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	Chapter 1
<u>1</u> .	Ratio
<u> </u>	Basic
	Que. 1. The monthly incomes of two persons are in the ratio
	4:5 and their monthly expenditures are in the ratio $\mathcal{F}$ :9.
	If each saves Rs. 50 per month, find their monthly
	íncomes.
	a. 600 and 7000 b. 500 and 400
	c. 900 and 700 d. 400 and 500
	Answer: D
	Solution: Let the monthly incomes of two persons be Rs. 4x and
	Rs. 5x so that the ratio is Rs. $4x$ : Rs. $5x = 4$ : 5. If each saves
	Rs. 50 per month, then the expenditures of two persons are Rs. (4x
	- 50) and Rs. (5x - 50).
	$\frac{36 \times 450}{5 \times 50} = \frac{35 \times 350}{9} \text{ or, } 36 \times -35 \times = 450 - 350$
	or, x = 100
	Hence, the monthly incomes of the two persons are Rs. 4 $ imes$ 100
	and Rs. 5 X 100 í.e. Rs. 400 and Rs. 500
<u>B</u> .	Inverse Ratio
	Que.2. The inverse ratio of 11 : 15 is
	a. 15:11 b. 11:11
	c. 15:15 d. V11: V15
	Answer: A
	Solution: One ratio is the inverse of another if their product is 1.
	Thus a: b is the inverse of b : a and vice-versa
<u>C</u> .	Duplicate Ratio
11	

	Chapter 1
3 <i>X</i> -2	2
Que.3. $\frac{5x-2}{5x++6}$ is the	duplicate ratio of $rac{2}{3}$ then find the value of
a. 2	6.6
c. 5	d. 9
Answer: B	
Solution: $\frac{3X-2}{3X-2}$ is the	ne duplicate ratio of $\frac{2}{3}$
5X++6	ac amplicate facto of 3
$\underbrace{\begin{array}{c} 3X-2 \\ 1.e., \frac{3X-2}{5X++6} \end{array}}_{2X-2} = \underbrace{\begin{array}{c} 2^2 \\ 3^2 \end{array}}_{3^2}$	
$\frac{3X-2}{5X++6} = \frac{4}{9}$	
<u>5x++6    9</u> 27x-18= 20x+24	
27x-20x = 24+18	
7x = 42	
X = 6	
<u>Sub duplicate Ra</u>	
Que.4.1f p:q ís the su	<u>tio</u> .b- duplícate ratío of p- $x^2$ : q- $x^2$ , then
Que.4.1f p:q ís the su $x^2$ ís :	.b- duplicate ratio of p- $x^2$ : q- $x^2$ , then
Que.4.1fp:q ís the su $x^2$ ís :	.b- duplicate ratio of p- $x^2$ : q- $x^2$ , then
Que.4.1fp:q ís the su $x^2$ ís :	b-duplicate ratio of p- $x^2$ : q- $x^2$ , then b. $\frac{p}{p+q}$
Que.4.1f p:q ís the su $x^2$ ís :	.b- duplicate ratio of p- $x^2$ : q- $x^2$ , then
Que.4.1fp:q ís the su $x^2$ ís :	b- duplicate ratio of p- $x^2$ : q- $x^2$ , then b. $\frac{p}{p+q}$
Que.4.1f p:q is the su $x^2$ is : a. $\frac{p}{p+q}$ c. $\frac{pq}{p+q}$ Answer: C	b-duplicate ratio of p- $x^2$ : $q$ - $x^2$ , then b. $\frac{p}{p+q}$ d. none
Que.4.1f p:q is the su $x^2$ is : a. $\frac{p}{p+q}$ c. $\frac{pq}{p+q}$ Answer: C Solution: Sub duplic	b- duplicate ratio of p- $x^2$ : q- $x^2$ , then b. $\frac{p}{p+q}$
Que.4.1f p:q is the su $x^2$ is : a. $\frac{p}{p+q}$ c. $\frac{pq}{p+q}$ Answer: C Solution: Sub duplic $\sqrt{p-x^2}: \sqrt{q-x^2}$	b-duplicate ratio of p- $x^2$ : q- $x^2$ , then b. $\frac{p}{p+q}$ d. none
Que.4.If p:q is the su $x^2$ is : a. $\frac{p}{p+q}$ c. $\frac{pq}{p+q}$ Answer: C Solution: Sub duplic $\sqrt{p-x^2}: \sqrt{q-x^2}$ p: $q = \sqrt{p-x^2}: \sqrt{q-x^2}$	b-duplicate ratio of p- $x^2$ : q- $x^2$ , then b. $\frac{p}{p+q}$ d. none
Que.4.If p:q is the su $x^2$ is : a. $\frac{p}{p+q}$ c. $\frac{pq}{p+q}$ Answer: C Solution: Sub duplic $\sqrt{p-x^2}: \sqrt{q-x^2}$ p: $q = \sqrt{p-x^2}: \sqrt{q-x^2}$	b-duplicate ratio of p- $x^2$ : q- $x^2$ , then b. $\frac{p}{p+q}$ d. none
Que.4.If p:q is the su $x^2$ is : $a. \frac{p}{p+q}$ $c. \frac{pq}{p+q}$ $c. \frac{pq}{p+q}$ Answer: C Solution: Sub duplic $\sqrt{p-x^2}: \sqrt{q-x^2}$ $p:q = \sqrt{p-x^2}: \sqrt{q-x^2}$ $p:q = \sqrt{p-x^2}$	b- duplicate ratio of $p-x^2 : q-x^2$ , then b. $\frac{p}{p+q}$ d. none pate ratio of $(p-x^2) : (q-x^2) =$
Que.4. If p:q is the su $x^2$ is : $a. \frac{p}{p+q}$ $c. \frac{pq}{p+q}$ $c. \frac{pq}{p+q}$ Answer: C Solution: Sub duplic $\sqrt{p-x^2}: \sqrt{q-x^2}$ $p:q = \sqrt{p-x^2}: \sqrt{q-x^2}$ $p:q = \sqrt{p-x^2}$ An squaring both sid	b- duplicate ratio of $p-x^2 : q-x^2$ , then b. $\frac{p}{p+q}$ d. none pate ratio of $(p-x^2) : (q-x^2) =$ de
Que.4.If p:q is the su $x^2$ is : $a. \frac{p}{p+q}$ $c. \frac{pq}{p+q}$ $c. \frac{pq}{p+q}$ Answer: C Solution: Sub duplic $\sqrt{p-x^2}: \sqrt{q-x^2}$ $p:q = \sqrt{p-x^2}: \sqrt{q-x^2}$ $p:q = \sqrt{p-x^2}$	b- duplicate ratio of $p-x^2 : q-x^2$ , then b. $\frac{p}{p+q}$ d. none pate ratio of $(p-x^2) : (q-x^2) =$ de

	Chapter 1
	$pq(p-q) = (p^2 q^2) x^2$
	$x^{2} = \frac{pq(p-q)}{(p+q)(p-q)}$
	$x^2 = \frac{pq}{(p+q)}$
	(p+q)
<u>E</u> .	<u>Triplicate Ratio</u>
	Que.5. The Tríplícate ratío of 4:7
	a. 4:7 b. 64:16
	c. 16:343 d. 64:343
	Answer: D
	Solution: $4^3$ : $7^3 = 64:343$
<u>F</u> .	<u>Sub-triplicate Ratio</u>
	Que.G. The Sub triplicate ratio of 125:729
	a. 5:9 b. 4:16
	c. 16:343 d. 64:343
	Answer: A
	Solution: 125:729 $\sqrt[3]{125}$ : $\sqrt[3]{729} = 64:343$
G.	<u>Compound Ratio</u>
≝.	Que.7. The ratio of the number of boys and girls in a college is 7
	8. If the percentage increase in the number of boys and girls be
	20% and 10% respectively, what will be the new ratio?
	a. 8:9 b. 17:18
	c. 121:22 d. None
	Answer: C
	Solution: Originally, let the number of boys and girls in the
	college be 7x and 8x respectively.
	$\left(\frac{120}{100} \times 7x\right) and \left(\frac{110}{100} \times 8x\right) = \frac{42x}{5} and \frac{44x}{5}$
	$\left  \left  \frac{1}{100} \times /x \right  ana \left  \frac{1}{100} \times \delta x \right  = -\frac{1}{100} ana -\frac{1}{100}$

<ul> <li>in the proportion of 5: 2: 4: 3. If C gets Rs. 1000 more than D, wh</li> <li>is B's share?</li> <li>a. 500</li> <li>b. 1500</li> <li>c. 2000</li> <li>d. None of these</li> <li>Answer: C</li> <li>Solution: Let the shares of A, B, C and D be Rs. 5x, Rs. 2x, Rs. 4, and Rs. 3x respectively Then, 4x - 3x = 1000 x = 1000 B's'share</li> <li>Rs. 2x = Rs. (2 x 1000) = Rs. 2000.</li> <li>2. Proportions</li> <li>A. Properties of Proportion</li> <li><i>i. Jauentendo</i></li> <li>Que.g. The ratio of the number of boys and girls in a college is 7:</li> </ul>		Chapter 1
Their increased number is $(120\% \text{ of } 7x)$ and $(110\% \text{ of } 8x)$ . Que.8. A sum of money is to be distributed among A, B, C, and I in the proportion of 5: 2: 4: 3. If C gets Rs. 1000 more than D, wh is B's share? a. 500 b. 1500 c. 2000 d. None of these Answer: C Solution: Let the shares of A, B, C and D be Rs. 5x, Rs. 2x, Rs. 4 and Rs. 3x respectively Then, $4x - 3x = 1000 \text{ x} = 1000 \text{ B}$ 's share Rs. $2x = \text{Rs.} (2x 1000) = \text{Rs.} 2000.$ 2. Proportions A Properties of Proportion <i>i. Juncriendo</i> Que.9. The ratio of the number of boys and girls in a college is 7: If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio? a. 3: 5 = 6: 10 b. 10: 6 = 5: 3 c. 6: 10 = 9: 15 d. None Answer: B Solution: a : b :: c : d a. $\frac{a}{b} = \frac{a}{a} = \frac{a}{c}$ 10: 6 = 5: 3 = 15: 9		
Que.8. A sum of money is to be distributed among A, B, C, and I in the proportion of 5: 2: 4: 3. If C gets Rs. 1000 more than D, wh is B's share? a. 500 b. 1500 c. 2000 d. None of these Answer: C Solution: Let the shares of A, B, C and D be Rs. 5x, Rs. 2x, Rs. 4 and Rs. 3x respectively Then, $4x - 3x = 1000 x = 1000$ B's'share Rs. $2x = Rs. (2 \times 1000) = Rs. 2000.$ 2. Proportions A Properties of Proportion <i>C. 9 muertendo</i> <i>Que.9.</i> The ratio of the number of boys and girls in a college is 7: If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio? a. $3:5 = 6:10$ b. $10:6 = 5:3$ c. $6:10 = 9:15$ d. None Answer: B Solution: a : b :: c : d a $\frac{a}{b}: \frac{c}{a} = \frac{b}{a} = \frac{d}{c}$ 10: $6 = 5:3 = 15:9$		$\therefore$ The required ratio = $\left(\frac{42x}{5}, \frac{44x}{5}\right) = 21:22$
in the proportion of 5: 2: 4: 3. If C gets Rs. 1000 more than D, wh is B's share? a. 500 b. 1500 c. 2000 d. None of these Answer: C Solution: Let the shares of A, B, C and D be Rs. 5x, Rs. 2x, Rs. 4 and Rs. 3x respectively Then, $4x - 3x = 1000 x = 1000$ B's'share Rs. $2x = Rs. (2 \times 1000) = Rs. 2000.$ 2. <u>Proportions</u> A. <u>Properties of Proportion</u> <i>C. Operation of the number of boys and girls in a college is 7:</i> If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio? a. $3:5 = 6:10$ b. $10:6 = 5:3$ c. $6:10 = 9:15$ d. None Answer: B Solution: $a:b::c:d$ $a: \frac{c}{b} = \frac{d}{c}$ 10:6 = 5:3 = 15:9		Their increased number is (120% of $\mathcal{F}x$ ) and (110% of $\mathcal{B}x$ ).
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$a. 3: 5 = 6: 10$ $b. 10: 6 = 5: 3$ $c. 6: 10 = 9: 15$ $d.$ None         Answer: B         Solution: $a: b:: c: d$ $a: \frac{c}{b} = \frac{b}{a} = \frac{d}{c}$ $10: 6 = 5: 3 = 15: 9$	Ċ.	<b>Invertendo</b> Que.9. The ratio of the number of boys and girls in a college is 7:
c. 6: 10 = 9: 15       d. None         Answer: B       Solution: $a: b:: c: d$ $a: c = b = d = c$ 10: $6 = 5: 3 = 15: 9$	<i>i.</i>	<b>Invertendo</b> Que.9. The ratio of the number of boys and girls in a college is 7: If the percentage increase in the number of boys and girls be 20%
Answer: B Solution: $a : b :: c : d$ $\frac{a}{b}: \frac{c}{d} = \frac{b}{a} = \frac{d}{c}$ 10: 6 = 5: 3 = 15: 9	<i>č.</i>	<b>Invertendo</b> Que.9. The ratio of the number of boys and girls in a college is 7: If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio?
Solution: a : b :: c : d $ \frac{a}{b}: \frac{c}{d} = \frac{b}{a} = \frac{d}{c} $ 10 : 6 = 5 : 3 = 15 : 9	<i>č.</i>	<b>Invertendo</b> Que.9. The ratio of the number of boys and girls in a college is $7$ :If the percentage increase in the number of boys and girls be 20%and 10% respectively, what will be the new ratio?a. 3: $5 = 6:10$ b. $10: 6 = 5:3$
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	<i>č.</i>	<b>Invertendo</b> Que.g. The ratio of the number of boys and girls in a college is $\neq$ :If the percentage increase in the number of boys and girls be 20%and 10% respectively, what will be the new ratio?a. 3: 5 = 6: 10b. 10: 6 = 5: 3c. 6: 10 = 9: 15d. NoneAnswer: BSolution: a : b :: c : d
ii. Alternendo		<b>Invertendo</b> Que.9. The ratio of the number of boys and girls in a college is $7$ :If the percentage increase in the number of boys and girls be 20%and 10% respectively, what will be the new ratio?a. 3: 5 = 6: 10b. 10: 6 = 5: 3c. 6: 10 = 9: 15d. NoneAnswer: BSolution: a : b :: c : d
ii. <del>Alternendo</del>		ImmericandoQue.9. The ratio of the number of boys and girls in a college is 7:If the percentage increase in the number of boys and girls be 20%and 10% respectively, what will be the new ratio?a. 3: 5 = 6: 10b. 10: 6 = 5: 3c. 6: 10 = 9: 15d. NoneAnswer: BSolution: a : b :: c : d $\frac{a}{b}: \frac{c}{d} = \frac{b}{a} = \frac{d}{c}$
		<b>Invertendo</b> Que.9. The ratio of the number of boys and girls in a college is 7:If the percentage increase in the number of boys and girls be 20%and 10% respectively, what will be the new ratio?a. 3: $5 = 6:10$ b. 10: $6 = 5:3$ c. $6:10 = 9:15$ d. NoneAnswer: BSolution: $a:b::c:d$ $\frac{a}{b}: \frac{c}{d} = \frac{b}{a} = \frac{d}{c}$ 10: $6 = 5:3 = 15:9$
		<b>Invertendo</b> Que.9. The ratio of the number of boys and girls in a college is 7:If the percentage increase in the number of boys and girls be 20%and 10% respectively, what will be the new ratio?a. 3: $5 = 6:10$ b. 10: $6 = 5:3$ c. $6:10 = 9:15$ d. NoneAnswer: BSolution: $a:b::c:d$ $\frac{a}{b}: \frac{c}{d} = \frac{b}{a} = \frac{d}{c}$ 10: $6 = 5:3 = 15:9$

	Chapter 1
	Que.10. If $a:b=c:d=e:f=\ldots$ , then each of these
	ratíos ís equal
	a. $(a + c + e + \dots)$ : $(b + d + f + \dots)$ is equal to each ratio
	b. $(a + c + e + \dots)$ : $(b + d + f + \dots)$ is greater to each ratio
	c. $(a + c + e +)$ : $(b + d + f +)$ is zero ratio
	d. None
	Answer: A
	Solution: Due to addendo property.
iii.	Componendo
	Que.11.4:5=8:10
	a. 1:1 b. 4:5 c. Both d. None
	Answer: A
	Solution: $\Rightarrow \frac{a}{r} = \frac{c}{r}$
	Solucion: $\rightarrow \frac{1}{b} - \frac{1}{d}$ Adding 1 to both sides, we get
	$\Rightarrow \frac{a}{b} + 1 = \frac{c}{d} + 1$
	$\Rightarrow \frac{a+b}{a+b} = \frac{c+d}{a+b}$
	Therefore, $(4 + 5): 5 = 9: 5 = 18: 10$
	= (8 + 10):10
üi.	Dividendo
	Que.12.5:4 = 10:8
	a. $(5-4): 4 = 1: 4 = (10-8): 8$
	b. $(5+4): 4 = 1: 4 = (10-8): 8$
	c. Both
	d. None

	Chapter 1
	Answer: A
	Solution: $\Rightarrow \frac{a}{b} = \frac{c}{d}$
	b d Subtracting 1 from both sides, , we get
	$\implies \frac{a}{b} - 1 = \frac{c}{d} - 1$
	$\Rightarrow \frac{a-b}{b} = \frac{c-d}{d}$
	Therefore, $(5 - 4) : 4 = 1 : 4 = (10 - 8) : 8$
<u>B</u> .	Third Proportion
	Que.13. Find the third proportion to 2.4 kg, 9.6 kg.
	a. 384 kg b. 38.4 kg
	c. 3804 kg d. 3.84 kg
	Answer: B
	Solution: Let the third proportion to 2.4 kg, 9.6 kg be x kg.
	Then 2.4 kg, 9.6 kg and x kg are in continued proportion since b2
	= ac
	$S_{0,2.4/9.6} = 9.6/x \text{ or}, x = (9.6 \times 9.6)/2.4 = 38.4$
<u> </u>	
	Que.14. The fourth proportional to 5, 8, 15 is:
	a.18 b.24
	c.19 d.20
	Answer: B
	Solution: Let the fourth proportional to 5, 8, 15 be x.
	Then, 5:8:15:X
	$\Rightarrow 5x = (8 \times 15)$
	$\Rightarrow x = ((8 \times 15)/5) = 24$
	View Answer Discuss in Forum Workspace Report

	Chapter 1
<u>3</u> .	<u>Indices</u>
	Que. 15. Find the value of k from $(\sqrt{9}) - 7 \times (\sqrt{3}) - 5 = 3k$
	a.19/2 b.19/3 c19/3 d19/2
	c19/3 d19/2 Answer: D
	Solution: $\Rightarrow$ (32 × 1/2) -7 × (3 <sup>1/2</sup> ) -5 = 3 <sup>R</sup>
	$\Rightarrow 3^{-19/2} = 3^{k} \qquad \Rightarrow k = -19/2$
	$-\frac{1}{2} + \frac{1}{2} + 1$
	Que. 16. If $x:y:z = 7:4:11$ then $(x+y+z/2)$ is:
	a.2 b.4
	c.3 d.5
	Answer: A
	Solution: $\Rightarrow$ If x:y:z = 7:4:11, Let x=7k, y=4k, z=11k
	$\frac{x+y+z}{2} = \frac{7k+4k+11k}{11k} = \frac{22k}{11k} = 2$
	2 11K 11K
<u>3</u> .	Logarithms
	$Que.17.log_2 log_2 log_2 16 = ?$
	a.o 0.3
	c.1 d.2
	Answer: C
	Solution: log2 log2 log2 16
	$\Rightarrow log_2 log_2 \left( log_2^{2^4} \right)$
	$\Rightarrow log_2 log_2^4 log_2^2$
	$\Rightarrow log_2 log_2^4$
	$\Rightarrow log_2^2 log_2^2$
	$ \Rightarrow 10g_{2}log_{2}  \Rightarrow 1\times 1 \qquad \Rightarrow 1 $

	Chapter 1
Que.18. The value of the e	expression: $a^{log^b_a.log^c_b.log^d_c.log^t_d}$
a.t	b. abcdt
c.(a+b+c+d+t)	d. None
Answer: A	
Solutíon:	
$\Rightarrow a^{log_a^b.log_b^c.log_c^d.log_d^t}$	
$\Rightarrow a \frac{\log^b}{\log^a} \cdot \frac{\log^c}{\log^b} \cdot \frac{\log^t}{\log^d}$	
$\Rightarrow a \frac{\log^t}{\log^t}$	
$\Rightarrow a \frac{g}{log^a}$	
$\Rightarrow a \log_a^t$	
⇒t	

	EQUATION Chapter 2		
<u>1.</u>	<u>Simultaneous Linear Equations:</u>		
<u>A</u> .	Properties of Proportion		
	Que.1. A man went to the Reserve Bank of Indía with • 1,000. He		
	asked the cashier to give him .5 and 10 notes only in return. The		
	man got 175 notes in all. Find how many notes of 5 and f10		
	díd he receíve?		
	a. (2,150) b. (40,110)		
	c (150,25) d. None		
	Answer: C		
	Solution:		
	Let the number of notes of, 5 be x and notes of 10 be y.		
	Then, $x + y = 175$ (1)		
	5x + 10y = 1000(2)		
	Solving (1) and (2) simultaneously. we get		
	x + 5y = 875		
	5x + 10y = 1000		
	-5y =-125		
	y= 25		
<u>B</u> .			
	Que.2. Find the value of x and y by using the using cross-		
	multíplícatíon method:		
	3x + 4y - 17 = 0 $4x - 3y - 6 = 0$		
	a. $x = 3, y = 2$ . b. $x = 2, y = 2$		
	c. $x = 5, y = 2.$ d. None		
	Answer: A		

	Chapter 2	
	Solutíon:	
	Two given equations are:	
	3x + 4y - 17 = 0	
	4x - 3y - 6 = 0	
	By cross-multiplication, we get:	
	$\frac{x/(4)(-6) - (-3)(-17)}{x/(4)(-6) - (-3)(-17)} = 14$	
	$\frac{1}{(-17)(4) - (-6)(3) = 1/(3)(-3) - (4)(4)} = y$	
	or, $x/(-24 - 51) = y/(-68 + 18) = 1/(-9 - 16)$	
	or, $x/-75 = y/-50 = 1/-25$	
	or, $x/3 = y/2 = 1$ (multiplying by -25)	
	or, x = 3, y = 2	
	Therefore, required solution: $x = 3$ , $y = 2$ .	
<u>C</u> .	QUADRATIC EQUATION METHOD	
	Que.3. Which of the following is correct ?	
í.	If $b^2-4ac = 0$ the roots are real and equal;	
íí.	If b2-4ac >0 then the roots are imaginary;	
ííí.	If $b^2-4ac < 0$ then the roots are equal;	
ív.	If b2-4ac is a perfect square (0) the roots are real, rational and	
	unequal	
∨.	If b <sup>2</sup> –4ac >0 but not a perfect square the rots are real, irrational and	
	unequal.	
	a. All are correct b. íí g ííí	
	c. all are correct except íí gííí d. í gííí gív ís correct	
	Answer: C	
	Solution:	
í.	If $b^2-4ac = 0$ the roots are real and equal;	
íí.	If $b^2-4ac > 0$ then the roots are real and unequal (or distinct);	

		Chapter 2	
ííí.	If b2-4ac <0 then the roots are imaginary;		
ív.	If b2-4ac is a perfect square (0) the roots are real, rational and		
	unequal(dístínct);		
∨.	If b2-4ac >0 but not a perfect sq	uare the rots are real, irrational and	
	unequal		
	Sínce b2 – 4ac díscrímínates the	e roots b2 – 4ac is called the	
	discriminant in the equation ax:	2 + bx + c = 0 as it actually	
	discriminates between the roots.		
	Que.4. Find the roots of the quad	ratic equation: $x^2 + 2x - 15 = 0$ ?	
	a. 5, 3	b. 3, -5	
	c3, 5	d3, -5	
	Answer: B		
	Solutíon:		
	$x^2 + 5x - 3x - 15 = 0$		
	x(x + 5) - 3(x + 5) = 0		
	(x - 3)(x + 5) = 0		
	$=> \chi = 3 \text{ or } \chi = -5.$		
<u></u> .	. CUBIC EQUATION METHOD		
	Que.5. $x^3 + x^2 - 16x = 16$		
	a. 4	b. +1	
	C. 1	d4	
	Answer: D		
	Solution: $x^{3}+x^{2}-16x = 16$		
	$x^3 + x^2 - 16x - 16 = 0$		
	Let $a(x) = x^3 + x^2 - 16x - 16$		
	a(-1) = (-1)3 + (-1)2 - 16(-1)	-16	
	= -1+1+16-16 = 0		

	Chapter 2
	$a(x) = (x+1)(x^2-16)$
	= (x+1) (x-4) (x+4)
	: 0 = (x+1)(x-4)(x+4)
	$\therefore x = -1 \text{ or } x = 4 \text{ or } x = -4$
	MATRICES
A	COLLINEAR
	Que.1. The value of K for which the points (k,1)., (5,5) and (10,7)
	may be collinear is:
	a. k-5 b. k=7
	c. k=9 d. k=1
	Answer: A
	Solutíon:
	Points are (k,1) (5,5) and (10,7)
	$x_1 = k$ , $x_2 = 5$ , $x_3 = 7$ $y_1 = 1$ , $y_2 = 5$ , $y_3 = 7$
	Points are collinear then area of $\Delta=o$
	Area of $\Delta = \frac{1}{2} [x_1(y_2 - y_3) + x_2 = (y_3 - y_1) + x_3 = (y_1 - y_2)]$
	0 = -2k + 30 - 40
	0 = -2k - 10
	-2k=10
	K=-5
<u>B</u> .	
<u> </u>	Que.2. If $\alpha + \beta = -2$ and $\alpha\beta = -3$ , then $\alpha, \beta$ are two roots of the
	equation, which is:
	$a. x^2 - 2x - 3 = 0$ $b. x^2 + 2x - 3 = 0$ $a. x^2 + 2x - 3 = 0$ $d. x^2 - 2x - 3 = 0$
	c. $x^2+2x+3=0$ d. $x^2-2x+3=0$
<u> </u>	

