4

MATHEMATICS [BASIC]
(018) E

FORMAT OF THE QUESTION PAPER - 2023

Note : This format of the question paper is meant for the guidance of the students, teachers, paper setters, modrators, etc. The paper setter has liberty to change the format keeping in mind the basic objectives of the syllabus and the chapterwise weightage of marks.

Section A : Objective Questions

+ Questions 1 to 24 (24 questions) (1 mark each)   **24**
+ All the questions are compulsory.
+ In this part, objective questions like MCQs, MRQs, True / False statement, Fill in the blanks, Definitions, Formulae, Units, Very short answer questions, Answer in a word or a number or a sentence, Give full form, Pick the non-similar word/phrase, Arrange in order, Questions based on graph, Match the list, etc. can be asked.
+ Care should be taken that the number of questions of the same kind does not exceed 2 or 3.

Section B : Short Answer Questions

+ Question No. 25 to 34 (10 questions) (2 marks each)   **20**
+ Internal options must be given in 4 questions.

Section C : Short Questions

+ Question No. 35 to 42 (8 questions) (3 marks each)   **24**
+ Internal option must be given in 3 questions.

Section D : Long Answer Questions

+ Question No. 43 to 45 (3 questions) (4 marks each)   **12**
+ Internal option will be given in 1 questions.

CHAPTERWISE WEIGHTAGE OF MARKS

Chapter No.	Name of Chapter	Weightage of Marks
1	Real Numbers	02
2	Polynomials	06
3	Pair of Linear Equations in Two Variables	04
4	Quadratic Equations	04
5	Arithmetic Progressions	08
6	Triangles	04
7	Coordinate Geometry	06
8	Introduction to Trigonometry	04
9	Some Applications of Trigonometry	02
10	Circles	04
11	Constructions	04
12	Areas Related to Circles	02
13	Surface Areas and Volumes	06
14	Statistics	14
15	Probability	10
	Total Marks	**80**

Q.PAPER

1

Mathematics (Basic)

QUESTION PAPER - 1   **Std.-10**

| Time : 3 Hours | **Board Sample Q. Papers (Fully Solved)** | Total Marks : 80 |

Instructions :
(1)   All questions are compulsory. Internal options are given.
(2)   45 questions of this question paper is divided in section A, B, C and D.
(3)   Number given at right side of question represent it's marks of the section.
(4)   Draw figure wherever necessary.
(5)   Start new section from new page. Write answer of question in sequnce.
(6)   Calculator is not allowed.

Section-A

Answer as per given instruction : (Question number 1 to 24) (1 mark each)   24

★ **State whether each of the following statements are true or false.**
   1.   The LCM of the smallest pirme number and the smallest composite number is 4.
   2.   A polynomial of n degree will have at the most $(n + 1)$ zeroes.
   3.   The sixth prime number in the AP 5, 7, 9, ... is 17.

   4.   For $0^0 < \theta < 90^0$, the value of sin increses as the value of increases.

   5. $\sin (A + B) = \sin A + \sin B \; (0^0 < A, B < 90^0)$

   6.   For a given frequency distribution, if mode=35 and mean=35, then median=35.

★ **Fill in the blanks by selecting the proper option from those given below each questions :**
   7.   If x, y and z are distinct prime numbers, their LCM is _____.
   (a) 1   (b) xy (c) yz (d) xyz

   8.   The graph of $p(x) = x^2 + 4x + 3$ is a / an _____
   (a) line   (b) ray
   (c) parabola opening upwards   (d) parabola opening downwards

   9.   For the part of line equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$

   (where $a_1^2 + b_1^2 \neq 0$ and a_1, b_1, c_1 are real numbers for $i = 1, 2$), if the relation
   .... holds good. they will have infinitely many solutions.

   (a) $\dfrac{a_1}{a_2} \neq \dfrac{b_1}{b_2} \neq \dfrac{c_1}{c_2}$ (b) $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$

   (c) $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} \neq \dfrac{c_1}{c_2}$ (d) $\dfrac{a_1}{a_2} \neq \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$

   10.   The formula to find the discriminant of the quadratic equation $ax^2 + bx + c = 0$ is
   $D =$ _____

   (a) $b^2 + 4ac$ (b) $b^2 - 4ac$ (c) $b^2 - ac$ (d) $b^2 - 2ac$

   11.   The formula to find the n th term of an AP is $a_n =$ _____
   (a) $a + d$ (b) $a + (n-1)d$ (c) $a + (n+1)d$ (d) $a + n - d$

12. The distance of the point P(x, y) from the origin is _____

   (a) $\sqrt{x^2 + y^2}$ (b) $\sqrt{x + y}$ (c) $|x + y|$ (d) $\sqrt{x^2 - y^2}$

★ **Fill in the blanks so as to make each of the following statement true :**

13. Ogive is the graphical representation of _____

14. In the experiment of rolling a balance die once, the probability of receiving 7 on the upper face is _____

15. The probability of 'event A' + the probability of 'event not a' = _____

16. The probability of a leap year having 53 Mondays is _____

17. If α and β are are the zeroes of the polynomial $p(x) = x^2 - 4x + 3$, then

   $\alpha^2 + \beta^2 =$ _____

18. The ($n - 2$) the term of the AP having the first term a and the common difference d is _____

★ **Answer the following in a sentence, a word or a number :**

19. Point A lies in the exterior of a circle with centre P. A tangent from a touches the circle at B. If PA = 25 cm and AB = 24 cm, find the radius of the circle.

20. The ratio of radii of two cylinders is 2 : 3 and the ratio of their heights is 5 : 3. Find the ratio of the volumes of these cylinders.

21. If the radius of a circle is increased by 10% by what per cent will its area increase?

22. Two cubes, each having volume 64 cm³, are joined together face to face to form a cuboid. Find the length of the cuboid so formed.

23. The following figures gives the graph of $y = p(x)$. From that, state the number of zeroes of $p(x)$.
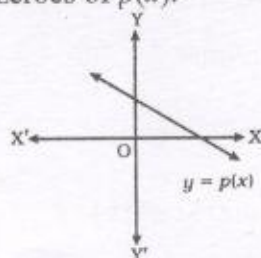
24. Find the maximum area of a triangle inscribed in a semicircle with diameter 20 cm.

<center>

Section : B

</center>

★ **Answer the following questions with calculations :**   20
   [Q. no. 25 to 34 - 2 marks each]

25. State the formula to find the n th term of an AP and hence find its ($n - 4$)th term.

<center>OR</center>

25. How many three digit natural numbers are divisible by 7 ?

26. The radii of a cylinder and a cone are equal and their heights are also equal. How many times is the voluem of the cylinder as compared to the volume of the cone?

<center>OR</center>

26. Find the maximum volume of a cone carved from a hemisphere of radius r.

27. A piggy bank contains hundred 50 paise coins, fifty ₹ 1 coins, twenty ₹ 2 conis and ten ₹ 5 coins. If it is equally likely that one of the coins will fall out when the bank is turned upside down, what is the probability that the coin (1) will be a 50 paise coin ? (2) will be a ₹ 5 coin ?

28. A box contains 3 blue, 2 white and 4 red marbles. If a marble is drawn at random from the box, what is the probability that it will be (1) blue ? (2) not red ?

29. Find the zeroes of the quadratic polynomial $2x^2 + 7x + 5$ and verify the relation between the zeroes and the coefficients.

<div align="center">OR</div>

29. If α and β are the zeroes of the quadratic polynomial $p(x) = ax^2 + bx + c$ (a, b, c are real number, $a \neq 0$), then without finding α and β, find $\alpha + \beta$ and $\alpha \cdot \beta$.

30. Evaluate : $2\cot^2 45^0 + \cos^2 60^0 - \sin^2 30^0$.

<div align="center">OR</div>

30. For angles P, Q and R of $\triangle PQR$, prove that $\tan\left(\dfrac{P+R}{2}\right) = \cot\dfrac{Q}{2}$.

31. The radii of two concentric circles are 21 cm and 29 cm. A chord of the bigger circle touches the smaller circle. Find the length of that chord.

32. A 1.5 m tall girl stands on the ground 28.5 m away from the base of a tower. The angle of elevation of the top of the tower from her eyes is 45^0. What is the hight of the tower ?

33. Find the coordinates of the point which divides the line segment PQ joining P (2, 3) and Q(6, 7) in the ratio 3 : 1 from the side of P.

34. For a given frequency distribution, in usual notations, $l = 200$, $f_1 = 27$. $f_0 = 18$, $f_2 = 20$ and $h = 100$. Find the mode of the data.

<div align="center">

Section : C

</div>

★   **Solve the following (Question number 35 to 42) (3 marks each)**   **24**

35. The observation of a data are $\dfrac{x}{5}, x, \dfrac{x}{4}$ and $\dfrac{x}{3}$ for some $x > 0$. If the median of the data is 10, find its mean.

36. The following table shows the ages of the patients admitted in a hospital during a year :

Age (in year)	5-15	15-25	25-35	35-45	45-55	55-65
Number of patients	6	11	21	23	14	5

Find the mode of the data given above.

37. Solve the pair of linear equations $2x + 3y = 11$ and $x - 2y = -12$ by the method of elimination and the find k which satisfiees $y = kx + 3$.

<div align="center">OR</div>

37. Find whether the following pairs of linear equations are consistent or inconsistent:

1. $3x + 2y = 5$ and $2x - 3y = 7$

2. $2x - 3y = 8$ and $4x - 6y = -9$

3. $9x + 10y = 42$ and $9x - 10y = 12$

38. Using quadratic formula, find the roots of the quadratic equation $3x^2 - 5x + 2 = 0$.

39. Find the sum :

$(-5) + (-8) + (-11) + ... + (-230)$

40. Find the value of x and y if A $(1, 2)$, B $(4, y)$, C $(x, 6)$ and D $(3, 5)$ are the vertices of parallelogram ABCD.

OR

40. Point P lies on the x-axis and its distance from point A $(11, 12)$ is 13. Find the coordinates of P.

41. Ronak made a wooden article by scooping out a hemisphere from each end of a solid cylinder. If the height of the cylinder is 10 cm and its base is of diameter 7 cm. Find the total surface area of the article.

42. A box contains 90 disce which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears :

1.   a two - digit number

2.   a perfect square number and

3.   a number divisible by 5.

OR

42. The marks scored out of 100 by certain studnts are tabulated below :

Marks scroed	0-34	35-50	51-70	71-90	90-100
Number of Students	7	10	14	11	8
Result (Grade)	F	D	C	B	A

Find the probability that a student selected at random.

1.   has received F grade.

2.   has received A grade.

3.   has received either C or D grade.

Section : D

★   **Answer the following questions with calculations :**

(Question no. 43 to 45) (4 marks each)   (12)

43. State the prove the basic proportionality theorem.   **OR**

43. State and prove Pythagoras theorem.

44. Draw a circle of radius 3 cm. Take two points P and Q on one of its extended diameter each at at a distance of 7 cm from its centre. Draw tangents to the circle from these two points P and Q. Write the steps of construction.

45. The median of the following data is 525. Find the values of x and y, If the total frequency is 100.

Class interval	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
Frequency	2	5	x	12	17	20	y	9	7	4

✦

| QUESTION PAPER : 1 - FULLY SOLVED |

| Section : A |

1. True   2. False

3. False   4. True

5. False   6. True

7. (d) xyz 8. (c) parabola opening upwards

9. (b) $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$ 10. (b) $b^2 - 4ac$

11. (b) $a + (n-1)d$ 12. $\sqrt{x^2 + y^2}$

13. cumulative frequency distribution   14. 0

15. 1   16. $\dfrac{2}{7}$

17. 10   18. $a + (n-3)d$

19. 7 cm   20. 20 : 27

21. 21%   22. 8 cm

23. one   24. 100 cm²

| Section : B |

25. The nth term (a_n) of an AP with the first term a and the common difference d is given by
$$a_n = a + (n-1)d$$
Now, replacing n by $(n-4)$
we get $a_{n-4} = a + (n-4-1)d = a + (n-5)d$
Thus, the $(n-4)$th term of an AP is $a + (n-5)d$.

OR

25. The list of three digit natural numbers divisible by 7 is as below :
105, 112, 119, ..., 987, 994.
These numbers form a finite AP with $a = 105$, $d = 112 - 105 = 7$ and last term $l = 994$.
Suppose the last term of the AP is its nth term.

$\quad l = a_n$

$\therefore \quad 994 = a + (n-1)d$

$\therefore \quad 994 = 105 + (n-1)7$

$\therefore \quad 7(n-1) = 889$

$\therefore \quad n-1 = 127$

$\therefore \quad n = 128$

Hence, there are 128 terms in the AP.
Hence, 128 three digit natural numbers are divisible by 7.

26. For the cylinder, let the radius $r = r_1$ and height $h = h_1$.

For the cone, let the radius $r = r_2$ and height $h = h_2$.

According to given, $r_1 - r_2 = R$ (say) and $h_1 = h_2 = H$ (say)

Now, $\dfrac{\text{Volume of the cylinder}}{\text{Volume of the cone}} = \dfrac{\pi r_1^2 h_1}{\frac{1}{3}\pi r_2^2 h_2}$

$$= \dfrac{3\pi R^2 H}{\pi R^2 H}$$

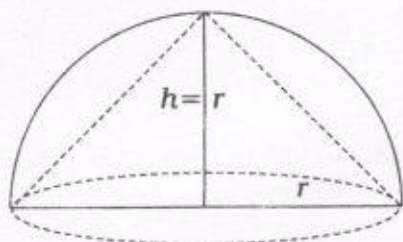$$= 3$$

∴ Volume of the cylinder = 3 × Volume of the cone.

OR

26. As shown in the figure, for the required cone with maximum volume, radius $= r$ and height $h = r$.

Volume of the cone $= \dfrac{1}{3}\pi r^2 h$

$$= \dfrac{1}{3}\pi r^2 \cdot r \ (\because h = r)$$

∴ Volume of the cone $= \dfrac{1}{3}\pi r^3$

27. Total number of cons in the piggy bank $= 100 + 50 + 20 + 10$
$$= 180$$

∴ The number of all possible outcomes in the experiment in which one coin falls out $= 180$.

1. Let A be the event 'the coin that falls out is a 50 paise coin'.

There are hundred 50 paise coins in the piggy bank.

∴ The number of outcomes favourable to A is 100.

∴ $P(A) = \dfrac{100}{180} = \dfrac{5}{9}$

2. Let B be the event 'the coins that falls out is a ₹5 coin.'

There are ten ₹5 coins in the piggy bank.

∴ The number of outcomes favarable to B is 10.

∴ $P(B) = \dfrac{10}{180} = \dfrac{1}{18}$

28. The number of possible outcomes $= 3 + 2 + 4 = 9$

1. Let B denote the event "the marble is blue".

There are 3 blue marbles in the box.

Hence, the number of outcomes favourable to event B = 3.

∴ $P(B) = \dfrac{3}{9} = \dfrac{1}{3}$

2. Lex X denote the event "the marble is not red".

There are 5 marbles (3 blue and 2 white) in the box which are not red.

Hence, the number of outcomes favourable to event X = 5.

$$\therefore \quad P(X) = \frac{5}{9}$$

29. $2x^2 + 7x + 5 = 2x^2 + 2x + 5x + 5$

$$= 2x(x+1) + 5(x+1)$$

$$= (x+1)(2x+5)$$

Taking $2x^2 + 7x + 5 = 0$, we get $x+1=0$ or $2x+5=0$, i.e., $x=-1$ or $x=-\frac{5}{2}$.

Hence, -1 and $-\frac{5}{2}$ are the zeroes of the given quadratic polynomial.

Now, sum of the zeroes $= (-1) + \left(-\frac{5}{2}\right) = \frac{-7}{2} = \frac{-(Coefficient\ of\ x)}{Coefficient\ of\ x^2}$

and, product of the zeroes $= (-1) \times \left(-\frac{5}{2}\right) = \frac{5}{2} = \frac{Constant\ term}{Coefficient\ of\ x^2}$ **OR**

29. α and β are the zeroes of quadratic polynomial $p(x) = ax^2 + bx + c$.

Hence, $x - \alpha$ and $x - \beta$ are two factors of $p(x)$.

$\therefore \quad ax^2 + bx + c = k(x-\alpha)(x-\beta)$ $(k \neq 0)$

$\therefore \quad ax^2 + bx + c = k(x^2 - \alpha x - \beta x + \alpha \beta)$

$\therefore \quad ax^2 + bx + c = kx^2 - k(\alpha + \beta)x + k\alpha\beta$

Comparing the coefficints of x^2 and x and the constant terms.

$a = k, b = -k(\alpha + \beta)$ and $c = k\alpha\beta$

$\therefore \quad \alpha + \beta = -\frac{b}{k}$ and $\alpha\beta = \frac{c}{k}$

$\alpha + \beta = \frac{b}{a}$ and $\alpha\beta = \frac{c}{a}$ $(\because a = k)$

30. $2\cot^2 45^0 + \cos^2 60^0 - \sin^2 30^0 = 2(1)^2 + \left(\frac{1}{2}\right)^2 - \left(\frac{1}{2}\right)^2 = 2(1) + \frac{1}{4} - \frac{1}{4} = 2$ **OR**

30. For $\triangle PQR$ using notations $\angle P = P, \angle Q = Q$ and $\angle R = R$,

$P + Q + R = 180^0$

$\therefore \quad P + R = 180^0 - Q$

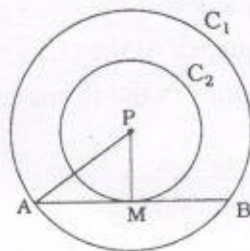$\therefore \quad \frac{P+R}{2} = \frac{180^0 - Q}{2}$ $\bigg|$ $\therefore \quad \tan\left(\frac{P+R}{2}\right) = \tan\left(90^0 - \frac{Q}{2}\right)$

$\therefore \quad \frac{P+R}{2} = 90^0 - \frac{Q}{2}$ $\bigg|$ $\therefore \quad \tan\left(\frac{P+R}{2}\right) = \cot\left(\frac{Q}{2}\right)$

31. For two concentric circles C_1 and C_2 with centre P, the radius of circle C_1 is 29 cm and the radius of circle C_2 is 21 cm. Also, chord AB of circle C_1 touches circle C_2 at M.

Hence, PA = 29 cm, PM = 21 cm, $\angle PMA = 90^0$ and AB = 2 AM.
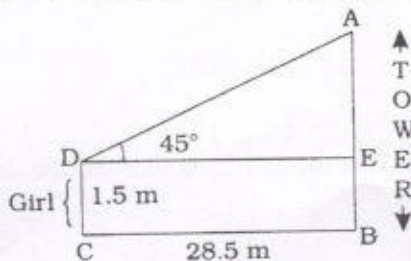
In $\triangle$ PMA, $\angle M = 90^0$

$$\therefore \quad AM = \sqrt{PA^2 - PM^2}$$

$$= \sqrt{29^2 - 21^2}$$

$$= \sqrt{841 - 441}$$

$$= \sqrt{400}$$

$$= 20 \text{ cm}$$

Now, AB = 2 AM

$$= (2 \times 20) \text{ cm}$$

$$= 40 \text{ cm}$$

Thus, the length of the chord of the bigger circle which touches the smaller circle is 40 cm.

32. Here, AB is the tower, CD is the girl observing the tower and $\angle ADE$ is the angle of elevation of the top of the tower from the girl's eyes.

Here, DCBE is a rectangle. Then, BE = CD = 1.5 m and DE = BC = 28.5 m.

In $\triangle$ AED, $\angle E = 90^0$, DE = 28.5 m and $\angle ADE = 45^0$

Then, from $\triangle$ AED.

$$\tan D = \frac{AE}{DE}$$

$$\therefore \quad \tan 45^0 = \frac{AE}{28.5}$$

$$\therefore \quad 1 = \frac{AE}{28.5}$$

$$\therefore \quad AE = 28.5 \text{ m}$$

Height of the tower = AB

$$= AE + BE$$

$$= (28.5 + 1.5) \text{ m}$$

$$= 30 \text{ m}$$

Thus, the height of the tower is 30 m.

