

# Model Question Paper

Time-3hrs  
90

Std-X

MaxMarks-

## General Instructions:

- 1.All questions are compulsory.
- 2.The question paper consists of 31 questions divided into 4 sections, A, B, C and D. Section-A comprises of 4 questions of 1 mark each. Section-B comprises of 6 questions of 2 marks each . Section-c comprises of 10 questions of 3 marks each and Section-D comprises of 11 questions of 4 marks each.

### Section-A

- If  $\cos\alpha = \sin 2\alpha$  and  $2\alpha < \pi$ , then find the value of  $\cot 3\alpha$ .
- 2. if ..... , are n observations with mean , then find -).
- If sides of two similar triangles are in the ratio 4:9, then find the ratio of the areas of the triangles.
- One equation of a pair of dependent linear equations is  $3x - 5y = 12$ . Find the second equation.

### Section-B

- If two positive integers a and b are written as  $a = x^5y^2$  and  $b = x^2y^3$ ; x,y are prime numbers, then find HCF LCM of a and b.
- In a frequency distribution, the mode and mean are 26.6 and 28.1 respectively. Fine out the median .
- A is any interior point of PQR. If  $PQ = 24$  cm,  $QR = 26$  cm ,angle  $PAR = \theta$  , $PA = 6$  cm and

AR= 8cm.Find angle QPR.

- What type of solution does the pair of equations  $x + y = -1$  ,  $x - y = 2$ , x ,y o have ?
- In ABC, D and E are the points on the sides AB and BC when  $DE \parallel AC$  and  $DF \parallel AE$ . Prove that  $DE = DF$  .
- On dividing  $x^3 - 3x^2 + x + 2$  by a polynomial  $g(x)$ , the quotient and remainder were

$(x - 2)$  and  $(-2x + 4)$  respectively. Find  $g(x)$ .

### Section-C

11.If the polynomial  $x^4 + 2x^3 + 8x^2 + 12x + 18$  is divided by another polynomial  $x^2 + 5$ , the

Remainder comes out to be  $px + q$  .Find the values of p and q.

12.Taxi charges in a city consists of fixed charges and the remaining depending upon the

Distance travelled in kilometres. If a person travels 70 Km, he pays Rs.500 and for

Travelling 100 Km, he pays Rs.680.Express the above statement with the help of

Linear equations and hence find the fixed charges and the rate per kilometres. A

Man who travelled 80 Km pays Rs.600.The taxi driver returns him the excess money

Saying that was not the correct amount. Find the amount returned by the taxi driver.

13.Prove that  $3 + \sqrt{2}$  is an irrational number.

14. M is the mid point of side CD of a parallelogram ABCD. The line BM is drawn intersecting AC in L and AD produced at E. Prove that  $EL = 2BL$ .

15. If the diagonals of a quadrilateral divide each other proportionally, prove that it is a Trapezium.

16. If  $\tan A + 1 = \sec A$ , show that  $\cos A - \sin A = \sin A$ .

17. Find the value of  $\cos A$  geometrically.

18. The median of the distribution given below is 14.4. Find the value of x and y, if the total frequency is 20.

Class Interval	0-6	6-12	12-18	18-24	24-30
Frequency	4	x	5	y	1

19. Evaluate  $\operatorname{cosec}^2 A - \cot A - \tan A$ .

20. The mean of the following frequency table is 53. But the frequencies X and Y in the classes 20-40 and 60-80 are missing. Find the missing frequencies.

Age(in yrs)	0-20	20-40	40-60	60-80	80-100	TOTAL
No. Of people	15	X	21	Y	17	100

#### SECTION- D

21. Using prime factorization method, find the HCF and LCM of 72, 126 and 168. Also show that  $\text{HCF} \times \text{LCM} = \text{Product of three numbers}$ .

22. The remainder on division of  $x^3 + 2x^2 + Kx + 3$  by  $x - 3$  is 21, find the quotient and the value of K. Hence, find the zeroes of the cubic polynomial  $x^3 + 2x^2 + Kx - 18$ .

23. Draw the graph of the following pair of linear equations:  $x + 3y = 6$ ;  $2x - 3y = 12$ .
- Hence find the area of region bounded by the lines  $x = 0$ ;  $y = 0$  and  $2x - 3y =$
- 12.
24. Prove that the ratio of area of two similar triangles is equal to the ratio of the Square of their corresponding sides.
25. Prove that:  $\sin A + \cos A = 2 \operatorname{cosec} A$ .
26. PQR is a right triangle, right angled at Q. X and Y are the points on PQ and QR such that  $PX : XQ = 1 : 2$  and  $QY : YR = 2 : 1$ . Prove that  $9(PY^2 + XY^2) = 13PR^2$ .
27. Obtain all other zeroes of  $2x^4 - 6x^3 + 3x^2 + 3x - 2$ , if two of its zeroes are  $\alpha$  and  $\beta$ .
28. Prove that  $\sin^2 A + \cos^2 A = 1$ .
29. If  $\sec A = 1 - a$ , prove that  $\sec A + \operatorname{cosec} A = (2 - a^2)^{3/2}$ .
30. Draw less than and more than ogive for the following distribution and hence Obtain the median

Marks	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. Of students	14	6	10	20	30	8	12

31. The number of educated females in different age groups in a certain village

During a year is given below :

Age groups	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. Of females	14	18	20	22	20	14	8

Find the mode for the above data .What values are depicted here?

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