	Chapter 2
Answer: B	
Solutíon:	
$i \neq \alpha + \beta = -2$	
Q.E. is $x^{2}-(\alpha+\beta)x+\alpha.\beta=0$	
$x^{2}-(-2)x+(-3)=0$	
$x^{2}+2x-3=0$	
TYPES OF MATRICES	
Ques. If $A = \begin{bmatrix} -5 & 2 \\ 1 & -3 \end{bmatrix}$ , then $adj$	A ís:
$\begin{bmatrix} -3 & -2 \end{bmatrix}$	$b \begin{bmatrix} 3 & -2 \\ -1 & 5 \end{bmatrix}$
$\begin{array}{c c} \hline c & \hline 5 & 1 \\ \hline 2 & 3 \end{array}$	$\frac{\begin{array}{c} 1 \\ 3 \\ 2 \\ 1 \\ 5 \end{array}}{d \cdot \begin{bmatrix} 3 & 2 \\ 1 \\ 5 \end{bmatrix}}$
Answer: A	
Solution:	
Given $A = \begin{bmatrix} -5 & 2 \\ 1 & -3 \end{bmatrix}$	
The co-factor of A	
$A_{11} = (-1)^{1+1} \cdot (-3) = (-1)^2 \cdot (-3) = -3$	
$A_{12} = (-1)^{1+2} \cdot (1) = (-1)^3 \cdot (-1) = -1$	
$A_{21} = (-1)^{2+1} \cdot (2) = (-1)^3 \cdot (-2) = -2$	
$A_{22} = (-1)^{1+2} \cdot (5) = (-1)^{4} \cdot (-5) = -5$	
Matríx made by co-factor of A	
$B = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix} = \begin{bmatrix} -3 & -1 \\ -2 & -5 \end{bmatrix}$	
Adj A=B <sup>+</sup>	

	Chapter 2
_	
$\begin{bmatrix} -3 & -1 \end{bmatrix}^T$	
[-2 -5]	
[-3 -2]	
$ \begin{bmatrix} -3 & -2 \\ -1 & -5 \end{bmatrix} $	
[2 0 0]	-
Que4. If $A$ If $A = 0 2 0$ , then $A$	5 =
[0 0 2]	
a. 5A	b. 10A
C. 16A	d. 32A
Answer: C	
Solution:	
$A = \begin{bmatrix} 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$	
$\mathbf{A}^{5} = \begin{bmatrix} 2^{5} & 0 & 0 \\ 0 & 2^{5} & 0 \end{bmatrix} \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \end{bmatrix}$	
$\mathbf{A}^5 = \begin{bmatrix} 0 & 2^5 & 0 & 2^4 & 0 & 2 & 0 \\ 0 & 0 & 2^5 & 0 & 0 & 2 \end{bmatrix}$	
= 16A	
	<b>_</b> _

## Chapter 3

<u>1</u> .	LINEAR INEQUALITIES IN ONE VARIABLE:
	×
	Que.1. Solve $\frac{x}{2} > 8$
	a.x<8 b.x>16
	c. x=8 d. x=4
	Answer: C
	Solution:
	$\frac{x}{2} > g$
	2
	=x>8×2
	= x>16
<u>2</u> .	LINEAR INEQUALITIES IN TWO VARIABLE:
	Que.2. The Linear relationship between two variables in an
	inequality
	a. x + by .5. c b. axby.c
	c. axy + by .5c d. ax+bxy.c
	Answer: A
	Solution:
	The línear relationship between two variables in an inequality is
	gíven by ax+by.5.c
	Any linear function that involves an inequality sign is a linear
	ínequality. It may be of one variable, or, of more than one variable
	$E_X: 3X + Y < 6, X - Y - 2, etc$
	Que.3. Solve $-1 < 2x + 3 < 6$
	a2 <x<3 2="" 2<="" 2<x<23="" b.="" th=""></x<3>
	c. 2 <x<3 2="" 3<="" d3<x<23="" th=""></x<3>

Answer: A Solution: = $-1 < 2x + 3 < 6$ Subtract 3 from all 3 sides = $-1 - 3 < 2x + 3 - 3 < 6 - 3$ = $-4 < 2x < 3$ Divide all sides by 2 = $-2 < x < 23$ Que.4. The inequalities $5x1 + 4x2 \ge 9$ , $x1 + x2 \ge 3$ , $x1 \ge 0$ of $x2 \ge 0$ is correct? a. True b. False c. Not sure d. None Answer: A Solution: We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$				Chap	ter 3
Solution: = $-1 < 2x + 3 < 6$ Subtract 3 from all 3 sides = $-1 - 3 < 2x + 3 - 3 < 6 - 3$ = $-4 < 2x < 3$ Divide all sides by 2 = $-2 < x < 23$ Que.4. The inequalities $5x1 + 4x2 \ge 9$ , $x1 + x2 \ge 3$ , $x1 \ge 0$ and $x2 \ge 0$ is correct? a. True b. False c. Not sure d. None Answer: A Solution: We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $5x1 + 4x2 = 9$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$			<u></u>		
Solution: = $-1 < 2x + 3 < 6$ Subtract 3 from all 3 sides = $-1 - 3 < 2x + 3 - 3 < 6 - 3$ = $-4 < 2x < 3$ Divide all sides by 2 = $-2 < x < 23$ Que.4. The inequalities $5x1 + 4x2 \ge 9$ , $x1 + x2 \ge 3$ , $x1 \ge 0$ and $x2 \ge 0$ is correct? a. True b. False c. Not sure d. None Answer: A Solution: We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$	Answer: A				
$= -1 < 2x + 3 < 6$ Subtract 3 from all 3 sides $= -1 - 3 < 2x + 3 - 3 < 6 - 3$ $= -4 < 2x < 3$ Divide all sides by 2 $= -2 < x < 23$ Que.4. The inequalities $5x1 + 4x2 \ge 9$ , $x1 + x2 \ge 3$ , $x1 \ge 0$ and $x2 \ge 0$ is correct? a. True b. False c. Not sure d. None Answer: A Solution: We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$					
Subtract 3 from all 3 sides = $-1-3<2x+3-3<6-3$ = $-4<2x<3$ Divide all sides by 2 = $-2Que.4. The inequalities 5x1 + 4x2 \ge 9, x1 + x2 \ge 3, x1 \ge 0 and x2 \ge 0 is correct?a. True b. Falsec. Not sure d. NoneAnswer: ASolution:We draw the straight lines 5x1 + 4x2 = 9 and x1 + x2 = 3Table for 5x1 + 4x2 = 9Table for 5x1 + 4x2 = 9Table for x1 + x2$		<6			
$= -1 - 3 < 2x + 3 - 3 < 6 - 3$ $= -4 < 2x < 3$ Divide all sides by 2 $= -2 < x < 23$ Que.4. The inequalities $5x1 + 4x2 \ge 9$ , $x1 + x2 \ge 3$ , $x1 \ge 0$ and $x2 \ge 0$ is correct? a. True b. False c. Not sure d. None Answer: A Solution: We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$					
= -4 < 2x < 3 Divide all sides by 2 $= -2 < x < 23$ Que.4. The inequalities $5x1 + 4x2 \ge 9$ , $x1 + x2 \ge 3$ , $x1 \ge 0$ and $x2 \ge 0$ is correct? a. True b. False c. Not sure d. None Answer: A Solution: We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$	•				
$= -2 < x < 23$ Que.4. The inequalities $5x1 + 4x2 \ge 9$ , $x1 + x2 \ge 3$ , $x1 \ge 0$ of $x2 \ge 0$ is correct? a. True b. False c. Not sure d. None Answer: A Solution: We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$	= -4<2x<3	3			
$= -2 < x < 23$ Que.4. The inequalities $5x1 + 4x2 \ge 9$ , $x1 + x2 \ge 3$ , $x1 \ge 0$ of $x2 \ge 0$ is correct? a. True b. False c. Not sure d. None Answer: A Solution: We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$	Divide all side	es by 2			
$x2 \ge 0$ is correct?a. Trueb. Falsec. Not sured. NoneAnswer: ASolution:We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$		$\mathbf{U}$			
$x2 \ge 0$ is correct?a. Trueb. Falsec. Not sured. NoneAnswer: ASolution:We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$					
$x2 \ge 0$ is correct?a. Trueb. Falsec. Not sured. NoneAnswer: ASolution:We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$	Que.4. The ín	equalítíes 5x1 +	$-4x2 \ge 9, x1 + 2$	x2≥3, X1	≥0 an
c. Not sure d. None Answer: A Solution: We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$		•			
Answer: A Solution: We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$	a. True		b. False		
Solution: We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$	c. Not sure		d. None		
We draw the straight lines $5x1 + 4x2 = 9$ and $x1 + x2 = 3$ Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$	Answer: A				
Table for $5x1 + 4x2 = 9$ Table for $x1 + x2$	Solution:				
	We draw the s	straight lines 5x	1 + 4x2 = 9 av	$1d \times 1 + \times 2$	2 = 3.
	Tolal a Courter	+4x2 = 9	Tak		+ x2 =
$x_{1} = 0 = \frac{9}{5} x_{1} = 0 = 3$	<b>4</b>				
<i>x</i> <sub>2</sub> 9/4 0 <i>x</i> <sub>2</sub> 3	x, 0	9/5	<i>x</i> <sub>1</sub>	0	3
	* , 0 * 2 9/1 Now, íf we tak	4 0 ce the point (4, 4	*2 -), we find		
	x, 0 x2 $9/1$ Now, if we tak 5x1 + 4x2 * 9	4 0 ce the point (4, 4	*2 -), we find		
x1 + x2 * 3	x, 0 x2 $9/1$ Now, if we tak 5x1 + 4x2 * 3 x1 + x2 * 3	4 0 ee the point (4, 4 ) or, 36 * 9 (Tru	*2 -), we find		
5x1 + 4x2 * 9 or, 36 * 9 (True) x1 + x2 * 3 í.e., 4 + 4 * 3	x, 0 x2 $9/4$ Now, if we tak 5x1 + 4x2 * 9 x1 + x2 * 3 i.e., 4 + 4 * 3	4 0 ee the point (4, 4 ) or, 36 * 9 (Tru	*2 -), we find		3
x1 + x2 * 3	x, 0 x2 $9/4$ Now, if we tak 5x1 + 4x2 * 0 x1 + x2 * 3 i.e., $4 + 4 * 3$ 8 * 3 (True)	4 0 ee the point (4, 4 ) or, 36 * 9 (Tru	*2 -), we find .e)	3	0

	Chapter 3
	Que.5. Solve the absolute value inequality 2 3x+9 <36
	a9 <x>3 b9<x<3< td=""></x<3<></x>
	c.9 <x>3 d.9<x<3< td=""></x<3<></x>
	Answer: B
	Solution:
	2 3x+9 2<3622 3x+9 2<362
	3x+9 <18 3x+9 <18
	-18<3x+9<18-18<3x+9<18
	-18-9<3x+9-9<18-9-18-9<3x+9-9<18-9
	-27<3x<9-27<3x<9
	-273<3x3<93-273<3x3<93
	-9 <x<3.< td=""></x<3.<>
	Que.6. On solving the inequalities $5x+y\leq 100$ , $x+y\leq 60$ , $x\geq 0$ , $y\geq$ ,
	we get the following solution:
	a.(0,0), (20,0), (10,50) § (0,60)
	b.(0,0), (60,0), (10,50) § (0,60)
	c.(0,0), (20,0), (0,100) § (10,50)
	d. None
	Answer: B
	Solution:
	On Solving the inequalities 5x+y≤100, x+y≤60, x≥0, y≥, we get
	(0,0), (20,0), (10,50) & (0,60) all satisfies above inequalities
<u>4.</u>	<u>GRAPHICAL METHOD</u>
	Que.7. The graph to express the inequality $x + y 56$ is:
	a. b. c. l
	c. Eíther a or b d. None of these

	Chapter 3
Answer: A	
Solution:	
x + y = 56 is graphically	j represent by
.6	
	×
1 10	
Que. 8. Common region of	the inequalities is:
, TG	
i HF	
K x+y=1 7x+9y=63	
	×
a. BCDB and DEFD	b. Unbounded
C. HFGH	d. ABDFHKA
Answer: A	
Solution: Common Region	of the inequalities is ABDFHKA

	Chapter 4
<u>1.</u>	SIMPLE INTEREST
	Que. 1. Rohika invested `70,000 in a bank at the rate of 6.5% p.a.
	símple ínterest rate. He receíved ` 85,925 after the end of term.
	Find out the period for which sum was invested by Rahul.
	a. 3.5 years b. 35 years
	c. 0.35 years d. 36 years
	Answer: A
	Solution:
	We know $A = P(1+it)$
	$i.e.85925 = 70000(1 + \frac{6.5}{100} \times t)$
	$\frac{85925}{70000} = \frac{100 + 6.5t}{100}$
	$\frac{85925 X100}{70000} - 100 = 6.5t$
	70000 - 100 - 0.52
	22.75 = 6.5t ,
	=>t=3.5
	tíme = 3.5 years
	Que. 2. Sonía deposíted ` 50,000 ín a bank for two years with the
	interest rate of 5.5% p.a. How much interest would she earn?
	a. 550 b. 55000
	c. 55 d. 5500
	Answer: D
	Solutíon:
	Requíred interest amount is given by
	$I = P \times i \times t$
	$50000 \times \frac{5.5}{100} \times 2 = 5500$
	=> Interest $=5500$

Chapter 4		
<b>2</b>		
Que. 3. Shíla has a sum of `46,875 was lent out at símple ínteres		
and at the end of 1 year 8 months the total amount was` 50,000.		
Find the rate of interest percent per annum.		
a. 0.4% b. 4%		
c. 40% d. 0.04%		
Answer: B		
Solution:		
We know $A = P(1 + it)$		
í.e. 50,000=46875(1+í X (8)/12)		
$(1.067 - 1) \times 3/5 = i$		
i = 0.04 = > rate = 4%		
COMPOUND INTEREST		
Que. 4. Ascertain the compound value and compound interest of		
 an amount of `75,000 at 8 percent compounded semiannually		
for 5 years.		
 a. 30615 b. 36051		
 c. 36501 d. 36015		
 Answer: D		
Solution:		
 Computation of Compound Value and Compound Interest		
 Semiannual Rate of Interest (i) = $8/2 = 4\%$		
 $n = 5 \times 2 = 10, P = 75,000$		
 $Compound  \forall alue = P(1+i)n$		
=75,000(1+4%)10		
$=75,000 \times 1.4802 = 1,11,015$		
 Compound Interest = $1, 11, 015 - 75,000 = 36,015$ .		
 Que. 5. Calculate if ` 10,000 is invested at interest rate of 12% pe		

	Chapter 4
annum, what is the an	моилt after з years íf the compounding of
ínterest ís done?	
a. 14049.28	b. 14185.19
c. 14857.61	d. 14094.28
Answer: B	
Solution:	
10,000[1+12/(100×:	2)] <sup>3×2</sup>
$= 10,000 (1 + 0.06)^6$	
=10,000 × 1.418519	
=`14,185.19	
	vested at annual rate of interest off 10%.
What is the amount a	fter two years if compounding is done:
(i) <u>ANNUALLY</u>	
a. 2420	b. 2431
c. 2440	d. 2469
Answer: A	
Solution:	
$A_n = P (1+i)^n$	
$A_2 = 2000(1+0.1)^2$	
$= 2000 \times (1.1)^2$	
= RS. 2000 × 1.2	1
= Rs. 2420	
(ii) <u>SEMI-ANNUA</u>	ALLY
a. 2420	b. 2431
c. 2440	d. 2469
Answer: A	

## Chapter 4

	Chapter 4
Solution:	
$A_{n} = P (1+i)^{n}$	
$n = 2 \times 2 = 4$	
i = 0.1/2 = 0.05	
$A_4 = 2000(1+0.05)^4$	
$= 2000 \times 1.2155 = Rs. 2$	,431
(iii) <u>QUARTERLY</u>	
a. 2420	b. 2431
c. 2440	d. 2436.80
Answer: D	
Solution:	
$n = 4 \times 2 = 8$	
i = 0.1/4 = 0.025	
$A_8 = 2000(1+0.025)8$	
= 2000 × 1.2184	
= Rs. 2,436.80	
(iv) <u>MONTHLY</u>	
a. 2420	6.2431
c. 2440.58	d. 2436.80
Answer: C	
Solution:	
$n = 12 \times 2 = 24$	
$\hat{i} = 0.1/12 = 0.00833$	
A24 = 2000(1+0.00833)24	
$= 2000 \times 1.22029 = Rs$	s. 2440.58

	Chapter 4
3.	EFFECTIVE INTEREST
	Que. 7. Relationship between annual nominal rate of interest and
	annual effective rate of interest, if frequency of compounding is
	greater than one:
	a. Effective rate > Nominal rate
	b. Effective rate < Nominal rate
	c. $Effective rate = Nominal rate$
	d. None of the above
	Answer: A
	Solutíon:
	Effective rate > Nominal rate
	Que. 8. Which is a better investment 3% per year compounded
	monthly or 33.2% per year simple intrest? Given that
	$(1+0.0025)^{12} = 1.0304.$
	a. 3.04% b. 3.4%
	c. 30.4% d. 0.34%
	Answer: A
	Solution:
	i = 3/12 = 0.25%
	= 0.0025
	n = 12
	E = (1+i)n-1
	$=(1+0.0025)^{12-1}$
	= 1.0304-1 = 0.0304
	= 3.04%
	Effective rate of interest€ being less than 3.2%, the simple interest
	3.2% per year is the better investment.

	Ch	apter 4
	ANNUITY	
)	FUTURE VALUE	
	(i) <u>ORDINARY/ NORMAL</u>	
	Que. 9. Bíchara ínvest ` 3000 ín a two year ínvestme	ent that pays
	you 12% per annum. Calculate the future value of the	e investmen
	a. 3,763.20 b. 376.320	
	c. 37632.00 d. 37.6320	
	Answer: A	
	Solutíon:	
	We know $F = C.F. (1 + i)^n$	
	Where $F = Future$ value	
	C.F. = Cash flow = ` 3,000	
	i = rate of interest = 0.12, n = time period = 2	
	$F = Rs.3,000(1+0.12)^2$	
	$= Rs.3,000 \times 1.2544 = 3,763.20$	
	(ii) <u>DUE</u>	
	Que. 10. Me. X ínvest Rs. 10,000 every year starting	from today
	for next: 10 years suppose interest rate is 8% per anni	
	compounded annually. 8% per annual compounded a	
	Calculate future value of the annuity.	0
	a. Rs. 1,56,454.88 b. Rs.1,56	5,554.88
	c. Rs. 1,44,865.625 d. None	
	Answer: A	
	Solutíon:	
	Annual Installment (A) = $10,000 \text{ A}=? \text{ R}= 8\% \text{ p.a.}$	c.í n= 10ye
	Future Value of Annuity due	<u> </u>

	Chapter 4
	<u> </u>
	$= A_{n,i} = \frac{A}{I} [(1+i)^n - 1](1+i)$
	$=\frac{10,000}{0.08}[(1+0.08)^{10}-1](1+0.08)$
	0.08
	$=\frac{10,000}{0.08}[(1.08)^{10}-1](1+0.08)$
	=
	= 1,56454.88
<u>(b)</u>	PRESENT VALUE
	(i) <u>ORDINARY</u>
	Que. 11. A builder borrows Rs. 2550 to be paid back with compound
	interest at the rate of 4% per annum by the end of 2 years in two
	equal yearly installments. How much will each installment be?
	a. Rs. 1352 b. Rs. 1377
	c.Rs. 1275 d. Rs. 1283
	Answer: A
	Solution:
	Amount = Rs 2550
	Rate = 4% per annum
	Time = 2 years Applying the formula
	$P = X / (1 + r/100) n + \dots X / (1 + r/100)$
	Here we have two equal installments, so
	There we have evol equal miscalements, so
	$\mathbf{D} = \begin{pmatrix} X & X \end{pmatrix}$
	$P = \frac{X}{\left[1 + \frac{r}{100}\right]^2} + \frac{X}{\left[1 + \frac{r}{100}\right]^2}$
	$=2550=\frac{X}{1}+\frac{X}{1}$
	$=2550 = \frac{X}{\left[\frac{4}{100}\right]^2} + \frac{X}{\left[1 + \frac{4}{100}\right]}$
	= Rs. 1352

	Chapter 5
1.	FACTORIAL
	Que. 1. The value of N in $\frac{1}{7!} + \frac{1}{8!} = \frac{N}{9!}$ is.
	a. Rs. 81 b. Rs. 78
	c. Rs. 89 d. Rs. 64
	Answer: A
	Solution: 1 1 N
	$If \frac{1}{7!} + \frac{1}{8!} = \frac{1}{9!}$
	$=\frac{9\times8\times1}{9\times8\times7!}-\frac{9\times1}{9\times8!}=\frac{N}{9!}$
	72 9 N
	$=\frac{72}{9!}+\frac{3}{9!}=\frac{1}{9!}$
	81 N
	$=\frac{81}{9!}=\frac{1}{9!}$
	Que. 2. Evaluate: 6! / (2! × 4!)
	a. 15 b. 78
	c. 8 d. 4
	Answer: A
	Solution:
	6! / (2! × 4!)
	$= (1 \times 2 \times 3 \times 4 \times 5 \times 6) / [(1 \times 2) \times (1 \times 2 \times 3 \times 4)]$
	=15
2.	PERMUTATION
	Que. 3. If $n_{P_r}$ =720, $n_{C_r}$ =120, then r ís
	a. 3 b. 4
	c.5 d.6

Chapter 5 Answer: A Solution: Given  $n_{P_r}$ =720,  $n_{C_r}$ =120 We know that  $\frac{n_{c_r}}{2} = \frac{1}{2}$  $n_{P_r}$  . 120 1 720 1 1  $\overline{\mathbf{6}} = \overline{\frac{r}{\cdot L}}$ R=3 (A) NUMBER SYSTEM Que. 4. A bag contains 4 red, 3 black, and 2 white balls. In how many ways 3 balls can be drawn from this bag so that they include at least one black ball? b. 46 a. 64 d. None c. 85 Answer: A Solution: No. of Total balls = 4 Red + 3 Black + 2 white = 9 balls2. If 3 are drawn from this bag getting at least one black balls. It may be following cases: (a)  $1B \leq 2$  other  $= 3_{C_1 \times 6_{C_2}} = 3 \times 15 = 45$ (b) 2B  $\leq$  1 other =  $3_{C_2 \times} 6_{C_1} = 3 \times 6 = 18$ (c) 3B <u>5</u> 0 other =  $3_{C_3 \times} 6_{C_0} = 1 \times 1 = 1$ Total ways = 45+18+1= 64

	Chapter 5
Que. 5. Compute the s	um of 4 dígit numbers which can be formed
with the four digits 1,	. 3, 5, 7, íf each dígít ís used only once ín
each arrangement.	
a.1,06,656	b. 1,46,800
c. 7,19,500	d. 4,10,800
Answer: A	
Solution:	
The number of arrang	jements of 4 different digits taken 4 at a
time is given by 4P4	=4!=24.
All the four digits wil	l occur equal number of times at each of the
positions, namely one	es, tens, hundreds, thousands.
Thus, each dígít will o	ccur 24 / 4 = 6 times in each of the positio
The sum of digits in on	e's position will be $6 \times (1 + 3 + 5 + 7) = 9$
Símílar ís the case ín	ten's, hundred's and thousand's places.
Therefore the sum will	l be 96 + 96 × 10 + 96 × 100 + 96 × 100
= 1,06,656.	
(B) LETTER SYS	STEM
Que. G. How many ar	rangements can be made out of the letters o
the word `DRAUGHT	', the vowels never beings separated?
a.1440	b. 720
c. 740	d. 750
Answer: A	
Solutíon:	
The word DRAUGHT	T' consists of 7 letters of which 5 are
consonants and two a	are vowels.
In the arrangement w	e are to take all the 7 letters but the
restriction is that the	two vowels should not be separated. We can
	one letter.
view the two vowels as	

	Chapter 5
	urther, we can arrange the six letters:
	mpound letter consisting of two
vowels. The total number of v	ways of arranging them is $6P6 = 6!$
= 720 ways.	
↓ · · · · · · · · · · · · · · · · · · ·	principle, the total number of
• · · ·	of the word DRAUGHT, the vowels
never being separated	
$= 2 \times 720 = 1440$ ways.	
Que. 7. A person has ten frie	nds of whom síx are relatíves. If h
	hat three of them are his relatives, the
the tot number of ways in w	•
a. 30	6.60
c. 120	d. 75
Answer: C	
Solution:	
Total Friend = 10	
No. of Relative = $6$	
No. of Friend = $4$	
	est such that three of them are his
relatíves.	· · · · · · · · · · · · · · · · · · ·
$= 6_{C_3} \chi 4_{C_2}$	
$= 6 \times 5 \times 4 \times 4 \times 3$	
= 3x2x12x1	
$=20 \times 6 = 120$	
	from the letter of word BHARAT, in
which B and H will never co	me together, ís
a. 360	b. 240
c. 120	d. None

	Chapter 5
	Answer: B
	Solution:
	Gíven Word
	BHARAT'
	123456
	Total No. of ways arrange the letter of word = $6!/2! = 720/2 = 360$
	If Letter 'B' and 'H' are never taken together
	=360-120 =240
3.	CIRCULAR PERMUTATION
	Que. 9. m men and n women are to be seated in a row so that no
	two women sit together. If $m > n$ , then the number of ways in which
	they can be seated is
	a. $\frac{m!(m+1)!}{(m-n+1)!}$ b. $\frac{m!(m-1)!}{(m-n+1)!}$
	(m-n+1)! $(m-n+1)!$
	C. $\frac{(m-1)!(m+1)!}{(m-n+1)!}$ d. none
	(m-n+1)!
	Answer: A
	Solutíon:
	Fírst arrange m men, ín a row ín m! ways. Sínce n <m and="" no<="" th=""></m>
	two women can sit together, in any one of the m! arrangement,
	there are places in which n women can be arranged in
	$m + 1_{P_n} = \frac{m! (m+1)!}{\{(m+1)-n\}!} = \frac{m! (m+1)!}{(m-n+1)!}$
	$n \{(m+1)-n\}! (m-n+1)!$
	Que. 10. Síx persons A, B, C, D, E and Fare to be seated at a
	círcular table. In how many ways can this be done, if A must
	always have either B or C on his right and B must always have
	eíther C or D on hís ríght?