33. Let P(x, y) be the point dividing the line segment PQ joining P(2, 3) and Q(6, 7) in the ratio 3 : 1 from the side of P.

Then, according to the section formula,

$$X = \frac{3(6) + 1(2)}{3 + 1}, Y = \frac{3(7) + 1(3)}{3 + 1}$$

$$X = \frac{18 + 2}{4}, Y = \frac{21 + 3}{4}$$

$$X = \frac{20}{4}, Y = \frac{24}{4}$$

$\therefore$ X = 5, Y = 6 Thus the coordinates of the required point are (5, 6).

34. Here, h = class size = 100

l = lower limit of the modal class = 200

f_1 = the frequency of the modal class = 27

f_0 = the frequency of the class preceding the modal class = 18

f_2 = the frequency of the class succeeding the modal class = 20

Substituting the values in the formula, we get

$$\text{Mode } Z = l + \left(\frac{f_1 - f_0}{2(f_1) - f_0 - f_2} \right) \times h$$

$$= 200 + \left(\frac{27 - 18}{2(27) - 18 - 20} \right) \times 100$$

$$= 200 + \left(\frac{9}{16} \right) \times 100$$

$$= 200 + \frac{900}{16}$$

$$= 200 + 56.25$$

$$= 256.25$$

Thus, the mode of the data is 256.25.

<div align="center">

Section : C

</div>

35. Arranging the observations in the ascending order, we get $\frac{x}{5}, \frac{x}{4}, \frac{x}{3}, \frac{x}{2}$ and x.

Here, $n = 5$ is odd.

Hence, median $M = \frac{n+1}{2}$ th observation

$$= \text{3rd observation}$$

$$= \frac{x}{3}$$

Now, median is 10.

$$\therefore \quad \frac{x}{3} = 10$$

$$\therefore \quad x = 30$$

Substituting $x = 30$ in the given observations, the observations are 6, 7.5, 10, 15, 30.

$$\text{Mean } \bar{x} = \frac{\text{sum of observations}}{\text{No. of observations}}$$

$$= \frac{6 + 7.5 + 10 + 15 + 30}{5}$$

$$= \frac{68.5}{5}$$

$$= 13.7$$

Thus, the mean of the observations is 13.7.

36. Here, the maximum frequency 23 is the frequency of class 35 – 45.

Hence, 35 – 45 is the modal class.

Now, l = lower limit of the modal class = 35.

$\qquad h$ = class size = 10

$\qquad f_1$ = the frequency of the modal class = 23.

$\qquad f_0$ = the frequency of the class preceding the modal class = 21.

$\qquad f_2$ = the frequency of the class succeeding the modal class = 14.

Substituting the values in the formula, we get

$$\text{Mode } Z = l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) \times h \qquad\qquad = 35 + \left(\frac{2}{11} \right) \times 10$$

$$\qquad\qquad\qquad = 36.8 \text{ (approx)}$$

$$= 35 + \left(\frac{23 - 21}{2 \times 23 - 21 - 14} \right) \times 10 \qquad \text{Thus, the mode of the data is 36.8.}$$

37. $\quad 2x + 3y = 11$ $\qquad\qquad\qquad\qquad\qquad$ ....(1)

$\quad x - 2y = -12$ $\qquad\qquad\qquad\qquad\qquad$ ....(2)

Multiplying equation (2) by 2, we get

$2x - 4y = -24$ $\qquad\qquad\qquad\qquad\qquad$ ....(3)

Subtracting equation (3) from equation (1), we get

$(2x + 3y) - (2x - 4y) = 11 - (-24)$

$\therefore \quad 7y = 35$

$\therefore \quad y = 5$

Substituting $y = 5$ in equation (1), we get

$\qquad 2x + 3(5) = 11$

$\therefore \quad 2x + 15 = 11$

$\therefore \quad 2x = -4$

$\therefore \quad x = -2$

Now, $y = kx + 3$

$\therefore \quad 5 = k(-2) + 3$

$\therefore \quad 2 = -2k$

$\therefore \quad k = -1$

Thus, the solution of the given pair of linear equations is $x = -2$, $y = 5$ and $k = -1$ satisfies $y = kx + 3$.

<div align="center">OR</div>

37. 1. $\quad 3x + 2y = 5$ and $2x - 3y = 7$

For the given pair of linear equations, $a_1 = 3$, $b_1 = 2$, $c_1 = -5$

$a_2 = 2$, $b_2 = -3$ and $c_2 = -7$

Now, $\dfrac{a_1}{a_2} = \dfrac{3}{2}$, $\dfrac{b_1}{b_2} = \dfrac{2}{-3} = \dfrac{-2}{3}$ and $\dfrac{c_1}{c_2} = \dfrac{-5}{-7} = \dfrac{5}{7}$

Here, $\dfrac{a_1}{a_2} \neq \dfrac{b_1}{b_2}$

Hence, the given pair of linear equations is consistent.

2. $2x - 3y = 8$ and $4x - 6y = -9$

   For the given pair of linear equations, $a_1 = 2, b_1 = -3, c_1 = -8$

   $a_2 = 4, b_2 = -6$ and $c_2 = -9$

   Now, $\dfrac{a_1}{a_2} = \dfrac{2}{4} = \dfrac{1}{2}, \dfrac{b_1}{b_2} = \dfrac{-3}{-6} = \dfrac{1}{2}$ and $\dfrac{c_1}{c_2} = \dfrac{-8}{9}$

   Here, $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} \neq \dfrac{c_1}{c_2}$

   Hence, the given pair of linear equations is not consistent.

3. $9x + 10y = 42$ and $9x - 10y = 12$

   For the given pair of linear equations, $a_1 = 9, b_1 = -10, c_1 = -42$

   $a_2 = 9, b_2 = -10$ and $c_2 = -12$

   Now, $\dfrac{a_1}{a_2} = \dfrac{9}{9}, \dfrac{b_1}{b_2} = \dfrac{10}{-10} = -1$ and $\dfrac{c_1}{c_2} = \dfrac{-42}{-12} = \dfrac{7}{2}$

   Here, $\dfrac{a_1}{a_2} \neq \dfrac{b_1}{b_2}$

   Hence, the given pair of linear equations is consistent.

38. $3x^2 - 5x + 2 = 0$

   Here, $a = 3, b = -5, c = 2$

   Then, $b^2 - 4ac = (-5)^2 - 4(3)(2) = 25 - 24 = 1 > 0$

   $\therefore \quad x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

   $\therefore \quad = \dfrac{5 \pm \sqrt{1}}{2(3)}$

   $= \dfrac{5 \pm \sqrt{1}}{6}$ i.e., $x = 1$ or $x = \dfrac{2}{3}$

   $= \dfrac{5 \pm 1}{6}$ Hence, the roots of the given quadratic equation are 1 and $\dfrac{2}{3}$.

39. $(-5) + (-8) + (-11) + \ldots + (-230)$

   For the given finit AP,

   $a = (-5); d = (-8) - (-5) = (-3)$

   and last term $l = (-230)$

   Suppose the last term of the AP is its nth term.

   $a_n = a + (n-1)d$

   $\therefore \quad -230 = -5 + (n-1)(-3)$

   $\therefore \quad -225 = -3(n-1)$

   $\therefore \quad n - 1 = 75$

   $\therefore \quad n = 76$

Now, $S_n = \dfrac{n}{2}(a+l)$, where l is the last term.

$$= \dfrac{76}{2}[(-5)+(-230)]$$

$$= 38(-235) = -8930$$

Hence, the required sum is -8930.

40. A$(1, 2)$, B$(4, y)$, C$(x, 6)$ and D$(3, 5)$ are the vertices of parallelogram ABCD. As ABCD is a parallelogram, its diagonals AC and Bd bisect each other.

∴ Mid point of Ac = Midpoint of BD.

∴ $\left(\dfrac{1+x}{2}, \dfrac{2+6}{2}\right) = \left(\dfrac{4+3}{2}, \dfrac{y+5}{2}\right)$ (Midpoint formula)

∴ $\left(\dfrac{1+x}{2}, 4\right) = \left(\dfrac{7}{2}, \dfrac{y+5}{2}\right)$

∴ $\dfrac{1+x}{2} = \dfrac{7}{2}$ and $4 = \dfrac{y+5}{2}$

∴ $x = 6$ and $y = 3$

OR

40. Point P lies on the X-axis. Hence, its coordinate are of the form $(x, 0)$.
Let P$(x, 0)$ be the required point whose distance from point A $(11, 12)$ is 13.
Hence, PA $= 13$.

∴ $PA^2 = 13^2$

∴ $PA^2 = 169$

∴ $(x-11)^2 + (0-12)^2 = 169$

∴ $x^2 - 22x + 121 + 144 = 169$

∴ $x^2 - 22x + 96 = 0$

∴ $(x-16)(x-6) = 0$

∴ $x = 16$ or $x = 6$

Hence, the coordinates of the point P are $(16, 0)$ or $(6, 0)$.

41. Radius of the cylinder as well as the hemispherical hollows $= r = \dfrac{\text{diameter}}{2} = \dfrac{7}{2}$ cm

Height of the cylinder $= h = 10$ cm.

Total surface area of the article

$=$ CSA of the cylinder $+ 2 \times$ CSA of hemispherical hollows.

$= 2\pi r h + 2 \times 2\pi r^2$

$= 2\pi r(h + 2r)$

$= 2 \times \dfrac{22}{7} \times \dfrac{7}{2}\left(10 + 2 \times \dfrac{7}{2}\right)$ cm^2

$= 22 \times 17$ cm^2

$= 374$ cm^2

Thus, the total surface area of the article is 374 cm^2.

42. One disc is drawn at random from a box containing 90 discs numbered from 1 to 90.

∴ The number of all possible outcomes in the experiment of drawing one disc = 90

1. Let A be the event 'the disc drawn bears a two-digit number'.

    Among numbers from 1 to 90, there are 81 two-digit numbers : 10, 11, ..., 90.

    ∴ The number of outcomes favourable to A is 81.

    ∴ $P(A) = \dfrac{81}{90} = \dfrac{9}{10}$

2. Let B be the event 'the disc drawn bears a perfect square number'.

    Among numbers from 1 to 90, there are 9 perfect numbers :

    1, 4, 9, 16, 25, 36, 49, 64, 81

    ∴ The number of outcomes favourable to B is 9.

    ∴ $P(B) = \dfrac{9}{90} = \dfrac{1}{10}$

3. Let C be the event 'the disc drawn bears a number divisible by 5'.

    Among numbers from 1 to 90, there are 18 numbers which are divisible by 5 :

    5, 10, 15, ..., 85, 90.

    ∴ The number of outcomes favourable to C is 18.

    ∴ $P(C) = \dfrac{18}{90} = \dfrac{1}{5}$

OR

42. Total number of students = 7 + 10 + 14 + 11 + B = 50

So, in the expriement of selecting a student at random, the number of total equally liked outcomes = 50.

1. Let A be the event that the selected student has received F grade.

    The number of students receving F grade = 7

    ∴ The number of outcomes favourable to event A = 7

    ∴ $P(A) = \dfrac{7}{50} = 0.14$

2. Let B be the event that the selected student has received A grade.

    The number of students receving A grade = B

    ∴ The number of outcomes favourable to event B = B

    ∴ $P(B) = \dfrac{8}{50} = 0.16$

3. Let C be the event that the selected student has received C or D grade.

    The number of students receving C or D grade = 14 + 10 = 24

    ∴ The number of outcomes favourable to event C = 24

    ∴ $P(C) = \dfrac{24}{50} = 0.48$

Section : D

43. **Basic Proportionality Theorem :** If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the same ration.

Given : In △ ABC, a line parallel to side BC intersect AB and Ac at D and E respectively.
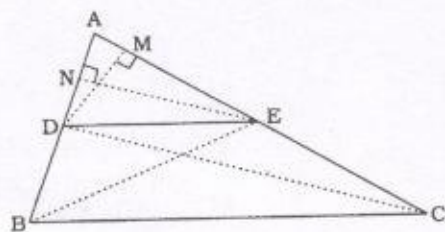
To prove : $\dfrac{AD}{BE} = \dfrac{AE}{EC}$.

Proff : Join BE and CD and also drawn DM $\perp$ AC and EN $\perp$ AB.

Then, $ar(ADE) = \dfrac{1}{2} \times AD \times EN$

$ar(BEE) = \dfrac{1}{2} \times DB \times EN$

$ar(ADE) = \dfrac{1}{2} \times AE \times DM$ and

$ar(DEC) = \dfrac{1}{2} \times EC \times DM$

$\therefore \quad \dfrac{ar(ADE)}{ar(BDE)} = \dfrac{\dfrac{1}{2} \times AD \times EN}{\dfrac{1}{2} \times DB \times EN} = \dfrac{AD}{DB}$ .... (1)

and $\quad \dfrac{ar(ADE)}{ar(DEC)} = \dfrac{\dfrac{1}{2} \times AE \times DM}{\dfrac{1}{2} \times EC \times DM} = \dfrac{AE}{EC}$ .... (2)

Now, $\triangle$ BDE and $\triangle$ DEC are triangles on the same base De and between the parallels BC $\parallel$ DE.

$\therefore \quad ar(BDE) = ar(DEC)$

Hence, from (1), (2) and (3), we get $\dfrac{AD}{DB} = \dfrac{AE}{EC}$.

OR

43. **Pythagoras Theorem :** In a right triangle, the square of the hypotenuse is equal to the sum of squares of the other two sides.

Given : ABC is a right triagnle, right angled at B.

To prove : $AC^2 = AB^2 + BC^2$

Proff : Draw BD $\perp$ AC such that D lies on AC.
Then, according to theorem 6.7,
$\triangle ADB \sim \triangle ABC$

$\therefore \quad \dfrac{AD}{AB} = \dfrac{AB}{AC}$

$\therefore \quad AD \times AC = AB^2$ .... (1)

Again, according to theorem 6.7,
$\triangle BDC \sim \triangle ABC$

$\therefore \quad \dfrac{CD}{BC} = \dfrac{BC}{AC}$
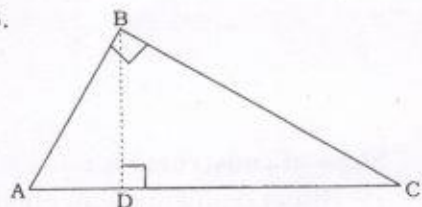
$\therefore \quad CD \times AC = BC^2$ ...... (2)

Adding (1) and (2)

$AD \times AC + CD \times AC = AB^2 + BC^2$

$\therefore \quad AC(AD + CD) = AB^2 + BC^2$

$\therefore \quad AC \times AC = AB^2 + BC^2$

$\therefore \quad AC^2 = AB^2 + BC^2$

44. Required : Draw a circle with centre O and radius 3 cm and take two points P and Q on its extened diameter XY each at distance 7 cm from centre O. Then, draw tangents from P and Q to the circle with centre O.
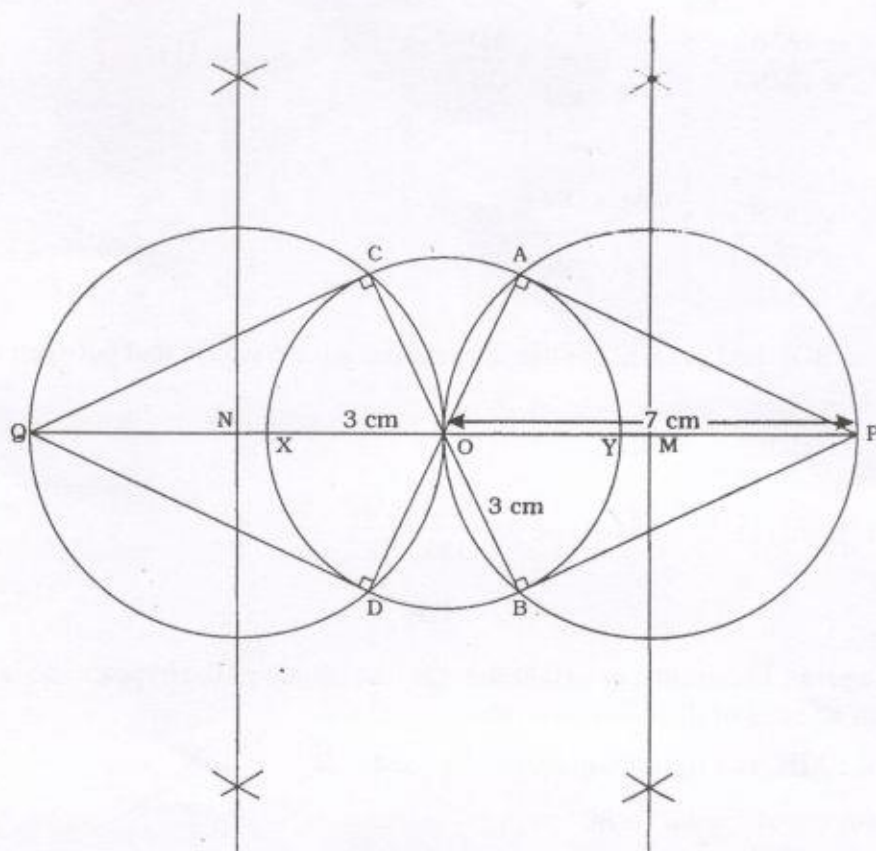
Steps of construction :

1. Bisect segment OP to obtain its midpoint M.
2. Draw the cricle with centre M and radius OM to intersect the circlewith centre O at A and B.
3. Join PA and PB.
   Then, PA and PB are the required tangents from point P to the circle with centre O.
4. Bisect segment OQ to obtain its midpoint N.
5. Draw the circle with centre N and radius ON to intersect the cricle with centre O at C and D.
6. Join Qc and QD.
   Then, QC and QD are the required tangents from point Q to the circle with centre O.

45.

Class intervals	Frequency	Cumulative frequency
0-100	2	2
100-200	5	7
200-300	x	$7 + x$
300-400	12	$19 + x$
400-500	17	$36 + x$
500-600	20	$56 + x$
600-700	y	$56 + x + y$
700-800	9	$65 + x + y$
800-900	7	$72 + x + y$
900-1000	4	$76 + x + y$

It is given that n = 100

So, $76 \times x \times y = 100$; i.e., $x + y = 24$

The median is 525, which lies in the class 500 - 600.

So, $l = 500$; $\dfrac{n}{2} = 50$; $f = 20$; $cf = 36 + x$; $h = 100$

Using the formula, Median $M = l + \left(\dfrac{\dfrac{n}{2} - cf}{f} \right) \times h$

we get $525 = 500 + \left(\dfrac{50 - 36 - x}{20} \right) \times 100$

i.e., $525 - 500 = (14 - x) \times 5$ i.e., $25 = 70 - 5x$ i.e., $5x = 70 - 25 = 45$

So, $x = 9$

Therefore, from (1), we get $9 + y = 24$ i.e., $y = 15$

◆

Q.PAPER
2

Mathematics (Basic)

QUESTION PAPER - 2

Std.-10

Time : 3 Hours
(018) E
Total Marks : 80

Instructions :

(1) All questions are compulsory. Internal options are given.
(2) 45 questions of this question paper is divided in section A, B, C and D.
(3) Number given at right side of question represent it's marks.
(4) Draw figure wherever necessary.
(5) Start new section from new page. Write answr of question in sequnce.
(6) Don't use calculator.

| Section-A |

Answer as per given instruction : (Question number 1 to 24) (1 mark each)   24

★ **State whether each of the following statement is true or false.**

1. The HCF of two positive integers a and b is the largest positive integer d that divides both a and b.
2. The maximum number of terms of a polynomial with exponent n is n.
3. "The taxi fare after each km when the fare is R 10 for the first km and R 8 for each additional km." This situation is A.P.
4. $\sin \theta > \cosec \theta$ is true for any value of θ.
5. $(1 - \sin\theta)(1 + \sin\theta) = \cos^2\theta$ (where $0 \le \theta \le 90$).
6. The mean of n observation $\bar{x}$ is substracted from each observation to get zero.

