

CLASS :- X

TIME ALLOWED :- 3 HR.

GENERAL INSTRUCTIONS:-

- All the questions are compulsory
- Question number 1 to 6 carry 1 mark each
- Question number 7 to 12 carry 2 mark each
- Question number 13 to 22 carry 3 mark each
- Question number 23 to 30 carry 4 mark each

Section -A

- 1 What is the HCF of $3^3 \times 5$ and $3^2 \times 5^2$? 1
- 2 If one of the zeros of the quadratic polynomial $(k-1)x^2 + kx + 1 = 0$ is -3 , then find the value of k ? 1
- 3 If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, then find value of k . 1
- 4 If one root of the equation $5x^2 + 13x + p = 0$ is reciprocal of the other, then find p ? 1
- 5 Write the acute angle θ satisfying $\sqrt{3} \sin \theta = \cos \theta$. 1
- 6 If the mode of a distribution is 8 and its mean is also 8, the find median. 2

Section-B

- 7 If α and β are zeros of polynomial $p(x) = x^2 + x + 1 \neq 0$, then find the values of $\frac{1}{\alpha} + \frac{1}{\beta}$ and $\alpha^2 + \beta^2$. 2
- 8 Find the value of α for which the following linear equations have infinite solutions : 2
 $2x + (\alpha - 2)y = \alpha$ $6x + (2\alpha - 1)y = 2\alpha + 5$
- 9 The 4th term of an AP is zero. Prove that the 25th term of the AP is three times its 11th term. 2
- 10 Let $\triangle ABC \sim \triangle DEF$ and their areas be respectively 64 cm^2 and 121 cm^2 . If $EF = 15.4 \text{ cm}$, find BC . 2
- 11 If $\cot \theta = \frac{7}{8}$ or $\tan \theta = \frac{8}{7}$, find the value of $\frac{(1 + \cos \theta)(1 - \sin \theta)}{(1 - \sin \theta)(1 + \sin \theta)}$. 2

- 12 A ticket is drawn at random from a bag containing tickets numbered from 1 to 40. Find the probability that the related ticket has a number which is a multiple of 5. 2

Section -C

- 13 The LCM of the two numbers is 14 times their HCF. The sum of LCM and HCF is 600. If one number is 280, then find the other number 3
- 14 If α and β are zeros of the quadratic polynomial $f(x) = 2x^2 - 5x + 7$, find a polynomial whose zeros are $2\alpha + 3\beta$ and $3\alpha + 2\beta$. 3

- 15 Solve for x and y : 3

$$\frac{6}{x-1} - \frac{3}{y-2} = 1; \frac{5}{x-1} + \frac{1}{y-2} = 2 \text{ where } x \neq 1, y \neq 2$$

- 16 Solve for x : 3

$$2 \left[\frac{2x-1}{x+3} \right] - 3 \left[\frac{x+3}{2x-1} \right] = 5; x \neq -3, \frac{1}{2}$$

- 17 The sum of the first 7 terms of an AP is 63 and the sum of its next 7 terms is 161. Find the 28th term of this AP. 3

- 18 The ratio of the areas of two similar triangles is equal to the ratio of the squares of any two corresponding sides. 3

19 If $7 \sin^2 \theta + 3 \cos^2 \theta = 4$, show that $\tan \theta = \frac{1}{\sqrt{3}}$.

20 The angles of elevation of the top of a rock from the top and foot of a 100m high tower are 30° and 45° respectively. Find the height of the rock?

21 Weekly income of 600 families is tabulated below: *Less than, give*

Weekly income (in Rs.	0 - 1000	1000 - 2000	2000 - 3000	3000 - 4000	4000 - 5000	5000 - 6000
Number of families)	250	190	100	40	15	5

Compute the median.

22 Three dice are thrown simultaneously. What is the probability of obtaining 17 or 18.

Section - D

23 Show that the cube of any positive integer is of the form $4m, 4m + 1$ or $4m + 3$, for some integer m .

24 Roohi travels 300km to her home partly by train and partly by bus. She takes 4 hours if she travels 60km by bus and the remaining by train. If she travels 100km by bus and the remaining by train, she takes 10 minutes longer. Find the speed of the train and the bus separately.

25 A motorboat whose speed in still water is 18 km/h, take 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

26 In an AP, the sum of the 4th and 10th term is 40, and the sum of its 8th and 16th term is 70, then find the sum of its first twenty terms?

27 In an equilateral triangle ABC, D is a point on side BC such that $BD = \frac{1}{3} BC$. Prove that $9AD^2 = 7AB^2$.

28 Prove that :

$$\frac{\tan \theta}{1 - \cot \theta} + \frac{\cot \theta}{1 - \tan \theta} = 1 + \sec \theta \operatorname{cosec} \theta = 1 + \tan \theta + \cot \theta$$

29 An aeroplane when 3000meters high passes vertically above another aeroplane at an instance when their angles of elevation at the same observation point are 60° and 45° respectively. How many metres higher is the one than the other?

What are the values you learn from the air traffic controller?

30 The mean of the following frequency distribution is 62.8 and the sum of frequencies is 50. Compute the missing frequencies f_1 and f_2 .

Class	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100	100 - 120	Total
Frequency	5	f_1	10	f_2	7	8	50