General Instructions:

A. All questions are compulsory.

B. The **Question Paper** consists of **30 Questions** divided into **Four** sections **A, B, C and D**.

C. **Section A** contains **6 Questions** of **1**mark each.

D. **Section B** contains **6Questions** of **2**marks each.

E. **Section C** contains **10 Questions** of **3**marks each.

F. **Section D** contains **8 Questions** of **4**marks each.

G. There is no overall choice. However, an **Internal choice** has been provided in **Four** questions of **3 Marks** each and **Three** questions of **4 Marks** each. You have to attempt only one of the alternatives in all such questions.

H. Use of **Calculators** is not permitted.

Section A

1

Check whether the following are quadratic equations:

$(x + 1)^2 = 2(x - 3)$

[1]

2

For the following APs, write the first term and the common difference

0.6, 1.7, 2.8, 3.9, . . .

[1]

3

State Euclid’s division algorithm.

[1]

4

Find the distance between the following pairs of points :

(– 5, 7), (– 1, 3)

[1]

5

Write the value of sin (65° + θ) -cos (25° - θ).

[1]

6

Give two different examples of pair of

(i) similar figures.

(ii) non-similar figures.

[1]

Section B

7

The H.C.F. and L.C.M. of two numbers are 12 and 240 respectively. If one of these numbers is 48; find the other number.

[2]

8

Find the number of solutions of the follow ing pair of linear equations :

x + 2y - 8 = 0

2x + 4y = 16

[2]

9

A deck of 52 cards is shuffled. Tanvika draws a single card from the deck at random. What is the probability that the card is a Jack.

[2]

10

Determine if the points (1, 5), (2, 3) and (– 2, – 11) are collinear

[2]

11

12 cards, numbered 1, 2,3....., 12 are put in a box and mixed throughly. A card is drawn at random from the box. Find the probability that the card drawn bears

(i) an even number

(ii) a number divisible by 2 or 3.

[2]

12

Choose the correct choice in the following and justify :

30th term of the AP: 10, 7, 4, . . . , is

11th term of the A.P. is $-3, \frac{1}{2}, 2, ...$

Section C

13

Kind a cubic polynomial with the sum, sum of the product of its zeroes taken two at a time, and the product of its zeroes as 2, -7, -14 respectively.

[3]

14

Find the distance between the points

(cos θ - sin θ), (-cos θ, sin θ)

[3]

OR

Find the distance between the points

Let the given points be A (a cos θ, 0) and B(0, a sin θ)

[3]

15

The sets of Physics, Chemistry and Mathematics books have to be stacked in such a way that all the books are stored topic wise and the height of each stack is the same. The number of Physics books is 12, the number of Chemistry books 20 and the number of Mathematics books is 30. Assuming that the books are of the same thickness, determine the number of stacks of Physics, Chemistry and Mathematics books.

[3]

16

For what value of k, the pair of linear equations 3x - ky + 7 = 0,x - 2y + 5 = 0 has unique solution.

[3]

17

Evaluate without using trigonometric tables:

[3] $\frac{3\cos 55^\circ}{7\sin 35^\circ} - \frac{4(\cos 70^\circ . \operatorname{cosec} 20^\circ)}{7(\tan 5^\circ . \tan 25^\circ . \tan 45^\circ . \tan 65^\circ . \tan 85^\circ)}$.

OR

Without using trigonometric tables, evalutate the following:

[3] $(\sin^2 25° + \sin^2 65°) + \sqrt{3}(\tan 5°.\tan 15°.\tan 30°.\tan 75°.\tan 85°)$

18

A conical flask is full of mater. The flask was base m radius r and height n. the mater is poored into a cylindrical flask of base radius mr. find the height of water in the cylindrical flask.

[3]

OR

A cylinder, a cone and a hemisphere are of equal base and have the same height. What is the ratio of their volumes?

[3]

19

The diagonal BD of a parallelogram ABCD intersects the segment AE at the point F, where E is any point on the side BC. Prove that DF × EF = FB × FA.

[3]

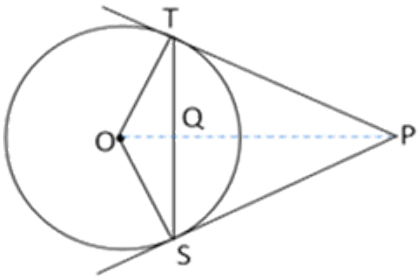
OR

The perimeters of two similar triangles ABC and PQR are respectively 36 cm and 24 cm. If PQ = 10 cm, find AB.

[3]

20

In Fig, from an external point P, two tangents PT and PS are drawn to a circle with centre O and radius r. If OP=2r, show that ∠ OTS = ∠ OST = 30°.



[3]

21

A chord of a circle of radius 14 cm subtends 60° at the centre. Find the area of the major sector.

22

The marks obtained by 40 students of class X of a certain school in Science paper consisting of 10 marks are presented in the table below. Find the mean marks obtained by the students.

Marks obtained(x_i)	5	6	7	8	9
Number of students (f_i)	4	8	14	11	3

[3]

Section D

23

Ramkali saved Rs. 5 in the first week of a year and then increased her weekly savings by Rs. 1.75, if in the nth week, her weekly savings became Rs. 20.75, find n.

[4]

24

Represent the following problem situations in the form of quadratic equations:

The area of a rectangular plot is 528 m^2. The length of the plot (in metres) is one more than twice its breadth. We need to find the length and breadth of the plot.

[4]

OR

Represent the following problem situations in the form of quadratic equations:

The product of two consecutive positive integers is 306. We need to find the integers.

[4]

25

Prove the following identities:

$(1 + \cot \theta - \operatorname{cosec} \theta)(1 + \tan \theta + \sec \theta) = 2$.

[4]

26

A hemispherical tank full of water is emptied by a pipe at the rate of $\frac{11}{7}$ litres per second. How much time will it take to half empty the tank, if the tank is 3 m in diameter.

[4]

27

Two poles of heights 6 m and 11 m stand on a plane ground. If the distance between the feet of the poles is 12 m, find the distance between their tops.

[4]

OR

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

[4]

28

Construct a triangle ABC in which AB = 5 cm, ∠B = 60° and altitude CD = 3 cm. Construct a triangle AQR similar to ΔABC, such that each side of ΔAQR is 1.5 times that of the corresponding side of ΔABC.

[4]

29

The angle of elevation of a jet plane from a point A on the ground is 60°. After a flight of 15 seconds the angle of elevation changes to 30°. If the jet plane is flying at a constant height of $1500\sqrt{3}$ m find the speed of the jet plane.

[4]

30

Find the value of P, if the mean of the following distribution is 18.

x:	13	15	17	19	20 + p	23
f:	8	2	3	4	5p	6

[4]

OR

The median of the following data is 52.5. Find the values of x and y if the total frequency is 100.

Class Interval	Frequency
0-10	2
10-20	5
20-30	x
30-40	12
40-50	17
50-60	20
60-70	y
70-80	9
80-90	7
90-100	4
	Total 100

[4]