★ **Choose correct alternative from given below to make each of the following statement ture.**

7. The lines represented by the equations $x = my + 2$ and $y = \dfrac{-3x-5}{2}$ intersect at exactly one point, then _____.

   (a) $m = \dfrac{2}{3}$ (b) $m \ne \dfrac{-2}{3}$ (c) $m = \dfrac{3}{2}$ (d) $m \ne \dfrac{-3}{2}$

8. HCF (512, 92) = _____
   (a) 1   (b) 2   (c) 3   (d) 4

9. For any quadratic polynomial $ax^2 + bx + c$. (Where a, b, c are real number, $a \ne 0$) the graph of the corresponding equation is _____
   (a) Linear   (b) Open downward parabolas
   (c) Open upwards parabolas   (d) (b) and (c) both

10. The solution of quadratic equation $25x^2 - 16$ are _____
    (a) reciprocal   (b) opposite
    (c) equal   (d) different and reciprocal

11. The formula to find the sum of first n term is _____

    (a) $\dfrac{n}{2}(a+l)$ (b) $a+(n-1)d$ (c) $\dfrac{n}{2}(a+(n-1)d)$ (d) $2a+(n-1)d$

12. If the points $(0, 2)$, $(k, -1)$, $(2, 0)$ are collinear, then k = _____
    (a) 0   (b) 1   (c) 2   (d) 4

★ **Fill in the blanks.**

13. The mode of 60, 40, 48, x, 43, 48, 43, 34 is 43, then $x + 3 =$ _____

14. The probability that five Mondays will come in the month of march of any year is _____

15. The probability of an event is greater than or equal to _____

16. Two different coins are tossed simultaneously. _____ is the probability to get one head.

17. If the zeros of polynomial $x^2 + 5x + 6$ are α and β, then $\alpha + \beta =$ _____

18. For an A.P. $a = -3$, $d = 4$ then $a_n =$ _____

★ **Answer the following by a number or a word or a sentence :**

19. The line containing the radius through the point of contact is called _____

20. What is the volume of cube if we double its length.

21. Find the area of shaded part. $(\pi = 3.14)$

4 cm
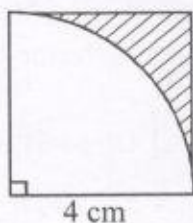
22. If the volume and curve surface area of cyllinder are equal, then find value of radius.

23. Fig. shows the graph of $y = p(x)$. Find the number of zeroes of $p(x)$.
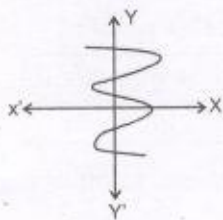
24. Find the area of shaded part.
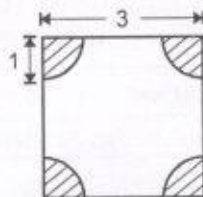
Section : B

★ **Solve the following (Question number 25 to 34) (2 Marks each)**   20

25. In a flower bed, there are 23 rose plants in the first row, 21 in the second, 19 in the third, and so on. There are 5 rose plants in the last row. How many rows are there in the flower bed ?

OR

25. Find the sum of the odd numbers between 0 and 50.

26. What is the volume of sphere if we double its radius ?

OR

26. The material of three cone is converted into the shape of a cylinder of equal radius. If the height and radius of cone are 1 m and 1 m respectively, then find the height of the cyllinder.

27. Gopi buys a fish from a shop for his aquarium. The shopkeeper takes out one fish at random, from a tank containing 5 male fish and 8 female fish. What is the probability that the fish taken out is (i) male and (ii) female ?

28. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting (i) a face card and (ii) a black colour card.

29. Find the zeroes of the polynomial $x^2 - 2x - 80$ and verify the relationship between zeroes and the coefficients.

OR

29. $3x^3 + x^2 + 2x + 5 \div x + 1$

30. Find value : $\sin 60^0 \cdot \cos 30^0 + \sin 30^0 \cdot \cos 60^0$

OR

30. In $\triangle$ ABC, right-angled at B. AB = 24 cm, BC = 7 cm, determine (i) sin A and (ii) cos A.

31. Two concentric circles are of radii 13 cm and 5 cm. Find the length of chord of the larger circle which touches the smaller circle.

32. A tower stands vertically on the ground. From a point on the ground, which is 15 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 60^0. Find the height of the tower.

33. Find the value of 'k', for which the points A(2, 3), B(4, k), C(6, −3) are collinear.

34. Find mean for the value of $a = 62.5$, $\Sigma f_i u_i = -13$, $\Sigma f_i = 100$ and $h = 15$.

Section : C

★ **Solve the following (Question number 35 to 42) (3 marks each)**   24

35. If the median of the data : 15, 17, x − 1, x + 5, 31, 36 is 22, then find Mean.

36. The table below shows the Marks obtained in mathematics of 100 students. Find the mean marks obtained by students by a suitable method.

Marks	0-10	10-20	20-30	30-40	40-50
Number of Students	20	10	20	30	20

37. The difference between two numbers is 26 and one number is three times of the other. Find them.

38. Find roots : $x + \dfrac{1}{x} = 3$ (where $x \neq 0$)

39. $10 + 15 + 20 + ... + 100 = (?)$

40. Name the type of quadrilateral formed by the points (4, 5), (7, 6), (4, 3), (1, 2) and give reasons for your answer.

OR

40. The distance of the point A(11, 12) from the Y-axis is 13 unit. Find co-ordinates of this point.

41. From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2.

42. One card is drawn from a well shuffled deck of 52 cards. Calculate the probability that the card will be (i) a heart (ii) queen or king (iii) black colour.

OR

42. Box A contains 25 slips of which 19 are marked R 1 and other are marked e 5 each. Box B contains 50 slips of which 45 are marked e 1 each and other are marked e 13 each. Slips of the boxes are poured into a third box and resuffled. A slip is drawn at random. What is the probability that it is marked other than e 1 ?

Section : D

★ **Solve the following. (Question no. 43 to 45) (4 marks each)**   **(12)**

43. Write the statement of Pythagoras Theorem and Prove it.

OR

43. Write the statement of Basic proportionality theorem and prove it.

44. Draw a circle of radius 6 cm. From a point 10 cm away from its centre, construct the pair of tangents to the circle.

45. 100 surname were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in the english alphabets in the surnames was obtained as follows.

No. of Letters	1-4	4-7	7-10	10-13	13-16	16-19
No. of surnames	6	10	f	16	4	4

If the median number of letters is 8.05, then find the value of 'f'.

♦

QUESTION PAPER : 2 - SHORT ANSWERS

1.	True	**2.**	False
3.	True	**4.**	False
5.	True	**6.**	True

7. (b) $m \neq \dfrac{-2}{3}$ **8.** (B) 2

9. (d) (b) and (c) both   **10.** (b) opposite

11. (a) $\dfrac{n}{2}(a + l)$ **12.** (b) 1

13. 43   **14.** $\dfrac{3}{7}$

15. 0   **16.** $\dfrac{1}{2}$

17. -5 **18.** $4n - 7$

19. normal   **20.** 8

21. 3.44 cm^3 **22.** 2

23. 1   **24.** π

25. Sum = 625   **26.** 8 OR

26. 1 m height of cyllinder   **27.** (i) 13 male (ii) $\dfrac{8}{13}$ female

28. (i) $\dfrac{3}{13}$ (ii) Black colour $\dfrac{1}{2}$ **29.** 10, -8 OR

29. Quotient polynomials $q(x) = 3x - 2x + 4$; and remainder poly. $r(x) = 1$

30. (i) $\dfrac{7}{25}$ (ii) $\dfrac{24}{25}$ **31.** length = 24 cm

32. Height of the tower = $15\sqrt{3}$ **32.** value k = 0

34. Mean = 64.45   **35.** Median = 20; Mean = 17.875

36. 27 Marks

37. Big numbers $x = 39$, small numbers $y = 13$

38. $\dfrac{3 \pm \sqrt{5}}{2}$ **39.** n = 19; S_{19} = 1045

40. OR P(0, y) = P(0, 16) ⅔ P(0, 6)   **41.** $\dfrac{176}{10} = 17.6$

42. (i) $\dfrac{1}{4}$ (ii) $\dfrac{2}{13}$ (iii) $\dfrac{1}{2}$ = 0.5 OR   **42.** $\dfrac{64}{75}$

43. $f = 40$

♦

Q.PAPER 3	**Mathematics (Basic)**	
	QUESTION PAPER - 3	**Std.-10**

Time : 3 Hours	**(018) E**	Total Marks : 80

Instructions : Same as question Paper - 1.

Section-A

Answer as per given instruction : (Question number 1 to 24) (1 mark each)   24

★ State whether each of the following statement is true or false.

1. Every positive even integer is of the form $2q$.

2. The maximum numbers of zeroes of a polynomial with exponent n is n.

3. For an A.P. $a_2 + a_8 = a_4 + a_6$.

4. $\sec \theta = 1 + \tan^2 \theta$

5. The resiprocal ratio of $\cos \theta$ is $\csc \theta$.

6. The mean of 5 observations is 18. If we add on new observation in this data then the mean is 20. The added new observation is 38.

★ Choose correct alternative from given below to make each of the following statement ture.

7. If HCF $(36, 63) = 9$, then Find LCM $(36, 63)$.
    (a) 324   (b) 9   (c) 252   (d) 7
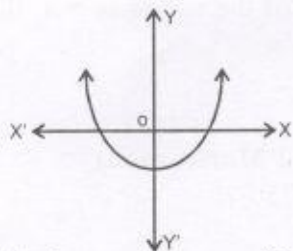
8.   Fig. shows the graph of $y = p(x)$.
    Find the number of zeroes of $p(x)$.

    (a) 1   (b) 2   (c) 3   (d) 4

9. If the lines represented by the equations $3x + 2my - 2 = 0$ and $2x + 5y + 1 = 0$ are parallel, then $m =$ _____

    (a) $\dfrac{-5}{4}$ (b) $\dfrac{2}{5}$ (c) $\dfrac{15}{4}$ (d) $\dfrac{3}{2}$

10. What is the condition to get solution of quadratic equation $ax^2 + bx + c = 0$ are different and real ?
    (a) $b^2 - 4ac = 0$ (b) $b^2 - 4ac < 0$
    (c) $b^2 - 4ac > 0$ (d) $b^2 - 4ac \leq 0$

11. Find the 10th term of an AP 5, 2, −1, −4,......
    (a) −20   (b) −22
    (c) −24   (d) −26

12. Find the area of $\triangle ABC$ whose vertices are A(2, 0), B(2, 2), C(2, 0).
    (a) 8   (b) 6   (c) 4   (d) 2

★ **Fill in the blanks.**

13. $n = 100$, $a = 20$, $\bar{x} = 20$, $\Sigma\,fidi$ = _____

14. The probability that five Mondays will come in the month of April of any year is _____

15. The probability of an event is less than or equal to _____

16. The probability of obtaining 80 marks in a mathematics question paper of 80 makrs is _____

17. If the zeroes of a polynomial $p(x) = x^2 - 4x + 4$ are α and β then $\dfrac{1}{\alpha} + \dfrac{1}{\beta} =$ _____

18. 10th term of an AP $\sqrt{3}, \sqrt{12}, \sqrt{27}, \ldots\ldots$ is _____

★ **Answer the following by a number or a word or a sentence :**

19. A tangent PT at point T of a circle of radius 7 cm meets a line through the centre O at a point P so that OP = 25 cm. Find the length of PT.

20. What is the volume of a cylinder made of 10 cylinders with a diameter of 4 cm and a height of 0.5 cm ?

21. The parimeter of a circle & square are same. Find the ratio of their areas.

22. If the volume and curve surface area of cylinder are same, then find its radius.

23. For which value of 'a' of quadratic polynomial $p(x) = ax^2 + bx + c$, we always get open upward parabolas ?

24. If the area of circle is six times than an area of the minor sector, then find the angle of minor sector.

<div align="center">

Section : B

</div>

★ **Solve the following (Question number 25 to 34) (2 Marks each)**   **20**

25. How many multiples of 4 lie between 10 and 250 ?

<div align="center">OR</div>

25. Two APs have the same common difference. The difference between their 10th terms is 10. What is a difference between their 100th terms ?

26. If the height of the cone is tripled and the radius is doubled, what is its volume ?

<div align="center">OR</div>

26. How much liters of ghee can be accomodated in a cylindrical container with a radius of 14 cm and a height of 25 cm ?

27. Suppose we throw a die once.
     (i) What is the probability of getting a number greater than 4?
     (ii) What is the probability of getting a number less than or equal to 4 ?

28. Two players, Sangeeta and Reshma played tennis match. The probability of Sangeeta wining the match is 0.62. Find out the probability of Reshma wining the match.

29. Find the zeroes fo the polynomial $6x^2 - 7x - 3$ and verify the relationship between zeroes and the coefficients.

OR

29. $x^3 - 3x^2 + 5x - 3 \div x^2 - 2$

30. Prove : $\tan 48^\circ \cdot \tan 23^\circ \cdot \tan 42^\circ \cdot \tan 67^\circ = 1$ **OR**

30. Find the value of $2 \tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60$.

31. Two concentric circles are of radii 5 cm and 3 cm. Find the length of chord of larger circle which touches the smaller circle.

32. An electrician has to repair an electric fault on a pole of height 5 m. He needs to reach a point 1.3 m below the top of the pole to undertake the reapir work. What should be the length of the Ladder that he should use which, when inclined at an angle of 60° to the horizontal, would enable his to reach the required position ? Also How far from the foot of the pole should he placed the foot of the ladder ?
(Take $\sqrt{3} = 1.73$)

33. Find the area of $\triangle ABC$ where A(5, 2), B(4, 7), C (7, −4).

34. $a=35$, $\sum fiui = 4$, $\sum fi = 50$, $h = 10$, find $\bar{x}$.

$$\boxed{\text{Section : C}}$$

★ **Solve the following (Question number 35 to 42) (3 marks each)**   24
35. If the median of data : 56, 58, 63, $x - 5$, $x + 1$, 75, 81, 85 is 67, then find the value of x and also find its mean.

36. Find median of given below frequency distribution.

Class interval	21-25	26-30	31-35	36-40	41-45	46-50	51-55
Frequency	18	32	30	40	25	15	40

37. Find out whether the lines representing the following pairs of the linear equations intersect at point, are parallel or coincident.

   (i) $5x - 4y + 8 = 0$ and $7x + 6y - 9 = 0$

   (ii) $6x - 3y + 10 = 0$ and $2x - y + 9 = 0$

   (iii) $9x + 3y + 12 = 0$ and $18x + 6y + 24 = 0$ **OR**

37. Use elimination method to find all possible solution of the following pair of linear equations :
   $9x - 4y - 2000 = 0$ and $7x - 3y - 2000 = 0$

38. $\dfrac{1}{x} - \dfrac{1}{x-2} = 3 \, (x \neq 0, 2)$

39. $34 + 32 + 30 + 28 + \ldots\ldots + 10 = (?)$

40. Find the coordinates of the points of trisection of the line segment joining (4, −1) and (−2, −3).   **OR**

40. Name the type of quadrilateral formed by the points (0, 0), (0, 1), (1, 1), (1, 0) and give reasons for your answers.

41. A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2 cm and diameter of the base is 4 cm. Determine the volume of the toy. If the right circular cylinder circumscribes the toy. Find the difference of the volume of cylinder and the toy. (Take $\pi = 3.14$)

5

42. At a fete, cards bearing numbers 1 to 100; one number on one card, are put in a box. Each players selects one card at random and that card is not replaced. If the selected card has a perfect square greater than 50, the player win a prize. What is the probability that (i) the first player win a prize ? (ii) the second player wins a prize, if the first won ?   **OR**

42. Three coins are tossed together. Find the probability of getting : (i) at least two heads (ii) exactly two heads (iii) no head.

$$\boxed{\text{Section : D}}$$

★   **Solve the following. (Question no. 43 to 45) (4 marks each)**   **(12)**

43. Write the statement of converse of the Pythagoras Theorem and prove it.   **OR**

43. Prove that : the ratio of the aeas of two similar triangles is equal to the square of the ratio of their corresponding sides.

44. Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm.

45. If the mean of the following frequency distribution is 18 then find 'f'.

Class interval	11-13	13-15	15-17	17-19	19-21	21-23	23-25
Frequency	7	6	9	13	f	5	4

✦

QUESTION PAPER : 3 - SHORT ANSWERS

1.	False	2.	True
3.	True	4.	False
5.	False	6.	False
7.	(c) 252	8.	(b) 2

9. (c) $\dfrac{15}{4}$ 10. (c) $b^2 - 4ac > 0$

11. (b) −22   12. (d) 2

13. 0   14. $\dfrac{2}{7}$

15. 1   16. $\dfrac{1}{81}$

17. 1   18. $\sqrt{300}$

19. 24 cm   20. 20π

21. $4 : \pi$ 22. 2

23. $a > 0$ 24. 60^0

25. multifires = 60 OR   25. Difference = 100

26. Volume 12 OR   26. 15.4 litres

27. (i) $\dfrac{1}{3}$ (ii) $\dfrac{2}{3}$ 28. 0.38 Probability

29. $\dfrac{3}{2}, \dfrac{-1}{3}, \dfrac{-3}{6}$ OR   29. $x - 3; 7x - 9$

30. OR Value = 2   31. 8 cm

32. $\dfrac{3.7\sqrt{3}\ m}{3}$ 33. Area of triangle = 2

34. mean = 35.8   35. 69; $\bar{x} = 69$

36. mode = 39.5   37. (1) point (2) parallel (3) coincident

37. OR $x = 2000; y = 4000$ 38. $\dfrac{-3 \pm \sqrt{3}}{3}$

39. $n = 13; S_{13} = 286$ 41. 25.12 cm²; 25.12 cm³

42. (i) $\dfrac{3}{100} = 0.03$ (ii) $P(B) = \dfrac{2}{99}$ OR

42. (i) $\dfrac{1}{2} = 0.5$ (ii) $\dfrac{3}{8} = 0.375$ (iii) $\dfrac{1}{8} = 0.125$

45. $f = 20$

✦

Q.PAPER
4

Mathematics (Basic)

QUESTION PAPER - 4

Std.-10

Time : 3 Hours   **(018) E**   Total Marks : 80

Instructions : Same as question Paper - 1.

Section-A

Answer as per given instruction : (Question number 1 to 24) (1 mark each)   24

★ **State whether each of the following statement is true or false.**

1. Any positive odd integer is of the form $4q + 1$ or $4q + 3$. Where q is some integer.

2. $4x + 3$ is a linear polynomial.

3. 23rd term of an AP 112, 107, 102, ... is first negative integer.

4. $\dfrac{\sin\theta \cdot \csc\theta}{\cos\theta} = \sec\theta$.

5. When the value of θ is increased from $0°$ to $90°$, the value of $\cos\theta$ is also increased.

6. The mean of first five positive integer is 5.

★ **Choose correct alternative from given below to make each of the following statement ture.**

7. Which one is irrational number ?

    (a) $\sqrt{512}$ (b) $\sqrt{256}$ (c) $\sqrt{324}$ (d) $\sqrt{729}$

8. Which polynomial has maximum three zeroes ?

    (a) $ax^3 + bx^2 + cx + d$ (b) $ax^2 + bx + c$

    (c) $ax + b$ (d) none of above.