	Chapter 5
a. 3	b. 6
c. 12	d. 18
Answer: D	
Solution:	
<b>U</b>	s, we must have AB or AC and BC or
Therefore, we have the follo	•
A, B, C, D, E, F which give	$\mathbf{U}$
ABD, C, E, F which gives	$\mathbf{U}$
AC, DB, E, F which gives	$\sim$
Hence, the total number of	tways are
= 3! + 3! + 3!	
= 6 + 6 + 6 = 18 ways	
Que. 11. Find the number	of ways in which 5 people A, B, C, D, E
	such that: A and B must always si
together.	0
a. 20	b. 22
c. 12	d. 56
Answer: C	
Solution:	
If we wish to seat A and B	s together in all arrangements, we co
consider these two as one i	<b>U</b>
So effectively we've to arri	ange 4 people in a circle, the number
ways being (4 – 1)! Or 6.	
But in each of these arran	gements, A and B can themselves
ínterchange places ín 2 wi	ays
Therefore, the total numbe	r of ways will be $6 \times 2 = 12$ .
B	
• • •	

Chapter 5	
Que. 12. In how many ways can the top 3 ranks be awarded for	a
particular Exam/competition involving 12 participants?	
a. 85 ways b. 1320 ways.	
C. 1230 ways d. none	
Answer: C	
Solution:	
There are 12 participants and 3 ranks, hence if a person secures	
the first rank then he cannot get the second rank,	
Likewise, if a person secures the second rank he cannot secure t	he
third rank. So, 12 x 11 x 10 = 1320 ways.	
Therefore, there are 1230 ways in which the top 3 ranks can be	
awarded.	
 COMBINATION	
 COMBINATION	
COMBINATION         Que. 13.1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ , Find x:         a. 999       b. 998	
Que. 13.1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ , Find x:	
Que. 13.1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ , Find x: a. 999 b. 998	
Que. 13.1000 $-999_{C_{97}} + x_{C_{901}}$ , Find x:a. 999b. 998C. 997d. 1000	
Que. 13.1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ , Find x: a. 999 b. 998 c. 997 d. 1000 Answer: A Solution: $\sqrt[p]{1000_{C98} - 999_{C97} + x_{C901}}$	
Que. 13.1000 $_{C_{98}} - 999_{C_{97}} + x_{C_{901}}$ , Find x:a. 999b. 998C. 997d. 1000Answer: ASolution:	
Que. 13.1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ , Find x:         a. 999       b. 998         C. 997       d. 1000         Answer: A         Solution:         # 1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ $\therefore$ $n_{C_r} + n_{C_{r-1}} = n + 1_{C_r}$	
Que. 13.1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ , Find x: a. 999 b. 998 c. 997 d. 1000 Answer: A Solution: $\sqrt[p]{1000_{C98} - 999_{C97} + x_{C901}}$	
Que. 13.1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ , Find x:         a. 999       b. 998         C. 997       d. 1000         Answer: A         Solution:         # 1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ $\therefore$ $n_{C_r} + n_{C_{r-1}} = n + 1_{C_r}$ Then x = 999[999 <sub>C901</sub> + 999 <sub>C98</sub> ]	
Que. 13.1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ , Find x:         a. 999       b. 998         C. 997       d. 1000         Answer: A         Solution:         # 1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ $\therefore$ $n_{C_r} + n_{C_{r-1}} = n + 1_{C_r}$ Then x = 999[999 <sub>C901</sub> + 999 <sub>C98</sub> ]         Que. 14. The number of triangle that can be formed by choosin	-
Que. 13.1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ , Find x:         a. 999       b. 998         C. 997       d. 1000         Answer: A         Solution:         # 1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ $\therefore$ $n_{C_r} + n_{C_{r-1}} = n + 1_{C_r}$ Then x = 999[999 <sub>C901</sub> + 999 <sub>C98</sub> ]	-
Que. 13.1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ , Find x:         a. 999       b. 998         C. 997       d. 1000         Answer: A         Solution:         # 1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ $\therefore$ $n_{C_r} + n_{C_{r-1}} = n + 1_{C_r}$ Then x = 999[999 <sub>C901</sub> + 999 <sub>C98</sub> ]         Que. 14. The number of triangle that can be formed by choosin the vertices from a set of 12 points, seven of which lie on the same the vertices from a set of 12 points, seven of which lie on the same the same term of the vertices from term of term of term of term of term of the vertices from the same term of term of term of term of the vertices from the same term of te	-
Que. 13.1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ , Find x:         a. 999       b. 998         c. 997       d. 1000         Answer: A         Solution:         # 1000 <sub>C98</sub> - 999 <sub>C97</sub> + $x_{C901}$ $\therefore$ $n_{C_r} + n_{C_{r-1}} = n + 1_{C_r}$ Then x = 999[999 <sub>C901</sub> + 999 <sub>C98</sub> ]         Que. 14. The number of triangle that can be formed by choosin the vertices from a set of 12 points, seven of which lie on the sam straight line, is:	-

	Chapter 5
Answer: A	
Solutíon:	
Here n=12, k=7	
No. of triangle are f	formed from 'n' point
In which (k) points	are collinear = $n_{C_3}$ - $k_{C_3}$
$12_{c_3} - 7_{c_3}$	
$12 \times 11 \times 10$ 7 × 6	5 × 5
$\overline{3 \times 2 \times 1}$ $\overline{3 \times 2}$	
=220-35 =185	
Que. 15. A boy has	з líbrary tíckets and 8 books of hís ínterest ín
the library of these	8, he does not want to borrow Mathematics
	ematics part-1 is also borrowed? In how many
ways can he choose	the three books to be borrowed?
a. 41	0.51
c. 61	d. 71
Answer: A	
Solutíon:	
There are two cases	
	chematics Part - II is borrowed (i.e. it means
Mathematics Part-I	has also been borrowed) Number of ways =
6C1 = 6 ways	
	thematics part-11 is not borrowed (i.e. 3 books
	$c of \mathcal{F}$ ) Number of ways = $\mathcal{F}C3 = 35$ ways
Therefore, total nun	1ber ways 35 + 6 = 41 ways
Que. 16. An examín	nation paper consists of 12 questions divided
ínto parts A and B.	Part A contains 7 _questions and part B
	s. A candidate is required to attempt 8
questions selecting	at least from each part. In how many

	Chapter 5
un avénum una na ague tha a an déd	ate cal est the superious 2
maximum ways can the candid	<b>`</b>
a. 35	b. 175
c. 210	d. 420
Answer: D	
Solution:	
The candidate can select 8 Quest	tions.by selecting at last" three
from each part in the following v	vays: 3 questions from part A
and 5 questions from part B = ;	
questions from part A and part	<b>V</b>
ways.	
Questions from part A and 3 qu	lestions from part $B^{\bullet} = 7C5 \times 5$
= 210 ways.	
Hence, the total number of ways	in which the candidate can cele
the question will be = $35 + 175$	
	, 1 210 - 720 Wugs

	Chapter 6		
•	<u>SEQUENCE</u>		
	Que. 1. A sequence of odd positive integers within 11 is		
	a. 1,3,5,7,9 b. 2,4,6,10		
	c. Both d. None		
	Answer: A		
	Solution:		
	A sequence of odd positive integers within 11 is 1,3,5,7,9		
	Que Q A caquera of muchancic actuada		
	Que. 2. A sequence of numbers is called?		
	a. geometric progression b. Arithmetic Progression (AP) c. Harmonic Progression (HP) d. All		
	Answer: D		
	Solution:		
	Harmonic Progression (HP)		
	A sequence of numbers is called a harmonic progression if the		
	recíprocal of the terms are in AP. In simple terms, a,b,c,d,e,f are in		
	HP íf 1/a, 1/b, 1/c, 1/d, 1/e, 1/f are ín AP.		
	<u>Arithmetic Progression (AP)</u>		
	A sequence of numbers is called an arithmetic progression if the		
	dífference between any two consecutive terms is always same.		
	<u>Geometric Progression (GP)</u>		
	A sequence of numbers is called a geometric progression if the		
	ratio of any two consecutive terms is always same.		
	SERIES		
	Que. 3. Find the sum of the series -2, 6, -187 terms?		
	a. 1554 b1094		

		Chapter 6
	c. 1094 d	8223
	Answer: B	
	Solution:	
	Here $a = -2, r = -3, n = 7$	
	$S_n = a.(1 - r^n) / (1 - r)$ when $r < 1$	
	$S_7 = (-2) [1 - (-3)^7] / [1 - (-3)]$	
	= (-2)(1 + 2187) / 4	
	= (-2)(2188) / 4	
	S7 = -1094	
	Que. 4. If the sum of n terms of an AP i	is 3n <sup>2</sup> -n and its common
	dífference ís 6, then íts first term ís:	
	a. 3	b. 2
	C. 1	d. 4
	Answer: C	
	Solution:	
	Given $S_n = (3n^2 - n)$	
	$n=1, S_1=3(1)^2-1=3-1=2$	
	$n=2, S_2=3(2)^2-1=12-1=11$	
	$n=3, S_3=3(3)^2-1=27-1=26$	
	$T_1 = S_1 = 2$	
	$T_2 = S_2 = 2 - S_1 = 11 - 2 = 9$	
	$T_3 = S_3 - S_2 = 26 - 11 = 15$	
	Fírst term of seríes	
	T <sub>1</sub> =2	
<u>3</u> .	ARITHMETIC PROGRESSION	
	Que.5. If 5 <sup>th</sup> and 12 <sup>th</sup> terms of an A.P. a	re 14 and 35 respectively,
	find the A.P.	
	a. 2, 5, 8, 11, 14,	
		<u>_</u>

	Chapter 6
b. 2, 3, 8, 11, 1:	2,
c. 2, 3, 4, 11, 1.	4,
d. 2, 5, 8, 1, 4,.	•••••••
Answer: A	
Solutíon:	
Let a be the firs	st term ξ d be the common dífference of A.P.
$t_5 = a + 4d =$	14
$t_{12} = a + 11d =$	= 35
On solving the	above two equations,
7d = 21 = i.e.,	d = 3
and $a = 14 - ($	$(4 \times 3) = 14 - 12 = 2$
Hence, the requ	íred A.P. ís 2, 5, 8, 11, 14,
Que.G. The 10th	term of an A. P. ís – 15 and 31 <sup>st</sup> term ís –57, fin
the 15 <sup>th</sup> term.	
a20	b. 20
c25	d 25
Answer: C	
Solutíon:	
Let a be the firs	it term and d be the common difference of the A. F
Then from the	formula:
$t_n = a + (n - 1)$	
$t_{10} = a + (10 - a)$	(1) $d = a + 9d t_{31} = a + (31 - 1) d = a + 30 d$
we have,	
a + 9d = -15.	(1)
a + 30d = -57	<sup>L</sup> (2)
Solve equation	s (1) and (2) to get the values of a and d.
Subtracting (1	.) from (2),we have
21d = -57 + 1	5 = -42
Again from (1)	), $a = -15 - 9d = -15 - 9(-2) = -15 + 18 = 3$

c. $n = 30$ Answer: A Solution: Here $a = 5$ , $d = 11-5 = 6$ $t_n = 119$ We know that $t_n = a + (n - 1) d 119 = 5 + (n - 1) \times 6$ (n-1) = (119-5)/6 = 19 n = 20, Therefore, 119 is the 20th term of the given A. P. Que.8. The sum of the series -8,-6, -4n terms is 52. The nun of terms n is: a. 11 b. 12 c. 13 d. 10 Answer: C Solution: Given series -8, -6, -4, n term Let term $(a) = -8$ Common difference $(d) = (-6) - (-8)$ = -6+8 = 2 Sum of 'n' term $(S_n) = 52$ , $n = ?$ We know that $S_n = n/2(2a + (n-1)d)$ $52 = \frac{n}{2}[2 \times (-8) + (n-1)(2)]$		Chapter 6
a. $n = 20$ b. $n = 2$ c. $n = 30$ d. $n = 19$ Answer: A       Solution:         Here $a = 5$ , $d = 11-5 = 6$ t. $n = 119$ We know that         t_n = 119 We know that       t. $n = 119$ We know that         t_n = a + $(n - 1) d 119 = 5 + (n - 1) \times 6$ (n-1) = $(119-5)/6 = 19$ $n = 20$ ,       Therefore, 119 is the 20th term of the given A. P.         Que.8. The sum of the series -8, -6, -4n terms is 52. The num of terms n is:         a. 11       b. 12         c. 13       d. 10         Answer: C         Solution:         Given series         -8, -6, -4, n term         Let term $(a) = -8$ Common difference $(d) = (-6) - (-8)$ $= -6+8 = 2$ Sum of 'n' term $(S_n) = 52$ , $n = ?$ We know that $S_n = n/2(2a + (n-1)d)$ $52 = \frac{n}{2} [2 \times (-8) + (n-1)(2)]$ $104 = n [2n-18]$	Now $t_{15} = a + (15)$	(-1)d = 3 + 14(-2) = -25
c. $n = 30$ Answer: A Solution: Here $a = 5$ , $d = 11-5 = 6$ $t_n = 119$ We know that $t_n = a + (n - 1) d 119 = 5 + (n - 1) \times 6$ (n-1) = (119-5)/6 = 19 n = 20, Therefore, 119 is the 20th term of the given A. P. Que.8. The sum of the series -8,-6, -4n terms is 52. The nun of terms n is: a. 11 b. 12 c. 13 d. 10 Answer: C Solution: Given series -8, -6, -4, n term Let term $(a) = -8$ Common difference $(d) = (-6) - (-8)$ = -6+8 = 2 Sum of 'n' term $(S_n) = 52$ , $n = ?$ We know that $S_n = n/2(2a + (n-1)d)$ $52 = \frac{n}{2}[2 \times (-8) + (n-1)(2)]$ 104 = n[2n-18]	Que.7. Whích term	of the A. P.: 5, 11, 17 ís 119?
Answer: A Solution: Here $a = 5$ , $d = 11-5 = 6$ $t_n = 119$ We know that $t_n = a + (n - 1) d 119 = 5 + (n - 1) \times 6$ (n-1) = (119-5)/6 = 19 n = 20, Therefore, 119 is the 20th term of the given A. P. Que.8. The sum of the series -8,-6, -4n terms is 52. The nun of terms n is: a. 11 b. 12 c. 13 d. 10 Answer: C Solution: Given series -8, -6, -4, n term Let term $(a) = -8$ Common difference $(d) = (-6) - (-8)$ = -6+8 = 2 Sum of 'n' term $(S_n) = 52$ , $n = ?$ We know that $S_n = n/2(2a + (n-1)d)$ $52 = \frac{n}{2}[2 \times (-8) + (n-1)(2)]$ 104 = n[2n-18]	a. $n = 20$	b. $n = 2$
Solution: Here $a = 5$ , $d = 11-5 = 6$ $t_n = 119$ We know that $t_n = a + (n - 1) d 119 = 5 + (n - 1) \times 6$ (n-1) = (119-5)/6 = 19 n = 20, Therefore, 119 is the 20th term of the given A. P. Que.8. The sum of the series -8,-6, -4n terms is 52. The num of terms n is: a. 11 b. 12 c. 13 d. 10 Answer: C Solution: Given series -8, -6, -4, n term Let term $(a) = -8$ Common difference $(d) = (-6) - (-8)$ = -6+8 = 2 Sum of 'n' term $(S_n) = 52$ , $n = ?$ We know that $S_n = n/2(2a + (n-1)d)$ $52 = \frac{n}{2}[2 \times (-8) + (n-1)(2)]$ 104 = n[2n-18]	c. n = 30	d. $n = 19$
Here $a = 5$ , $d = 11-5 = 6$ $t_n = 119$ We know that $t_n = a + (n - 1) d 119 = 5 + (n - 1) \times 6$ (n-1) = (119-5)/6 = 19 n = 20, Therefore, 119 is the 20th term of the given A. P. Que.8. The sum of the series -8,-6, -4n terms is 52. The nun of terms n is: a. 11 b. 12 c. 13 d. 10 Answer: C Solution: Given series -8, -6, -4, n term Let term $(a) = -8$ Common difference $(d) = (-6) - (-8)$ = -6+8 = 2 Sum of 'n' term $(S_n) = 52$ , $n = ?$ We know that $S_n = n/2(2a + (n-1)d)$ $52 = \frac{n}{2}[2 \times (-8) + (n-1)(2)]$ 104 = n[2n-18]	Answer: A	
$t_{n} = 119 \text{ We know that}$ $t_{n} = a + (n - 1) d 119 = 5 + (n - 1) \times 6$ $(n-1) = (119-5)/6 = 19$ $n = 20,$ Therefore, 119 is the 20th term of the given A. P. Que.8. The sum of the series -8,-6, -4n terms is 52. The nun of terms n is: a. 11 b. 12 c. 13 d. 10 Answer: C Solution: Given series -8, -6, -4, n term Let term (a) = -8 Common difference (d) = (-6) - (-8) = -6+8 = 2 Sum of 'n' term (S_n) = 52, n =? We know that S_n = n/2(2a + (n-1)d) $52 = \frac{n}{2}[2 \times (-8) + (n-1)(2)]$ 104 = n[2n-18]	Solutíon:	
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(n-1) = (119-5)/6 = 19 n = 20, Therefore, 119 is the 20th term of the given A. P. Que.8. The sum of the series -8,-6, -4n terms is 52. The nun of terms n is: a. 11 b. 12 c. 13 d. 10 Answer: C Solution: Given series -8, -6, -4, n term Let term (a) = -8 Common difference (d) = (-6) - (-8) = -6+8 = 2 Sum of 'n' term (S_n) = 52, n =? We know that S_n = n/2(2a + (n-1)d) $52 = \frac{n}{2} [2 \times (-8) + (n-1)(2)]$ 104 = n[2n-18]	$t_n = 119$ We know t	:hat
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Therefore, 119 is the 20th term of the given A. P. Que.8. The sum of the series -8,-6, -4n terms is 52. The num of terms n is: a. 11 b. 12 c. 13 d. 10 Answer: C Solution: Given series -8, -6, -4, n term Let term (a) = -8 Common difference (d) = (-6) - (-8) = -6+8 = 2 Sum of 'n' term (S <sub>n</sub> ) = 52, n=? We know that S <sub>n</sub> =n/2(2a+(n-1)d) $52=\frac{n}{2}[2\times(-8)+(n-1)(2)]$ 104 = n[2n-18]	(n-1)=(119-5)/6=	19
Que.8. The sum of the series -8,-6, -4n terms is 52. The num of terms n is: a. 11 b. 12 c. 13 d. 10 Answer: C Solution: Given series -8, -6, -4, n term Let term (a) = -8 Common difference (d) = (-6) - (-8) = -6+8 = 2 Sum of 'n' term (S <sub>n</sub> ) = 52, n=? We know that S <sub>n</sub> =n/2(2a+(n-1)d) $52 = \frac{n}{2}[2 \times (-8) + (n-1)(2)]$ 104 = n[2n-18]	n = 20,	
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a. 11       b. 12         c. 13       d. 10         Answer: C       Solution:         Given series       -8         -8, -6, -4, n term       Let term (a) = -8         Common difference (d) = (-6) - (-8)       =         = -6+8 = 2       Sum of 'n' term (S_n) = 52, n=?         We know that $S_n = n/2(2a + (n-1)d)$ 52 = $\frac{n}{2}[2 \times (-8) + (n-1)(2)]$ 104 = n[2n-18]	Que.8. The sum of th	ne seríes -8,-6, -4n terms ís 52. The num
c. 13 Answer: C Solution: Given series -8, -6, -4, n term Let term (a) = -8 Common difference (d) = (-6) - (-8) = -6+8 = 2 Sum of 'n' term (S <sub>n</sub> ) = 52, n=? We know that S <sub>n</sub> =n/2(2a+(n-1)d) $52=\frac{n}{2}[2\times(-8)+(n-1)(2)]$ 104 = n[2n-18]	of terms n ís:	
Answer: C Solution: Given series -8, -6, -4, n term Let term (a) = -8 Common difference (d) = (-6) - (-8) = -6+8 = 2 Sum of 'n' term (S <sub>n</sub> ) = 52, n=? We know that S <sub>n</sub> =n/2(2a+(n-1)d) $52=\frac{n}{2}[2\times(-8)+(n-1)(2)]$ 104 = n[2n-18]	a. 11	
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Given series -8, -6, -4, n term Let term (a) = -8 Common difference (d) = (-6) - (-8) = -6+8 = 2 Sum of 'n' term (S <sub>n</sub> ) = 52, n=? We know that S <sub>n</sub> =n/2(2a+(n-1)d) $52=\frac{n}{2}[2\times(-8)+(n-1)(2)]$ 104=n[2n-18]	Answer: C	
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Common difference $(d) = (-6) - (-8)$ = $-6+8 = 2$ Sum of 'n' term $(S_n) = 52$ , $n=?$ We know that $S_n = n/2(2a + (n-1)d)$ $52 = \frac{n}{2}[2 \times (-8) + (n-1)(2)]$ 104 = n[2n-18]		U
= -6 + 8 = 2 Sum of 'n' term (S <sub>n</sub> ) = 52, n=? We know that S <sub>n</sub> =n/2(2a+(n-1)d) $52 = \frac{n}{2}[2 \times (-8) + (n-1)(2)]$ 104 = n[2n-18]	• •	
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$52 = \frac{n}{2} [2 \times (-8) + (n-1) (2)]$ 104 = n[2n-18]		
104 = n[2n-18]		• • • •
	$52 = \frac{n}{2} [2 \times (-8) + (n-3)]$	1) (2)]
$104 = 2n^2 - 18n$	104 = n[2n - 18]	

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 $2n^2 - 18n - 104 = 0$
 $n^2-9n-52=0$
 (n-13)(n+4)=0
 If $n-13 = 0 \rightarrow n=13$ and $n+4=0 \rightarrow n=-4$
Que.9. If the P <sup>th</sup> term of an A.P. is 'q' and the q <sup>th</sup> term is 'p', then
 íts r <sup>th</sup> term ís
a. p+q-r b. P+q+r
c.p-q-r d.p-q
Answer: A
Solution:
Let I <sup>st</sup> term of AP is 'a' And common difference is 'd'
Given $T_p = q$
a+(p-1)d = q
a + pd - d = q ( <i>i</i> )
and $T_p = P$
a + (q-1)d = p
a + qd - d = p ( <i>íí</i> )
equation (i) and equation (ii)
a+pd-d =p
a+qd-d=p
Pd-qd = q-p
d(p-q) = -(p-q)
 d = -1
Putting $d = -1$ in equation (i)
 a+p(-1) - (-1) = q a-p+1 = q a=p+q-1 There $T = a+(x, 1)d$
 Then, $T_r = a + (r-1)d$
 = p + q - 1 + (r - 1) (-1)

	Chapter 6		
	=p+q-1-r+1		
<u>4</u> .	GEOMETRIC PROGRESSION		
	Que.10. Which term of the G. P.: 5, -10, 20, - 40, is 320?		
	a. 7 <sup>th</sup> b. 8 <sup>th</sup>		
	$c.10^{th}$ $d.1^{st}$		
	Answer: A		
	Solution:		
	In this case, $a = 5$ ; $r = \frac{-10}{5} = -2$ .		
	Suppose that 320 is the nth term of the G. P. By the formula,		
	$t n = ar^{n-1}$ , we get		
	$t_n = 5. \ (-2)^{n-1}$		
	$\therefore 5. (-2)^{n-1} = 320$ (Given)		
	$\therefore (-2)^{n-1} = 64 = (-2)^6$		
	$\therefore n-1=6$		
	$\therefore n = 7$		
	Hence, 320 is the 7th term of the G. P.		
	Que.11. The sum of three numbers in a GP is 26 and their product		
	is 216. and the numbers.		
	a. 2, 6 and 18 b. 3, 7, and 11		
	c. Both d. None of these		
	Answer: C		
	Solution:		
	Let the numbers be a/r, a, ar.		
	=> (a / r) + a + a r = 26		

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$=> a (1 + r + r_2) / r = 26$
Also, it is given that product = $216$
$=> (a / r) \times (a) \times (a r) = 216$
$=> a^3 = 216$
=>a=6
$=> 6 (1 + r + r_2) / r = 26$
$=>(1 + r + r_2)/r = 26/6 = 13/3$
=>3+3r+3r2=13r
$=>3r_2-10r+3=0$
=>(r-3)(r-(1/3))=0
=>r=3  or  r=1/3
Thus, the required numbers are 2, 6 and 18.
Que.12. Find the sum of $1^{st}$ 8 terms of G.P series $1+2+4+8+$
a. 155 b. 255
c. 185 d822
Answer: B
Solution:
Here $a = 1, r = 2, n = 8$
$S_n = a.(r^n - 1)/(r - 1)$ when $r > 1$
$S_8 = 1.(2^8 - 1) / (2 - 1)$
= 1(256 - 1) = 255
Thus $S_8 = 255$
Que.13. If n geometric means between a and b be G1, G2, Gn and
a geometric mean be G, then the true relation is
a. $G_1, G_2, \dots, G_n = G$ b. $G_1, G_2, \dots, G_n = G^{1/n}$
c. $G_1, G_2, \ldots, G_n = G^n$ d. None

	Chapter 6
Answer: C	
Solution:	
1	
Here $G = (a b)^{\frac{1}{2}}$ and	
$G_1 = ar^1, G_2 = ar^2, \dots$	. $G_n = ar^n$ . Therefore
$G_1.G_2.G_3\ldots.G_n = a^n n$	$r^{1+2+\dots+n} = a^n r^{n(n+1)/2}$ but
$ar^{n+1} - b$	
$\frac{dI}{r = \left(\frac{b}{a}\right)^{\frac{1}{n+1}}}$	
$r = \left(\frac{-}{a}\right)^{-1}$	
Therefore the wear find an	roduct is $a^n \left(\frac{b}{a}\right)^{\frac{1}{l(n+1)}n(n+1)2}$
n n	$\frac{baaccus a}{a}$
$=(ab)\overline{2}$	
$=\left\{(ab)^{\frac{1}{2}}\right\}^{n}$	
<u> </u>	fast
TADLE. IL IS A WELL-RHOWH	

