 100 km distance at at t is his average speed of a : $\Sigma x = 50$, $\Sigma y = -30$, is sides.	n. In how many ways can th + $2y + 2 = 0$, then find the v + $3K^2 - 2L^2 + 7KL$ when K = an average speed of 30km p over the entire distance (200 $\Sigma x^2 = 290$, $\Sigma y^2 = 300 \Sigma xy$	T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2 = 14 T x 2

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PART Answer any seven (7) questions. Q.No.40 is compulsory 0.8 0.2 31. The technology matrix of an economic system of two industries is the system is viable at 0.9 0.7 Simon conditions Find the independent term of 'x' in the expansion of $\left(x^2 - \frac{2}{3x}\right)$ 32. Find the angle between the straight lines x² + 4xy + y 33 Solve $\tan^{-1}(x+2) + \tan^{-1}(2-x) = \tan^{-1}(3)$ 34 35 If y = acosmx + bsinmx, then show that $y_2 + m^2y = 0$ For a particular process, the cost function is given by C = 56 - 8x + x², where 'C' is cost per unit and x, the number of the cost and the 36 corresponding number of units to be produced. A person deposits ₹4,000 in the beginning of every year. If the rate of compound interest is 14% then, find the amount after 10 years. 37 $[(1.14)^{10} = 3.707]$ 77342.56 Find the coefficient of correlation between x & y from the following two regression equations. 38 4x - 5y + 33 = 0, 20x - 9y - 107 = 039 Construct a network diagram for the following situation. A < D, E; B, D < F; C < G and B < H Two balls are drawn at random one after the other without replacement. Find the A bag contains 5 white and 3 black balls. 40 probability that both bails drawn are black. PART - D 7 x 5 = 35 Answer all the questions. In an economy there are two industries P, and P, and the following table gives the supply and the demand position in crores of rupees. Production sector Gross output Final demand Consumption sector 25 50 10 15 60 Ρ 20 30 10 Determine the outputs when the final demand changes to 35 for P, and 42 for P, (OR) (2 - x if x < 2)Verify the continuity of the function f(x) given by f(x) = 12 + x if $x \ge 2$ 42. By the principle of mathematical induction prove that $1.2 + 2.3 + 3.4 + ... + n(n + 1) = \frac{n(n + 1)(n + 2)}{3}$, for all $n \in N$. (OR) Find the vertex, focus, axis, directrix, and the length of latus rectum of the parabola y2 - 8y - 8x + 24 = 0 43. Prove that $\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ = \frac{1}{16}$ (OR) The demand for a commodity 'x' is $q = 5 - 2p_1 + p_2 - p_1^2 p_2$. Find the partial elasticities $\frac{Eq}{Ep_1}$ and $\frac{Eq}{Ep_2}$ when $p_1 = 3$ and $p_2 = 7$ 44. Sundar bought ₹4500, 12% of ₹10 shares at par. He sold them when the price rose to ₹23 and invested the proceeds in ₹25. Shares paying 10% per annum at ₹18. Find the change in his income. (OR) A factory has 3 machines A, A, A, producing 1000, 2000, 3000. Screws per day respectively. A, produces 1% defectives, A, produces 1.5% and A, produces 2% defectives. A screw is chosen at random at the end of a day and found defective. What is the probability that it comes from machines A,? Calculate rank correlation coefficient of the following data. 90 95 82 85 87 60 ,70 80 40 46 54 Subject 1 75 72 42 70 40 55 65 50 43 45 Subject 2 (OR) Let U = log $\left(\frac{x^4 + y^4}{x + y}\right)$. By using Euler's theorem show that $x \cdot \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = 3$ Solve by matrix inversion method 3x - y + 2z = 13; 2x - y - z = 3; x + 3y - 5z = -8 (OR) Find out the coefficient of mean deviation about median in the following series. 20-30 - 30-40 40-50 50-60 60-70 70-80 10-20 0-10 Age in year 40 42 35 10 25 32 20 No. of person Calculations have to be made correct to two places of decimals. 747. The following table gives the activities of a project and their duration in days. 4-5 3-5 1-3 2-3 2-4 3-4Activity 1-2 8 8 6 5 4 5 Duration Construct the network and calculate the earliest start time, earliest finish time, latest start time and latest finish time of each activity and determine the critical path of the project and duration to complete the project. (OR) A cricket team of 11 players is to be formed from 16 players including 4 bowlers and 2 wicket-keepers. In how many different ways can a team be formed so that the team contains atleast 3 bowlers and atleast one wicket - keeper?

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