9. If the lines represented by the equations $3x - y + 8 = 0$ and $6x - my + 16 = 0$ are coincident, then $m = $ _____

    (a) $\dfrac{1}{2}$ (b) $-\dfrac{1}{2}$ (c) 2   (d) -2

10. What is the condition for getting opposite solutions of quadratric equation $ax^2 + bx + c = 0$?

    (a) $a = c$ (b) $b = 0$
    (c) $b^2 - 4ac = 0$ (d) $a \neq c$

11. For an AP : 5, 15, 25, 35,......, $a_n = $ _____

    (a) $5n - 10$ (b) $5n + 15$
    (c) $10n - 5$ (d) $10n + 5$

12. If the points A(a, 0), B(1, 1) and C(0, b) are colinear, then $\dfrac{1}{a} + \dfrac{1}{b} = $ _____

    (a) 1   (b) 2
    (c) 4   (d) none of above

★ **Fill in the blanks.**

13. If the Mean of data : 1, 2, 3,......, n is $\dfrac{6n}{11}$, then $n = $ _____

14. _____ is the probability that a leap year has 53 sundays.

15. The sum of the probabilities of all the elementary events of an experiment is _____

16. If $P(A) = 0.53$, $P(\overline{A}) = $ _____

17. The zeroes of quadratric polynomial $x^2 + 8x - 20$ are α and β. $\alpha - \beta = $ _____

18. For an AP : 5, 15, 25, 35, ..., $a_n = $ _____

★ **Answer the following by a number or a word or a sentence :**

19. A tangent PA at point A of a circle of radius r cm meets a line through the centre O at a point P so that OP = 13 cm and PA = 12 cm. Find radius.

20. Calculate the surface area of cyliner whose height double and radius three times.

21. The ratio of the radii of the two circles is 2 : 3. The ratio of the angle sustended at centre by them is 5 : 2. Find the ratio of their areas of minor sector.

22. Find the total surface area of hollow hemisphere whose outer radius is R and inner radius is r.

23. For which value for 'a' of quadratric polynomial $p(x) = ax^2 + bx + c$, we always get open downward parabola.

24. Find the area of the inner square in a circle or radius 8 cm.

> **Section : B**

★ **Solve the following (Question number 25 to 34) (2 Marks each)**   **20**

25. How many multiples of 10 lie between 10 and 200 ?

OR

25. The 17th term of an AP exceeds its 10th term by 7. Find the common difference.

26. A toy is in the form of a cone of radius 3 cm mounted on a hemisphere of same radius. The height of cone is 4 cm. Find the total surface area of the toy.

OR

26. Find the volume of right circular cone 6 cm high, if the slant height of cone is 10 cm.

27. Savita and Hamida are friends. What is the probability that both will have
(i) different birthdays ?
(ii) the same birthdays ? (ignoring leap year)

28. 25 boys and 15 girls of standard X of a school participate in a game. What is the probability that (i) a girl win the game ? (ii) a boy win the game ?

29. $3x^2 - x^3 - 3x + 5 \div x - 1 - x^2$

OR

29. Find the zeroes of the polynomial $5x^2 - 27x + 10$ and verify the relationship between zeroes and the co-efficient.

30. If $\sin 4A = \operatorname{cosec}(A - 20^\circ)$, Find the value of A.

OR

30. If $\sin A = \dfrac{3}{4}$, find the value of cos A and tan A.

31. If the tangent PA and PB from point P to a circle with centre O are inclinded to each other at angle 110°, then find $\angle AOP$.

32. A circus artist is climbing a 20 m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground. Find the height of the pole, if the angle made by the rope with the ground level is 30°.

33. Name the type of triangle formed by the points A(1, 1), B(1, 0), C(0, 1).

34. The mean of ten number is 12.5. Later on it was discovered that a number 9 was misread as 4. Find the correct mean.

| Section : C |

★ **Solve the following (Question number 35 to 42) (3 marks each)**   24

35. Find Mean and median of data : 72, 15, 28, 31, 32, 51, 44, 43 and 62.

36. Find median for frequency distribution given below.

Class interval	10-20	20-30	30-40	40-50	50-60	60-70
frequency	2	10	40	25	13	10

37. Find the value of 'm', if the pair of linear equations $2x + 3y = 7$ and $2kx + ky = 28 - my$ has infinite solutions.

OR

37. Find the solution of pair of linear equation $x + y = 5$ and $y - x = 9$ by substitution method.

38. Find 'x' : $\dfrac{1}{x + 4} - \dfrac{1}{x - 7} = \dfrac{11}{30}$ (Where $x \neq -4, 7$)

39. $a_3 = 15$, $S_{10} = 120$, find a_{10}.

40. Find the co-ordinates of the points of trisection of the line segment joining the points A(2, −2) and B(−7, 4)

41. A solid is in the shape of a cone standing on a hemisphere with both their radius being equal to 1 cm and the height of the cone is equal to its radius. Find the volume of the solid in terms of π.

42. A lot consists of 48 mobile phones of which 42 are good, 3 have only minor defects and 3 have major defects. Mehul will buy a phone if it is good but keyur will only buy a mobile if, it has no major defect. One phone is selected at random from the lot. What is the probability that it is (i) acceptable to Mehul ? (ii) acceptable to Keyur ?

OR

42. In a game, the entry fee is r 5. The game consists of tossing coin 3 times. If one or two heads shows, player gets his entry fee back. If he throws 3 heads, he receives

double the entry fee. Otherwise he will lose. For tossing a coin three times, find the probability that he (i) lose the entry fee. (ii) gets double entry fee.

<div align="center">

Section : D

</div>

★   **Solve the following. (Question no. 43 to 45) (4 marks each)**   **(12)**

43.   Write the statement of Basic proportionality theorem and prove it.

<div align="center">

OR

</div>

43.   Write the staement of Pythagoras theorem and prove it.

44.   Draw a circle of radius 3 cm. Take two points P and Q on one of its extended diameter each at a distance of 7 cm from its centre. Draw tangents to the circle from these two points P and Q.

45.   If the mean of following frequency distribution is 65, find the value of 'a' and 'b' where the sum of all frequinces is 100.

Class interval	15-35	35-55	55-75	75-95	95-115
Frequency	17	a	32	b	19

<div align="center">✦</div>

QUESTION PAPER : 4 - SHORT ANSWERS

1.	False	2.	True
3.	False	4.	True
5.	False	6.	False
7.	(d) $\sqrt{729}$	8.	(a) $ax^3 + bx^2 + cd + d$
9.	(c) 2	10.	(b) $b=0$
11.	(c) $10n - 5$	12.	(a) 1
13.	11	14.	$\frac{1}{7}$
15.	1	16.	0.47
17.	144	18.	$10n - 5$
19.	5 cm	20.	6
21.	10 : 9	22.	$3\pi (R^2 - r^2)$
23.	$a < 0$	24.	128^0
25.	24 OR	25.	General Defference = 1
26.	Surface $103\frac{5}{7}$ cm² OR	26.	Surface $100\frac{4}{7}$ cm³
27.	(i) $\frac{364}{365}$ (ii) $\frac{1}{365}$	28.	(i) $\frac{3}{8}$ (ii) $\frac{5}{8}$
29.	9–2 OR	29.	5, $\frac{2}{5}$
30.	22° value of A OR	30.	$\frac{3}{\sqrt{7}}$
31.	$\angle APO = 35°$	32.	height of the pole = 10 m
34.	Real Mean = 13	35.	$\bar{x}$ = 44.22 m = 51
36.	median = 39.5	37.	k = 4; m = 8 OR
37.	$(x, y) = (-2, 7)$	38.	x = 2 and 1
39.	$\frac{25}{4}$	40.	(1, 0) Q(–3, 2) OR
40.	2 sq. unit	41.	Volume 3.14 m³
42.	(i) $\frac{1}{8}$ = 0.125	42.	(i) $\frac{1}{8}$ (ii) $\frac{1}{8}$
45.	$a = 18; b = 14$		

✦

Q.PAPER **5**	**Mathematics (Basic)**	
	QUESTION PAPER - 5	**Std.-10**
Time : 3 Hours	**(018) E**	Total Marks : 80

Instructions : Same as question Paper - 1.

Section-A

Answer as per given instruction : (Question number 1 to 24) (1 mark each)   24

★ State whether each of the following statement is true or false.

1. HCF $(420, 130) = 20$.

2. The maximum zeroes of cubic polynomials are three.

3. If $k + 2$, 20 and $3k - 2$ are in A.P. the value of k is 10.

4. If $\sin \theta = \alpha$, then $\tan \theta = \sqrt{1 - \alpha^2}$ (where $0 \le \theta, \alpha \le 90$)

5. $\dfrac{\tan 37^0}{\cot 53^0} = 1$

6. The x-coordinate of the intersection point of the 'less than' ogive and 'greater than' ogive gives the median of data.

★ **Choose correct alternative from given below to make each of the following statement ture.**

7. Let $x = \dfrac{p}{q}$ be a rational number, such that the prime factorisation of q is not of the form $2^n\ 5^m$, where n, m are non-negative integers. Then, x has a decimal expansion which is _____
    (a) non terminating and repating   (b) terminating
    (c) terminating and repeating   (d) None of above.

8. Which type of graph we get for quadratric polynomial $p(x) = ax^2 + bx + c$ (where a, b, c, are real number and $a \ne 0$) where $a < 0$?
    (a) open downward parabola   (b) Line
    (c) open upward parabola   (d) none of above

9. Which is the condition to get unique solution of pair of linear equation $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$
    (where $a_1, b_1, c_1, a_2, b_2, c_2$ are real number and $a_1^2 + b_1^2 + 0, a_2^2 + b_2^2 + 0$)
    (a) $\dfrac{a_1}{a} \ne \dfrac{b_1}{b_2}, \dfrac{b_1}{b_2} \ne \dfrac{c_1}{c_2}, \dfrac{a_1}{a_2} \ne \dfrac{c_1}{c_2}$ (b) $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2}, \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}, \dfrac{a_1}{a_2} = \dfrac{c_1}{c_2}$
    (c) $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2}, \dfrac{b_1}{b_2} \ne \dfrac{c_1}{c_2}, \dfrac{a_1}{a_2} = \dfrac{c_1}{c_2}$ (d) $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2}, \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}, \dfrac{a_1}{a_2} \ne \dfrac{c_1}{c_2}$

10. If one solution of quadnatric equation $2x^2 - 5x + m = 0$ is $\dfrac{7}{2}$, then $m = $ _____
    (a) 7   (b) −7   (c) 4   (d) 2

11. $(1) + (1 + 1) + (1 + 1 + 1) + \dots + (1 + 1 + 1 + \dots 100 \text{ times}) =$ _____
    (a) 4950   (b) 5050   (c) 100   (d) 10000

12. The trisection points of line segment joined by points A$(-7, 5)$ and B $(5, -1)$ are P and Q, the co-ordinatie of Q is _____
    (a) $(3, -3)$ (b) $(-3, 3)$
    (c) $(1, 2)$ (d) $(1, 1)$

★ **Fill in the blanks.**

13. The mean of first 10 Natural number is _____

14. _____ is the probability that a February month of Leap year has five Sundays.

15. 'Who born is always die'. This event is _____ event. The probability of this event is _____.

16. _____ is the probability of two friends have their birthdays on same date of an ordinary year.

17. The zeroes of quadratric polynomial $p(x) = ax^2 + bx + c$ are α and β.
    $$\frac{1}{\alpha} + \frac{1}{\beta} = \underline{\quad\quad}$$

18. _____ multiples of 3 lie between 1 and 50.

★ **Answer the following by a number or a word or a sentence :**

19. How many parallel tangents of a circle ?

20. If the radius of a circle is diminished by 10%, then its area is diminished by ?

21. AB is a chord of a circle with centre O and radius 42 cm. AB is of.length 42 cm. Find the area of the sector of the circle formed by chord AB.

22. The larger possible cylinder is carved out of a wooden solid cube of side 'a' cm. Find the volume of the cylinder in term of π.

23. $x^3 + 4x^2 + 4x + 1 \div x + 1$ (Write only remainder polynomial.)

24. Find the area of quadrant of a circle of radius 28 cm.

<div align="center">

Section : B

</div>

★ **Solve the following (Question number 25 to 34) (2 Marks each)   20**

25. Find an A.P. whose third term is 5 and seventh term is 9.

<div align="center">OR</div>

25. Write the formula to find sum of first n terms of an A.P. Also find sum of first $(n - 1)$ terms of this A.P.

26. Find the volume of cone whose height is 12 cm and area of base is 60 cm^2.

27. A solid cuboid of iron with dimentions 49 cm × 33 cm × 24 cm is melted and recast into a sphere. Find the radius of sphere.

28. A box contains 30 slips which are numbered from 1 to 30. If one slip is drawn at random from the box. Find the probability that it bears (i) multiple of 3 (ii) prime number.

<div align="center">OR</div>

28. A box contains 7 red, 9 black and 5 white balls. If a ball is drawn at random from the box, What is the probability that it will be (i) not red ? (ii) Black ?

29. $x^4 - 3x^2 + 5x - 3 \div x^2 - 2$ OR

29. Find the zeroes of the polynomial $4x^2 - 12x + 9$ and verify the relationship between zeroes and coefficient.

30. Find value : (i) $\dfrac{2\tan 30^0}{1 + \tan^2 30}$ (ii) $\dfrac{1 - \tan^2 45^0}{1 + \tan^2 45^0}$ OR

30. Find value : $\dfrac{\sin^2 63^0 + \sin^2 27^0}{\cos^2 17^0 + \cos^2 73^0}$

31. If the tangent PT and QT from point T to a circle with centre O are inclinded to each other at 70^0, then find $\angle$POT.

32. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle 30^0 with it. The distance between the root of the tree to the point where the top touches the ground is 8 m. Find the height of the tree.

33. Determine if the points $(1, 5)$, $(2, 3)$ and $(-2, -11)$ are collinear.

34. Find Mean.

Marks of obtained	1	2	3	4	5	6	7
No. of Student	5	9	12	17	14	10	6

Section : C

★ **Solve the following (Question number 35 to 42) (3 marks each)**   24

35. Find Mean by using step deviation method.

Class interval	200-299	300-399	400-499	500-599	600-699	700-799	800-899
Frequency	3	61	118	139	126	151	2

36. Find Mode.

Class interval	0-100	100-200	200-300	300-400	400-500	500-600
Frequency	7	21	37	13	12	10

37. Find out whether the following pair of linear equations are consistent, or inconsistent.

(i) $x + 3y = 12$ and $2x - 3y = 12$

(ii) $2x - y = 6$ and $x - 0.5\ y = 5$

(iii) $0.5x + 0.25y = 3$ and $2x + y = 12$

OR

37. Solve $3x - y = 31$ and $2x + 3y = 39$ by applying substitution method and hence find the value of 'm' for which $y = mx + 2$

38. Find the roots of the quadratric equation $2x^2 - 2x - 1 = 0$ by applying the quadratric formula.

39. Find the sum of first 21 terms of an AP whose third and fourth terms are 14 and 22 respectively.

40. Find the ratio in which the Y-axis devides the line segment joining the points (5, −6) and (−1, −4). Also find the point of intersection.

41. A container shaped like a right circular cylinder having diameter 12 cm and height 15 cm is full of ice-cream. The ice cream is to be filled into cones of height 12 cm and diameter 6 cm, having hemispherical shape on the top. Find the number of such cones which can be filled with ice cream.

42. Two dice are thrown at the same time. List the possible outcomes. Find the probability of getting (i) same numbers on the two dice. (ii) the product of the number on the two dice is multiple of 4.   OR

42. Two dice are thrown at the same time. List the possible outcomes. Find the probability of getting (i) Sum of number on the two dice is 4 (ii) difference of the numbers on the two dice is 4.

Section : D

★ **Solve the following. (Question no. 43 to 45) (4 marks each)**   (12)
43. Prove that, the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides. **OR**

43. Write the statement of Pythagoras Theorem and prove it.

44. Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle 60°.

45. If the mean of given below frequency distribution is 43.75, then find 'f'.

interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	8	4	20	45	64	32	f	8	2	2

✦

QUESTION PAPER : 5 - SHORT ANSWERS

1. False
2. True
3. False
4. False
5. True
6. True
7. (c) terminating and repeating
8. (a) open downward parabola

9. (a) $\frac{a_1}{a} \neq \frac{b_1}{b_2}, \frac{b_1}{b_2} \neq \frac{c_1}{c_2}, \frac{a_1}{a_2} \neq \frac{c_1}{.c_2}$
10. (b) -7

11. (b) 5050
12. (d) $(1, 1)$
13. 5.5

14. $\frac{1}{7}$
15. impossible event, 0

16. $\frac{1}{365}$
17. $-\frac{9}{20}$

18. 16
19. 2

20. 19%
21. 924 cm³

22. $\frac{a^3}{4}(24 - \pi)$
23. 0

24. 616 cm³

25. Terms of A.P. 3, 4, 5, 6... $(2 + n)$ OR

25. $S_n = \frac{n}{2}(2a + (n - 1d)$, $S_{n-1} = \frac{(n-1)}{2}[2a + (n - 2)d]$

26. Volume of cone 240 cm³ OR
26. radius 21 cm

27. (i) $\frac{1}{3}$ (ii) $\frac{1}{3}$
28. (i) $\frac{2}{3}$ (ii) $\frac{3}{7}$

29. $x^2 - 1$; $5x - 5$
30. (i) $\frac{\sqrt{3}}{2}$ (ii) 0 OR

30. 1
31. 35°

32. Height of the tree = $8\sqrt{3}$ મી
33. Rno collinear

34. ≈ 4
35. Mean = 581.3

36. mede = 840

37. OR $(x, y) = (12, 5)$, M = $\frac{1}{4}$
39. 1050

40. P = $\left(0, \frac{-13}{3}\right)$
41. 10 cones

42. (i) $\frac{1}{6}$ (ii) $\frac{1}{12}$
42. OR (i) $\frac{1}{12}$ (ii) $\frac{1}{7}$

45. $f = -165$

♦

Q.PAPER 6	**Mathematics (Basic)**	⌐

	QUESTION PAPER - 6	**Std.-10**

Time : 3 Hours	**(018) E**	Total Marks : 80

Instructions : Same as question Paper - 1.

Section-A

Answer as per given instruction : (Question number 1 to 24) (1 mark each)   24

★   **State whether each of the following statement is true or false.**

1.   HCF $(135, 225) = 45$

2.   If the one zero of quadratiric polynomial is zero, then he coefficient of x is zero.

3.   If $a_{30} - a_{25} = 0$ for an A.p. then $d = 5$.

4.   If $2 \sin\theta = 3\cos\theta$, then the value of $\tan\theta$ is $\dfrac{2}{3}$.

5. $\tan 5^0 \cdot \tan 30^0 \cdot \tan 85^0 = 1$

6.   To represent the 'less than' type ogive, we mark the upper limits of the class intervals on the horizontal axis.

★   **Choose correct alternative from given below to make each of the following statement ture.**

7.   Which of the following has terminating decimal expansion ?

   (a) $\dfrac{6}{15}$ (b) $\dfrac{29}{343}$ (c) $\dfrac{27}{210}$ (d) $\dfrac{129}{50}$

8.   Find the sum of zeroes of $p(x) = 3x^2 + 5x - 2$.

   (a) $\dfrac{5}{3}$ (b) $-\dfrac{5}{3}$ (c) $-\dfrac{2}{3}$ (d) $\dfrac{2}{3}$

9.   For which condition we don't get solution of $a_1 x + b_1 y + c_1 = 0$ and $a_2 x + b_2 y + c_2 = 0$?
     (where $a_1, b_1, b_1, b_2, c_1, c_2$ are real numbers and $a_1^2 + b_1^2 \neq 0$, $a_2^2 + b_2^2 \neq 0$)

   (a) $\dfrac{a_1}{a_2} \neq \dfrac{b_1}{b_2} \neq \dfrac{c_1}{c_2}$ (b) $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$

   (c) $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} \neq \dfrac{c_1}{c_2}$ (d) $\dfrac{a_1}{a_2} \neq \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$

10. Find the value fo discriminant of quadratiric equation $(x + 2)(x - 5) = 0$.

   (a) 49   (b) –10   (c) 3   (d) –31

11. If $Sn = 2n^2 + 3n$ then $d =$ _____

   (a) 13   (b) 4   (c) 9   (d) –2

12. Find the coordinate of the point which devides the line segment joining the points $(0, -1)$ and $(3, 5)$ in the ratio 2 : 1 internally.