Chapter 7

	Chapter 7
<u>1</u> .	<u>SET</u>
	Que.1. If A={1,2,3,4,5,6,7} and s= {2,4,6,8}. Cardinal number
	of A-Bís:
	a. 4 b. 9
	c.g d.7
	Answer: A
	Solution:
	$A = \{1, 2, 3, 4, 5, 6, 7\}$
	$B = \{2,4,6,8\}$
	$A-B = \{1,2,3,4,5,6,7\} - \{2,4,6,8\}$
	$= \{1, 3, 5, 7\}$
	n(A-B) = 4
	Que.2. If $A = \{1, 2\}$ and B::: $\{3, 4\}$ . Determine the number of
	relations from A and B
	a. 3 b. 16
	c. 5 d. 6
	Answer: B
	Solution:
	Given $A = \{1, 2\}$
	$B = \{3, 4\}$
	$A \times B = \{1,2\} \times \{3,4\}$
	$= \{ (1,3) \ (1,4) \ (2,3) \ (2,4) \}$
	n(AXB) = 4
	No. of relation from A and $B = 2$ "
	$= 2^4 = 16$ or A liter Shortcut:
	$A = \{1, 2\}, n(A) = 2$
	$B = \{3,4\}, n (B) = 2$
	No. of Relation from A and $B = 2m^*n$

= 2 2*2 = 2 4 = :	16
Que.3. The Cartesí	an Product B x A is equal to the Cartesian
product A x B. Is it	· · · · · · · · · · · · · · · · · · ·
a. True	b. False
c. partíal true	d. not sure
Answer: B	
Solutíon:	
Let $A = \{1, 2\}$ and	$d \mathcal{B} = \{a, b\}.$
The Cartesian proc	$Auct A \times B = \{(1, a), (1, b), (2, a), (2, b)\}$
and the Cartesian	product $B \times A = \{(a, 1), (a, 2), (b, 1), (b, 2)\}$
This is not equal t	COAXB.
Que.4. The numbe	rs of proper sub set of the set {3,4,5,6,7} is:
a. 32	0.31
c. 30	d. 25
Answer: B	
Solutíon:	
Gíven	
$A = \{3, 4, 5, 6, 7\}$	}
n(A)'=5	
No. of proper subse	$t = 2^{n} - 1 = 2^{5} - 1$
= 32-1	
= 31	
DE' MORGAN'S	5 LAW
Que.5. If A and B k	oe any two sets, then (ANB)' is equal to
a. A'NB'	6. A'UB'
C. ANB	d AUB

	Chapter 7
Answer: D	
Solution:	
From De' Morgan's Law, ANB)	)'=A'UB'
$Qur. G. If A = \{1, 2, 3, 4, 5\}, B$	$b = \{2, 4, 6\}, C = \{3, 4, 6\}, then$
$(AUB) \cap C$ is	
a. {3, 4, 6}	b. {1, 2, 3}
c. {1, 4, 3}	d. None of these
Answer: A	
Solution:	
AUB={1,2,3,4,5,6} \ (AUB)(	$\int c = \{ 2, 4, 6 \}$
VENN DIAGRAMS	
Que I let A and P he two sets	then (ALIR) 'LL (A'OR) is equa
a. A'	b. A
a. A' c. B'	
a. A' c. B' Answer: A	b. A d. None of these
a. A' c. B' Answer: A Solutíon:	b. A d. None of these
a. A' c. B' Answer: A Solutíon: From Venn-Euler's Díagram,	b. A d. None of these
a. A' c. B' Answer: A Solutíon: From Venn-Euler's Díagram,	d. None of these
a. A' c. B' Answer: A Solution: From Venn-Euler's Díagram, ∴(AUB)'U(A'∩B)=A'	b. A d. None of these $(A \cup B)' \qquad U$ $(A \cup B)' \qquad U$
a. A' c. B' Answer: A Solutíon:	b. A d. None of these $(A \cup B)' \qquad U$ $(A \cup B)' \qquad U$
a. A' c. B' Answer: A Solution: From Venn-Euler's Diagram, ∴(AUB)'U(A'∩B)=A' Que.8. The shaded region in th	b. A d. None of these
a. A' c. B' Answer: A Solution: From Venn-Euler's Diagram, ∴(AUB)'U(A'∩B)=A' Que.8. The shaded region in th a. A∩ (BUC)	b. A d. None of these $A \to B'$ $U$ $A \to B'$ $U$ $B \to B'$ $D$ $B \to $
a. $A'$ c. $B'$ Answer: $A$ Solution: From Venn-Euler's Diagram, $\therefore (AUB)'U(A'\cap B) = A'$ Que.8. The shaded region in th a. $A \cap (B \cup C)$ c. $A \cap (B - C)$	b. A d. None of these
a. A' c. B' Answer: A Solution: From Venn-Euler's Diagram, $\therefore$ (AUB)'U(A' $\cap$ B) = A' Que.8. The shaded region in th a. A $\cap$ (B U C) c. A $\cap$ (B – C) Answer: D	b. A d. None of these $A = B^{(A = B)^{*}} U$ e given figure is b. A U (B $\cap C$ )
a. A' c. B' Answer: A Solution: From Venn-Euler's Diagram, $\therefore$ (AUB)'U(A' $\cap$ B) = A' Que.8. The shaded region in th a. A $\cap$ (B U C) c. A $\cap$ (B - C) Answer: D Solution:	b. A d. None of these $a = \frac{a = B^{T}}{a = B^{T}} \frac{u}{a = B^{T}}$ e given figure is b. A U (B $\cap$ C) d. A - (B U C)
a. A' c. B' Answer: A Solution: From Venn-Euler's Diagram, $\therefore$ (AUB)'U(A' $\cap$ B) = A' Que.8. The shaded region in th a. A $\cap$ (B U C) c. A $\cap$ (B – C) Answer: D	b. A d. None of these a = b = a = a = a = a = a = a = a = a =

	Chapter 7
<u>3</u> .	FUNCTION
	Que.9. Identity the function from the following:
	$a. \{(1,1), (1,2), (1,3)\}$
	$b. \{(1,1), (2,1), (2,3)\}$
	c. { $(1,2)$ , $(2,2)$ , $(3,2)$ , $(4,2)$ }
	d. None of these
	Answer: C
	Solution:
	{(1,2) (2,2) (3,2) (4,2)} is the function Many one function
	Que.10. Let N be the set of all natural numbers; $E$ be the set of all
	even natural numbers then the function $F:N = E$ defined as $f(x)$
	= 2X - VX EN is $=$
	a. One-one-ínto b. Many-one-ínto
	c. One-one onto d. Many-one-onto
	Answer: C
	Solution:
	Given
	$N = \{1, 2, 3, 4, 5, 6 \dots 00\}$
	$E = \{2, 4, 6, 8, \dots, 00\}$
	F:N→E
	VXEN
	f(x) = -2x
	$f(1) = 2 \times 1 = 2$
	$f(2) = 2 \times 2 = 4$
	$f(3) = 2 \times 3 = 6$
	Range of function = $\{2, 4, 6, \dots, \} = E$
	and $/(x_1) = f(x_2)$
	$2X_1 = 2X_2 = X_2$

Chapter 7	
So f(x) function is one-one and one to.	
Que.11. Identity the function from the following:	
a. {(1,1), (1,2), (1,3)}         b. {(1,1), (2,1), (2,3)}	
$\begin{array}{c} 0. \left((1,1), (2,1), (2,3)\right) \\ 0. \left\{(1,2), (2,2), (3,2), (4,2)\right\} \end{array}$	
d. None of these	
Answer: C	
Solution:	
$\{(1,2), (2,2), (3,2), (4,2)\}$	
is the function Many one function	
2 4	
36	
4 8	
5	

	Chapter 8
	DIFFERENTIAL
	COEFFICIENT
<u>1</u> .	DIFFERENTIAL COEFFICIENT
	$n^{1^{p}+2^{p}+3^{p}+\cdots+n^{p}}$
	Que.1. $\lim_{n \to \infty} \frac{1+2+3+\dots+n}{n^{P+1}}$
	$a \cdot \frac{1}{b \cdot \frac{1}{b$
	$\begin{array}{c} p = 1 \\ 1 \\ 1 \end{array} $
	$c.\frac{1}{p}-\frac{1}{p-1}$ d. None
	Answer: A
	Solution:
	$\lim_{n \to \infty} \frac{1^p + 2^p + 3^p + \dots + n^p}{1 + 1 + 1 + 1} = \lim_{n \to \infty} \sum_{i=1}^n \left[ \frac{r^p}{r^i} \right]$
	$n \to \infty$ $n^{p+1}$ $n \to \infty \sum_{r=1}^{n \to \infty} \lfloor n^{p+1} \rfloor$
	=
	$\lim_{n \to \infty} \frac{1}{n} \sum_{r=1}^{n} {\binom{r}{n}}^{p} = \int_{0}^{1} x^{p} dx = \begin{bmatrix} x^{p+1} \\ p+1 \end{bmatrix}_{0}^{1} = \frac{1}{p+1}$
	Que.2. $\lim_{n\to\infty} \left[\frac{1}{n} + \frac{1}{n+1} + \frac{1}{n+2} + \dots + \frac{1}{2n}\right] =$
	$\begin{array}{c c} \hline & & & \\ \hline & & \\ \hline a. & & \\ \hline a. & & \\ \hline \end{array} \begin{array}{c} & & \\ \hline a. & \\ \hline \end{array} \begin{array}{c} & & \\ \hline \end{array} \begin{array}{c} & & \\ \hline \\ \hline \end{array} \begin{array}{c} & & \\ \end{array} \end{array} \begin{array}{c} & & \\ \hline \end{array} \begin{array}{c} & & \\ \hline \end{array} \begin{array}{c} & & \\ \end{array} \end{array} \begin{array}{c} & & \\ \end{array} \end{array}$
	c. $Log_e 3$ d. $Log_e 2$
	Answer: D
	Solution:
	$\lim_{n \to \infty} \left[ \frac{1}{n} + \frac{1}{n+1} + \frac{1}{n+2} + \dots + \frac{1}{2n} \right]$
	$= \frac{1}{n} \lim_{n \to \infty} \left[ 1 + \frac{1}{1 + \frac{1}{n}} + \frac{1}{1 + \frac{2}{n}} + \dots + \frac{1}{1 + \frac{n}{n}} \right]$
	1 $1$ $1$
	$\frac{1}{n}\lim_{n\to\infty}\sum_{r=0}^{\infty}\left[\frac{1}{1+\frac{r}{n}}\right]$
	$\int \frac{1}{1} \frac{1}{1} dx$
	$\frac{\int_{0}^{1} 1 + x^{exx}}{[\log_{e}(1+x)]_{0}^{1}} => \log_{e} 2 - \log_{e} 1 = \log_{e} 2$
	$[105e(1+x)]_0 = -7105e^2 - 105e^2$

	Chapter 8
<u>2</u> .	DERIVATIVE OF A FUNCTION OF FUNCTION
<u> </u>	
	Que.3. Dífferentíate log $(1 + x^2)$ wrt. X
	$a. \frac{2x}{(1+x^2)}$ <b>b.</b> $\frac{2x}{(1-x^2)}$
	$c. \frac{2x}{(1+x)}$ d. None
	Answer: A
	Solution:
	Let $y = \log (1 + x^2) = \log t$ when $t = 1 + x^2$ dy dy dt 1 2x 2x
	$\frac{dy}{dx} = \frac{dy}{dt}\frac{dt}{dx} = \frac{1}{t} \times (0 + 2x) = \frac{2x}{t} = \frac{2x}{(1 + x^2)}$
	$\frac{dy}{dx} = \frac{dy}{dt}\frac{dt}{dx} = \frac{1}{t} \times (0 + 2x) = \frac{2x}{t} = \frac{2x}{(1 + x^2)}$ The rule is called Chain Rule
<u>3</u> .	IMPLICIT FUNCTIONS
	Que.4. The value of $\int_{1}^{2} \frac{1-x}{1+x} dx$ is equal to:
	$a. \log \frac{3}{2} - 1$ $b. 2\log \frac{3}{2} - 1$ $c. \frac{1}{2}\log \frac{3}{2} - x$ $d. \frac{1}{2}\log \frac{3}{2} - 1$
	Answer: B Solutíon:
	$\int_{1}^{2} \left(\frac{1-x}{1+x}\right) dx = \int_{1}^{2} \left(\frac{1}{1+x} - \frac{x}{1+x}\right) dx$
	$\int_{1}^{2} \frac{1}{1+x} dx - \int_{1}^{2} \frac{x}{x+1} dx$
	$\int_{1}^{2} \frac{1}{1+x} dx - \int_{1}^{2} \left(\frac{1+x-1}{1+x}\right) dx$
	$\int_{1}^{2} \frac{1}{(1+x)} dx - \int_{1}^{2} \left(\frac{1}{1+x}\right) dx$

Chapter 8  

$$\int_{1}^{2} \frac{1}{1+x} dx - \int_{1}^{2} 1 \times dx + \int_{1}^{2} \frac{1}{1+x} dx$$

$$2\int_{1}^{2} \frac{1}{1+x} - \int_{1}^{2} 1 dx$$

$$2[log(1+x)]_{1}^{2} - [x]_{1}^{2}$$

$$2[log(2+1) - log(1+1)] - [2-1]$$

$$2[log3-log2] - 1$$
4. LOGARITHMIC DIFFERENTIATION  
Que.5. The rate of increase of bacteria in a certain culture is  
proportional to the number present. If it double in 5 hours then in  
25 hours, its number would be  
a. 2 times the original b. 16 times the original  
c. 32 times the original d. 64 times the original  
Answer: C  
Solution:  
Let Pe be the initial population and let the population after t years  
be p  
Then  $\frac{dp}{dt} = kp = \frac{dp}{p} = kdt$   
On intergrating we have log P=kt+log Po  
Log Po = kt  
When t = 5 hrs, p = 2PO  
Log  $\frac{2Po}{po} = 5k = k = \frac{log2}{5} : log \frac{p}{Po} = \frac{log2}{5}t$ 

	Chapter 8
$\frac{\left(\frac{dy}{dx}\right)^2}{\left(\frac{dy}{dx}\right)^2}  y  \left(\frac{dy}{dx}\right)^3 - x^2$	$\left(\frac{dy}{dx}\right)^2 + xy\left(\frac{dy}{dx}\right)^1 - \frac{y^2}{4} - 0$ When $T = 25$ hours, we have
$\frac{p}{\log p} = \frac{\log p}{\log p}$	$\frac{2}{-X25} = 5log2 = \log 32 : p = 32Po$
$\frac{\log \frac{1}{Po}}{Po} = \frac{1}{5}$	$-X23 - 5t0y2 - 10g32 \cdot p - 32F0$
DEGREE OF	DIFFRENTIAL EQUATION
Que.6. The degi	ree of the differential equation $3\frac{d^2y}{dx^2} = \{1 + \left(\frac{dy}{dx}\right)^2\}^3$
a.1	0.2
0.3	d. 6
Answer: B	
Solution:	
$3\frac{d^2y}{dx^2} = \left\{1 + \left(\frac{dy}{dx}\right)\right\}$	$\left.\right)^{2}\right\}^{\frac{3}{2}}$
On Square we	$get, 9\left(\frac{d^2y}{dx^2}\right)^2 = \left\{1 + \left(\frac{dy}{dx}\right)^2\right\}^3$
Obviously the 1	-tighest derivative $\frac{d^2y}{dx^2}$
	<u> </u>
Que.7. The díf	ferential equation representing the family of cu
_ · · ·	where c is a positive parameter, is of
a. Order 1	b. Order 2
c. Degree 2	d. Degree 4
Answer: A	
Solutíon:	
Gíven curve ís	$y^2 = 2c(x + \sqrt{c})$
Dífferentiate w	.r.t.x, $2y\frac{dy}{dx} = 2c = c = y\frac{dy}{dx}$
	cial Equation is $y^2 = 2y \frac{dy}{dx} \left( x + \sqrt{y \frac{dy}{dx}} \right)$

**Chapter 8**  $y \frac{2dy}{dx} - x y \frac{dy}{dx}$  Squaring and Multiplying By  $\frac{\left(\frac{dy}{dx}\right)^2}{\left(\frac{dy}{dx}\right)^3} = \frac{y^2}{x^2}\left(\frac{dy}{dx}\right)^2 + \frac{y^2}{y^2}\left(\frac{dy}{dx}\right)^3 - \frac{y^2}{4} = 0$ 6. PARAMETRIC EQUATION Que.8.  $\int_0^2 \frac{3^{\sqrt{x}}}{\sqrt{x}}$  is equal to  $\sqrt[2]{2}$ <u>b.0</u> a.  $log_e 3$  $\frac{3\sqrt{2}}{\sqrt{2}}$  $\frac{2(3\sqrt{2}-1)}{\log_e 3}$ Answer: C Solution:  $\int_0^2 \frac{3^{\sqrt{x}}}{\sqrt{x}} dx$ Let  $\sqrt{x} = t$  $\int_{0}^{2} 3^{\sqrt{x}} \cdot \frac{1}{\sqrt{x}} dx \frac{1}{2\sqrt{x}} dx = dt$  $\frac{1}{\sqrt{x}} dx = 2dt$  $\int_{0}^{\sqrt{2}} 3^{t} \cdot 2dt = \int_{0}^{\sqrt{2}} 3^{t} dt$  $\begin{bmatrix} \frac{3^t}{\log 3} \end{bmatrix}_0^{\sqrt{2}} = 2 \begin{bmatrix} \frac{3^{\sqrt{2}}}{\log 3} - \frac{3^0}{\log 3} \end{bmatrix}$  $2\left(3^{\sqrt{2}}-3^{0}\right)$ log<sub>e</sub>3

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Solut Mean, Que.3 X	íon: , medían .The follo <sup>.</sup> <i>12</i>	wing frequ 17	iency díst 24	críbutio	n ís cl 36		ied as: 45					
Solut Mean, Que.3 X F	íon: , medían .The follo 12 2	wing frequ 17 5	uency díst 24 3	ríbutío	n ís cl 36 <b>8</b>	assífi	ied as: <i>45</i> 9					
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Solut Mean, Que.3 X F a. Cov	ion: , median .The follor 12 2 rtinuous c	wing frequ 17 5	иепсу díst <i>24</i> Л	críbutío b	n ís cl 36 <b>8</b> Dísc	assífi rete dí	ied as: <i>45</i> 9					
Solut Mean, Que.3 X F a. Cov c. Cuv	ion: , median .The follow 72 2 rtinuous o nulative f	wing frequ 17 <b>5</b> distribution	иепсу díst <i>24</i> Л	críbutío b	n ís cl 36 <b>8</b> Dísc	assífi rete dí	ied as: <i>45</i> 9 istribu					
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Solut Mean, Que.3 X F a. Cov c. Cuv Answ Solut X	ion: , median .The follor 12 2 rtinuous c nulative f rer: D ion:	wing frequ 17 5 distribution frequency	iency díst 24 3 n dístríbutí	críbutío b on d	n ís cl 36 <b>8</b> Dísc	assífi rete di e of th	ied as: <i>45</i> 9 istribu					
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Solut Mean, Que.3 X F a. Cov c. Cuv Answ Solut X F ís cla Que.4	ion: , median .The follow 72 2 vtinuous of nulative f rer: D ion: 72 2 ssified as	wing frequ 17 5 distribution frequency 77 5 Discrete d e is a graph	iency dist 24 3 n distributi 24 3 istribution nical repre	críbutío b on d 30 8 n. sentatío	n ís cl 36 8 Dísc Non	assifi rete di e of th 45 9	ied as: <i>15</i> <i>9</i> istribune above					
Solut Mean, Que.3 X F a. Cov Answ Solut X F ís cla Que.4 a. Cui	ion: , median .The follow 72 2 vtinuous of nulative f rer: D ion: 72 2 ssified as	wing frequ 17 5 distribution frequency 17 5 Discrete d e is a graph frequency	iency díst 24 3 n dístríbutí dístríbutíon nícal repre dístríbutí	críbutío b on d 30 8 n. sentatío	n ís cl 36 8 Dísc Non Non	assifi rete di e of th 45 9	ied as: <i>45</i> <i>9</i> istribune about <i>about</i> <i>y</i> distribune					

Answer: A Solution: An 'O' give is a graphical representation of a distribution. Que.5. Class 0-10 10-20 20-30 Frequency 4 6 20 For the class 20-30. Cumulative frequency 1 a. 10 b. 26 c. 30 d. 41 Answer: C Solution: C/ F 0-10 f 10-20 6 20-30 20 30-40 8 40-50 3 Cumulative frequency of Class Interval '20	80 - 40 8 25:	· · ·
Solution:         An 'O' give is a graphical representation of a distribution.         Que.5.         Chass       0 - 10       10 - 20       20 - 30         Frequency       4       6       20       6         For the class 20-30. Cumulative frequency i       0. 26       0. 26         C. 30       d. 41         Answer: C       Solution:       0         20-10       4       0         10-20       6       20         20-30       20       3	30 - 40 8 2S: 2 2 4 10 30	40 - 50
An 'O' give is a graphical representation of a distribution.         Que.5.         Class       0 - 10       10 - 20       20 - 30       3         Frequency       4       6       20       6         For the class 20-30. Cumulative frequency i       0.26       0.26         Solution:       0.26       0.41         Answer: C       Solution:       0       0.26         20-30       20       0       0         20-30       20       0       0         30-40       8       0       0         40-50       3       3       0	30 - 40 8 2S: 2 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	40 - 50
Aistribution.         Que.5.         Class       0 - 10       10 - 20       20 - 30         Frequency       4       6       20       6         For the class 20-30. Cumulative frequency is       0.26       0.26         2. 30       0.41       0.26         2. 30       0.41       0.41         Answer: C       50       0.41         Solution:       6       20         20-30       20       6         30-40       8       40-50	30 - 40 8 2S: 2 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	40 - 50
Que.5.       O - 10       10 - 20       20 - 30       30         Frequency       4       6       20       6         For the class 20-30. Cumulative frequency 1       6       20       6         For the class 20-30. Cumulative frequency 1       6       20       6         Solution:       0.26       30       d. 41         Answer: C       5       5       6       20         Solution:       7       6       20       6         20-30       20       6       20       20         30-40       8       20       3	8 	
Class       0 - 10       10 - 20       20 - 30       30         Frequency       4       6       20       0         For the class 20-30. Cumulative frequency is       0.20       0.20         1.10       b.20       0.20         2.30       d.41         Answer: C       50       0.41         Solution:       7       7         0-10       4       10-20       0         10-20       6       20         30-40       8       3	8 	
Class       0 - 10       10 - 20       20 - 30       30         Frequency       4       6       20       0         For the class 20-30. Cumulative frequency 10       0.20       0.20         10       0.20       0.20       0.20         10       0.20       0.20       0.20         10       0.20       0.20       0.20         10       0.20       0.20       0.20         0.30       0.41       0.20       0.41         Answer: C       50       50       0.41         0-10       4       0.20       0.20         20-30       20       0.20       0.20         30-40       8       0.20       0.20	8 	
Frequency       4       6       20         For the class 20-30. Cumulative frequency is         1.10       b.26         1.10       b.26         2.30       d.41         Answer: C       d.41         Solution:       f         0-10       f         10-20       6         20-30       20         30-40       8         40-50       3	8 	
For the class 20-30. Cumulative frequency i a. 10 b. 26 b. 30 d. 41 Answer: C Solution: C/ F 0-10 4 10-20 6 20-30 20 30-40 8 40-50 3	C. F 4 10 30	3
10       b. 26         2.30       d. 41         Answer: C       50lution:         C.1       F         0-10       4         10-20       6         20-30       20         30-40       8         40-50       3	C. F 4 10 30	
2.30 d.41 Answer: C Solution: C./ F 0-10 4 10-20 6 20-30 20 30-40 8 40-50 3	<i>C. F</i> 4 10 30	
Answer: C Solution: <i>C.1 F</i> 0-10 4 10-20 6 20-30 20 30-40 8 40-50 <b>3</b>	<i>C. F</i> 4 10 30	
Solution:         0-10       F         0-10       4         10-20       6         20-30       20         30-40       8         40-50       3	4 10 30	
C.1     F       0-10     4       10-20     6       20-30     20       30-40     8       40-50     3	4 10 30	
0-10     4       10-20     6       20-30     20       30-40     8       40-50     3	4 10 30	
10-20       6         20-30       20         30-40       8         40-50       3	10 30	
20-30     20       30-40     8       40-50     3	30	
30-40 8 40-50 <b>3</b>		
40-50 3	38	
Cumulative frequency of Class Interval '20		
	-30' ís 3	30

						Chap	ter 15	
CE		SURES ( L TEND						
<u>1</u> . <u>AR</u>	ITHM	ETIC N	<u>NEAN</u>					
(A)	<u>COM</u>	BINED	MEAN	]				
per m	onth a	nd that f	ary for a c for a grou	p of 60	male wo			
a. 61		it is the c	combined	meuns	b. 616			
c. 6.1					d. 61.6			
$X 1 =$ hence $\overline{X} = \frac{1}{2}$ $= 616$	tion: Ven $n_1$ RS.52 , the co $n_1 + n_2 = n_1 + n_2$ 50	mbined i 2	$x_2 = 60,$ $x_2 = Rs.$ mean salu	ary per				
			89 390 - 40					- 4
requency	23	38	58	82	65	31	11	
a. 41	6			b. 41	6.17			
c. 41	6.71			d. 41	71			
Ansv								
Solut	tion:							

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	C	omputation of A	M					
Class Interval		Mid-Value (x )	d= xi-A	fd				
			xi= -419.50					
(1)	(2)	(3)	(4)	(5) = (2)				
350 - 369	23	359,50	- 3	- 6				
370 - 389	38	379,50	- 2	- 7				
390 - <del>4</del> 09	58	399.50	- 1	- 5				
410 - <i>42</i> 9	82	419,50 (A)	0	0				
<i>430 - 449</i>	65	439,50	1	65				
<i>450 - 469</i>	31	459,50	2	62				
470 - 489	11	479,50	3	33				
Total	308	-	-	- 4				
= 419.50+ = 419.50- = 416.71								
(B) <u>MIS</u>								
	<b>i</b> i	e observations x,	, x + 4, x + 6,	.x+8an				
	find the vali		F-1					
a. 154			. 54					
c. 451		C	1.541					
Answer: C								
Answer: C Solutíon:								
Answer: C Solutíon: Mean of the	gíven obsen	/atíons 5) + (x + 8) +						