   (a) $(3, 2)$ (b) $(2, 3)$ (c) $(1, 2)$ (d) $(2, 1)$

★ **Fill in the blanks.**

13. To represent the ogive, we mark _____ of the class intervals on the Y-axis.

14. _____ is the probibity to pick up one card randomlly from well-shuffled deck of 52 card is face card.

15. _____ is the probility that a birthday of a student come in month having 31 days.

16. If $P(\bar{E}) = \dfrac{4}{7}$, then $P(E) =$ _____

17. If the zeroes of quadratiric polynomial $ax^2 + bx + c$ are α and β, then $\alpha^2 + \beta^2$ = _____

18. _____ is the 101 term of an AP 5, 11, 17, ...

★ **Answer the following by a number or a word or a sentence :**

19. If the tangent drawn to the circle from point A on the outside of the circle with centre O and readius r, touches the circle to the point T, then what is the perpendicular point of the perpendicular drawn to the tangent from O?

20. How many small sphere of radius 5 cm are made by melting a large sphere of radius 10cm ?

21. If the radius of a circle is disminished by 20%, then its area is disminished by ?

22. We arrange three equal cube in a row. Find the ratio of total surface area of cuboid made by this arrangement and surface area of sum of these three cube.

23. $x^2 - 1 \div x - 1$

24. An arc of length 10 cm subtends an angle of 90^0 at the centre of circle. Find the area of the sector.

Section : B

★ **Solve the following (Question number 25 to 34) (2 Marks each)** 20

25. Check whether -150 is the term of the AP whose first term is 2 and common difference is -3.

OR

25. Find the number of terms in the AP 7, 13, 19, ..., 205.

26. Find the total surface area of cone of radius and slant height are 12 cm and 14 cm respectively.

OR

26. Find the voluem of a sphere of radius 1.5 cm in term of multiple of π.

27. A lot of 20 bulbs contain 4 defective bulbs. One bulb is drawn at random from the lot. What is the probability that this bulb is not defective ?

28. Two dice are thrown at the same time. List the possible outcomes. Find the probability of getting the product of the numbers on the two dice is 10.

29. $3x^2 - 2x^2 - 9x - 12 \div x^2 - 3$

OR

29. Find a quadratiric polynomial, the sum and product of whose zeroes are $\frac{1}{5}$ and $\frac{2}{5}$ respectively.

30. Find value : (i) $\frac{\tan 26^0}{\cot 64^0}$ (ii) $\cos 48^0 - \sin 42^0$.

OR

30. If $15 \cot A = 8$, then find the value of $\sin A$.

31. Two concentric circle are of radii 10 cm and 6 cm. Find the length of chord of the larger circle which touches the smaller circle.

32. A contractor plants to install slides for the children to play in a park. For the children below the age of 5 years, he prefer to have a slide whose top is at a height 1.5 m, and is inclined at an angle of 30^0 to the ground. What should be the length of the slide ?

33. Check whether the points $(1, 5)$, $(2, 3)$ and $(-2, -11)$ are collinear or not.

34. Find mean and median of the data : $\frac{4}{3}, \frac{4}{9}, \frac{3}{7}, \frac{5}{9}$.

<div align="center">Section : C</div>

★ **Solve the following (Question number 35 to 42) (3 marks each)**   **24**

35. The mean of the data : 7, 2x, 4, 14, 5x, 3x, 5 is 10. Find the value of x and also median.

36. Find mean :

No. of mangoes	50-52	53-55	56-58	59-61	62-64
No. of boxes	15	110	135	115	25

37. The larger of two supplementary angle exceeds the smaller by 18^0. Find them.

OR

37. Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old Nuri and Sonu ?

38. Find roots of the quadratic equation $x^2 + 48x - 324 = 0$ by applying quadratric formula.

39. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289. Find the sum of first n terms.

40. Find the area of a rhombus if its vertices are $(3, 0)$, $(4, 5)$, $(-1, 4)$ and $(-2, -1)$ taken in order.

OR

40. Name the type of triangle formed by the points $(4, 5)$, $(7, 6)$ and $(4, 3)$.

41. A cylindrical bucket, 32 cm high and with radius of the base 18 cm, is filled with sand. This bucket is emptied on the ground and a conial heap of sand is formed. If the height of the conical heap is 24 cm, find the radius and slant height of the heap.

42. All the jacks, queens and kings are removed from a deck of 52 playing cards. The remaining cards are well shuffled and then one card is drawn at random. Giving ace a value 1 similar value for each card, find the probability the card has a value (i) 7 (ii) greater than 7.

<div align="center">OR</div>

42. If choosing one number from 0 to 100 randomally. Find the probability that the numbers choosen is of (i) one digit (ii) two digit (iii) last digit is greater than first digit of two number.

<div align="center">

Section : D

</div>

★ Solve the following. (Question no. 43 to 45) (4 marks each)   (12)

43. In triangle $\triangle ABC$, $\angle B = 90^\circ$. Prove that $AC^2 = AB^2 + BC^2$.

<div align="center">OR</div>

43. Write the statement of Basic Proportionality theorem and proove it.

44. Draw a line segment AB of length 8 cm. Taking A as centre, draw a circle of radius 4 cm and taking B as centre, draw another circle of radius 3 cm. Construct tangent to each circle from the centre of the other circle.

45. The mode of give below frequency distribution is 34.5. The sum of all frequencies is 165. Find the value of 'x' and 'y'.

Class interval	5-14	14-23	23-32	32-41	41-50	50-59	59-68
Frequency	5	11	x	53	y	16	10

<div align="center">✦</div>

QUESTION PAPER : 6 - SHORT ANSWERS

1. True
2. False
3. True
4. True
5. False
6. True

7. (d) $\dfrac{129}{50}$

8. (b) $-\dfrac{5}{3}$

9. (c) $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} \neq \dfrac{c_1}{c_2}$

10. (a) 49

11. (b) 4

12. (b) (2, 3)

13. Cumilative frequency

14. $\dfrac{3}{13}$

15. $\dfrac{7}{12}$

16. $\dfrac{3}{7}$

17. $\dfrac{b^2 - 2ac}{a^2}$

18. 605

19. T

20. 8

21. 36%

22. 7 : 9

23. $x + 1$

24. $\dfrac{100}{\pi} cm^3$

25. Not possible OR

25. 34 step

26. Area $= \dfrac{4224}{7}$ cm² OR

26. 4.5 cm³

27. $\dfrac{1}{5} = 02$

28. $\dfrac{1}{18}$

29. $9(x) = 3x - 2$; $r(x) = -18$ OR

29. $k(5x^2 - x + 2)$

30. (i) 1 (ii) 0

31. 16 cm

32. length of the side 3 cm

33. not collinear

34. mean $= \dfrac{9}{14}$; median $= \dfrac{31}{63}$

35. $x = 4$, M $= 8$

36. $\bar{x} = 57.18$ mangoes

37. smaller $= 81 + 18 = 99°$ OR

37. Nuri AGe 80 year, Age of Sonu 30 year

38. -54, 6

39. $S_n = n^2$

40. Area $= 24$ Sq. unit

41. $r = 36$ cm; $r = 12\sqrt{3}$ cm

42. (i) $\dfrac{1}{10} = 01$ (ii) $\dfrac{3}{10} = 0.3$

42. OR (i) $\dfrac{10}{101}$ (ii) $\dfrac{90}{101}$ (iii) $\dfrac{36}{101}$

45. $x = 43$; $y = 27$

✦

Q.PAPER	Mathematics (Basic)	
7	**QUESTION PAPER - 7**	**Std.-10**
Time : 3 Hours	**(018) E**	Total Marks : 80

Instructions : Same as question Paper - 1.

Section-A

Answer as per given instruction : (Question number 1 to 24) (1 mark each)   24

★   State whether each of the following statement is true or false.

1.   HCF $(616, 62) = 8$

2.   If the sum of zeroes of qubic polynomial is zero, then the coefficient of x^2 is zero.

3.   If the first term and last term of an AP is 2 and 22 respectively, then the sum of first ten terms is 11000.

4.   If $\tan^2 45^0 - \cos^2 30^0 = x \cdot \sin 45^0 \cdot \cos 45^0$, then the value of x is $\dfrac{1}{2}$.

5. $\sqrt{(1 - \cos^2 \theta) \cdot \sec^2 \theta} = \tan \theta$

6.   The relationship between mean, meadian and mode is : Mode $= 3$ (Mean) $- 2$ (Median).

★   **Choose correct alternative from given below to make each of the following statement ture.**

7.   The decimal expansion of $\dfrac{129}{2^2 5^7}$ is ....

    (a) non terminating and repeating   (b) terminating and repeating
    (c) terminating   (d) None of above.

8.   The product of zeroes of polynomial $x^2 + 7x + 10$ is _____.
    (a) -10 (b) 10   (c) 7   (d) -7

9.   Four years ago, the sum of four people is 40 year. Two years later, the sum of these four people is _____.
    (a) 10   (b) 48   (c) 42   (d) 64

10.   The discriminant of quadratric equation $x^2 - 10x + (2m - 1) = 0$ is 40, Find value of m.
    (a) 8   (b) 79   (c) 13   (d) 15

11. $3 + 5 + 7 + ... + n$ term $= 288$, find the value of n.
    (a) 14   (b) 15   (c) 16   (d) 17

12.   A $(3, -2)$ and B$(-1, 4)$ are the point of diameter of a circle. Find the coordinate of centre.
    (a) $(1, 1)$ (b) $(-1, 1)$ (c) $(1, -1)$ (d) $(-1, -1)$

★   **Fill in the blanks.**

13.   The mode of a graph represent 'Less than' type ogive and 'greater than' type ogive is _____

14. If $P(A) = 0.35$, then $P(\bar{A})$ = _____

15. _____ is the probility to get 45 marks out of 100 makrs question paper.

16. _____ is the probility of card is not ace drawn from well shuffled deck of 52 cards.

17. The zeroes of $p(x) = ax^2 + bx + c$ are α and β. $\dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha}$ = _____

18. For an AP : $\sqrt{3}, \sqrt{27}, \sqrt{75}, \ldots\ldots$ the common difference is _____

★ **Answer the following by a number or a word or a sentence :**

19. If the tangent drawn to the circle from point P on the outside of the circle with centre O and radius 15 cm. touches the circle to the point T, If PT = 8 cm, then find OP.

20. The largest cone is curved out from a wooden hemisphere of radius r. Find the volume of the remaining wooden.

21. A paper is in the form of a rectangle ABCD in which BC=20 cm and CD = 14 cm. A semicircluar portion with AXB is cut off. **Find** the parimeter of remaining part.
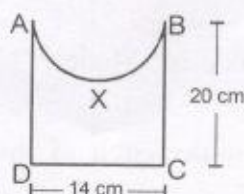
22. The ratio of radius of two sphere is 3 : 4. Find the ratio of their volume.

23. The one zero of $p(x) = ax^2 - 5x + 6$ is 3. Find 'a'.

24. A chord of a circle of radius 10 cm substened an angle of 60^0 at the centre. Find the area of minor sector.

Section : B

★ **Solve the following (Question number 25 to 34) (2 Marks each)**   20

25. How many terms in an AP $18, 15\frac{1}{2}, 13, \ldots\ldots, -47$.

OR

25. Check whether 301 is the term of the 45 of numbers 5, 11, 17, 23, ...

26. The volume of a cylinder is 550 cm³. If the radius of these cylinder is 5 cm, find its height.

OR

26. A solid cylinder of diameter and height 2 cm and 16 cm respectively is melted and recast into 10 small identical sphere. Find the radius of sphere.

27. Three unbiased coins are tossed together. Find the probability of getting (i) at least two heads. (ii) two heads.

28. A box contains 25 discs which are numbered from 1 to 25. If one disc is drawn at random from the box, find the probality that it bears
(i) perfect square (ii) a number divisible by 5.

29. Find the quadratiric polynomial, the sum and product of whose zeroes are $\frac{1}{3}$ and $\frac{1}{2}$.

OR

29. $x^3 - 5x^2 + 5x \div x - 1$

30. Find the value of $\sin 25^0 \cdot \cos 65^0 + \cos 25^0 \cdot \sin 65^0$

OR

30. If $\tan A = \frac{3}{4}$, then find the value of $\frac{1 - \tan^2 A}{1 + \tan^2 A}$.

31. The tangents drawn to the cricle from point P on the outside of the circle with centre O and radius 5 cm touches the circle to the point A and B. If $AP = 12$ cm, then find AB.

32. A contractor plans to install slide for the children to play in the park. He prefers to have a slide whose top is at a height 3 m, and is inclined at angle of 60^0 to the ground. What should be the height of the slide ?

33. The distance between two points P(2, −3) and Q(10, y) is 10. Find the value fo 'y'.

34. Find median class-interval and mode class-interval.

Class interval	45-55	55-65	65-75	75-85	85-95
Frequency	3	10	11	8	3

Section : C

★ Solve the following (Question number 35 to 42) (3 marks each) 24
35. Find Mean by applying step deviation method for given below frequency distribution.

Class Interval	15-25	25-35	35-45	45-555	55-65	65-75	75-85
Frequency	6	11	7	4	4	2	1

36. The Mode of the data : 64, 40, 48, x, 43, 48, 43, 34 is 43 Find the value of x and also find mean and median.

37. Find the solutions of pair of linear equations $3x - 5y - 4 = 0$ and $9x = 2y + 7$ by applying elimination method.

OR

37. Find the solutions of pair of linear equations $\frac{x}{2} + \frac{2y}{3} = -1$ and $x - \frac{y}{3} = 3$ by applying substitution method.

38. The sum of the reciprocals of Rehman's age 3 years ago and 5 years from now is $\frac{1}{3}$. Find his present age.

39. The nth term of an AP is $3 + 2n$. Find the sum of first 24 terms of this AP.

40. The mid point of sides of △ABC, With vertices are A(1, −1), B(−4, 6), C(−3, −5) are D, E, F rispectively. Find the area of △DEF.

OR

40. Find the coordinates of the points of trisection of the line segment joining (4, 5) and (−1, 4).

41. A toy in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

42. Five cards - the ten, jack, queen, king and ace of dimonds, are well-shuffled with their face downwards one card is then picked up at random.
   (i)   What is the probability the card is the queen ?
   (ii) If the queen is drawn and put aside, what is the probability that the second card picked up is an ace ?

OR

42. A lot consists of 144 pens of which 20 are defective and other are good. Nuri will buy a pen if it is good, but will not buy if it is defective. The shopkeeper drawn one pen at random and gives it to her. What is the probability that
   (i)   She will buy it ?
   (ii) She will not buy it ?

Section : D

★ Solve the following. (Question no. 43 to 45) (4 marks each)   (12)

43. If , $\triangle ABC \sim \triangle PQR$ then Prove $\dfrac{ABC}{PQR} = \dfrac{AB^2}{PQ^2} = \dfrac{BC^2}{QR^2} = \dfrac{AC^2}{PR^2}$.

OR

43. If $DE^2 = DF^2 + EF^2$ in DEF, then prove $\angle F = 90^0$.

44. Draw a line segment of length 7.6 cm and divide it in the ratio 5 : 8.

45. The mode of below frequency distribution is $33\dfrac{1}{3}$. If the sum of all frequencies is 100, then find the value of 'a' and 'b'.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	7	12	a	28	b	9

◆

QUESTION PAPER : 7 - SHORT ANSWERS

1. True
2. True
3. False
4. True
5. True
6. False

7. (c) terminating
8. (b) 10
9. (d) 6
10. (a) 8
11. (c) 16
12. (a) (1, 1)
13. x co-ordinate of its intersection point.
14. 0.65

15. $\dfrac{1}{101}$
16. $\dfrac{12}{13}$

17. $\dfrac{b^2 - 2ac}{ac}$
18. $2\sqrt{3}$

19. 17 cm
20. $\dfrac{1}{3}\pi r^3$

21. 76 cm
22. 27 : 64

23. 1
24. $\dfrac{50}{3}\pi \ cm^3$

25. 27 is step.
26. Height 7 cm OR
26. $r = 1$ cm

27. (i) $\dfrac{1}{2} = 0.5$ (ii) $\dfrac{3}{8} = 0.375$
28. (i) $\dfrac{4}{25}$ (ii) $\dfrac{1}{5}$

29. $k(6x^2 - 2x + 3)$ OR
29. $q(x) = x^2 - 4x$; remain = $r(x) = x$

30. 1 OR
30. $\dfrac{7}{25}$

31. $AB = \dfrac{120}{3}$
32. length $2\sqrt{3}$
33. $y = -9; \ y = 3$
34. 65, 75
35. Mean = 48.98 female teachers
36. $x = 45.375$; median = 43

37. $(x,y) = \left(\dfrac{-5}{13}, \dfrac{-67}{65}\right)$ OR
37. $(x, y) = (2, -3)$
38. 7 years
39. 672

40. Area = 6 Sq. OR
40. $Q = \dfrac{2}{3}, \dfrac{13}{3}$

41. Surface 214.5

42. (i) $\dfrac{1}{5} = 0.2$ (ii) $\dfrac{1}{4} = 0.25$ OR
42. (i) $\dfrac{31}{36}$ (ii) $\dfrac{19}{143}$

45. $a = 24; \ b = 20$

◆

Q.PAPER **8**	**Mathematics (Basic)**	▢

	QUESTION PAPER - 8	**Std.-10**

Time : 3 Hours	**(018) E**	Total Marks : 80

Instructions : Same as question Paper - 1.

Section-A

Answer as per given instruction : (Question number 1 to 24) (1 mark each)   **24**

★ State whether each of the following statement is true or false.

1. The cube of any positive integer is of the form 9m, 9m+1 or 9m+8.

2. The sum and product of quadratric polynomial $x^2 + 4x + 3$ are 4 and 3 respectively.

3. $-1, -\dfrac{3}{2}, -2, \dfrac{5}{2}, \ldots$ is an A.P.

4. If $\sec^2 \theta + \tan^2 \theta = \dfrac{13}{12}$, then the value of $\sec^4 \theta - \tan^4 \theta$ is $\dfrac{12}{13}$.

5. The value of $\sec \theta$ increases as θ increases.

6. If Median $-$ Mean $= 2$ and mode $= 24$ of any data, then the value of median is 20.

★ **Choose correct alternative from given below to make each of the following statement ture.**

7. The sum and difference of rational and irrational number is ....
   (a) rational   (b) Irrational   (c) Integer   (d) Natural

8. The sum and product of quadratiric polynomial _____ is -3 and 2 respectively.
   (a) $x^2 + 3x + 2$ (b) $x^2 - 3x + 2$ (c) $x^2 + 3x - 2$ (d) $x^2 - 3x - 2$

9. If $a_1b_2 - a_2b_1 = 0$, $b_1c_2 - b_2c_1 = 0$ and $c_1a_2 - c_2a_1 = 0$, then the solution of pair of linear equation is _____
   (a) unique   (b) not possible   (c) Infinie   (d) (1, 1)

10. Quadratiric equation $9x^2 + 30x + 25 = 0$ has.....
    (a) no real roots   (b) equal roots   (c) different roots   (d) None of above

11. The 11th term of an AP $-3, -\dfrac{1}{2}, 2, \ldots$ is _____
    (a) 28   (b) 22   (c) -38 (d) -48

12. A $(-4, 2)$ and B$(4, -2)$. In which ratio the X-axis divide the line segment ?
    (a) $1 : 2$ (b) $2 : 1$ (c) $1 : 1$ (d) $3 : 2$

★ **Fill in the blanks.**

13. $n = 55$, $l = 70$, $cf = 26$, $f = 11$, $h = 10$, median = _____

14. _____ is the probability of one unbiased dice tossed to get the numbr greater than 2.

15. Two dice are tossed together. _____ is the probability that the sum of numbers on these two dice is 7.

16. Two unbiased coin are tossed together to get first head and second tail. _____ is the probability of that.

17. The zeroes of $ax^2 + bx + c = 0$ are α and β. $\dfrac{1}{\alpha} + \dfrac{1}{\beta} =$ _____

18. If $2k + 1$, 13 and $5k - 3$ are in A.P. Find the value of k.

★ **Answer the following by a number or a word or a sentence :**

19. From a point P, the length of the tangent to a circle is 8 cm and the distance of P from the centre is 17 cm. Find the diameter of the circle.

20. A large spherical tablet of radius r is crushed in 1000 small particles. Now, how many times the surface area of a larger table increased ?

21. The area of minor sector is 75 cm² of a circle of radius 10 cm. Find the length of the arc.

22. A bucket is in the form of frustum of a cone of height 3 cm with radii of its lower and upper ends as 2 cm and 20 cm, respectively. Find the capacity of the bucket.

23. Find the sum of zeroes of qudratric polynomial $p(y) = y^2 - 9$.

24. Find the area of shaded part shown in figure.
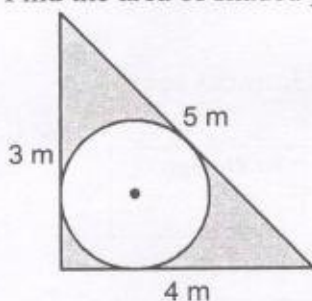
Section : B

★ **Solve the following (Question number 25 to 34) (2 Marks each)**   20

25. Which term of the AP : 3, 8, 13, 18, ... is 78 ?

OR

25. $a = -18$, $d = 2$, $n = 10$, find a_n.

26. Metallic spheres of radii 3 cm, 4 cm and 5 cm respectively are melted to form a single solid sphere. Find the radius of the resulting sphere.

OR

26. A solid cylinder is 1 m in diameter and 1.6 m in height. Find the cost of painting the total surface area of cylinder at the rate of r 10 per m².

27. If A is an event of any experiment and $[P(A)]^2 + 5[P(A)] - 6 = 0$ then find P(A).

28. Find the probability that the month of February of an ordinary year will have (i) only 4 Sundays (ii) 5 Sundays.

29. $x^4 + 1 \div x + 1$

OR

29. Find the zeroes of quadratiric polynomial $9x^2 - 8x - 1$ and verify the relationship between zeroes and coefficient.

30. Find value : (i) $9\sec^2 A - 9\tan^2 A$ (ii) $\cos ec31^0 - \sec 59^0$

<div align="center">OR</div>

30. If $\sec\theta = \dfrac{13}{12}$, then find the value of $\tan\theta$ and $\cos\theta$.

31. Draw a circle and two lines parallel to given line such that one is tangent and the other, a secant to the circle.

32. A kite is flying at a height of 60 m above the ground. The string attached to the kite is termporarily tied to a point on the ground. The inclination of the string with the ground is 60^0. Find the length of the string, assuming that there is no slack in the string.

33. Find the coordinates of the point which divides the line segment joining the points $(-3, 4)$ and $(7, -1)$ in the ratio 3 : 2 internally.

34. Find the differnce of the frequency of mode class interval and Median class interval of below table.

Class interval	0-5	5-10	10-15	15-20	20-25
Frequency	7	16	25	32	20

<div align="center">

Section : C

</div>

★ **Solve the following (Question number 35 to 42) (3 marks each)**   24

35. Find Median.

Class interval	40-50	50-60	60-70	70-80	80-90
Frequency	10	25	28	12	10

36. Find Mode.

Class interval	0-5	5-10	10-15	15-20	20-25
Frequency	10	15	12	20	9

37. The cost of 5 oranges and 3 apples is r 35 and the cost of 2 oranges and 4 apples is r 28. Find the cost of one apple and one orange.

<div align="center">OR</div>

37. Find out whether the following pair of linear equations have one solution or infinite solution.

   (i) $x - 3y - 3 = 0$ and $3x - 9y - 2 = 0$

   (ii) $2x + y = 5$ and $3x + 2y = 8$

   (iii) $3x - 5y = 20$ and $6x - 90y = 40$

38. The difference of square of two numbers is 180. The square of smaller number is 8 times than the larger number. Find the two numbers.

39. Show that $(1) + (1 + 1) + (1 + 1 + 1) + ... + (1 + 1 + 1 + ... +1$ (n times)) $= \dfrac{n(n+1)}{2}$.

40. If $(-4, 3)$ and $(4, 3)$ are two vertices of an equilateral triangle, find the coordinates of the third vertex, given that the origin lies in the interior of the triangle.

30. Find value : (i) $9\sec^2 A - 9\tan^2 A$ (ii) $\cos\text{ec}\,31^0 - \sec 59^0$

<div align="center">OR</div>

30. If $\sec\theta = \dfrac{13}{12}$, then find the value of $\tan\theta$ and $\cos\theta$.

31. Draw a circle and two lines parallel to given line such that one is tangent and the other, a secant to the circle.

32. A kite is flying at a height of 60 m above the ground. The string attached to the kite is termporarily tied to a point on the ground. The inclination of the string with the ground is 60^0. Find the length of the string, assuming that there is no slack in the string.

33. Find the coordinates of the point which divides the line segment joining the points $(-3, 4)$ and $(7, -1)$ in the ratio $3 : 2$ internally.

34. Find the differnce of the frequency of mode class interval and Median class interval of below table.

Class interval	0-5	5-10	10-15	15-20	20-25
Frequency	7	16	25	32	20

<div align="center">Section : C</div>

★ **Solve the following (Question number 35 to 42) (3 marks each)**   24
35. Find Median.

Class interval	40-50	50-60	60-70	70-80	80-90
Frequency	10	25	28	12	10

36. Find Mode.

Class interval	0-5	5-10	10-15	15-20	20-25
Frequency	10	15	12	20	9

37. The cost of 5 oranges and 3 apples is r 35 and the cost of 2 oranges and 4 apples is r 28. Find the cost of one apple and one orange.

<div align="center">OR</div>

37. Find out whether the following pair of linear equations have one solution or infinite solution.

(i) $x - 3y - 3 = 0$ and $3x - 9y - 2 = 0$

(ii) $2x + y = 5$ and $3x + 2y = 8$

(iii) $3x - 5y = 20$ and $6x - 90y = 40$

38. The difference of square of two numbers is 180. The square of smaller number is 8 times than the larger number. Find the two numbers.

39. Show that $(1) + (1 + 1) + (1 + 1 + 1) + \ldots + (1 + 1 + 1 + \ldots + 1 \text{ (n times)}) = \dfrac{n(n+1)}{2}$.

40. If $(-4, 3)$ and $(4, 3)$ are two vertices of an equilateral triangle, find the coordinates of the third vertex, given that the origin lies in the interior of the triangle.

41. A juice seller was serving his customers using glasses as shown in figure. The inner diameter of the cylindrical glass was 5 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of the glass was 10 cm, find the apparent capacity of the glass and its actual capacity. (Take π =3.14)
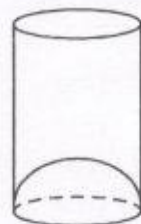
42. Two dice are thrown at the same time. What is the probability that the sum of the two numbers appearing on the top of the dice is
    (i)   Prime number ?   (ii) a perfect square ?   (iii) an odd number ?

OR

42. Cards with numbers 2 to 101 are placed in a box. A card is slelected at random. Find the probability the card has
    (i)   an even number   (ii) a perfect square   (iii) multiple of 3.

Section : D

★ Solve the following. (Question no. 43 to 45) (4 marks each)   (12)

43. If , $\triangle PQR$, given that $PR^2 = PQ^2 + QR^2$, then prove that $\angle Q = 90^\circ$.

OR

43. If $\triangle ABC \sim \triangle DEF$, then prove that $\dfrac{ABC}{DEF} = \dfrac{AB^2}{DE^2} = \dfrac{BC^2}{EF^2} = \dfrac{AC^2}{DF^2}$

44. Construct a triangle of side 4 cm, 5 cm and 6 cm and then a triangle similar to it. Whose sides are $\dfrac{2}{3}$ of the corresponding side of the first triangle.

45. The median of below frequency distribution is 32. Find a and b.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	10	a	25	30	b	10

✦

QUESTION PAPER : 8 - SHORT ANSWERS

1.	True	2.	True
1.	True	2.	False
3.	True	4.	False
5.	True	6.	True
7.	(b) irrational	8.	(a) $x^2 + 3x + 2$
9.	(c) infinite	10.	(b) equal roots
11.	(b) 22	12.	(a) $1:2$

13.   71.36

14. $\dfrac{1}{6}$

15. $\dfrac{1}{6}$

16. $\dfrac{1}{4}$

17. $\dfrac{-b}{c}$

18.   4

19.	30 cm	20.	100
21.	15 cm	22.	22 cm
23.	0	24.	$6 - \pi$
25.	16 term OR **25.** $a_{18} = 0$	26.	Redius 6 cm OR **26.** 6.6 m
27.	Not possible.	28.	(i) $\dfrac{6}{7}$ (ii) $\dfrac{1}{7}$

29. $q(x) = x^2 - x^2 + x - 1$; remainder : $r = (x) = 2$ OR

29. $1, \dfrac{-1}{9}$

30.   (i) 9 (ii) 0 OR   30. $\cos\theta = \dfrac{12}{13}$

32.   length of string $40\sqrt{3}$ 33. $p\left(3, \dfrac{3}{5}\right)$

34.   Median class 15-20; frequency = 7   35.   median = 62.7

36.   Mean = 15.6

37.   Orange 4 ₹, Apple 5 ₹ OR

37.   (i) no solution. (ii) one solution (iii) one solution

38.   18, 12   40. $x = 0$ $(0, 3y, \sqrt{3})$

41.   raduced the capacity = 32.71 cm³; real capacity = 33.54 cm³

42.   OR (i) $\dfrac{1}{2} = 0.5$ (ii) $\dfrac{9}{100} = 0.09$ (iii) $\dfrac{33}{100} = 0.33$

45. $a = 9; b = 16$

✦

G.PAPER	**Mathematics (Basic)**	
9	**QUESTION PAPER - 9**	**Std.-10**
Time : 3 Hours	**(018) E**	Total Marks : 80

Instructions : Same as question Paper - 1.

Section-A

Answer as per give n instruction : (Question number 1 to 24) (1 mark each)   24
★ State whether each of the following statement is true or false.

1. Every composit number can be expressed as a product of primes, and this factorisation is unique, apart from the order in which the prime factor occur.

2. The graph of quadratiric polynomial always intersect X-axis in two different points.

3. The 9th term of a series 32, 28, 24, ... is zero.

4. If $\sin\theta = \cos(2\theta - 45^0)$, then $\tan\theta = 1$.

5. $(\tan\theta + 2)(2\tan\theta + 1) = 5\tan\theta + \sec^2\theta$

6. If Mode > Median, then Median > Mean.

★ Choose correct alternative from given below to make each of the following statement ture.

7. Let p be a prime number. If p divides a^2, then _____, where a is a positive integer.
 (a) p divides a
 (b) a divides p
 (c) p doesn't divide a
 (d) No relation between a and p.

8. If the quation is zero when $p(x) \div g(x)$,then.....
 (a) exponent of $p(x)$ > exponent of $g(x)$
 (b) exponent of $p(x)$ < exponent of $g(x)$
 (c) exponent of $p(x)$ ≥ exponent of $g(x)$
 (d) exponent of $p(x)$ ≤ exponent of $g(x)$

9. If the sum of numbers of two digits is equal to the product of numbers of two digit, the two digit number is _____
 (a) 11   (b) 23   (c) 10   (d) 22

10. The roots of quadratric equation $x^2 + 12x + 36 = 0$ are _____
 (a) reciprocal   (b) opposite   (c) irrational   (d) equal

11. _____ is the tenth term of an AP 2, 7, 12, ...
 (a) 37   (b) 42   (c) 47   (d) 52

12. The coordinate points of first trisection points is _____ of line segment joining points (1, 1) and (4, 7)
 (a) (2, 3)   (b) (3, 5)   (c) (3, 2)   (d) (5, 3)

★ Fill in the blanks.

13. What is the median of first 50 even number ?

14. $P(\bar{E}) = \dfrac{13}{27}$ then P(E) = _____

15. A box contains 100 slips which numbered from 1 to 100. If one slip is drawn at random from the box, _____ is the probability that if bears one digit number.

16. _____ is the probability of getting a tail more time than heads when three coins are tossed at same time.

17. The zeroes of quadratric polynomial $p(x) = ax^2 + bx + c$ are α and β.

$\alpha + \beta =$ _____

18. If $a_4 = 7$ and $a_7 = 4$ then $a_{10} =$ _____.

★ **Answer the following by a number or a word or a sentence :**

19. How many tangents are drawn from a point lies on a circle ?

20. What is the ratio of radii of two sphere, whose ratio of surface area is $1 : 4$?

21. If the area of a circle is six times than its minor sector, then find angle of minor sector.

22. Find the volume of cone with radius 7 cm and slant height 25 cm.

23. Find the product of zeroes of quadratiric polynomial $p(x) = 4x^2 - 4x + 1$.

24. The ratio of radii of two circle is $2 : 3$. The ratio of the angle subtended at the centre of a circle is $5 : 2$. Find the ratio of area of the minor sector.

$$\boxed{\text{Section : B}}$$

★ **Solve the following (Question number 25 to 34) (2 Marks each)**   **20**

25. If $a = 46$, $d = -3$, $n = 18$ then find S_n.

OR

25. If $a = -18.9$, $n = 10$, $a_n = 3.6$ then find d.

26. Find the ratio of two hemisphere whose radii are 7 cm and 14 cm.

OR

26. The surface area of a sphere is 64π cm². If it is divided into two hemisphere, then find the total surface area of these hemispheres.

27. Two dice are tossed together. Write all possible outcomes. What is the probability that both dice have same numbers on top side?

28. Three unbiased coins are tossed together. Write all possible outcomes. Find the probability to get (i) two heads (ii) one head.

29. Find the zeroes of $2x^2 - 9x - 5$ and verify the relationship between zeroes and coefficient.
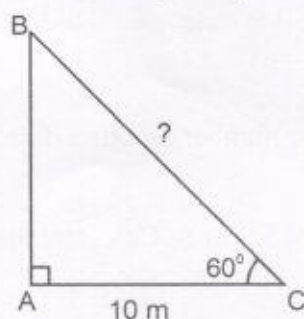
OR

29. The sums and product of zeroes are 5 and -5 respectively. Write quadratric polynomial.

30. If $\cot \theta = \dfrac{7}{8}$, then find $\operatorname{cosec} \theta$ and $\sin \theta$.

OR

30. If $\tan(A + B) = \sqrt{3}$ and $\tan(A - B) = \dfrac{1}{\sqrt{3}}$, then find **A.**

31. Two concentric circle are of radii 26 cm and 24 cm. Find the length of the chord of the larger circle which touches the smaller circle.

32. With the help of figure shows below find BC.

33. Find the value of 'y' for which the distance between the points P(2, −3) and Q (10, y) is 10 units.

34. Find differnce between lower limit of mode class inteval and frequency of median class interval.

Class interval	1-3	3-5	5-7	7-9	9-11
Frequency	7	8	2	2	1

Section : C

★ Solve the following (Question number 35 to 42) (3 marks each)   24

35. Find Median.

Class interval	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55
Frequency	3	8	9	10	3	0	0	2

36. Find Mode.

Class interval	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	10	35	52	61	38	29

37. If the following pair of linear equation have no solutions, then find the value of k.
   (i) $3x + y = 1$ and $(2k - 1) x + (k - 1) y = 2k + 1$.
   (ii) $4x + ky + 8 = 0$ and $2x + 2y + 2 = 0$

OR

37. Find the solution of pair of linear equations, $3x + 4y = 10$ and $2x - 2y = 2$ by cross section method.

38. Find two consecutive positive odd integers, sum of whose square is 290.

39. The sum of the 4th and 8th terms of an AP is 24 and the sum of sixth and tenth terms is 44. Find the first three terms of the AP.

40. A median of a triangle whose vertices are A(4, −6), B(3, −2), and C(5, 2) is AD. Prove that the area of △ABD = the area of △ACD.

OR

40. Find the co-ordinates of the point P which divides the line segment joining the points A(3, 2) and B(5, 1). If P lies on a line $3x - 18y + k = 0$, then find value of 'k'.

41. A tent is in the form of right circular cylinder of diameter 4 m and height 2.1 m surmounted by a right circular cone of slant height 2.8 m. Find the cost of the canvas at r 500 per m².

42. Two dice are tossed same time. Write all possible outcomes. Find the probability of getting
    (i) Same number on the two dice.
    (ii) A number on first dice is larger than the number on other dice.

<div align="center">OR</div>

42. One card is drawn from a well shuffled deck of 52 cards. Calculate the probability that the card will be
    (i) a number written on it.
    (ii) a face card.
    (iii) a number with perfect square.

<div align="center">

Section : D

</div>

★ Solve the following. (Question no. 43 to 45) (4 marks each)   (12)

43. Write the statement of the basic proportionality theorem and prove it.

<div align="center">OR</div>

43. If in $\triangle ABC$, $\angle A = 90°$, then prove $BC^2 = AB^2 + AC^2$.

44. Construct a triangle of side 5 cm, 6 cm and 7 cm and then another triangle whose side are 7 : 5 of the corresponding sides of the first triangle.

45. If the median of below frequencey distribution is 28.5 and the sum of all frequencies is 60, then find 'f_1' and 'f_2'.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	f_1	20	15	f_2	5

<div align="center">◆</div>

QUESTION PAPER : 9 - SHORT ANSWERS

1.	False	2.	False
3.	True	4.	True
5.	True	6.	False
7.	(a) p divides a	8.	(a) exponent of $p(x)$ > exponent of $g(x)$
9.	(d) 22	10.	(c) equal
11.	(c) 47	12.	(a) (2, 3)
13.	51	14.	$\dfrac{14}{27}$
15.	0.09	16.	$\dfrac{1}{2}$
17.	$-\dfrac{b}{a}$	18.	1
19.	1	20.	1 : 2
21.	60°	22.	1232 cm²
23.	$\dfrac{1}{4}$	24.	10 : 9

25. $S_n = 45$ OR   25. $d = 2.5$

26. ratio 1:8 OR   26. Area = 96 π cm²

27. Probability $\dfrac{1}{6}$ 28. (i) P(A) = 0.375 (ii) P(B) = 0.375

29. 5; $\dfrac{-1}{2}$ OR   29. $k(x^2 - 5x - 5)$

30. $\sqrt{\dfrac{113}{8}}$, $\dfrac{8}{\sqrt{113}}$ OR   30. A = 45°

31. length of the chord = 20 cm   32. AC = 20 m

33. 3 or –9   34. –5

35. median = 28.56   36. mode = 65.625

37. (1) k = 2 (2) k = 4 OR   37. $(x, y) = (2, 1)$

38. 11, 13   39. –13, –8, –3 .... (5n – 18)

40. OR k = $\dfrac{40}{3}$ 41. 44 m², ₹ 22,000

42. (i) $\dfrac{5}{6}$ (ii) $\dfrac{5}{12}$ OR   42. (i) $\dfrac{9}{13}$ (ii) $\dfrac{1}{3}$ (iii) $\dfrac{2}{13}$

45. $f_1 = 8$; $f_2 = 7$

✦

Q.PAPER
10

Mathematics (Basic)

QUESTION PAPER - 10

Std.-10

Time : 3 Hours

(018) E

Total Marks : 80

Instructions : Same as question Paper - 1.