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	cording to the problem, mean $=$ 16 (given).
Therefore, (5x + 30	0)/5 = 16
⇒5x + 30 = 16 >	$x 5 \Rightarrow 5x + 30 = 80$
⇒ 5x + 30 - 30 =	80 - 30
$\Rightarrow 5x = 50 \Rightarrow x =$	50/5
$\Rightarrow x = 10$	
Hence, $x = 10$ .	
148 + 153 + 146	+ 147 + 154
	<u>red mean</u>
	f 40 numbers was found to be 38. Later on, it
<b>•</b> • •	nber 56 was mísread as 36. Fínd the correct i
of given numbers.	
a. 38.5	b. 0.369
c. 3.25	d. 3.85
Answer: C	
Solution:	
	f 40 numbers = 38.
	ed sum of these numbers = $(38 \times 40) = 152$
Correct sum of thes	
<b>`</b>	ítem) + (correct ítem)]
= (1520 - 36 + 50	<i>()</i>
= 1540.	a + 104000 = 1540/40 = 205
i rierezure, che curre	ct mean = 1540/40 = 38.5.
(D) <u>REPLACI</u>	<u>ING VALUE</u>
OUR E MARINA LL	enty observations is 15. If two observations 3

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	and 9 respectively, then the new mean will be
a. 14	b. 15
C. 16	d. 17
Answer: D	
Solution:	VOLIANCE - 1E
Mean of 20 obser	
	$rvations = 15 \times 20 = 300$
•	14 by 8 and 9 will mean that 3+14=17is
replaced by 8+9=	
	e no effect on the sum. It will still remain 300 and alogn as and will remain 15
SU LAE MEAN WILL	not change and will remain 15.
	RIC MEAN
Que.G. The Geome	tríc mean of 3, 6, 24 and 48 ís
Que.6. The Geome a. 8	tríc mean of 3, 6, 24 and 48 ís b. 12
Que.G. The Geome a. 8 c. 24	tríc mean of 3, 6, 24 and 48 ís
Que.G. The Geome a. 8 c. 24 Answer: B	tric mean of 3, 6, 24 and 48 is b. 12
Que.G. The Geome a. 8 c. 24 Answer: B Solutíon:	tríc mean of 3, 6, 24 and 48 ís b. 12 d. 6
Que.6. The Geome a. 8 c. 24 Answer: B Solutíon: $G.M. = (X_1 X_2)$	tríc mean of 3, 6, 24 and 48 ís b. 12 d. 6
Que.6. The Geome a. 8 c. 24 Answer: B Solution: $G.M. = (x_1 X_2)$ Here, $n = 4$	tríc mean of 3, 6, 24 and 48 ís b. 12 d. 6 2. X <sub>3</sub> . X <sub>4</sub> ) 1/4
Que.6. The Geome a. 8 c. 24 Answer: B Solution: $G.M. = (x_1 X_2)$ Here, $n = 4$ $(3 \times 6 \times 24 \times 2)$	tríc mean of 3, 6, 24 and 48 ís b. 12 d. 6 2. X <sub>3</sub> . X <sub>4</sub> ) 1/4 48) <sup>1/4</sup>
Que.6. The Geome a. 8 c. 24 Answer: B Solution: $G.M. = (x_1 X_2)$ Here, $n = 4$ $(3 \times 6 \times 24 \times 1)$ $\sqrt{(3 \times 6 \times 24 \times 48)}$	tríc mean of 3, 6, 24 and 48 ís b. 12 d. 6 2. X <sub>3</sub> . X <sub>4</sub> ) 1/4 48) <sup>1/4</sup>
Que.6. The Geome a. 8 c. 24 Answer: B Solution: $G.M. = (X_1 X_2)$ Here, $n = 4$ $(3 \times 6 \times 24 \times 1)$ $(3 \times 6 \times 24 \times 48)$ $= 4\sqrt{(3 \times 6 \times 24 \times 48)}$	tríc mean of 3, 6, 24 and 48 ís b. 12 d. 6 2. X <sub>3</sub> . X <sub>4</sub> ) 1/4 48) <sup>1/4</sup>
Que.6. The Geome a. 8 c. 24 Answer: B Solution: $G.M. = (x_1 \times x_2)$ Here, $n = 4$ $(3 \times 6 \times 24 \times x_2)$ $\sqrt{(3 \times 6 \times 24 \times 48)}$	tríc mean of 3, 6, 24 and 48 ís b. 12 d. 6 2. X <sub>3</sub> . X <sub>4</sub> ) 1/4 48) <sup>1/4</sup>
Que.6. The Geome a. 8 c. 24 Answer: B Solution: $G.M. = (x_1 \times x_2)$ Here, $n = 4$ $(3 \times 6 \times 24 \times x_2)$ $= 4\sqrt{(3 \times 6 \times 24 \times 48)}$ $= 4\sqrt{(3 \times 3 \times 2 \times 2)}$ = 2x2x3	tríc mean of 3, 6, 24 and 48 ís b. 12 d. 6 2. X <sub>3</sub> . X <sub>4</sub> ) 1/4 48) <sup>1/4</sup>
Que.6. The Geome a. 8 c. 24 Answer: B Solution: $G.M. = (x_1 \times x_2)$ Here, $n = 4$ $(3 \times 6 \times 24 \times x_2)$ $= 4\sqrt{(3 \times 6 \times 24 \times 48)}$ $= 4\sqrt{(3 \times 3 \times 2 \times 2)}$ = 2x2x3	tríc mean of 3, 6, 24 and 48 ís b. 12 d. 6 2. X <sub>3</sub> . X <sub>4</sub> ) 1/4 48) <sup>1/4</sup>
Que.6. The Geome a. 8 c. 24 Answer: B Solution: $G.M. = (x_1 \times x_2)$ Here, $n = 4$ $(3 \times 6 \times 24 \times x_2)$ $= 4\sqrt{(3 \times 6 \times 24 \times 48)}$ $= 4\sqrt{(3 \times 3 \times 2 \times 2)}$ = 2x2x3	tríc mean of 3, 6, 24 and 48 ís b. 12 d. 6 2. X <sub>3</sub> . X <sub>4</sub> ) 1/4 48) <sup>1/4</sup>
Que.6. The Geome a. 8 c. 24 Answer: B Solution: $G.M. = (x_1 \times x_2)$ Here, $n = 4$ $(3 \times 6 \times 24 \times x_2)$ $= 4\sqrt{(3 \times 6 \times 24 \times 48)}$ $= 4\sqrt{(3 \times 3 \times 2 \times 2)}$ = 2x2x3	tríc mean of 3, 6, 24 and 48 ís b. 12 d. 6 2. X <sub>3</sub> . X <sub>4</sub> ) 1/4 48) <sup>1/4</sup>

MEDIAN						
(A) REPLAC	ING VALUE					
		-				
Que.7. The height	t of 30 boys of	a class are gívei	n in the following			
table:						
Height in cm		Frequency				
120 - 129		2				
130 - 139		8				
140 - 149		10 7				
150 - 159						
		3				
160 - 169 If by joining of a	1 boy of height		dían of the height.			
		140 cm, the me	dían of the height.			
lf by joining of a		140 cm, the me				
If by joining of a changed from M <u>-</u>		140 cm, the mei M2ín cm ís	1			
If by joining of a changed from M a. 0.1 c. 0 Answer: C		140 cm, the mea M2 ín cm ís b0.:	1			
If by joining of a changed from M a. 0.1 c. 0 Answer: C Solution:	$_1$ to $M_2$ then $M_1$ -	140 cm, the mea M2 ín cm ís b0.: d. 0.2	1 2			
If by joining of a changed from M a. 0.1 c. 0 Answer: C	$_1$ to $M_2$ then $M_1$ -	140 cm, the med M2 ín cm ís b0. d. 0.2 Cumulatíve	1 2 Actual Class			
If by joining of a changed from M a. 0.1 c. 0 Answer: C Solution: Height In cms	to M₂thenM₁-	140 cm, the med M2 ín cm ís b0.: d. 0.2 Cumulatíve Frequency	1 2 Actual Class límít			
If by joining of a changed from M a. 0.1 c. 0 Answer: C Solution: Height In cms 120 - 129	to M2thenM1 Frequency 2	140 cm, the med M2 ín cm ís b0.: d. 0.2 Cumulatíve Frequency 2	1 2 Actual Class límít 119.5–129.3			
If by joining of a changed from M <u>-</u> a. 0.1 c. 0 Answer: C Solution: Height In cms 120 - 129 130 - 139	<ul> <li>to M<sub>2</sub>thenM<sub>1</sub>-</li> <li>Frequency</li> <li>2</li> <li>8</li> </ul>	140 cm, the med M2 ín cm ís b0. d. 0.2 Cumulatíve Frequency 2 10	Actual Class límít 119.5–129.2 129.5–139.2			
If by joining of a changed from M: a. 0.1 c. 0 Answer: C Solution: Height In cms 120 - 129 130 - 139 140 - 149	<ul> <li>to M<sub>2</sub>thenM<sub>1</sub>-</li> <li>Frequency</li> <li>2</li> <li>8</li> <li>10</li> </ul>	140 cm, the med M2 ín cm ís b0. d. 0.2 Cumulatíve Frequency 2 10 20	1 Actual Class límít 119.5–129. 129.5–139. 139.5–149.			
If by joining of a changed from M: a. 0.1 c. 0 Answer: C Solution: Height In cms 120 - 129 130 - 139 140 - 149 150 - 159	<ul> <li>to M<sub>2</sub>thenM<sub>1</sub>-</li> <li>Frequency</li> <li>2</li> <li>8</li> <li>10</li> <li>7</li> </ul>	140 cm, the med M2 in cm is b0.: d. 0.2 Cumulative Frequency 2 10 20 27	1 Actual Class límít 119.5–129.8 129.5–139.8 139.5–149.8 149.5–159.8			
If by joining of a changed from M a. 0.1 c. 0 Answer: C Solution: Height In cms 120 - 129 130 - 139 140 - 149 150 - 159 160 - 169	<ul> <li>to M<sub>2</sub>thenM<sub>1</sub>-</li> <li>Frequency</li> <li>2</li> <li>8</li> <li>10</li> </ul>	140 cm, the med M2 ín cm ís b0. d. 0.2 Cumulatíve Frequency 2 10 20	1 Actual Class límít 119.5–129.3 129.5–139.3 139.5–149.3			
If by joining of a changed from M: a. 0.1 c. 0 Answer: C Solution: Height In cms 120 - 129 130 - 139 140 - 149 150 - 159 160 - 169 n = 30	to M2thenM1- Frequency 2 8 10 7 3	140 cm, the med M2 in cm is b0.: d. 0.2 Cumulative Frequency 2 10 20 27 30	1 Actual Class límít 119.5–129. 129.5–139. 139.5–149. 149.5–159.			
If by joining of a changed from M a. 0.1 c. 0 Answer: C Solution: Height In cms 120 - 129 130 - 139 140 - 149 150 - 159 160 - 169	to M2thenM1- Frequency 2 8 10 7 3	140 cm, the med M2 in cm is b0.: d. 0.2 Cumulative Frequency 2 10 20 27 30	1 Actual Class límít 119.5–129. 129.5–139. 139.5–149. 149.5–159.			

		//	C	hapte	r 1
£_10 10 - 20 0 - 10					
f=10,n=30,c=10					
Medían $M_1 = L_1 +$					
$= 139.5 + \frac{10}{10}(15 -$	- 10)				
$=139.5 + \frac{10}{10} \times 5 =$	= 144.5				
If by joining fab		0 cms, th	ne n=31	L,f=11	
$\therefore$ Medían M <sub>2</sub> = 139					
	11				
$= 139.5 + \frac{10}{11} \times 5.$	5 = 144.5 cm	S			
Then $M_1 - M_2 = 14$ .	4.5-144.5 = 0				
Que.8. The mean o	f 20 ítems of o	lata ís 5	and if e	ach íten	n ís
<u>multíplíed by з, tl</u>	<u>nen the new me</u>	an will b	е		
a.5			. 10		
c. 15		0	1.20		
Answer: C					
Solution: By shifting the sc	ala Magin in ala	mand			
New Mean = K					
k = 3					
New Mean =3)	(5 = 15				
/					
MODE					
Que.g. Identify the	: mode of the gi	ven dísti	ríbutíon	/•	
	4	5	6	7	٤
Marks			10	6	1
Marks Number of Students	3	5	10	U	
	3	b	1. 1 1. 6	U	,

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A	Answer: D Solution:										
S											
M	ode ís 6	as it b	ias the	highest-	frequenc	y					
Q	ue.10. Fí	ind the	mode	for the fa	ollowing	data.					
Ag.		0-6	6-12	12-18	18-24	24-30	30-36	36-42			
Fre	equency	6	11	25	35	18	12	6			
a.	19.41					b. 23	L.12				
c. :	20.14					d. 2	20.22				
A	nswer: I	2									
S	Solution:										
S	Sínce, maximum class frequency is 35, so the mode class										
ís:	ís18–24.										
N	Now, Mode = $L + \frac{f_{1}-f_{0}}{2f_{1}-f_{0}-f_{2}} \times h$										
				$f_0 - f_2$	·						
18	$3 + \left(\frac{3}{2 \times 35}\right)$	-25-18	$) \times 6$								
	18+2.2	22 = 2	0.22								
R	RELATION OF MEAN MEDIAN & MODE										
						dían anc					
				lean - M							
_											
с.	b. Mode = 3 Medían - 2 Mean c. Both										
d.	d. None of these										
	iswer: C	1									
_	lution:										
If i	a freque	incy dí	stríbut	tion is po	sítívely	skewed,	the mean	n is are			
	<u> </u>				eater thai			<u> </u>			
				5							
QI	1.12.1f	medía	n - 20	, and me	ean-22.5	5 in a mo	deratelu	skewed			
							0				

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dístríbutíon then c	ompute approximate value of mode
a.15	b. 20
c. 25	d. 30
Answer: A	
Solutíon:	
Mean - Mode = 3(	Mean-Medían)
22.5 - Mode = 3(2	2.5 - 20)
22.5 - Mode = 7.5	,
Mode =22.5 - 7.5	
Mode = 15	
Que.13. Medían an	d mode of the wage distribution are known
Rs. 33.5 and 34 re	espectively. Find the third missing values.
Wages (Rs.)	No. of Workers
0 - 10	4
10 - 20	16
20 - 30	?
30 - 40	?
40 - 50	?
50 - 60	6
60 - 70	4
Total	230
a. 6	6.10
c. 9	d. 60
Answer: D	
Solution:	
We assume the mis	ssíng frequencíes as 20 – 30 as x, 30 – 40 i
and	
	4 + 16 + x + y + 6 + 4) = 200 - x - y.

Wages (Rs.)	d further to compute n	ússína frequencies
	No. of workers	Cumulative frequenc
X	ť	Cf
0 - 10	4	4
10 - 20	16	20
20 - 30	X	20 + x
30 - 40	у	20 + x + y
40 - 50	200 - x - y	220
50 - 60	6	226
60 - 70	4	230
	N = 230	
Apply, Medían		
	- 30) = (115 - 20 - ,	x)10
3.5y = 1150 - 20		
10х + з.5у = 95		
Apply, Mode = 3		
= 4 (3y - 200) =		
10x + 2y = 800	V	
<b>v</b>	n (íí) from equation (	()
<u> </u>		<i>v),</i>
1.5y = 150, y =	13	Rtion (i)
	m of y - too in equi	
we get 10x + 3.5(100) =	950	
10x = 950 - 350 x = 600/10 = 60		
I MIRU MISSING TR	equency - 200 - x - {	y = 200 - 60 - 100 = ·

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	we age are and at a reconstitution there the value of the median
	mean are 32.1 and 35.4 respectively, then the value of the median is
	a. 34.3     b. 33.3       c. 34     d. 33
	Answer: A
	Solution:
	Given:
	Mode = 32.1,
	Medían =?
	Mean = 35.4
	Mode = 3 Medían - 2 Mean
	$32.1 = 3 \text{ Median} - 2 \times 35.4$
	32.1 = 3  Median - 70.8 3
	Medían = 32.1 + 70.8 3 Medían = 102.9
	$=>$ Median $\frac{102.9}{3}=34.3$
	DISPERSION
1	RANGE
<u>1</u> .	Que.15. What is the coefficient of Range for the following
	distribution of weights?
	Weights in kgs: 50 - 54 55 - 59 60 - 64 65 - 69 70 - 74
	No. of Students:         12         18         23         10         3
	a. 20 b. 21
	c. 20.16 d.40.34
	Answer: C
	Solution:
	I NE LOWEST CLUSS ODUNAUVU IS 49.50 R.AS.
	The lowest class boundary is 49.50 kgs.

av	d the highest class bound	dary ís 74.50 kgs.
		.50  kgs. - 49.50  kgs. = 25  kgs.
	coefficient of Range = $\frac{7}{7}$	$\overline{4.50 + 49.50} \times 100$
=	$\frac{25}{124} \times 100$	
	124	
=:	20.16	
M	EAN DEVIATION	
<u>ה</u>	re 16 What is the mean of	deviation about mean for the followin
	umbers? 5, 8,	
	1.74, 123	b. 1.67, 12.45
	1.8, 989	d. 1.47, None
	nswer: B	
	olution:	
	<u>e mean ís gíven by</u> 5+8+10+10+12+9	
Ā	6	
	0	
=		outation of MD about AM
	X_i	$\frac{X_i - X}{X_i - X}$
5		4
8		1
10	•	1
		1
10		
	·	3
10 12 9		3 0

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	Thus mean deviation about mean is given by
	$X_i - X = \frac{\sum 10}{6}$
	= 1.67
	MD about Median
	$\frac{\text{MD about Median}}{\text{Median}} \times 100$
	8714.28 × 100
	70000 × 100
	=12.45
<u>3</u> .	QUARTILE DEVIATION
	Que.17. The wheat production (in Kg) of 20 acres is given as:,
	1320, 1040, 1080, 1200, 1440, 1360, 1680, 1730, 1785, 1342,
	1960, 1880, 1755, 1720, 1600, 1470, 1750, 1120, 1240 and
	1885. Find the quartile deviation.
	a. 246.875 b. 246
	c. 246.89 d. 1750
	Answer: A
	Solution:
	After arranging the observations in ascending order, we get 1040,
	1080, 1120, 1200, 1240, 1320, 1342, 1360, 1440, 1470, 1600,
	1680, 1720, 1730, 1750, 1755, 1785, 1880, 1885, 1960.
	$Q1 = Value of \left(\frac{n+1}{4}\right)$ th ítem
	$=$ value of $\left(\frac{20+1}{4}\right)$ th
	= $value of (5.25) th item$
	=5th ítem $+0.25$ (6th ítem $-5$ th ítem) $=1240+0.25(1320-1240)$
	Q1=1240+20=1260
	n+1
	$Q3 = \forall alue of 3(\frac{n+1}{4}) th item$
<u> </u>	= value of $3\left(\frac{20+1}{4}\right)$ th item

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	= $\vee$ alue of (15.75)th ítem
	=15th ítem $+0.75(16$ th ítem $-15$ th ítem) $=1750$
	Q3=1750+3.75=1753.75
	$Q_{1} = Q_{3} - Q_{1} = 1753.75 - 1260 = 492.75$
	$Q. D. = \frac{1}{2} = \frac{1}{2} = \frac{1}{2}$
	=246.875
<u>4</u> .	STANDARD DEVIATION
	Que.18. If the S.D. of the 1st n natural Nos. is $\sqrt{30}$ , Then the value
	ofnís
	a. 19 b. 20
	c. 21 d. None
	Answer: A Solutíon:
	Solucion: S.D of Fírst 'n' natural
	$\frac{1}{n^2 - 1}$
	$=\frac{n^2-1}{12}$
	$n^2 - 1$
	$\sqrt{30} = \sqrt{\frac{n^2 - 1}{12}}$
	On squaring both side $30 = \frac{n^2 - 1}{12}$
	Numbers: $360 = n^2 - 1$
	$n^2 = 360 \pm 1$
	$n^2 = 361$
	$n = \sqrt{361}$
	n = 19
	Que.19. Standard Deviation for the marks obtained by a student in
	test in mathematic (out of 50) as 30, 35, 25, 20, 15 is

			Chapter 15
a. 25		6. 150	
c. 130		d. 50	
Answer: B			
Solutíon:			
Gíven data's ar	re		
15, 20, 25, 30,	35		
		$\frac{5+30+35}{5} = \frac{12}{5}$	.5
Mean $(X) = \frac{1}{N}$	=5	=5	— = 5
For S.D			
X	$\overline{X}$	$d = x - \overline{X}$	d <sup>2</sup>
15	25	-10	100
20	25	-5	25
25	25	0	0
30	25	5	25
35	25	10	100
N=5			$\sum d^2 = 250$
$\sum d^2$	250		
$SD = \sqrt{\frac{2\pi}{N}} = \sqrt{\frac{2\pi}{N}}$	5		
$=\sqrt{50}$			

Que.1. What is the probability of havin throws of a project die? a. 5/6 b. (5/	x
Que.1. What is the probability of havin throws of a project die?a. 5/6b. (5/c. 1-(1/6)3d. 1Answer: DSolution:For a die Probability of getting Six $P(A) = \frac{1}{6} \rightarrow p$ $P(\overline{A}) = 1 - \frac{1}{6} = \frac{5}{6} \rightarrow q$ Here $n = 3$ $P(getting at least '1' Six) = P(X>1)$ $= 1-P(X<1)$ $= 1-P(X<1)$ $= 1-P(X=0)$ $= 1-3c_0 \cdot \left[\frac{1}{6}\right]^0 \cdot \left(\frac{1}{6}\right)^{3-0}$ $Que.2. A coin is tossed six times, then theheads and tells alternatively isa. 1/2b. 1/64c. 1/32d. 1/16Answer: CSolution:If one coin is tossed '6' timesP(H) = 1/2, P(T) = 1/2$	x
throws of a project die? a. 5/6 b. (5/ c. 1-(1/6)3 d. 1 Answer: D Solution: For a die Probability of getting Six $P(A) = \frac{1}{6} \rightarrow p$ $P(\overline{A}) = 1 - \frac{1}{6} = \frac{5}{6} \rightarrow q$ Here $n = 3$ P(getting at least '1' Six) = P(X>1) = 1-P(X<1) = 1-P(X<1) = 1-P(X=0) $= 1-3c_0 - \left[\frac{1}{6}\right]^0 - \left(\frac{1}{6}\right)^{3-0}$ $= 1-3c_0 - \left[\frac{1}{6}\right]^0 - \left(\frac{1}{6}\right)^{3-0}$ Que.2. A coin is tossed six times, then theheads and tells alternatively is a. 1/2 b. 1/64 c. 1/32 d. 1/16 Answer: C Solution: If one coin is tossed '6' times $P(H) = 1/2, P(T) = 1/2$	x
a. 5/6b. (5)c. 1-(1/6)3d. 1-1Answer: DSolution:For a die Probability of getting Six $P(A) = \frac{1}{6} \rightarrow p$ $P(\bar{A}) = 1 - \frac{1}{6} = \frac{5}{6} \rightarrow q$ Here $n = 3$ $P(getting at least '1' Six) = P(x>1)$ $= 1-P(x<1)$ $= 1-P(x<1)$ $= 1-P(x<0)$ $= 1-P(x<1)$ $= 1-P(x<1)$ $= 1-P(x<1)$ $= 1-1 \times 1 \times \left[\frac{5}{6}\right]^3 = 1 - \left[\frac{5}{6}\right]^3$ $que.2. A coin is tossed six times, then the heads and tells alternatively isa. 1/2b. 1/64c. 1/32d. 1/16Answer: CSolution:If one coin is tossed '6' timesP(H) = 1/2, P(T) = 1/2$	l. 1-(5/6)3 X
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Solution: If one coin is tossed '6' times P(H) = 1/2, P(T) = 1/2	/16
If one coin is tossed '6' times P(H) = 1/2, P(T) = 1/2	
P(H) = 1/2, P(T) = 1/2	
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	Chapter 16
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	$\frac{1}{64} + \frac{1}{64} = \frac{2}{64} = \frac{1}{32}$
<u>2</u> .	CLASSICAL DEFINITION OF PROBABILITY OR A
	PRIOR DEFINITION
	Que.3. Tickets numbered 1 to 20 are mixed up and then a ticket i
	drawn at random. What is the probability that the ticket drawn
	has a number which is a multiple of 3 or 5?
	a. 1/2 0. 3/5
	c. 9/20 d. 8/15
	Answer: C
	Solution:
	Here, $S = \{1, 2, 3, 4,, 19, 20\}.$
	Let $E = event$ of getting a multiple of 3 or 5
	$= \{3, 6, 9, 12, 15, 18, 5, 10, 20\}.$
	P(E) = n(E)/n(S) = 9/20.
	Que to Que en el construction de la construction de
	Que.4. One card is drawn at random from a pack of 52 cards.
	What is the probability that the card drawn is a face card (Jack,
	Queen and King only)?
	a. 3/13 b. 1/13
	c. 3/52 d. 9/52
	Answer: D
	Solution:
	Clearly, there are 52 cards, out of which there are 12 face cards.
	P (getting a face card) = $12/52=3/13$ .