Section-A

Answer as per give n instruction : (Question number 1 to 24) (1 mark each)   24
★ State whether each of the following statement is true or false.

1.   HCF (a, b) · LCM $(a, b) = a \times b$

2.   The graph of quadratiric polynomial intersects the X-axis in maximum three points.

3.   The sum of first n terms of an any AP is not $n^2 + 1$.

4. $\cos^2 5^0 - \sin^2 85^0 = 1$

5. $\sin (x + 10^0) = \dfrac{1}{2}$, then $x = 30^0$.

6.   Median $= 3 \times$ Mode $- 2 \times$ Mean.

★ **Choose correct alternative from given below to make each of the following statement ture.**

7.   The number of decimal places after which the decimal expansion of the rational
number $\dfrac{14588}{625}$ will terminate, is

   (a) 1   (b) 2   (c) 3   (d) 4

8.   Relationship between exponents of divisor polynomial and remainder polynomial.
   (a) exponent of divisor polynomial > exponent of remainder polynomial.
   (b) exponent of divisor polynomial < exponent of remainder polynomial.
   (c) exponent of divisor polynomila = exponent of remainder polynomial.
   (d) exponent of divisor polynomila ≤ exponent of remainder polynomial.

9.   The solution of pair of linear equations $x + y - 1 = 0$ and $2x + 2y - 5 = 0$ is ....
   (a) $x = 1, y = 0$ (b) $x = 0, y = 1$
   (c) $x = 1, y = 1$ (d) not possible.

10. The 10th term of an AP 2, 7, 12, ... is _____
   (a) 40   (b) 43   (c) 47   (d) 49

11. The roots of quadratric equation $3x^2 - 4x + 1 = 0$ is _____

   (a) $1, \dfrac{1}{3}$

   (b) $-\dfrac{1}{3}, -\dfrac{1}{3}$

   (c) $-1, 1$

   (d) $0, 1$

12. The point $P(1, y)$ which divides the line segment joining the points $A(0, 2)$ and
   $B(3,5)$ in the ratio 1 : 2. Find the value of 'y'.
   (a) 0   (b) 1   (c) 2   (d) 3

★   **Fill in the blanks.**

13.   Median − Mean = 2, and Median + Mean = 38, then Mode = _____

14.   If $P(C) = \dfrac{2}{7}$, then $P(\overline{C}) =$ _____

15.   If 'A' is an event of any experiment and $[P(A)]^2 - 3[P(A)] + 2 = 0$, then P(A) = _____

16.   _____ is the probability to get number greater than 3, when a dice tossed one time.

17.   The zeroes of quadratric polynomial $p(x) = ax^2 + bx + c$ are α and β. $(\alpha + \beta)^2$ = _____

18.   _____ is the 10th term from the last term (towards the first term) of the AP : 1, 2, 3, ..., 100.

★   **Answer the following by a number or a word or a sentence :**

19.   Give the name of a line whose two, points are on the cricle.

20.   If the radius of a sphere is doubled, then the surface aea of sphere is _____

21.   An arc of a circle is of length 20π cm and the sector bounds has an area of 100π cm². Find the radius of the circle.

22.   A spherical ball of radius R is melted to make 8 new identical ball each of radius r, then find the ralation between R and r.

23.   The sum and product of zeroes are 4 and 1 respectively. Find quadratric polynomial.

24.   What is the area of a sector of an angle P(in degree) of a circle with radius R ?

<div align="center">

| Section : B |

</div>

★   **Solve the following (Question number 25 to 34) (2 Marks each)**   20

25. $a = 7, d = 3, n = 8$ then find a_n.

<div align="center">OR</div>

25. $a = -18, d = 2, n = 10$, then find S_n.

26.   Find the length of a side of a cube with volume 1728 cm³.

<div align="center">OR</div>

26.   A solid hemispherical at the bottom and conical above. If the surface aeas of the two parts are equal, then find the ratio of its radius and slant height of its conical part.

27.   (i) If $P(A) : P(\overline{A}) = 3 : 4$, then find P(A).

      (ii) If $P(E) = \dfrac{12}{13}$ than find $P(\overline{E})$.

28.   Give defination of (i) Impossible event (ii) sure event.

29.   Find the zeroes of quadratric polynomial $x^2 - 10x + 25$ and verify the relationship between zeroes and co-efficient.

<div align="center">OR</div>

29. Without finding zeroes of qubic polynomial $x^3 - 8x^2 + 17x - 10$. Write the sum of zeroes, the product of zeroes and the sum of multiplication of two zeroes.

30. If $\cot\theta = \dfrac{4}{3}$, then find $\cos^2\theta - \sin^2\theta$.

OR

30. Prove that : $\sin^2\theta - \cos^2\theta = 2\sin^2\theta - 1$

31. Write the answer of following questions :
 (i) Give the name of line passes through the two end points of its corresponding chord coincide.
 (ii) How many maximum parallel tangents are drawn in a circle ?

32. A tower stands vertically on the ground. From a point on the ground, which is 30 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 30°. Find the height of the tower.

33. If $(1, 2)$, $(4, 7)$, $(x, 6)$ and $(3, 5)$ are the vertices of a parallelogram taken in order, find x and y.

34. Mode − Mean = 6, Median = 20, then find mean.

$$\boxed{\text{Section : C}}$$

★ **Solve the following (Question number 35 to 42) (3 marks each)**   **24**

35. The median of data : 25, 25, 26, $x + 2$, $x + 3$, 30, 31, 34 is 27.5 Find mean.

36. Find Median.

Class interval	140-150	150-160	160-170	170-180	180-190	190-200
Frequency	10	25	28	12	10	15

37. If the pair of linear equation $2x + 3y = 7$ and $(a-b)x + (a+b)y = 3a + b - 2$ have infinite solutions, then find a and b.

OR

37. Find the solutions of the pairs of linear equations $3x - 5y = 0$ and $9x = 2y + 7$ by appliying elemination method.

38. Find the roots of quadratric equation $5x^2 - 6x - 2 = 0$ by applying quadratric formula.

39. Find the 20th term from the last term (towards the firt term) of the A.P. : 3, 8, 13, ..., 253.

40. $A(-6, 4)$, $B(-2, 3)$, $C(2, 5)$ are the vertices of $\triangle ABC$. Prove that the median of a triangle divides it into two triangles of equal areas.

41. A hemispherical depression is cut from one face of a cubical wooden block such that the diameter l of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid.

42. A bag contains 24 balls of which x are red, $2x$ are white and $3x$ are blue. A ball is selected at random. What is the probability that it is
 (i) not red ?
 (ii) white ?

OR

42. A carton of 24 bulbs contain 6 defective bulbs. One bulb is drawn at random. What is the probability that the bulb is not defective ? If the bulb selected is defective and it is not replaced and a second bulb is selected at random from the rest. What is the probability that the second bulb is defective ?

Section : D

★ **Solve the following. (Question no. 43 to 45) (4 marks each)**   (12)

43. Write the statement of Pythagoras Theorem and Prove it.

OR

43. Write the statement of Basic Proportionality Theorem and Prove it.

44. Construct an isosceles triangle whose base is 8 cm and altitude 4 cm. and then another triangle whose sides are $\frac{3}{2}$ times the coresponding sides of the isosceles triangle.

45. If the median of below frequency distribution is 240, then find x.

Class interval	0-100	100-200	200-300	300-400	400-500	500-600	600-700
Frequency	15	17	x	12	9	5	2

◆

QUESTION PAPER : 10 - SHORT ANSWERS

1. True   2. True
3. False   4. False
5. False   6. True
7. (d) 4
8. (a) exponent of divisor polynomial > exponent of remainder polynomial.
9. (d) not possible.   10. (c) 47

11. (a) $1, \dfrac{1}{3}$ 12. (d) 3

13. 24   14. $\dfrac{5}{7}$

15. 1   16. $\dfrac{1}{2}$

17. $\dfrac{b^2}{a^2}$ 18. 91

19. the tangent to a circle is a special case of the secant
20. 4 times
21. 10   22. $R = 2r$

23. $k(x^2 - 4x + 1)$ 24. $\dfrac{\pi R^2 P}{360^0}$

25. $a_n = 28$ OR   25. $S_n = -90$
26. length of side = 12 cm OR   26. ratio = 1:2

27. (i) $P(A) = \dfrac{3}{7}$; $P(\overline{A}) = \dfrac{4}{7}$; (ii) $P(\overline{E}) = \dfrac{1}{13}$

28. (i) 0 (zero) (ii) 1
29. 5 OR   29. 8, 10, 17

30. $\dfrac{7}{25}$ 31. (i) Tangent (ii) two

32. Height of the tower = $30\sqrt{3}$ m   33. $x = 6$; $y = 3$
34. mean = 18   35. mean = 28.25
36. median = 165.35   37. $a = 5$ OR

37. $(x, y) = \left(\dfrac{35}{39}, \dfrac{7}{13} \right)$ 38. $\dfrac{3 \pm 2\sqrt{19}}{5}$

39. 20 term = 158   40. OR m_1; $m_2 = 6:7$

41. $\dfrac{l^2}{4}(\pi + 24)$

42. (i) $\dfrac{5}{6}$ (ii) $\dfrac{1}{3}$ OR   42. (i) $\dfrac{3}{4} = 0.75$ (ii) $\dfrac{5}{23}$

45. $x = 20$

✦

g.PAPER **11**	**Mathematics (Basic)**	
	QUESTION PAPER - 11	**Std.-10**
Time : 3 Hours	**(018) E**	Total Marks : 80

Instructions : Same as question Paper - 1.

Section-A

Answer as per give n instruction : (Question number 1 to 24) (1 mark each)   24

★ State whether each of the following statement is true or false.

1.   The Square of any positive integer is either in the form of $3m + 2$ or $3m + 4$.

2.   The graph of quadratric polynomial is in the form of open upward parabola, when the coefficient of x^2 is negative integer.

3.   If $S_n = n^2 + 4_n$, then $a_n = 2n + 5$

4.   The value of $\cos^2 13^0 - \sin^2 73^0$ is zero.

5. $\tan 30^0 = \sqrt{3}$

6.   The mode class interval is 60-70 of given below frequency distribution.

Class interval	40-50	50-60	60-70	70-80	80-90
Frequency	10	25	28	12	10

★ Choose correct alternative from given below to make each of the following statement ture.

7.   Which one is in the form of terminating and repeating decimal expansion from following ?
   (a) 1.101001000....   (b) 43.4725657789....
   (c) 7.478478478...   (d) 22.314413314413...

8.   Which is the factor of polynomial $x^3 + 3x^3 + 3x + 1$ from following ?
   (a) $x - 1$ (b) $x + 1$
   (c) $x^2 + x + 1$ (d) $x^2 - x - 1$

9.   The sum and difference of two numbers are 20 and 8 respectively. Find the larger one.
   (a) 6   (b) 14
   (c) 20   (d) 18

10.   If the roots of $6x^2 - 13x + k = 0$ are reciprocal, then $k =$ _____
   (a) -13 (b) -6
   (c) 6   (d) 78

11.   The 21st term of the AP 20, 16, 12, 8, ... is _____
   (a) 60   (b) -60
   (c) 64   (d) -64

12.   If the distance between two points $(-3, -4)$ and $(7, b)$ is 10 units, then $b =$ _____
   (a) -4 (b) -3
   (c) 0   (d) 7

★ **Fill in the blanks.**

13. If Mean = 21.44 and Mode = 19.13, then Median = _____

14. _____ is the probability that the card drawn from well shuffled deck of 52 cards at random is of red colour.

15. A flower pot have 5 red, 2 yellow and 3 white roses, _____ is the probability that a rose picked at random from pot is of red colour.

16. If $P(E) = 0.47$, then $P(\bar{E})$ = _____

17. The zeroes of $ax^3 + bx^2 + cx + d$ are α, β and γ. If $\alpha = 0$, then $d =$ _____

18. An AP 3, 8, 13, ..., 13 have _____ terms.

★ **Answer the following by a number or a word or a sentence :**

19. A length of tangent PT drawn from point P outside a circle with centre O and radius 3 cm, is 4 cm. Find the length of OP.

20. How many times greater than, the total surface area of a cone from its surface area ?

21. The difference of circumfarance of circle and radius is 18.5 cm. Find its circumfarance.

22. A solid is shown in figure. Find the total surface are of the solid.
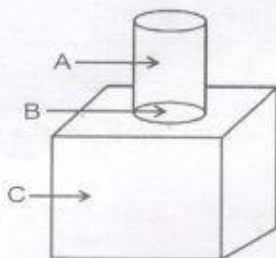
23. Find a quadratric polynomial with 1 and 1 as the sum and product of its zeroes respectively.

24. Write the formula to find radius of circle who touches the side of $\triangle ABC$ with $\angle B = 90^\circ$.

| Section : B |

★ **Solve the following (Question number 25 to 34) (2 Marks each)**   **20**

25. Find the 10th term of the AP $\dfrac{3}{2}, \dfrac{1}{2}, -\dfrac{1}{2}, -\dfrac{3}{2}, \ldots$

OR

25. $a = -4, l = 6, n = 6$ then find S_n.

26. The volume of a cylinder with radius 5 cm is 550 cm³. Find its height.

OR

26. Find the volume of a cone with 4 cm radius and same as the height in term of π.

27. One card is drawn from a well shuffled deck of 52 cards. Calculate the probability that the card will

(i) be a queen or king.

(ii) an ace of red color.

28. Defination : (i) Elementry event (ii) Complementary event

29. If the sum and product of zeroes of quadratric polynomial $x^2 + (k-9)x + (k-1)$ are same, then find the value of k.

OR

29. If the zeroes of quadratric polynomial $2x^2 - 3x + a$ are reciprocal of each other, then find the value of a.

30. Prove : $(\sin\theta + \cos\theta)^2 = 1 + 2\sin\theta \cdot \cos\theta$

OR

30. Express in terms of trigonometric ratio of angles between 0° and 45°.
   (i) $\sin 53^\circ + \cos 83^\circ$
   (ii) $\cot 79^\circ + \tan 65^\circ$

31. Defination : (i) tangent (ii) Secant

32. The ratio of the height of a tower and its shadow is $\sqrt{3} : 1$. Find the angle of elevation of the Sun.

33. Find the co-ordinate of P lies on line segment AB, joining the points A(1, 2) and B(6, 7) so that AP = $\dfrac{2}{5}$ AB.

34. If Mode − Median = 4 and Mode + Median = 44, Find the value of Median.

Section : C

★ Solve the following (Question number 35 to 42) (3 marks each)   24

35. Convert the below frequency distribution in 'less than' and 'greater than' cumilative frequency distribution.

Class interval	0-5	5-10	10-15	15-20	20-25
Frequency	13	10	15	8	11

36. Find Median.

Class interval	100-120	120-140	140-160	160-180	180-200
Frequency	10	15	20	22	18

200-220	220-240
12	13

37. Give the answer of following questions for the pair of linear equations $2x + 3y = 8$ and $4x + 6y = 7$.
   (i) Are they consistent ?
   (ii) Which type of lines they represented in the graph ?
   (iii) Have Solutions ? How many ?

OR

37. 10 students of class X took part in a Mathematical quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.

38. Find the roots of quadratric equation $4x^2 + 3x + 5 = 0$ by applying quadratric formula.

39. For what value of n, are the nth terms of two APs 63, 65, 67, ... and 3, 10, 17, ... are equal.

40. Find the area of triangle whose vertices are :
(i)   (2, 3), (−1, 0), (2, −4)   (ii) (−5, −1), (3, −5), (5, 2)

OR

40. Find the value of 'k' for which the points (7, −2), (5, 1), (3, k) are collinear.

41. A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter of the hemisphere can have ? Find the surface area of the solid block.

42. Two dice are thrown simultaneously. What is the probability that the sum of the numbrs appearing on the dice is (i) 8? (ii) 13? (iii) 12 or less than 12 ?

OR

42. A lot consists of 100 shirts of which 88 are good, 8 have only minor defect and 4 have major defects. The trader Jimi will buy a shirt if it is good but the other trader Sujata will only buy a shirt if it has no major defect. One shirt is selected at random from the lot, What is the probability that it is
(i)   acceptable to Jimi ?   (ii) acceptable to Sujata ?

Section : D

★ **Solve the following. (Question no. 43 to 45) (4 marks each)**   (12)
43. Prove that : the ratio of the aeas of two similar triangles is equal to the square of the ratio of their corresponding sides. **OR**

43. Write the statement of Pythagoras Theorem and Prove it.

44. Draw a triangle ABC with side BC=6 cm. AB=5 cm and $\angle ABC=60^0$. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC.

45. Find a and b for the following frequency distribution with mode 45 and total numbers of observation 50.

Class Interval	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	4	8	a	12	10	4	b

QUESTION PAPER : 11 - SHORT ANSWERS

1. False
2. False
3. False
4. True
5. False
6. True
7. (c) 7.478478478...
8. (b) $x+1$
9. (b) 14
10. (c) 6
11. (b) −60
12. 0
13. 20.67
14. $\frac{1}{2}$
15. $\frac{1}{2}$
16. 0.53
17. 0
18. 11
19. 5 cm
20. πr^2
21. 22 cm
22. $A - B + C$
23. $k(x^2 - x + 1)$
24. $\dfrac{AB + BC - AC}{2}$
25. $a_{10} = \dfrac{-15}{2}$ OR   25. $S_6 = 6$
26. 7 સેમી OR
26. $\dfrac{64}{3}\,\pi$ cm^3
27. (i) $\dfrac{2}{13}$ (ii) $\dfrac{1}{26}$
29. k = 5 OR
29. $a = 2$
30. OR (i) $\cos37° + \sin7°$ (ii) $\tan11° + \cot25°$
32. elution of the sun = 60°
33. co-ordinant of P = $\dfrac{17}{7}, \dfrac{24}{7}$
34. M = 20
36. mean = 172.36
37. (i) No consistent (ii) parallel lines (iii) no solution
37. OR students = 3 અને students = 7
38. $\dfrac{3 \pm \sqrt{71}}{8}$
39. 13
40. (i) $\dfrac{21}{2}$ (ii) $\dfrac{1}{2}$ (64)
41. diameter = 7 cm
    Total volume = 87.5 cm^2
42. (i) $\dfrac{5}{36}$ (ii) 0 (iii) 1 OR
42. (i) 0.88 (ii) 0.96
45. $f_1 = 10$; $f_2 = 2$

✦

Mathematics (Basic)

QUESTION PAPER - 12   Std.-10

Time : 3 Hours   **(018) E**   Total Marks : 80

Instructions : Same as question Paper - 1.

Section-A

Answer as per give n instruction : (Question number 1 to 24) (1 mark each)   24

★ **State whether each of the following statement is true or false.**

1.   Consider the number 4^n, where n is a natural number. For any value of n for which 4^n ends with the digit zero.

2.   The product of zeroes of quadratric polynomial $2x^2 - 9x + 7$ is 3.5.

3.   The common difference of any AP is not a negative integer.

4. $\sin(\alpha + \beta) = \sin \alpha + \sin \beta$

5. $\tan^2 \alpha - \sec^2 \alpha = -1$

6. $\text{Mode} = l + \left(\dfrac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) \times h$ where l is a lower limit of mode class interval.