	Chapter 16
OUR E TÍARNA DRI	concernation and Recit down of
	sons among whom are A and B, sit down at Id table. The probability that there are 4 person
between A and B,	$\mathbf{\tilde{s}}$
0.1/3	b. 2/3
	d. 1/7
c. 2/7 Answer: D	V. 1/ J
Solution:	
	Least at the yound table
	j seat at the round table.
	seats available for B.
	our persons between A and B
$\sim$	two ways to sít, as show in the fig.
Que.6. A bag con	robabílíty 2/14=1/7 taíns 8 red and 7 black balls. Two balls are 1. The probabílíty that both the balls are of the
Que.6. A bag con drawn at randon same colour ís	taíns 8 red and 7 black balls. Two balls are 1. The probabílíty that both the balls are of the
Que.6. A bag con drawn at randon same colour ís a. 14/15	taíns 8 red and 7 black balls. Two balls are 1. The probabílíty that both the balls are of the b. 11/15
Que.6. A bag con drawn at randon same colour ís a. 14/15 c. 7/15	taíns 8 red and 7 black balls. Two balls are 1. The probabílíty that both the balls are of the
Que.6. A bag con drawn at randon same colour ís a. 14/15 c. 7/15 Answer: C	taíns 8 red and 7 black balls. Two balls are 1. The probabílíty that both the balls are of the b. 11/15
Que.6. A bag con drawn at randon same colour ís a. 14/15 c. 7/15 Answer: C Solutíon:	taíns 8 red and 7 black balls. Two balls are L. The probability that both the balls are of the b. 11/15 d. 4/15
Que.6. A bag con drawn at randon same colour ís a. 14/15 c. 7/15 Answer: C Solutíon: Requíred probabí	tains 8 red and 7 black balls. Two balls are L. The probability that both the balls are of the b. 11/15 d. 4/15 lity = Either the balls are red or the balls are b
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$\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $\frac{6+4-3}{12} = \frac{7}{12}$ $\frac{7}{12} = \frac{12}{12}$ Que.9. If P(AUB) = 0.8 and P(A ∩ B) = 0.3, then P( $\bar{A}$ ) + P( $\bar{B}$ ) equal to $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2} + \frac{1}{2$		Chapter 16
b. P (A U B) = P(A) × P(B/A) c. P (A ∩B) = P(A) × P(B) d. P (A U B) = P(A) + P(B) - P(A ∩ B) Answer: A Solution: The theorem of compound probability states that for only eve an B given by P (A∩B) = P(A) × P(B/A) Que.8. If P(A) = $\frac{1}{2}$ , P(B) = $\frac{1}{3}$ , and P(A∩B) = $\frac{1}{4}$ , then P(AUB) is equal to a. 11/12 b. 10/12 c. 7/12 d. 1/6 Answer: C Solution: P(A) = $\frac{1}{2}$ , P(B) = $\frac{1}{3}$ , and P(A∩B) = $\frac{1}{4}$ We know that P(AUB) = P(A) + P(B) - P(A∩B) $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ Set $\frac{1}{2} + \frac{7}{3} - \frac{7}{12}$ Que.9. If P(AUB) = 0.8 and P(A∩B) = 0.3, then P( $\overline{A}$ ) + P( $\overline{B}$ ) equal to a. 0.3 b. 0.5 c. 0.7 d. 0.9 Answer: D		
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d. $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ Answer: A Solution: The theorem of compound probability states that for only eve an B given by $P(A \cap B) = P(A) \times P(B/A)$ Que.8. If $P(A) = \frac{1}{2}$ , $P(B) = \frac{1}{3}$ , and $P(A \cap B) = \frac{1}{4}$ , then $P(A \cup B)$ is equal to a. 11/12 b. 10/12 b. 10/12 c. $\frac{7}{12}$ d. 1/6 Answer: C Solution: $P(A) = \frac{1}{2}$ , $P(B) = \frac{1}{3}$ , and $P(A \cap B) = \frac{1}{4}$ We know that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ Set $\frac{1}{2} - \frac{7}{12}$ Que.9. If $P(A \cup B) = 0.8$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ equal to a. 0.3 b. 0.5 c. 0.7 d. 0.9 Answer: D		
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Solution: The theorem of compound probability states that for only eve an B given by P (A \(\mathbf{B}\)) = P(A) x P(B/A) Que.8. If P(A) = $\frac{1}{2}$ , P(B) = $\frac{1}{3}$ , and P(A \(\mathbf{B}\)) = $\frac{1}{4}$ , then P(AUB) is equal to a. 11/12 b. 10/12 b. 10/12 c. $\frac{7}{12}$ d. 1/6 Answer: C Solution: P(A) = $\frac{1}{2}$ , P(B) = $\frac{1}{3}$ , and P(A \(\mathbf{B}\)) = $\frac{1}{4}$ We know that P(A \(\mathbf{B}\)) = P(A) + P(B) - P(A \(\mathbf{B}\)) $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ Self P(AUB) = 0.8 and P(A \(\mathbf{B}\)) = 0.3, then P(\(\bar{A}\)) + P(\(\bar{B}\)) equal to a. 0.3 b. 0.5 c. 0.7 d. 0.9 Answer: D		<u>- P(B) - P(A [] B)</u>
The theorem of compound probability states that for only eve an B given by P (A \B) = P(A) x P(B/A) Que.8. If P(A) = $\frac{1}{2}$ , P(B) = $\frac{1}{3}$ , and P(A \B) = $\frac{1}{4}$ , then P(AUB) is equal to a. 11/12 b. 10/12 c. 7/12 d. 1/6 Answer: C Solution: P(A) = $\frac{1}{2}$ , P(B) = $\frac{1}{3}$ , and P(A \B) = $\frac{1}{4}$ we know that P(AUB) = P(A) +P(B) - P(A \B) $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ Sue.9. If P(AUB) = 0.8 and P(A \B) = 0.3, then P(\bar{A}) + P(\bar{B}) equal to a. 0.3 b. 0.5 c. 0.7 d. 0.9 Answer: D		
an B given by P (A \beta B) = P(A) x P(B/A) Que.8. If P(A) = $\frac{1}{2}$ , P(B) = $\frac{1}{3}$ , and P(A \beta B) = $\frac{1}{4}$ , then P(AUB) is equal to a. 11/12 b. 10/12 b. 10/12 c. 7/12 d. 1/6 Answer: C Solution: P(A) = $\frac{1}{2}$ , P(B) = $\frac{1}{3}$ , and P(A \beta B) = $\frac{1}{4}$ We know that P(A U B) = P(A) +P(B) - P(A \beta B) $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $\frac{644-3}{12} = \frac{7}{12}$ Que.9. If P(AUB) = 0.8 and P(A \beta B) = 0.3, then P(\beta) + P(\beta B) equal to a. 0.3 b. 0.5 c. 0.7 d. 0.9 Answer: D		
Que.8. If $P(A) = \frac{1}{2}$ , $P(B) = \frac{1}{3}$ , and $P(A \cap B) = \frac{1}{4}$ , then $P(A \cup B)$ is equal to $P(A \cup B)$ is equal to $P(A \cup B) = \frac{1}{2}$ , $P(B) = \frac{1}{3}$ , and $P(A \cap B) = \frac{1}{4}$ $P(A) = \frac{1}{2}$ , $P(B) = \frac{1}{3}$ , and $P(A \cap B) = \frac{1}{4}$ $P(A) = \frac{1}{2}$ , $P(B) = \frac{1}{3}$ , and $P(A \cap B) = \frac{1}{4}$ $P(A) = \frac{1}{2}$ , $P(B) = \frac{1}{3}$ , and $P(A \cap B) = \frac{1}{4}$ $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $P(A \cup B) = \frac{1}{2}$ , $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $P(A \cup B) = \frac{1}{2}$ , $P(A \cup B) = \frac{1}{3}$ , and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ $P(A \cup B) = 0.8$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ $P(A \cup B) = 0.8$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ $P(A \cup B) = 0.3$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ $P(A \cup B) = 0.3$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ $P(A \cup B) = 0.3$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ $P(A \cup B) = 0.3$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ $P(A \cup B) = 0.3$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ $P(A \cup B) = 0.3$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ $P(A \cup B) = 0.3$ and $P(A \cap B) = 0.3$ .		
P(AUB) is equal to a. 11/12 b. 10/12 b. 10/12 c. 7/12 d. 1/6 Answer: C Solution: P(A) = $\frac{1}{2}$ , P(B) = $\frac{1}{3}$ , and P(A∩B) = $\frac{1}{4}$ We know that P(AUB) = P(A) +P(B) - P(A∩B) $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $\frac{6+4-3}{12} = \frac{7}{12}$ Que.9. If P(AUB) = 0.8 and P(A∩B) = 0.3, then P( $\bar{A}$ ) + P( $\bar{B}$ ) equal to a. 0.3 b. 0.5 b. 0.5 c. 0.7 d. 0.9 Answer: P	an B given by P (AN E	$B = P(A) \times P(B/A)$
P(AUB) is equal to a. 11/12 b. 10/12 b. 10/12 c. 7/12 d. 1/6 Answer: C Solution: P(A) = $\frac{1}{2}$ , P(B) = $\frac{1}{3}$ , and P(A∩B) = $\frac{1}{4}$ We know that P(AUB) = P(A) +P(B) - P(A∩B) $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $\frac{6+4-3}{12} = \frac{7}{12}$ Que.9. If P(AUB) = 0.8 and P(A∩B) = 0.3, then P( $\bar{A}$ ) + P( $\bar{B}$ ) equal to a. 0.3 b. 0.5 b. 0.5 c. 0.7 d. 0.9 Answer: P	$\overline{\rho}$	$(\mathbf{P}) = \frac{1}{2}$ and $\mathbf{P}(\mathbf{A} \cap \mathbf{P}) = \frac{1}{2}$ then
a. 11/12       b. 10/12         c. $7/12$ d. 1/6         Answer: C       Solution: $P(A) = \frac{1}{2}$ , $P(B) = \frac{1}{3}$ , and $P(A \cap B) = \frac{1}{4}$ we know that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $6+4-3 = \frac{7}{12} = \frac{7}{12}$ Que.9. If $P(A \cup B) = 0.8$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ equal to         a. 0.3       b. 0.5         b. 0.7       d. 0.9         Answer: D	-	$\frac{1}{3}$ $\frac{1}$
c. $7/12$ Answer: C Solution: $P(A) = \frac{1}{2}, P(B) = \frac{1}{3}, and P(A \cap B) = \frac{1}{4}$ We know that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $\frac{6+4-3}{12} = \frac{7}{12}$ Que.g. If $P(A \cup B) = 0.8$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ equal to a. 0.3 b. 0.5 c. 0.7 Answer: D	L L	
Answer: C Solution: $P(A) = \frac{1}{2}, P(B) = \frac{1}{3}, and P(A \cap B) = \frac{1}{4}$ We know that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $\frac{6+4-3}{12} = \frac{7}{12}$ Que.9. If $P(A \cup B) = 0.8$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ equal to a. 0.3 b. 0.5 b. 0.5 c. 0.7 d. 0.9 Answer: D		
Solution: $P(A) = \frac{1}{2}, P(B) = \frac{1}{3}, \text{ and } P(A \cap B) = \frac{1}{4}$ We know that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $\frac{6+4-3}{12} = \frac{7}{12}$ Que.9. If $P(A \cup B) = 0.8$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ equal to a. 0.3 b. 0.5 b. 0.7 Answer: D		a. 1/6
$P(A) = \frac{1}{2}, P(B) = \frac{1}{3}, \text{ and } P(A \cap B) = \frac{1}{4}$ We know that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $\frac{6+4-3}{12} = \frac{7}{12}$ Que.9. If $P(A \cup B) = 0.8$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ equal to a. 0.3 b. 0.5 c. 0.7 d. 0.9 Answer: D		
We know that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $1 + \frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $6+4-3 - \frac{7}{12} - \frac{7}{12}$ $Que.9. \text{ If } P(A \cup B) = 0.8 \text{ and } P(A \cap B) = 0.3, \text{ then } P(\overline{A}) + P(\overline{B})$ equal to a. 0.3 b. 0.5 b. 0.7 d. 0.9 Answer: D		1
$\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $\frac{6+4-3}{12} = \frac{7}{12}$ $\frac{7}{12} = \frac{7}{12}$ $\frac{2}{12}$	$\mathbb{P}(A) = \frac{1}{2}, \mathbb{P}(B) = \frac{1}{3}$	and $P(A \cap B) = \frac{-}{4}$
$\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ $\frac{6+4-3}{12} = \frac{7}{12}$ $\frac{7}{12} = \frac{7}{12}$ $\frac{2}{12}$	We by ow that D(AUF	$\mathbf{R} = \mathcal{P}(\mathbf{A}) + \mathcal{P}(\mathbf{R}) - \mathcal{P}(\mathbf{A} \cap \mathbf{R})$
$2 + 3 - 4$ $\frac{6+4-3}{12} - \frac{7}{12}$ $2 + 3 - 4$ $\frac{6+4-3}{12} - \frac{7}{12}$ $2 + 3 - 4$ $\frac{7}{12} - 12$ $2 + 3 - 4$ $2 + 3 - 4$ $\frac{7}{12} - 12$ $2 + 3 - 4$ $2 + $		
12       12         12       12         Que.9. If $P(AUB) = 0.8$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ equal to         a. 0.3       b. 0.5         b. 0.7       d. 0.9         Answer: D	$\frac{1}{2} + \frac{1}{3} - \frac{1}{4}$	
Que.9. If $P(AUB) = 0.8$ and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$ equal to a. 0.3 b. 0.5 c. 0.7 Answer: D	6+4-3 7	
equal to a. 0.3 b. 0.5 c. 0.7 d. 0.9 Answer: D		
equal to a. 0.3 b. 0.5 c. 0.7 d. 0.9 Answer: D		
equal to a. 0.3 b. 0.5 c. 0.7 d. 0.9 Answer: D	Que.9.1fP(AUB) = 0.8	and $P(A \cap B) = 0.3$ , then $P(\overline{A}) + P(\overline{B})$
a. 0.3 b. 0.5 c. 0.7 d. 0.9 Answer: D		
c. 0.7 d. 0.9 Answer: D	·	b. 0.5
Answer: D		
	Answer: D	
	Solution:	

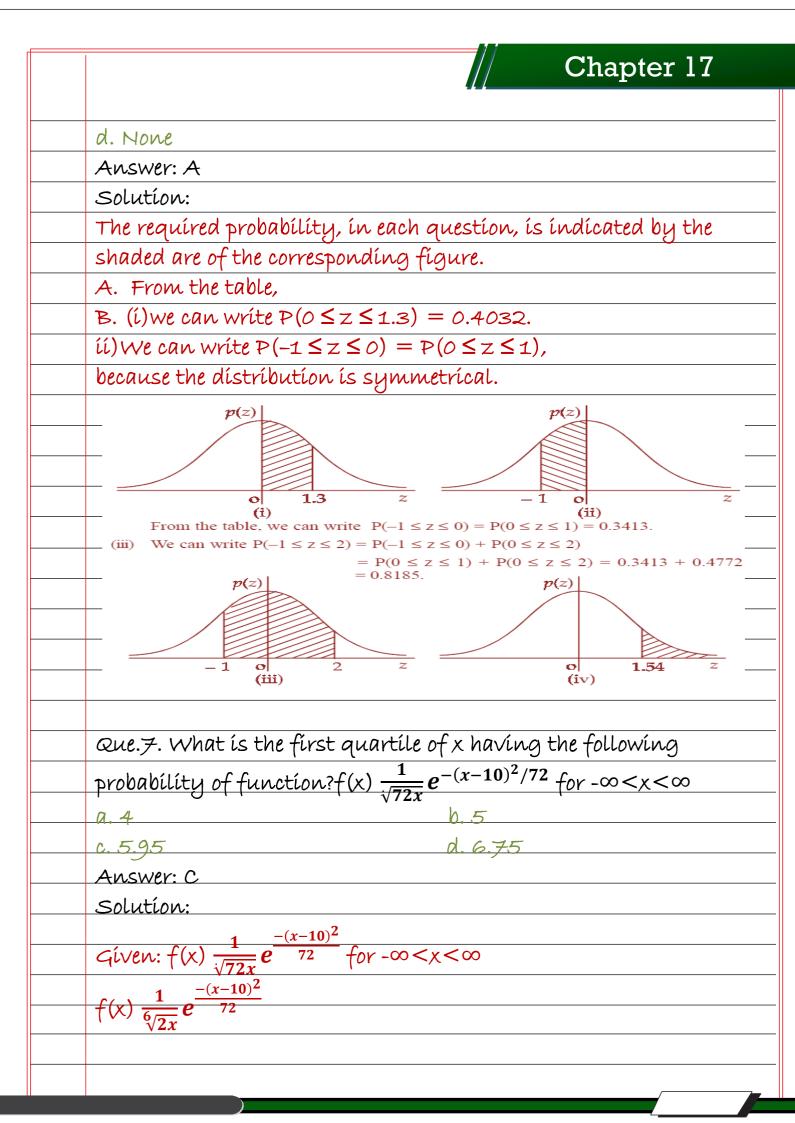
	// Chapter 16
Gíven	
P(AUB) = 0.8 a	and $P(A \cap B) = 0.3$
We know that, 7	$P(AUB) = P(A) + P(B) - P(A \cap B)$
0.8 = [1-P(A)]	[+ [1-P(B)]-0.3
$P(\bar{A}) + P(\bar{B}) = z$	2-0.3-0.8
$P(\bar{A}) + P(\bar{B}) = a$	
Que.10. Sum of	all probabilities mutually exclusive and exhaustiv
events ís equal t	
a. 0	0. 1/2
C. 1/4	d. 1
Answer: D	
Solutíon:	
Sum of all probe	abilities mutually exclusive and exhaustive events
ís equal to 1	
3. RANDOM V	
	e of a random variable x is given by
a. E (X-µ) <sup>2</sup>	b. E[X-E (X)] <sup>2</sup>
c. E (X2-µ)	d. (a)or (b)
Answer: D	
Solution:	
Variance of a rai	ndom variable x is given by $\vee(x) = \in (X-\mu)^2$
	Or NTO
$\wedge(\mathbf{x}) = [\mathbf{E}(\mathbf{X} - \mathbf{E})]$	x)] <sup>2</sup>
-	indom variables x and y are related by $Y=2-3x$ ,
then the SD of y	
a3 × SD of x	b. 3× SD of x
c.g X SD of X	d. 2 XSD of X

		 Chapter 16
	iswer: B	
SO	lution:	
- Gív	ven Equation	
y=	$= 2-3x$ $= \frac{-3}{\text{coefficient of } x} = \frac{-3}{1} = -3$	
b=	$\frac{-\text{coefficient of x}}{-3} = \frac{-3}{-3}$	
	coefficient of y 1	
S.I	D of y=  b  S.D of x  -3 . SD of x	 
=	-3. SD of X	
= :	3XSD of X	

	Chapter 17
1	BINOMIAL DISTRIBUTION
<u> </u>	
	Que.1. The variance of a binomial distribution with parameters n
	and p ís:
	a. $np^2(1-p)$ b. $nq(1-q)$
	c. $\sqrt{np - (1-p)}$ d. $n^2 p^2 (1-p)^2$
	Answer: C
	Solutíon:
	= npq
	= nqp
	= nq(1-q)
	Que.2. In a Binomial Distribution, if p, q and n are probability of
	success, failure and number of trials respectively then variance is
	given by
	a. np b. npq
	c. np²q d. npq² Answer: C
	Answer: C Solutíon:
	For a discrete probability function, the variance is given by
	n
	$Variance(V) = \sum x^2 p(x) - \mu^2$
	x=0
	Where $\mu$ is the mean, substitute $P(x) = nCx px q(n-x)$ in the above equation
	and put $\mu =$ np to obtain
	V = npq
	Que.3. In a Binomial Distribution, if $p = q$ , then $P(X = x)$ is
	given by

	Chapter 17
a. <sup>n</sup> C <sub>x</sub> (0.5) <sup>n</sup>	b. <sup>n</sup> C <sub>n</sub> (0.5) <sup>n</sup>
c. ${}^{n}C_{x} P^{(n-x)}$	d. ${}^{n}C_{n} p^{(n-x)}$
Answer: A	
Solution:	
If $p = q$ , then $p = 0.5$	
Substituting in $P(x) =$	$^{n}C_{x} p^{x} q^{(n-x)}$ we get $^{n}C_{n} (0.5)^{n}$ .
POISSION DIST	RIBUTION
	ríate X, $P(X=2)=3P(X=4)$ , then the
standard deviation of	
a. 2	6.4
c. 12	d. 3
Answer: C	
Solution:	
For Poisson Variate X,	
$\frac{e^m m^2}{2} = \frac{3e^{-m}m^4}{2}$	
$\frac{2!}{m^2} = \frac{4!}{3m^4}$	
$\frac{m^2}{2} = \frac{3m^4}{24}$	
$6m^4 = 24m^2$	
$m^2 = \frac{24}{6}$	
$m^2 = 4$	
m=2	
S.D. = $\sqrt{m} = \sqrt{2}$	
Que.5. A man was able	: to complete з files a day on an average
Find the probability the	at he can complete 5 files the next day
a. 0.108	b. 0.1008

	Chapter 17
	Answer: C
	Solution:
	Here we know this is a Poisson experiment with following values
	given:
	$\mu=$ 3, average number of files completed a day
	x = 5, the number of files required to be completed next day
	And $e = 2.71828$ being a constant
	On substituting the values in the Poisson distribution formula
	mentioned above
	we get the Poisson probability in this case
	We get,
	$P(\mathbf{x},\boldsymbol{\mu}) = \frac{(e^{-\boldsymbol{\mu}})(\boldsymbol{\mu}^{\mathbf{x}})}{r!}$
	$(2.71828)^{-3}(3^5)$
	$\rightarrow P(5,3) = \frac{(2.71828)^{-3}(3^5)}{5!}$
	= 0.1008 approximately.
	Hence the probability for the person to complete 5 files the next da is 0.1008 approximately.
<u>3</u> .	Hence the probability for the person to complete 5 files the next da
<u>3</u> .	Hence the probability for the person to complete 5 files the next da is 0.1008 approximately. <u>NORMAL DISTRIBUTION</u>
<u>3</u> .	Hence the probability for the person to complete 5 files the next da is 0.1008 approximately. NORMAL DISTRIBUTION Que.6. Using the table of areas under the standard normal curve,
<u>3</u> .	Hence the probability for the person to complete 5 files the next da is 0.1008 approximately. NORMAL DISTRIBUTION Que.6. Using the table of areas under the standard normal curve, find the following probabilities :
<u>3</u> .	Hence the probability for the person to complete 5 files the next da is 0.1008 approximately. <b>NORMAL DISTRIBUTION</b> Que.6. Using the table of areas under the standard normal curve, find the following probabilities : $P(0 \le z \le 1.3)$
<u>3</u> .	Hence the probability for the person to complete 5 files the next da is 0.1008 approximately. NORMAL DISTRIBUTION Que.6. Using the table of areas under the standard normal curve, find the following probabilities : $P(0 \le z \le 1.3)$ $P(-1 \le z \le 0)$
<u>3</u> .	Hence the probability for the person to complete 5 files the next da is 0.1008 approximately. <b>NORMAL DISTRIBUTION</b> Que.6. Using the table of areas under the standard normal curve, find the following probabilities : $P(0 \le z \le 1.3)$
<u>3</u> .	Hence the probability for the person to complete 5 files the next da is 0.1008 approximately. NORMAL DISTRIBUTION Que.6. Using the table of areas under the standard normal curve, find the following probabilities : $P(0 \le z \le 1.3)$ $P(-1 \le z \le 0)$ $P(-1 \le z \le 12)$ a. 0.4032, 0.3413,0.8185
<u>3</u> .	Hence the probability for the person to complete 5 files the next da is 0.1008 approximately. NORMAL DISTRIBUTION Que.6. Using the table of areas under the standard normal curve, find the following probabilities : $P(0 \le z \le 1.3)$ $P(-1 \le z \le 0)$ $P(-1 \le z \le 12)$



	Chapter 17
$\frac{-(x-\mu)^2}{2}$	
$f(x) \frac{1}{\sqrt[6]{2x}} e^{\frac{-(x-\mu)^2}{20^{-2}}}$	
We get	
$\sigma=6$ , $\mu=$ 10	
First quartile $Q_1 = \mu - 0.67$	5 <b>0</b>
= 10-0.675×6	
= 10-4.05	
= 5.95	
-	
Que.8. If for a normal distrib	oution $Q_1 = 54.52$ and $Q_3 = 78.86$
then the median of the distrib	oution is
a. 12.17	b. 39.43
c. 66.69	d. None
Answer: C	
Solutíon:	
Q1 = 54.52 and	Q3 = 78.86
We know that	
$Q1 = \mu$ -0.675 = 54.52	(1)
$Q3 = \mu - 0.675 = 78.86$	(2)
on Adding	
2µ = 133.38	
$\mu = 133.38/2$	
$\mu = 66.69$	
In normal Distribution Mea	n, Medían and Mode are equal.
So, Medían = Mean = 66.3	369

<u></u>	COR	RELA	TION	<u> </u>						
					COEFFI		_ , ,			
					hows the					
		-			9 people. 1	-ind the	correla	tion co	pettici	ent o
l	nter.		our res							
_		68	72	65	70	62	75	78	64	68
	<i>y</i>	90	85	88	100	105	98	70	65	72
0		70	00		700	100	70	70	00	12
6	a. 0.1	5				b. 0	.56			
	20.					d. c				
		wer: C	•							
		tion:								
Y	'ou n	лауи	se the	facts t	hat (doul	le check	this fo	or pract	tice)	
				•	$x^2 = 43,206,$		•			
	- · ·	e the nu								
	$n\sum(x)$	y)-( <u>)</u>	x) (∑y)	= 9 - 53336	6 <b>- 622 · 773</b> = -	782				
	[		_	$\frac{1}{2} - \left(\sum y\right)^2$	•					
1	ш <u>С</u> х			( <u>_</u> _y)_						
=	$=\sqrt{9}$	.4320	6 – (62	$(2)^2 \cdot \sqrt{9}$	9.68007 —	$(773)^2$				
				= 535		<b>``</b>				
					$\frac{782}{0.89} = -0.1$	5				
	,			535	0.89					
0	Rue.:	2. If t	he corr	elation	l coefficie	nt betwee	en the v	/aríabl	.e X av	rd Y
					r between					
	7.1					b. 0.5			0	
0	20.	5				d. 0				

Solution	A:							
	cient of cor	relation	rxu = c	).5				
• • • •	$= 2x - 4 a_1$							
	=0 an		0					
$h = \frac{-coe}{2}$	fficient of u	$\sim$	$d = \frac{-co}{co}$	efficio	ent of v			
<b>coef</b>	ficient of x		coe	fficie	nt of y			
$b = \frac{1}{2}$		(	$d = \frac{-1}{2}$					
Here, b a	and d both	have díf	ferent sí	ign sc	, γ <sub>ων</sub> = .	-γ <sub>×μ</sub> =	0.5	
			•					
<u>(B) PE</u>	ARSON'S	5 CORR	ELATI	<u>ON (</u>	<u>COEFF</u>	ICIE	<u>NT</u>	
Que.3. Th	e following	data relat	te to the te	st sco	res obtai	ined bu	eíght s	ales
	itude test ar					0	, -	
	1	2	3 1	4	5	6	7	ć
scores ;	60	55	62	56	62	64	70	
Sales ;	31	28	26 2	24	30	35	28	L
a.45				b. 56	. ?			
c. 43.5 d. 0.48								
0.73.3								
Answer:								
Answer: Solutíon	N: As $b = \frac{24+3}{2}$							
Answer: Solutíon Scores (x <sub>i</sub> )	$h: As \ b = \frac{24+3}{2}$ Sales in	u <sub>i</sub> = x <sub>i</sub> -6	62 $\mathbf{v_i} = \mathbf{y}$	7 <sub>i</sub> –30	uiv (5)=(2)w		u <sup>2i</sup>	
Answer: Solutíon	N: As $b = \frac{24+3}{2}$		62 v <sub>i</sub> = y (4	7 <u>i</u> –30 4)	u <sub>i</sub> v (5)=(3)x(		u <sup>2 i</sup> (6)=(3) <sup>2</sup>	(7
Answer: Solutíon Scores (x <sub>i</sub> )	$h: As \ b = \frac{24+3}{2}$ Sales in $1000$	u <sub>i</sub> = x <sub>i</sub> -6	62 v <sub>i</sub> = y (4	7 <u>i</u> -30 4)	uiv (5)=(3)x( -2	(4) (	u <sup>2i</sup> (6)=(3) <sup>2</sup> 4	(7
Answer: Solutíon Scores (x <sub>i</sub> ) (1)	$N: \frac{As \ b}{2} = \frac{24+3}{2}$ Sales in `1000 (y_i) (2)	u <sub>i</sub> = x <sub>i</sub> -6 (3)	('	7 <u>i</u> -30 4)	(5)=(3)×(	( <sup>4)</sup> (	(6)=(3) <sup>2</sup>	(7
Answer: Solutíon Scores (x <sub>i</sub> ) (1) 60	$N: As b = \frac{24+3}{2}$ Sales in `1000 (y <sub>i</sub> ) (2) 31	$u_i = x_i - (3)$	('	7 <u>i</u> -30 4)	(5)=(3)x(	( <sup>4</sup> ) ( 4	(6)=(3) <sup>2</sup> 4	(7
Answer: Solutíon Scores (x <sub>i</sub> ) (1) 60 55	$h: A_{s} b = \frac{24+3}{2}$ Sales in `1000 (y_i) (2) 31 28	$u_i = x_i - (3)$ -2 -7	(4 1 -2	7 <u>i</u> -30 4)	(5)=(3)×( -2 14	( <sup>4</sup> ) ( 4 4 (	(6)=(3) <sup>2</sup> 4 49	(7 1 4
Answer: Solutíon Scores (x <sub>i</sub> ) (1) 60 55 62	$h: A_{s} b = \frac{24+3}{2}$ Sales in `1000 (y_i) (2) 31 28 26	$u_i = x_i - (3)$ -2 -7 0	(* 1 -2 -4	7 <u>i</u> -30 4)	(5)=(3)×( -2 14 0	(4) ( 4 4 ( 0 5	(6)=(3) <sup>2</sup> 4 49 D	1 4 16
Answer: Solution Scores (x;) (1) 60 55 62 56	$A: As b = \frac{24+3}{2}$ Sales in `1000 (y <sub>i</sub> ) (2) 31 28 26 24	$ \begin{array}{c} \mathbf{u_{i}} = \mathbf{x_{i}} - (6) \\ (3) \\ -2 \\ -7 \\ 0 \\ -6 \\ \end{array} $	(* 1 -2 -4 -6	7 <sub>1</sub> -30 4)	(5)=(3)×( -2 14 0 36	( <sup>4</sup> ) ( 4 4 ( 1 5 ( 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(6)=(3) <sup>2</sup> 4 49 0 36	(7 1 4 16 36
Answer: Solution Scores (xi) (1) 60 55 62 56 62	$h: As b = \frac{24+3}{2}$ Sales in `1000 (yi) (2) 31 28 26 24 30	$ \begin{array}{c} \mathbf{u_i} = \mathbf{x_i} - (6) \\ (3) \\ \hline -2 \\ -7 \\ 0 \\ \hline -6 \\ \hline 0 \\ \end{array} $	(* 1 -2 -4 -6 0	7 <sub>i</sub> -30 4)	(5)=(3)×( -2 14 0 36 0	(4) ( 4 4 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	(6)=(3) <sup>2</sup> 4 49 0 36 0	(7 1 4 16 36 0
Answer: Solution Scores (x;) (1) 60 55 62 56 62 62 64	$A: As b = \frac{24+3}{2}$ Sales in `1000 (yi) (2) 31 28 26 24 30 35	$ \begin{array}{c} \mathbf{u_{i}} = \mathbf{x_{i}} - (6) \\ (3) \\ -2 \\ -7 \\ 0 \\ -6 \\ 0 \\ 2 \end{array} $	(* 1 -2 -4 -6 0 5	7i -30 4)	(5)=(3)×( -2 14 0 36 0 10	(4) ( 4 4 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	(6)=(3) <sup>2</sup> 4 49 0 36 0 4	(7 1 4 16 36 0 25

$\frac{8 \times 90 - (-13) \times (-14)}{\sqrt{8 \times 221 - (-13)^2} \times \sqrt{8 \times 122 - (-14)^2}} = \frac{538}{\sqrt{1768 - 169} \times \sqrt{976 - 196}} = 0.48$ (C) PROBABLE ERROR Que.4. If $r = 0.7$ ; and $n = 64$ find out the probable error of coefficient of correlation a. 0.043 b. 0.43 c. 0.747, 0.657 c. 0.747, 0.657 c. 0.657 c. 0.6745) $\times (0.06375) = 0.043$ (D) RANK CORRELATION Que.5. Three competitors in a contest are ranked by two judg order 1,2,3 and 2,3,1 respectively. Calculate the Spearman's correlation coefficient. a0.5 c. 0.8 c. 0.7 c	origin, we have $= \frac{8 \times 90 - (-13) \times (-1)}{\sqrt{8 \times 221 - (-13)^2} \times \sqrt{8 \times 12}}$ (C) PROBABLE ER		F20	due to chan
origin, we have $= \frac{8 \times 90^{-}(-13) \times (-14)}{\sqrt{8 \times 221^{-}(-13)^2} \times \sqrt{8 \times 122^{-}(-14)^2}} = \frac{538}{\sqrt{1768 - 169 \times \sqrt{976 - 196}}} = 0.48$ (C) PROBABLE ERROR Que.4. If $r = 0.7$ ; and $n = 64$ find out the probable error of coefficient of correlation a. 0.043 b. 0.43 c. 0.747, 0.657 d. 0.7 Answer: A Solution: $r = 0.7$ ; $m = 64$ Probable Error (P.E.) = $0.6745 \times \frac{1-(0.7)^2}{\sqrt{64}}$ = $(0.6745) \times (0.06375) = 0.043$ (D) RANK CORRELATION Que.5. Three competitors in a contest are ranked by two judg order 1,2,3 and 2,3,1 respectively. Calculate the Spearman's correlation coefficient. a0.5 b0.8 c. 0.8 d. 0.5 Answer: A Solution Rank by Rank by	origin, we have $= \frac{8 \times 90 - (-13) \times (-1)}{\sqrt{8 \times 221 - (-13)^2} \times \sqrt{8 \times 12}}$ (C) PROBABLE ER		F20	due to chan
origin, we have $= \frac{8 \times 90^{-}(-13) \times (-14)}{\sqrt{8 \times 221^{-}(-13)^2} \times \sqrt{8 \times 122^{-}(-14)^2}} = \frac{538}{\sqrt{1768 - 169 \times \sqrt{976 - 196}}} = 0.48$ (C) PROBABLE ERROR Que.4. If $r = 0.7$ ; and $n = 64$ find out the probable error of coefficient of correlation a. 0.043 b. 0.43 c. 0.747, 0.657 d. 0.7 Answer: A Solution: $r = 0.7$ ; $m = 64$ Probable Error (P.E.) = $0.6745 \times \frac{1-(0.7)^2}{\sqrt{64}}$ = $(0.6745) \times (0.06375) = 0.043$ (D) RANK CORRELATION Que.5. Three competitors in a contest are ranked by two judg order 1,2,3 and 2,3,1 respectively. Calculate the Spearman's correlation coefficient. a0.5 b0.8 c. 0.8 d. 0.5 Answer: A Solution Rank by Rank by	origin, we have $= \frac{8 \times 90 - (-13) \times (-1)}{\sqrt{8 \times 221 - (-13)^2} \times \sqrt{8 \times 12}}$ (C) PROBABLE ER		F20	une co chun
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$\frac{(C) \text{ PROBABLE ERROR}}{\sqrt{8 \times 221 - (-13)^2 \times \sqrt{8 \times 122 - (-14)^2}} - \frac{\sqrt{1768 - 169 \times \sqrt{976 - 196}}}{\sqrt{1768 - 169 \times \sqrt{976 - 196}}} = 0.48$ $\frac{(C) \text{ PROBABLE ERROR}}{Que.4. \text{ If } r = 0.7 \text{ ; and } n = 64 \text{ find out the probable error of coefficient of correlation}}{a. 0.043}  b. 0.43  c. 0.74  c. 0.657  c. 0.77  c. 0.77  c. 0.657  c. 0.77  c. $	$\frac{1}{\sqrt{8 \times 221 - (-13)^2} \times \sqrt{8 \times 12}}$	$=$ $\sqrt{1768}$	$\frac{330}{169} \times \sqrt{976 - 1}$	
(C) PROBABLE ERRORQue.4. If $r = 0.7$ ; and $n = 64$ find out the probable error ofcoefficient of correlationa. 0.043b. 0.43c. 0.747, 0.657d. 0.7Answer: ASolution: $r = 0.7$ ; $n = 64$ Probable Error (P.E.) = $0.6745 \times \frac{1-(0.7)^2}{\sqrt{64}}$ = (0.6745) $\times$ (0.06375) = 0.043(D) RANK CORRELATIONQue.5. Three competitors in a contest are ranked by two judgorder 1,2,3 and 2,3,1 respectively. Calculate the Spearman'scorrelation coefficient.a0.5b0.8c. 0.8d. 0.5Answer: ASolutionRank byInjudge R1Judge R2Rank byRank by	(C) PROBABLE ER			= 0.48
Que.4. If $r = 0.7$ ; and $n = 64$ find out the probable error of coefficient of correlationa. 0.043b. 0.43c. 0.747, 0.657d. 0.7Answer: ASolution: $r = 0.7$ ; $n = 64$ Probable Error (P.E.) = $0.6745 \times \frac{1-(0.7)^2}{\sqrt{64}}$ = $(0.6745) \times (0.06375) = 0.043$ (D) RANK CORRELATIONQue.5. Three competitors in a contest are ranked by two judg order 1,2,3 and 2,3,1 respectively. Calculate the Spearman's correlation coefficient.a0.5b0.8c. 0.8d. 0.5Answer: ASolutionRank by I=judge R1Judge R2R1 - H2121111				
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a. 0.043       b. 0.43         c. 0.747, 0.657       d. 0.7         Answer: A       Solution: $r = 0.7$ ; $n = 64$ Probable Error (P.E.) = $0.6745 \times \frac{1-(0.7)^2}{\sqrt{64}}$ = $(0.6745) \times (0.06375) = 0.043$ <b>(b) RANK CORRELATION</b> Que.5. Three competitors in a contest are ranked by two judg         order 1,2,3 and 2,3,1 respectively. Calculate the Spearman's         correlation coefficient.         a0.5       b0.8         c. 0.8       d. 0.5         Answer: A         Solution         Rank by       Judge R2 $1 = 1$ $1 = 1$ $2 = -1$ $1 = 1$ $1 = 1$ $1 = 1$	Que.4. If $r = 0.7$ ; an	dn = 64 find or	ut the probo	able error of t
c. 0.747, 0.657 Answer: A Solution: $r = 0.7$ ; $n = 64$ Probable Error (P.E.) = $0.6745 \times \frac{1-(0.7)^2}{\sqrt{64}}$ = $(0.6745) \times (0.06375) = 0.043$ (b) RANK CORRELATION Que.5. Three competitors in a contest are ranked by two judg order 1,2,3 and 2,3,1 respectively. Calculate the Spearman's correlation coefficient. a0.5 b0.8 c. 0.8 d. 0.5 Answer: A Solution Rank by 11 Judge R2 1 2 -1 1 1 2 -1 2 -1	· · · · · · · · · · · · · · · · · · ·	•		¥
Answer: ASolution: $r = 0.7$ ; $n = 64$ Probable Error (P.E.) = $0.6745 \times \frac{1-(0.7)^2}{\sqrt{64}}$ $= (0.6745) \times (0.06375) = 0.043$ (D) RANK CORRELATIONQue.5. Three competitors in a contest are ranked by two judg order 1,2,3 and 2,3,1 respectively. Calculate the Spearman's correlation coefficient. $a0.5$ $b0.8$ $c. 0.8$ $d. 0.5$ Answer: ASolutionSolutionRank by $1^{nd}$ $1^{ank}$ by $1^{and}$ Diff D= $1^{aff}$ O2 $1$ $2$ $-1$ $1$ $1$ $2$ $-1$ $1$ $1$ $2$ $-1$ $1$ $1$	a. 0.043	k	). 0.43	
Solution: $r = 0.7$ ; $n = 64$ Probable Error (P.E.) = $0.6745 \times \frac{1-(0.7)^2}{\sqrt{64}}$ $= (0.6745) \times (0.06375) = 0.043$ (D) RANK CORRELATION         Que.5. Three competitors in a contest are ranked by two judg         order 1,2,3 and 2,3,1 respectively. Calculate the Spearman's         correlation coefficient. $a0.5$ $b0.8$ $c. 0.8$ $d. 0.5$ Answer: A         Solution         Rank by       Rank by ll <sup>nd</sup> Diff D= $1^a$ $1$ $1$ $2$ $-1$ $1$ $1$ $2$ $-1$ $1$	c. 0.747, 0.657	0	1. 0.7	
$r = 0.7$ ; $n = 64$ Probable Error (P.E.) = $0.6745 \times \frac{1-(0.7)^2}{\sqrt{64}}$ $= (0.6745) \times (0.06375) = 0.043$ (D) RANK CORRELATIONQue.5. Three competitors in a contest are ranked by two judg order 1,2,3 and 2,3,1 respectively. Calculate the Spearman's correlation coefficient. $a0.5$ $b0.8$ $c. 0.8$ $d. 0.5$ Answer: ASolutionRank by $11^{nd}$ Diff D= R1 - H2 $1$ $2$ $1$ $2$ $1$ $1$ $1$ $1$ 1 $1$ $1$	Answer: A			
$= (0.6745) \times (0.06375) = 0.043$ (b) RANK CORRELATION Que.5. Three competitors in a contest are ranked by two judg order 1,2,3 and 2,3,1 respectively. Calculate the Spearman's correlation coefficient. a0.5 b0.8 c. 0.8 d. 0.5 Answer: A Solution Rank by Ind Diff D= I Judge R2 R1 - H2 02 I 2 -1 1 I I 1 +2 4	Solution:			
order 1,2,3 and 2,3,1 respectively. Calculate the Spearman's correlation coefficient. $a0.5$ $b0.8$ $c. 0.8$ $d. 0.5$ Answer: A $d. 0.5$ SolutionSolutionRank by 1stjudge R1Judge R2 $R_1 - H2$ 0212-1123-1111+24				
correlation coefficient. $a0.5$ $b0.8$ $c. 0.8$ $d. 0.5$ Answer: A         Solution         Rank by $l^{lnd}$ $J^{at}Judge R_1$ $J^{at} ge R_2$ $1$ $2$ $-1$ $2$ $-1$ $1$ $2$ $-1$ $1$ $1$ $1$ $1$				
a0.5 $b0.8$ $c. 0.8$ $d. 0.5$ Answer: A $d. 0.5$ Solution       Rank by II <sup>nd</sup> Diff D=         Rank by       Rank by II <sup>nd</sup> Diff D=         IstJudge R1       Judge R2       R1 - H2       02         1       2       3       -1       1         2       3       -1       1         1       +2       4			iculute the a	Spearman's
c. 0.8       d. 0.5         Answer: A       Solution         Rank by       Rank by llnd       Diff D=         1stJudge R1       Judge R2       R1 - H2       02         1       2       -1       1         2       3       -1       1         1       1       +2       4				
Answer: ASolutionRank by $1^{st}$ Judge R1 $Pif D=$ Judge R212-123-11111				
SolutionRank by $1^{st}$ Judge R1Rank by llnd Judge R2Diff D= R1 - H20212-1123-1111+24	_	Ø. C	2.5	
Rank by 1stJudge R1     Rank by llnd Judge R2     Diff D= R1 - H2     02       1     2     -1     1       2     3     -1     1       1     1     4				
1stJudge R1     Judge R2     R1 - H2     02       1     2     -1     1       2     3     -1     1       1     1     +2     4	· ·	- Donly by lind	D;# D	
2 3 -1 1 1 +2 4	-	-		02
1 +2 4	1	2	-1	1
	2			
$\sum d$		1	+2	4
				$\sum d^2$

Chapter 18

Chapter 18
Here $n = 3$
Spearman's Rank Correlation coefficient = $1 - 6 \frac{\sum d^2}{n(n^2-1)}$
Spearman's Rank Correlation coefficient = $1 - 6 \frac{\sum d^2}{n(n^2-1)}$ = $1 - \frac{6 \times 6}{3(3^2-1)}$
= -0.5
(E) REGRESSION
Que.6. If the two regression lines are $3x = y$ and $8y = 6x$ , then the
value of correlation coefficient is
a. 0.5 b0.5
c. 0.75 d0.80
Answer: A
Solution
Gíven Regressíon líne
3x=y and 8y=6x
3x-y =0 and 6x-8y = 0
$b_{XX} = \frac{-coeff.of y}{coeff.of x} and b_{XY} = \frac{-coeff.of x}{coeff.of y}$ $-(-1) = -6 = 3$
$\frac{-(-1)}{-(-1)} = \frac{-6}{-6} = \frac{3}{-6}$
$bxy = \frac{1}{3}$
Coeff. Of correlation is given by
$r = \pm \sqrt{byx \times bxy}$
$=\pm \sqrt{\frac{3}{4} \times \frac{1}{3}}$
$= + \sqrt{\frac{1}{4}} = + \frac{1}{2} = 0.5$
Que.7. If the two line of regression are x+2y-5=0 and 2x+3y-8
 =0,then the regression line of y on x s:
 a. $x+2y-5=0$ b. $2x+3y-8=0$

Chapter 18
c. x + 2y = 0 $d. 2x + 3y = 0$
Answer: A
Solution
Gíven two regressíon línes are
x+2y-5 = 0 and 2x+3y-8 = 0
by $x = \frac{-coeff.of x}{coeff.of y} = \frac{-1}{2}$ and by $y = \frac{-coeff.of y}{coeff.of x} = \frac{-3}{2}$
Here, byx Xbxy <u>&lt;</u> 1 which is satisfied.
So $1^{st}$ equation $x+2y-5 = 0$ is the regression equation y on x.
Que.8. A relationship $r^2=1-rac{500}{300}$ is not possible
a. True b. False
c. Both d. None
Answer: A
Solution
Gíven
$r^2 = 1 - \frac{500}{300}$ is possible
$r^{2} = -\frac{-200}{300}$ is not possible So, it is true.
So, it is true.

	D								
<b>DEX NUMBE</b>									
PRICE RELATI									
Que.1. The most ap	opropríati	e averao	e ín avera	aíng the prí					
ís				5 5 [					
a. Medían			b. Harm	onic mean					
c. Arithmetic mea	n		d. Geom	etric mean					
Answer: D									
Solution									
Geometric mean in					, U				
	A     A	1.1 /			to husi alat				
			I	(price or quantity) ratios with their importance exponents derived from one or more observed budget shares This a					
derived from one o	r more ok	oserved	budget shi	ares Thís	approach				
	r more ok	oserved	budget shi	ares Thís	approach				
derived from one o	r more ok	oserved	budget shi	ares Thís	approach				
deríved from one o dírectly ínspíred k <b>SIMPLE AGGR</b>	r more ob by the lite EGATIV	oserved l erature d VE PRI	budget shi on índex n <b>CE INDE</b>	ares Thís umber theor X	approach ry.				
deríved from one o dírectly ínspíred k <u>SIMPLE AGGR</u> Que.2. Construct t	r more ok by the lite <b>EGATIV</b> the follow	oserved l erature o VE PRI ⁄ing ino	budget shu on index n CE INDE lices by ta	ares Thís umber theor X	approach ry.				
deríved from one o dírectly ínspíred k <b>SIMPLE AGGR</b>	r more ok by the lite <b>EGATIV</b> the follow	oserved l erature o VE PRI ⁄ing ino	budget shu on index n CE INDE lices by ta	ares Thís umber theor X	approach ry.				
deríved from one o dírectly ínspíred k <u>SIMPLE AGGR</u> Que.2. Construct t	r more ok by the lite <b>EGATIV</b> the follow	oserved l erature o VE PRI ⁄ing ino	budget shu on index n CE INDE lices by ta	ares Thís umber theor X	approach ry.				
deríved from one o dírectly ínspíred k SIMPLE AGGR Que.2. Construct t (í) símple Aggreg Items	or more ok by the lite <b>EGATIV</b> the follow ative price	oserved l erature d VE PRI ⁄ing ind ce Index	budget shi on index n <b>CE INDE</b> lices by ta Items	ares Thís umber theor <b>X</b> kíng 1997	approach ry. as the ba				
deríved from one o dírectly ínspíred k SIMPLE AGGR Que.2. Construct t (í) símple Aggreg Items Príces Rs. (1997)	er more ok by the lite <b>EGATIV</b> the follow ative price A	oserved erature VE PRI ⁄ing ina ce Index B 2	budget shu on index n CE INDE lices by ta ltems C 4	ares This umber theor X king 1997 D 10	approach ry. as the ba E 8				
deríved from one o dírectly ínspíred k SIMPLE AGGR Que.2. Construct t (í) símple Aggreg Items Príces Rs. (1997) Príces Rs. (1998)	er more ok by the lite EGATIN Che follow ative price A 6 10	oserved erature VE PRI Ving ino ce Index B 2 2 2	budget shi on index n icce INDE lices by ta lices by ta Items C 4 6	ares This umber theor X king 1997 D 10 12	approach ry. as the ba E 8 12				
deríved from one o dírectly ínspíred k SIMPLE AGGR Que.2. Construct t (í) símple Aggreg Items Príces Rs. (1997)	er more ok by the lite <b>EGATIV</b> the follow ative price A	oserved erature VE PRI ⁄ing ina ce Index B 2	budget shu on index n CE INDE lices by ta ltems C 4	ares This umber theor X king 1997 D 10	approach ry. as the ba E 8				
deríved from one o dírectly inspired k SIMPLE AGGR Que.2. Construct t (í) símple Aggreg Items Príces Rs. (1997) Príces Rs. (1998) Príces Rs. (1999)	er more ok by the lite EGATIN Che follow ative price A 6 10	oserved erature VE PRI Ving ino ce Index B 2 2 2	budget shi on index n index n ices by ta lices by ta ltems C 4 6 8	ares This number theor X king 1997 D 10 12 12 14	approach ry. as the ba E 8 12				
deríved from one o dírectly ínspíred k SIMPLE AGGR Que.2. Construct t (í) símple Aggreg Items Príces Rs. (1997) Príces Rs. (1998) Príces Rs. (1999)	er more ok by the lite EGATIN Che follow ative price A 6 10	oserved erature VE PRI Ving ino ce Index B 2 2 2	budget shi on index n index n ices by ta lices by ta ltems c 4 6 8 b. 120.9	Ares This number theor X king 1997 D 10 12 14	approach ry. as the ba E 8 12				
deríved from one o dírectly ínspíred k SIMPLE AGGR Que.2. Construct t (í) símple Aggreg Items Príces Rs. (1997) Príces Rs. (1998) Príces Rs. (1999) A. 140 , 186.67 C. 140 , 120.90	er more ok by the lite EGATIN Che follow ative price A 6 10	oserved erature VE PRI Ving ino ce Index B 2 2 2	budget shi on index n index n ices by ta lices by ta ltems C 4 6 8	Ares This number theor X king 1997 D 10 12 14	approach ry. as the ba E 8 12				
deríved from one o dírectly ínspíred k SIMPLE AGGR Que.2. Construct t (í) símple Aggreg Items Príces Rs. (1997) Príces Rs. (1998) Príces Rs. (1999)	er more ok by the lite EGATIN Che follow ative price A 6 10	oserved erature VE PRI Ving ino ce Index B 2 2 2	budget shi on index n index n ices by ta lices by ta ltems c 4 6 8 b. 120.9	Ares This number theor X king 1997 D 10 12 14	approach ry. as the ba E 8 12				

	$P_0$	$\mathbb{P}_1$	$P_2$	$P_1 = \frac{P_1}{P_0} \times 10$	$P_2 = \frac{P_2}{P_0} \times 100$		
A	6	10	15	166.67	250		
В	2	2	3	100.00	150		
- c	4	6	8	150.00	200		
D	10	12	14	120.00	140		
E	8	12	16	150.00	200		
-	$\sum P_0 = 3$	$0  \sum P_1 = 0$	$42 \sum P_2 =$	56 $\sum \left(\frac{P_1}{P_0} \times 100\right) = 686$	$67 \sum_{P_0} \left( \frac{P_2}{P_0} \times 100 \right) = 940$		
$P_{02} = \underbrace{\sum_{P_0}^{P_2} \times 100}_{P_0} = \frac{56}{30} \times 100 = 186.67  (For 1999)$ $\underbrace{\text{WEIGHTED AGGREGATIVE PRICE INDEX}}_{(A) LASPEYRE'S METHOD}$ $\underbrace{\text{Que.3. Calculate weighted aggregative price index from the}}_{P_1}$							
<mark>(A) LA</mark> Qие.з. С	<b>SPEYRE</b> alculate	<mark>'S MET</mark> weighted	HOD aggregat	íve príce íno			
<b>(A) LA</b> Que.3. C followín	<mark>SPEYRE</mark> alculate g data us	<b>'S MET</b> weighted sing Las	HOD aggregat peyre's m	íve príce íno	lex from the		
<b>(A) LA</b> Que.3. C followín	<b>SPEYRE</b> alculate g data us Base Perí	<b>'S MET</b> weighted sing Las	HOD aggregat peyre's m Ci	íve príce íno ethod	lex from the d		
(A) LA Que.3. C following B	<b>SPEYRE</b> alculate g data us Base Perí	<b>'S MET</b> weighted ing Las	HOD aggregat peyre's m Ci	íve príce íno ethod Irrent Perío	lex from the d		
(A) LA Que.3. C following Price A B	SPEYRE alculate g data us Sase Perí Qui 2 5	<b>'S MET</b> weighted ing Las	HOD aggregat peyre's m Ci Príce 10 12	íve príce íno ethod urrent Perío Quant 4 6	lex from the d cíty 5 10		
(A) LA Que.3. C following Price A B C	SPEYRE alculate g data us Sase Perí Qui 2 5 4	<b>'S MET</b> weighted ing Las	HOD aggregat peyre's m Ci Príce 10 12 20	íve príce íno ethod urrent Perío Quant 4 6 5	lex from the d ity 5 10 15		
(A) LA Que.3. C following Price A B	SPEYRE alculate g data us Sase Perí Qui 2 5 4 4 2	<b>'S MET</b> weighted ing Las	HOD aggregat peyre's m Ci Príce 10 12	íve príce íno ethod urrent Perío Quant 4 6	lex from the d tity 5 10 15 10		

					//	Chap	pter ]	.9
A								
Answer: C								
Solution								
Commodíty	)							
A	2	10	4	5	20	40	10	20
В	5	12	6	10	60	72	50	60
C	4	20	5	15	80	100	60	デ 30
D	~	15	3	10	30	45 $P(\sum_{P_{1}q_{0}} = 257)$	20	
	N D .	_	-	167				<u> </u>
$P_{01}^{L} = 4$	$\sum P_0 q$	<u>≇0</u> ×10 ∄o	$10 = \frac{2}{1}$	$\frac{257}{90} \times 10$	0 = 135	5.26		
Que.4. $\sum \sum$						$\mathbf{Q}_0 = 0$	UU, <u>}</u> I	- <sub>0</sub> Q
192 then t	ne las	peyre's	. Inde,					
					0.300			
a. 250								
c. 350					d. 200			
c. 350 Answer: A Solutíon:				C	d. 200			
c. 350 Answer: A	$_{0} = 24$	$10 \sum P_1$	$Q_1 =$	C	d. 200	600,∑ <i>F</i>	$P_0Q_1 =$	192
c. 350 Answer: A Solution: If $\sum \sum P_0 Q$				ζ 480,∑p	d. 200 $p_1 Q_0 =$		$P_0Q_1 =$	192
c. 350 Answer: A Solutíon:				ζ 480,∑p	d. 200 $p_1 Q_0 =$		$P_0 Q_1 =$	192
c. 350 Answer: A Solution: If $\sum \sum P_0 Q$				ζ 480,∑p	d. 200 $p_1 Q_0 =$		$P_0 Q_1 =$	192
c. 350 Answer: A Solution: If $\sum \sum P_0 Q$ Laspeyra's	.Index	$x No. \frac{\sum F}{\sum F}$	$\frac{P_1Q_0}{P_0Q_0} =$	480,∑p 600 240 ×100	d. 200 $p_1 Q_0 =$		$P_0 Q_1 =$	192
c. 350 Answer: A Solution: If $\sum \sum P_0 Q$ Laspeyra's	.Index CHE'S	$x No. \frac{\sum F}{\sum F}$	$\frac{P_1Q_0}{P_0Q_0} =$	480,∑p 600 240 ×100	d. 200 $p_1 Q_0 = 0$ 0 = 250	>		
c. 350 Answer: A Solution: If $\sum \sum P_0 Q$ Laspeyra's Que.5. Calc	. <i>Index</i> CHE'S ulatev	$x No. \frac{\sum F}{\sum F}$ <b>5 MET</b> veíghter	$\frac{P_1Q_0}{P_0Q_0} =$	( <u>480,∑p</u> <u>600</u> <u>240</u> ×100 regatíve	d. 200 $p_1 Q_0 = 0$ $p_2 = 250$	>		
c. 350 Answer: A Solution: If $\sum \sum P_0 Q$ Laspeyra's Que.5. Calc	. <i>Index</i> CHE'S ulatev	$x No. \frac{\sum F}{\sum F}$ <b>5 MET</b> veíghter	$\frac{P_1Q_0}{P_0Q_0} =$	( <u>480,∑p</u> <u>600</u> <u>240</u> ×100 regatíve	d. 200 $p_1 Q_0 = 0$ $p_2 = 250$	>		
c. 350 Answer: A Solution: $If \sum P_0Q$ Laspeyra's Que.5. Calc following di	. Index CHE'S ulatev ata by	x No.∑F ∑F MET veíghter usíng i	2100 2000 HOD d aggi Passc	( <u>480,∑p</u> <u>600</u> <u>240</u> ×100 regatíve	d. 200 $p_1 Q_0 = 0$ $p_2 = 250$	) lex num		
c. 350 Answer: A Solution: If $\sum \sum P_0 Q$ Laspeyra's Que.5. Calc	. Index CHE'S ulatev ata by	$x No. \frac{\sum F}{\sum F}$ $5 MET$ veighter using the server of	2100 000 HOD d aggi Passc	$\frac{480, \sum p}{240}$	d. 200 $p_1 Q_0 = 0$ $p_2 = 250$ price ind nod :	) lex num ent	ber frov	ntb
c. 350 Answer: A Solution: $If \sum P_0Q$ Laspeyra's Que.5. Calc following di	. Index CHE'S ulatev ata by Ba	$x No. \frac{\sum F}{\sum F}$ $5 MET$ veighter using the server of	2100 000 HOD d aggi Passc	$\frac{480, \sum p}{\frac{600}{240} \times 100}$ regatives he's meth	d. 200 $p_1 Q_0 = p_1 Q_0 = p_2 p_2 p_2 p_2$ $p_2 p_2 p_2 p_2 p_2 p_2 p_2 p_2 p_2 p_2 $	) lex num ent		ntb
c. 350 Answer: A Solution: If $\sum \sum P_0 Q$ Laspeyra's Que.5. Calc following du	. Index CHE'S ulatev ata by J Ba Prí	$x No. \frac{\sum F}{\sum F}$ $5 MET$ veighter using the server of	<b>HOD</b> d aggr Passcl	$\frac{480, \sum p}{240}$ $\frac{600}{240} \times 100$ $regativep$ he's meth	d. 200 $p_1 Q_0 = p_1 Q_0 = p_2 p_2 p_2 p_2 p_2 p_2 p_2 p_2 p_2 p_2$	) lex num ent	berfron Quan	ntb
c. 350 Answer: A Solution: $If \sum P_0Q$ Laspeyra's Que.5. Calc following di Commodity A	.Index CHE'S ulatev ata by J Ba Prí 10	$x No. \frac{\sum F}{\sum F}$ $5 MET$ veighter using the server of	2100 2000 HOD d aggi Passc	$\frac{480, \sum p}{240} \times 100}$ $regative p$ he's methematical production of the second sec	d. 200 $p_1 Q_0 =$ $p_2 = 250$ $p_1 Q_0 =$ $p_1 Q_0 =$ $p_2 = 250$ $p_1 Q_0 =$ $p_1 Q_0 =$ $p_2 = 250$ $p_1 Q_0 =$ $p_1 Q_0 =$ $p_2 = 250$ $p_1 Q_0 =$ $p_1 Q_0 =$ $p_1 Q_0 =$ $p_2 = 250$ $p_1 Q_0 =$ $p_1 Q_0 =$ $p_1 Q_0 =$ $p_2 = 250$ $p_1 Q_0 =$ $p_2 = 250$ $p_2 = 250$ $p_1 Q_0 =$ $p_2 = 250$ $p_1 Q_0 =$ $p_2 = 250$ $p_2 = 25$	) lex num ent	berfron Quan 50	ntb

d. 12.888         Answer: B         Solution:         Commodity Po       Po       Pi       Poq       Piq         A       10       30       12       50       500       600         B       8       15       10       25       200       250         C       6       20       6       30       180       180       180         D       4       10       6       20       80       120         Passche's. Index No. $\frac{\sum P_1 q_1}{\sum P_0 Q_1} = \frac{1150}{960} \times 100$ E 119.79         (C) FISHER'S METHOD         Que.e. If Laspeyre's Index Number is 250 and Paache's Index         Number is 160, then Fisher's Index Number is 250 and Paache's Index         Number is 250 and Paache's Index         Number is 250 and Paache's Index         Number is 250 and Paache's Index         Number is 250 and Paache's Index         Number is 250 and Paache's Index         Number is 250 and Paache's Index							
Auswer: B         Solution:         commodity       Po	a. 199.79				6.11	9.79	
Solution:         Commodity       Po       P	c. 135.26				d. 1:	2.888	
Commodity         Po         Po         Po         Pi         Pi         Pi         Po         Pi         Pi<							
A       10       30       12       50       500       600         B       8       15       10       25       200       250         C       6       20       6       30       180       180         P       4       10       6       20       80       120         P       5       100       5       80       120         Passche's.Index No. $\sum P_{1}q_{1} = \frac{1150}{960} \times 100$ $\Sigma P_{0}q_{1} = 900$ $\Sigma F_{1}q_{1} = 100$ Passche's.Index No. $\sum P_{0}q_{1} = \frac{1150}{960} \times 100$ $\Sigma 100$ $\Sigma P_{0}q_{1} = 100$ Que.e.       If Laspeyre's Index Number is 250 and Paache's Index       Number is 160, then Fisher's Index Number is 250 and Paache's Index         Number is 160, then Fisher's Index Number is 250 $Z 200$ $d. 16/25$ Answer: C       Solution: $Given$ $Z 250$ Laspeyre Index No. (L) $Z 50$ Faasche Index No. (P) $Z 5$							
B       8       15       10       25       200       250         C       6       20       6       30       180       180       180         D       4       10       6       20       80       120         D       Image: Construct of the state of the s	Commodity	P <sub>0</sub>	9 <mark>0</mark>	$P_1$	q <sub>1</sub>	P <sub>0</sub> q <sub>1</sub>	$P_1q_1$
c       6       20       6       30       180       180         p       10       6       20       80       120         Passche's. Index No. $\frac{\sum P_1 q_1}{\sum P_0 Q_1} = \frac{1150}{960} \times 100$ $\sum P_{0}q_1 = 960$ $\sum P_{0}q_1 = 960$ = 119.79       6       250       and Paache's Index         Rue.6. If Laspeyre's Index Number is 250 and Paache's Index         Number is 160, then Fisher's Index Number is       a. 40,000       b. 25/16         c. 200       d. 16/25         Answer: C       Solution:         Given       Laspeyre Index No. (L) = 250         Paasche Index No. (F) = $\sqrt{L \times P}$ $= \sqrt{(250 \times 160)}$	A	10	30	12	50	500	600
C p41062080120 $\Sigma P_{0q_{1}} = 960$ $\Sigma P_{0q_{1}} = 960$ $\Sigma P_{0q_{1}} = 960$ Passche's. Index No. $\Sigma P_{0q_{1}} = 960$ $\Sigma P_{0q_{1}} = 960$ Passche's. Index No. $\Sigma P_{0q_{1}} = 1150$ $\Sigma P_{0q_{1}} = 960$ $\Sigma P_{0q_{1}$	В	8	15	10	25	200	250
P41062080120 $\sum P_{0}q_{1} = 960$ Passche's. Index No. $\frac{\sum P_{1}q_{1}}{\sum P_{0}Q_{1}} = \frac{1150}{960} \times 100$ = 119.79(C) FISHER'S METHODQue.6. If Laspeyre's Index Number is 250 and Paache's IndexNumber is 160, then Fisher's Index Number isa. 40,000b. 25/16c. 200d. 16/25Answer: CSolution:GivenLaspeyre Index No. (L) = 250Paasche Index No. (F) = $\sqrt{L \times P}$ = $\sqrt{(250 \times 160)}$	С	6	20	6	30	180	180
Passche's. Index No. $\frac{\sum P_1 q_1}{\sum P_0 Q_1} = \frac{1150}{960} \times 100$ = 119.79(C) FISHER'S METHODQue.e. If Laspeyre's Index Number is 250 and Paache's IndexNumber is 160, then Fisher's Index Number isa. 40,000b. 25/16c. 200d. 16/25Answer: CSolution:GivenLaspeyre Index No. (L) = 250Paasche Index No. (F) = $\sqrt{L \times P}$ = $\sqrt{(250 \times 160)}$		4	10	6	20	80	120
Passche's. Index No. $\frac{\sum P_1 q_1}{\sum P_0 Q_1} = \frac{1150}{960} \times 100$ = 119.79 (C) FISHER'S METHOD Que.6. If Laspeyre's Index Number is 250 and Paache's Index Number is 160, then Fisher's Index Number is a. 40,000 b. 25/16 c. 200 d. 16/25 Answer: C Solution: Given Laspeyre Index No. (L) = 250 Paasche Index No. (F) = $\sqrt{L \times P}$ = $\sqrt{(250 \times 160)}$							
= 119.79 (C) FISHER'S METHOD Que.6. If Laspeyre's Index Number is 250 and Paache's Index Number is 160, then Fisher's Index Number is a. 40,000 b. 25/16 c. 200 d. 16/25 Answer: C Solution: Given Laspeyre Index No. (L) = 250 Paasche Index No. (P) = 160 Fisher Index No. (F) = $\sqrt{L \times P}$ = $\sqrt{(250 \times 160)}$						$\sum P_0 q_1 = 960$	$\sum P_1 q_1 = 11$
c. 200 Answer: C Solution: Given Laspeyre Index No. (L) = 250 Paasche Index No. (P) = 160 Fisher Index No. (F) = $\sqrt{L \times P}$ = $\sqrt{(250 \times 160)}$	(C) FIS	HER'S			.s 250 an	d Paache's Iv	ndex
Answer: C Solution: Given Laspeyre Index No. (L) = 250 Paasche Index No. (P) = 160 Fisher Index No. (F) = $\sqrt{L \times P}$ = $\sqrt{(250 \times 160)}$	<u>(C) FIS</u> Qие.G. If L	HER'S _aspeyr	e's Index	Numberi			ndex
Solution: Given Laspeyre Index No. (L) = 250 Paasche Index No. (P) = 160 Fisher Index No. (F) = $\sqrt{L \times P}$ = $\sqrt{(250 \times 160)}$	(C) FIS Que.6. If L Number is	HER'S _aspeyr	e's Index	Numberi	Number b. 25	ís 716	ndex
Given Laspeyre Index No. (L) = 250 Paasche Index No. (P) = 160 Fisher Index No. (F) = $\sqrt{L \times P}$ = $\sqrt{(250 \times 160)}$	(C) FIS Que.G. If L Number is a. 40,000	HER'S _aspeyr	e's Index	Numberi	Number b. 25	ís 716	ndex
Laspeyre Index No. (L) = 250 Paasche Index No. (P) = 160 Físher Index No. (F) = $\sqrt{L \times P}$ = $\sqrt{(250 \times 160)}$	(C) FIS Que.6. If L Number is a. 40,000 c. 200 Answer: C	HER'S _aspeyr 5 160, t	e's Index	Numberi	Number b. 25	ís 716	ndex
Paasche Index No. (P) = 160 Fisher Index No. (F) = $\sqrt{L \times P}$ = $\sqrt{(250 \times 160)}$	(C) FIS Que.6. If L Number ís a. 40,000 c. 200 Answer: C Solutíon:	HER'S _aspeyr 5 160, t	e's Index	Numberi	Number b. 25	ís 716	ndex
Fisher Index No. (F) = $\sqrt{L \times P}$ = $\sqrt{(250 \times 160)}$	(C) FIS Que.G. If L Number is a. 40,000 c. 200 Answer: C Solution: Given	HER'S Laspeyr 160, t	e's Index hen Físhe	Number í er's Index	Number b. 25	ís 716	rdex
$=\sqrt{(250\times160)}$	(C) FIS Que.G. If L Number is a. 40,000 c. 200 Answer: C Solution: Given Laspeyre	HER'S Laspeyr 160, t	re's Index hen Físhe Ho. (L) =	Numberi er's Index 250	Number b. 25	ís 716	ndex
	(C) FIS Que.G. If L Number is a. 40,000 c. 200 Answer: C Solution: Given Laspeyre Paasche II	HER'S Laspeyr 160, t 160, t	re's Index hen Físhe 10. (L) = 0. (P) = 1	Numberi er's Index 250 160	Number b. 25	ís 716	ndex
$= \sqrt{40,000} = 200$	(C) FIS Que.6. If L Number is a. 40,000 c. 200 Answer: C Solution: Given Laspeyre Paasche II Fisher Inc	HER'S Laspeyr 160, t 160, t Index N ndex No.	re's Index hen Físhe 10. (L) = 0. (P) = 1	Numberi er's Index 250 160	Number b. 25	ís 716	ndex
	(C) FIS Que.G. If L Number is a. 40,000 c. 200 Answer: C Solution: Given Laspeyre Paasche II Fisher Ind $= \sqrt{(250)}$	HER'S Laspeyr 160, t 160, t Index N Ndex No. X160)	re's Index hen Físhe to. (L) = (P) = 1 $(F) = \sqrt{l}$	Numberi er's Index 250 160	Number b. 25	ís 716	ndex

				//	Chapt	ter 19
3.	CONSUME		TNDEX			
	Que.7. An e			ets of the mil	dale class	s famílíes í
	a certaín cít					
	Expenses on	<b>U</b> =	Fuel	Clothing		Mísc.
	Items	35%	10%	20%	15%	20%
	Príces ín 2004 (Rs.)	1500	<u> </u>	750	300	400
	Príces ín	1400	200	500	200	250
	1995 (RS.)					
	a. 165.62			0.13	4.5	
	c. 165.60			d. 32	25.89	
	Answer: B					
	Solution:					
	Items	W in %	₽₀ (1995)	P <mark>1</mark> (2004)	$R = \frac{P_1}{P_0} \times 1$	00 RW
	Food	35	1400	1500	107.14	3750
	Fuel	10	200	250	125.00	1250
	Clothing	20	500	750	150.00	3000
	Rent	15	200	300	150.00	2250
	Mísc :	20	250	400	160.00	3200
	$C P t = \frac{\sum RW}{\sum W}$	$\frac{1}{2} = \frac{13450}{100} =$	= 134.5			
<u>4</u>	. <u>COST OF</u>	LIVING	INDEX			
	Que.g. What	t will be th	e real wage	of the consul	ner if his	s money wa
	ís Rs. 10,00			•		0
	a. 1900			b. 1901		
	c. 2186			d. 466		
	Answer: B					

	Chapter 19
	Solution:
	Real Wages = $\frac{Money Wages}{Cost of living Index} \times 100$
	$\frac{10,000}{526} \times 100 = \text{Rs. 1901}$
<u>5</u> .	TIME REVERSAL
	Que.9. Which of the following formula satisfy the time reversal
	test?
	a. $p_{01} = \frac{\sum P_1 q_0}{\sum P_0 q_0}$ b. $p_{01} = \frac{\sum P_1 q_1}{\sum P_0 q_1}$
	$c. p_{01} = \sqrt{\frac{\sum P_1 q_0}{\sum P_0 Q_0} \times p_{01}} = \frac{\sum P_1 q_1}{\sum P_0 Q_1} \qquad d. \text{ None}$
	$\sqrt{2^{1}020}$ $2^{1}021$
	Answer: C
	Solution:
	Time reversal test. This test is proposed by Inving Fisher. According
	to him, an index number (formula) should be such that when the
	base year and current year are interchanged (reversed) the resulting
	index number should be the reciprocal of the earlier.
	Que.10. Tíme reversal E'factor reversal are:
	a. Quantity Index b. Ideal Index
	c. Príce Index d. Test of consístency
	Answer: C
	Solution:
	Time reversal and factor reversal test are test of consistency.
6.	INFLATION RATE
	Que.11. Given the following data: Year 1995-96 1996-97 1997-98

4ear	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	200
WPI	121,6	127,2	132,8	140.7	145.7	155,7	161,3	166
(1993-94)	_		-		-		-	
a. 5.94	1%	1	·		b. 59.8	9%		
d. 4.4	C				d. None			
Answe								
Solutí	on:							
Inflat	íon rate	for díft	ferent y	ears are	e calcula	ted as:		
Year 1	996-97	$= \frac{X_t - X_t}{X_t - X_t}$	$\frac{1}{2} \times 10^{-1}$	$00 = \frac{12}{12}$	7.2–121.6 121.6	× 100	= 4.6%	
		$X_{t-1}$	1	13	<del>121.6</del> 2.8–127.2			
Year 1	997-98	$=\frac{x^{-1}}{X_{t-1}}$	<del>- * 10</del>	0 = -	$   \begin{array}{r}     121.6 \\     2.8 - 127.2 \\     127.2 \\     0.7 - 132.8 \\     132.8   \end{array} $	× 100	= 4.40%	0
Venue	998-99 :	$=\frac{X_t-X_t}{X_t-X_t}$	$\frac{-1}{-1} \times 10$	$0 = \frac{140}{1}$	0.7-132.8	× 100 :	= 5.94%	, )
I CUT					1220			
	ULAR .				132.8			
CIRC Que.12 a. Lespi	<b>:ULAR</b> . Círcula eyre's In	<b>TEST</b> r test ís dex Nu	s satísfi mber		132.8			
CIRC Que.12 a. Lespi b. Paas	Círcula . Círcula eyre's In che's Inc	<b>TEST</b> r test ís dex Nu lex Nur	s satísf mber nber	ied by				
<b>CIRC</b> Que.12 a. Lespi b. Paas c. The s	<b>Círcula</b> . Círcula eyre's In che's Ina .ímple ge	<b>TEST</b> r test ís dex Nu lex Nur cometrío	s satísf mber nber c mean	ied by of price	relatíves			
CIRC Que.12 a. Lespa b. Paas c. The s aggreg	Círcula . Círcula eyre's In che's Inc	<b>TEST</b> r test ís dex Nu lex Nur cometrío	s satísf mber nber c mean	ied by of price				
CIRC Que.12 a. Lespa b. Paas c. The s aggreg	Círcula Círcula eyre's In che's Ind imple ge ative wit e of these	<b>TEST</b> r test ís dex Nu lex Nur cometrío	s satísf mber nber c mean	ied by of price				
CIRC Que.12 a. Lespi b. Paas c. The s aggreg d. None	Círcula Círcula eyre's In che's Ind imple go ative wit e of these r: C	<b>TEST</b> r test ís dex Nu lex Nur cometrío	s satísf mber nber c mean	ied by of price				
CIRC Que.12 a. Lespi b. Paas c. The s aggreg d. None Answe Soluti	Círcula . Círcula eyre's In che's Ina imple ga ative wit e of these r: C	<b>TEST</b> r test ís dex Nur lex Nur cometrío ch fíxed	s satísf mber nber c mean weíght	ied by of price		s and t	he weigh	ted
CIRC Que.12 a. Lespe b. Paas c. The s aggreg d. None Answe Soluti Círcula	Círcula Círcula eyre's In che's Ind imple go ative wit e of these r: C on: on:	<b>TEST</b> r test ís dex Nu lex Nur cometrío ch fíxed satísfie	s satísf mber nber c mean weíght	ied by of price s.	e relatíves	s and th críc m a	he weigh an of pri	ted
CIRC Que.12 a. Lespe b. Paas c. The s aggreg d. None Answe Soluti Círcula	Círcula Círcula eyre's In che's Ind imple go ative wit e of these r: C on: on:	<b>TEST</b> r test ís dex Nu lex Nur cometrío ch fíxed satísfie	s satísf mber nber c mean weíght	ied by of price s.	e relatíves le geomet	s and th críc m a	he weigh an of pri	ted
CIRC Que.12 a. Lespi b. Paas c. The s aggreg d. None Answe Solutí Círcula relatíve	Círcula eyre's In che's Ind che's Ind imple ge ative wit e of these on: on: on: on: on: on: s and w	<b>TEST</b> r test ís dex Nur lex Nur cometríc ch fíxed satísfie eíghted	s satísf mber nber c mean weight ed by th aggreg	ied by of price s.	e relatíves le geomet	s and th críc m a	he weigh an of pri	ted
CIRC Que.12 a. Lespe b. Paas c. The s aggreg d. None Answe Soluti Círcula relatíve	Círcula Círcula eyre's In che's Ind imple go ative wit e of these r: C on: on:	rtest ís dex Nu lex Nuv cometrío ch fíxed satísfie eíghted	s satísf mber nber c mean weight ed by th aggreg	ied by of price s. ne simpl gative w	e relatíves le geomet íth fixed	s and th críc m a	he weigh an of pri	ted

				Chapter 19	
0.3		d 4			
Answer:	D				
Solution	l:				
The Nur	nber of test of Adea	inacy is 4			
	ME SERIES				
Que.1. N	nethods of Measuríi	ng Trends	)		
a. Free h	and curve method	-	b. Average	e method	
c. Geogr	aphical method		d. None		
Answer:	A				
Solutíon	ı:				
Trend c	an be determined:				
(í) free b	nand curve method;				
(íí) mov	ing averages metho	od;			
(ííí) sen	ií averages method;	and			
(í∨) leas	t-squares method.				
Que.2. V	Vhích of these ís a 1	nethod of	least sanar	re?	
a. Línea			· ·	ntial Trend	
	olíc Trend		d. All of th		
Answer:	Þ		,		
Solutíon	r:				
There wi	ll be many straigh	t línes wh	ích can me	et the first condi	tíon.
	all different lines,			•	
-	n. It is because of t	$\sim$			lís
known i	as method of least s	quares.			
	· · · · ·				
Que.3. A	tddítíve model oftí	me seríes	ís		
a. O = 7	-+S+C+1		b. O = TS	CI	

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c. O = a + bx	d. none
Answer: A	
Solution:	
$O = T \times S \times C \times I$	
where O refers to original di	ata,
⊤ refers to trend	
S refers to seasonal variation	ons,
C refers to cyclical variation	ns and
I refers lo irregular variation	NS.
This is the most commonly	j used model in the decomposition of t
series.	
This model is called Additi	ve model.
Que.4. The multiplicative ti	íme seríes model ís
a. y = T + S + C + I	b. $y = TSCI$
c. $y = a + bx$	d. $y = a + bx + cx^2$
Answer: A	
Solutíon:	
$y = T \times S \times C \times I$ ,	
where,	
T refers to Trend Variation	
S refers to seasonal variation	ons,
C refers to cyclical variation	ns and
I refers lo irregular variation	NS.
Que.5. The sale of Cold Driv	nk would go up •in summers and go c
in the winters is an exampl	e of
in the winters is an example	
a. Trend Variation	b. Seasonal Variation

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Answer: b
Solution:
The sale of cold drínk would go up ín summers end go down ín the winder ís an example of seasonal variation.
winder is un example of seusonal variación.