★ **Choose correct alternative from given below to make each of the following statement ture.**

7.   On the basis of Eclid's division Lemma which one is true ?
(a) $0 < r < b$ (b) $0 \le r < b$ (c) $0 < r \le b$ (d) $0 \le r \le b$

8.   The sum of zeroes of qubic polynomial $ax^3 + bx^2 + cx + d$ is _____

(a) $-\dfrac{b}{a}$ (b) $-\dfrac{c}{a}$ (c) $-\dfrac{d}{a}$ (d) $\dfrac{b}{a}$

9.   If the solutions of pair of linear equations $2x + 3y = 5$ and $4x + my = 10$ are infinite, then find m.
(a) 6   (b) 3   (c) 4   (d) 2

10.   From following quadratric equation, which one has equal roots ?
(a) $x^2 - 6x - 8 = 0$ (b) $x^2 - 6x + 9 = 0$
(c) $x^2 - 9 = 0$ (d) $x^2 = 4$

11.   If the value of nth term of the AP 42, 36, 30, ... is zero, then $n =$ _____
(a) 10   (b) 9   (c) 8   (d) 7

12.   Find the distance between the point $(2, -3)$ and $(7, 9)$.
(a) 17   (b) 13   (c) 12   (d) 5

★ **Fill in the blanks.**

13.

Class interval	0-5	5-10	10-15	15-20	20-25
Frequency	7	15	12	20	6

The lower limit of mode class interval is _____

14. A box contains 5 red, 8 yellow and 7 blue balls. One ball is drawn from box at random. _____ is the probability that the ball is of yellow.

15. One card drawn from a well shuffled deck of 52 cards. _____ is the probability that the card will be ace of black colour.

16. When a dice thrown one time, _____ is the probability that the number on top of the dice will be odd.

17. The zeroes of quadratric polynomial $ax^2 + bx + c$ are α and β. If $\alpha = 0$, then $c =$ _____

18. _____ is the sum of first 30 integers which are multiple of 6.

★ **Answer the following by a number or a word or a sentence :**
19. Which type of tangents are we get, which is drawn at the end points of a diameter of a circle ?

20. The radius and heights are same for a cone and cyliner. Find the ratio of the volume of cylinder and cone.

21. Find the area of the largest circle that can be inscribed in a square of side 14 cm.

22. radii of two sphere are in the ratio 3 : 4. Find the ratio of their volume.

23. Find the quadratric polynomial with the numbers $\dfrac{1}{4}$ and $\dfrac{3}{4}$ as the sum and product of its zeroes respectively.

24. The ratio of volume of two cone and their radii are 4 : 5 and 2 : 3. Find the ratio of their height.

$$\boxed{\text{Section : B}}$$

★ **Solve the following (Question number 25 to 34) (2 Marks each)   20**
25. $a_2 = 38$, $a_6 = -22$, then find a_n.

OR

25. The 11th term of an AP exceeds its 8th term by 8. Find the common difference.

26. A solid in the shape of a cylinder with two hemispheres stuck to each of its ends. The length and radius of the cylinder are 36 cm and 7 cm respectively. Find the total surface area of the solid.

OR

26. The length of edge of a cube is equal to the radius of a sphere. What is the ratio of the volume of the sphere to that of the cube ?

27. A dice is thrown one time. What is the probability of getting a number
(i) is divisible by 4 ?
(ii) is divisible by 3 ?

28. A random number choosen from two digits natural numbers. What is the probability of getting a number (i) with last digit 5 ? (ii) with last digit 3 ?

29. The product of zeroes of quadratric polynomial $(m^2 - 14) x^2 - 2x - 4$ is 1. Find the value of m.

OR

29. The zeroes of quadratric polynomial $2x^2 - 3x + a$ are reciprocal. Find the value of a.

30. Prove : $\dfrac{1 + \tan^2 \theta}{1 + \cot^2 \theta} = \tan^2 \theta$

OR

30. If $\tan \theta = \dfrac{4}{3}$, then find the value of $\sec \theta$ and $\cos \theta$.

31. The sides AB, BC and AC of triangle ABC, touch a circle at D, E and F respectively. If AB = 13 cm, BC = 12 cm and AC = 9 cm, then find the length of AD.

32. The angle of depression of a boat from the top of 25 m high light house. Find the distance of the boat from the light house.

33. The vertices of $\triangle$ ABC are A(2, 3), B(−1, 0) and C(2, − 4). Find the area of $\triangle$ ABC.

34. Convert the following frequency distribution into cumulative frequency distribution.

Class interval	1-3	3-5	5-7	7-9	9-11	11-13
Frequency	20	45	80	55	40	12

Section : C

★ Solve the following (Question number 35 to 42) (3 marks each)   24

35. Find Median :

Class interval	30-35	35-40	40-45	45-50	50-55	55-60	60-65
Frequency	14	16	18	23	18	8	3

36. Find Mean.

Class interval	10-20	20-30	30-40	40-50	50-60
Frequency	2	4	7	6	1

37. Solve $2x - y = 11$ and $5x + 4y = 1$ and hence find the value 'm' for which $y = mx - 11$.

OR

37. Which of the following pairs of linear equations are consistent ?

(i) $2x + 3y = 10$ and $3x - 4y = 24$

(ii) $3x - 2y = 12$ and $6x - 4y = 20$

(iii) $2x - 5y = 10$ and $x - \dfrac{5y}{2} = 5$

38. Find the roots of quadratric equation $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$ by applying quadratric formula.

39. Find the sum of the numbers between 10 and 100 divisible by 4.

40. Find the area of a quadrilateral if its vertices are $(-4, -2), (-3, -5), (3, -2)$ and $(2, 3)$ taken in order.

OR

40. In $\triangle ABC$, $\angle B = 90^0$. A(2, 9), B(a, 5) and C(5, 5) are the vertices of $\triangle ABC$. Find the value of a.

41. A solid consisting of a right circular cone of height 120 cm. Standing on a hemisphere of radius 60 cm is placed in a right circular cylinder full of water such that it touches the bottom. Find the volume of water left in the cylinder, if the radius of the cylinder is 60 cm and its height is 180 cm.

42. A box contains 3 blue marbles, 2 white marbles and 4 red marbles. One marble taken out of the box at random. What is the probability that the marble taken out will be
   (i)   White ?
   (ii) Blue ?
   (iii) Red ?

OR

42. 12 defective pens are accidentally mixed with 132 good ones. It is not possible to just look at a pen and tell whether it is good or not it is defective. One pen taken out at random from this lot. Determine the probability that the pen taken out is a good one.

Section : D

★ **Solve the following. (Question no. 43 to 45) (4 marks each)**   (12)
43. Write the statement of Basic proportionality theorem and prove it.

OR

43. Write the statement of Pythagoras Theorem and Prove it.

44. Draw a triangle ABC with sides BC=7 cm. $\angle B=45^0$ and $\angle C=30^0$. Then construct a triangle whose sides are $\frac{4}{3}$ of the corresponding sides of the triangle $\triangle ABC$.

45. If the mode=39, then find the value of x.

Class interval	5-15	15-25	25-35	35-45	45-55	55-65	65-75
Frequency	2	3	x	7	4	2	2

QUESTION PAPER : 12 - SHORT ANSWERS

1.	False	2.	True
3.	False	4.	False
5.	True	6.	True

7.   (b) $0 \leq r < b$ 8.   (a) $-\dfrac{b}{a}$

9.   (a) 6   10.   (b) $x^2 - 6x + 9 = 0$

11.   (c) 8   12.   (b) 13

13.   15   14. $\dfrac{2}{5}$

15. $\dfrac{1}{26}$ 16. $\dfrac{1}{6}$

17.   0   18.   2790

19.   parallel   20. $3 : 1$

21.   154 cm²   22. $27 : 64$

23. $k(4x^2 - x + 3)$ 24. $45 : 1$

25. $a_n = 68 - 15\ n$ OR   25.   d = 2 = common difference

26.   surface = 2200 cm² OR   26. $\dfrac{4}{3}\pi$

27.   (i) $\dfrac{1}{2} = 0.5$ (ii) $\dfrac{1}{3}$ 28.   (i) $\dfrac{1}{10} = 0.1$ (ii) $\dfrac{1}{10} = 0.1$

29. $m = \pm\ 4$ OR   29. $a = 2$

30. $\dfrac{5}{3}; \dfrac{3}{5}$ OR   31.   AD = 5 cm

32.   25   33.   Area of Triangles = $\dfrac{21}{2}$ sq. unit.

35.   median = 45.43   36.   mean = 35

37. $x = \dfrac{45}{13}$ and $y = \dfrac{-53}{13}$; m = 2

37.   OR (i) Is consistent (ii) No consistent (iii) is consistent

38. $\dfrac{-5}{\sqrt{2}}; -\sqrt{2}$ 39.   Numbers of sum = $S_{23} = 1288$

40.   Area = 28 OR   40. $a = 5\ or\ 2$

41.   Volume of water = 1130.4 liters   42.   (i) $\dfrac{2}{9}$ (ii) $\dfrac{1}{3}$ (iii) $\dfrac{4}{9}$ OR

42.   probability = $\dfrac{11}{12}$ 45. $x = 5$

✦

Q.PAPER 13	Mathematics (Basic)	
	QUESTION PAPER - 13	Std.-10
Time : 3 Hours	(018) E	Total Marks : 80

Instructions : Same as question Paper - 1.

Section-A

Answer as per give n instruction : (Question number 1 to 24) (1 mark each)   24

★ State whether each of the following statement is true or false.

1. HCF $(6, 20) = 2$

2. The number of zeroes of $x^3 - x$ is 1.

3. 5, 5, 5, 5.... is not an A.P.

4. $\sin \alpha = \cos \alpha$ then $\alpha = 90^0$

5. The value of $\cos \theta - \sin \theta$ is always greater than 1.

6. For any frequency distribution the value of Mean is greater than the value of Mode.

★ Choose correct alternative from given below to make each of the following statement ture.

7. LCM of prime numbers is equal to _____.
   (a) sum of these prime numbers
   (b) difference of these prime numbers
   (c) product of these prime numbers
   (d) Don't guess without given prime numbers

8. The numbers of zeroes of graph shown in figure $y = p(x)$ is _____
   (a) 2
   (b) 3
   (c) 4
   (d) 5
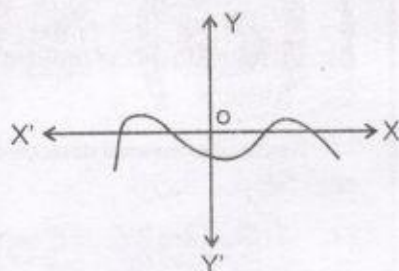
9. If the pair of linear equations $x + 2y - 3 = 0$ and $5x + by + 7 = 0$ has no solution, then find the value of b.
   (a) 6   (b) 3   (c) 10   (d) 7

10. The discriminant $(3x - 14)^2 = 0$ is _____
    (a) 4   (b) $\frac{4}{3}$
    (c) 0   (d) -3

11. How many two digit natural numbrs are divisible by 7 ?
    (a) 13   (b) 12   (c) 11   (d) 10

12. Name the triangle formed by the points $(0, 0)$, $(2, 0)$ and $(1, \sqrt{3})$
    (a) right angle triangle   (b) equilateral triangle
   (c) isosceles triangle   (d) acute triangle

18

★ **Fill in the blanks.**

13. The class-interval of mode for following frequency distributin is _____

Marks 'less than'	10	20	30	40	50
cumilative frequency	3	12	27	57	75

14. _____ is the probability to obtained 75 marks out of 100 marks.

15. Two coins are tossed at same time. _____ is the probability that both coin have tail.

16. _____ is the probability that a letter choosen from alphabet is vovel.

17. The zeroes of $ax^2 + bx + c$ are α and β, $(\alpha \cdot \beta)^2 = $ _____

18. For an AP, If $S_{10} = 2$ and $S_{12} = 10$, then $S_{22} = $ _____

★ **Answer the following by a number or a word or a sentence :**

19. Find the radius of inscribed circle in a triangle ABC whose sides are AB=3 cm, BC=4 cm and AC=5 cm.

20. The total surface area and the volume of cube are numerically equal. Find the length of cube.

21. Find perimeter of OAPB.
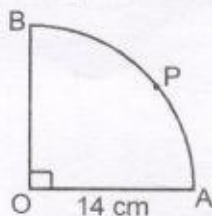
22. The radius and height of a cone and cylinder are equal. Find the ratio of their volume.

23. Find the quadritric polynomial, −3 and 2 as the sum and product of its zeroes respectively.

24. The area of a circle with radius 30 cm is 300 cm². Find the length of arc.

$$\boxed{\text{Section : B}}$$

★ **Solve the following (Question number 25 to 34) (2 Marks each)**   **20**

25. If the 3rd and 9th terms of an AP are 4 and −8 respectively, which term of this AP is zero ?   **OR**

25. Defermine the AP whose 3rd term is 16 and 7th term exceeds the 5th term by 12.

26. A solid circular cylinder with height 15 cm and radius of the base 8 cm is covered a right circular cone of the same height and same base. Find the total volume of this solid.   **OR**

26. Two identical cube of ege 4 cm are joined end to end. Find the surface area of the resulting cuboid.

27. (i) A number choosen from 1 to 11 is a prime number. Find its probability.
     (ii) Why is tossing a coin considered to be fair way of deciding which team should get the first chance to play in any game ?

28. (i) Sonu and Monu are friends. The probability of their birthday on same day is 0.08. What is the probability that their birthday not having the same day ? (ignore leap year)

(ii) There are 15 boys and 5 girls in a class. What is the probability that the class monitor choosen from these students is a girl ?

29. Find the zeroes of quadratric polynomial $6t^2 + 7t + 2$ and verify retationship between zeroes and their coefficeint.

OR

29. Substract the sum of zeroes of $x^2 + x - 20$ from the product of zeroes of $x^2 - 10x + 21$.

30. Prove : $(\sec\theta + \tan\theta)(1 - \sin\theta) = \cos\theta$

OR

30. Find value : (i) $\dfrac{\tan 15^0}{\cot 75^0}$ (ii) $\sec 20^0 - \cos ec 70^0$

31. A circle touches all the four sides of a quadrilateral ABCD with AB=5 cm, BC=8 cm, CD=13 cm. Find AD.

32. From a tower of 15 m high, the angle of depression of a car is observed 60^0. Find the distance between the car and tower.

33. Determine, if the point $X\left(-\dfrac{3}{2}, 3\right)$, $Y(6, -2)$ and $Z(-3, 4)$ are collinear.

34. Find $f_2 - f_1$ for the below frequency distribution.

Class interval	10-12	12-14	14-16	16-18	18-20
Frequency	7	12	18	13	9

Section : C

★ **Solve the following (Question number 35 to 42) (3 marks each)**   **24**

35. Find mean.

Class	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	3	4	3	3	4

	60-70	70-80	80-90	90-100
	7	9	7	8

36. Convert 'less than' type cumilative frequency distribution into 'greater than' type cumilative frequency distribution.

Height (in cm)	No. of students
Less than 140	4
Less than 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51

37. Find out whether the line representing the following pair of linear equations intersect at a point, are parallel or coincident.

   (i) $2x + 3y = 10$ and $3x - 4y = 24$

   (ii) $3x - 2y = 12$ and $6x - 4y = 20$

   (iii) $2x - 5y = 10$ and $2x - 5y = 30$

OR

37. Find the solution of pair of linear equations $x + 2y + 4 = 0$ and $3x + 4y = 6$ by applying elimination method.

38. Find two numbers whose sum is 27 and product is 182.

39. Find the sum of first 24 terms of the AP 112, 107, 102, ...

40. Find the area of the triangle whose vertices are :

   (i) $(1, 1), (-4, 6), (-3, -5)$

   (ii) $(5, 2), (4, 7), (7, -4)$

OR

40. Name the type of triangle formed by the points $P(-1.5, 3), Q(6, -2), R(-3, 4)$.

41. A decorative block is made of two solids - a cube and a hemisphere. The base of the block is a cube with edge 5 cm, and the hemisphere fixed on the top has a diameter of 4.2 cm. Find the total surface area of the block.

(Take $\pi = \dfrac{22}{7}$)

42. A box contains 100 cards which are numbered from 1 to 100. If one card is drawn at random from the box. Find the probability that it bears

   (i)   last digit is 1

   (ii)   divisible by 2 and 5.

OR

42. A box contains 6 white, 8 red, 5 black and 3 blue balls. One ball is taken out of the box at random. What is the probability that the ball take out will be

   (i)   black or white ?

   (ii)   Red ?

   (iii)   not blue ?

Section : D

★   **Solve the following. (Question no. 43 to 45) (4 marks each)**   (12)

43. Write the statement of pythagoras Theorem and proove it.

OR

43. Write the statement of Basic Proportionality Theorem and proove it.

44. Draw a right triangle in which the sides (other than hypotenuse) are of length 4 cm and 3 cm. Then construct another triangle whose sides are $\dfrac{5}{3}$ time the corresponding sides of the given triangel.

45. The mean of below frequency distribution is 28.5 and total of frequencies is 60. Find a and b.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	6	a	20	15	b	4

✦

QUESTION PAPER : 13 - SHORT ANSWERS

1.	True	**2.**	False
3.	False	**4.**	False
5.	False	**6.**	True
7.	(c) product of these prime numbers	**8.**	(c) 4
9.	(c) 10	**10.**	(c) 0
11.	(a) 13	**12.**	(b) equilateral triangle

13. 30 - 40

14. $\dfrac{1}{101}$

15. $\dfrac{1}{4}$

16. $\dfrac{21}{26}$

17. $\dfrac{c^2}{a^2}$

18. 22

19. 1 cm

20. 6

21. 39

22. 3 : 1

23. $k(x^2 + 3x + 2)$

24. 20 cm

25. n = 5 OR

25. Parallel 4, 10, 16 … 6n − 6

26. Total $= 4022\dfrac{6}{7}$ cm³ OR

26. Surface = 160 cm²

27. (i) 0.25 (ii) have equally likely out comes

28. (i) 0.92 (ii) $\dfrac{1}{4}$ = 0.25

29. $\dfrac{-2}{3}, \dfrac{-1}{2}$ OR

29. 22

30. (i) 1 (ii) 0 OR

31. AD = 10 cm

32. distance of car = $5\sqrt{3}$ m

33. Not collinear point.

34. −5

35. mean = 58.77

37. (i) Intersect lines (ii) lines parallel (iii) parallel lines OR

37. $x = 14, y = -9$

38. 1308 sum

39. 2208

40. (i) 2 sq. unit (ii) 2

41. 163.86 cm² Total surface

42. (i) 0.14 (ii) 0.1 (iii) 0.1 OR

42. (i) $\dfrac{1}{2}$ = 0.5 (ii) $\dfrac{4}{11}$ (iii) $\dfrac{19}{22}$

45. $a = 8; b = 7$

Q.PAPER

14

Mathematics (Basic)

QUESTION PAPER - 14

Std.-10

Time : 3 Hours

MARCH-2022 (018)E

Total Marks : 80

Instructions :

(1) Write in a clear legible handwriting.
(2) This question paper has five sections A, B, C, D & E and Question Numbers from 1 to 55.
(3) All section are compulsory. General options are given.
(4) The numbers to the right represent the marks of the questions.
(5) Draw neat diagrams wherever necessary.
(6) New sections should be writtne in a new page. Write the answers in numerical order.
(7) Calculator is not allowed.

Section-A

★ **Answer the following as per instruction given (Questions 1 to 24) (each one mark) [24]**
★ **Choose the correct option from the following (1 to 12)**   **[6]**

1. For pair of linear equations $2x + 3y = 5$ and $4x + 6y - 10 = 0$. There are _____
    solution.

    (A) Infinity   (B) Unique   (C) Zero   (D) None

2. The product of zeroes in $P(x) = x^2 - 3x + 2$ is _____.

    (A) 2   (B) $\frac{3}{2}$ (C) 1   (D) -2

3. The formula to find Discriminant of the quadratic equation is _____.

    (A) $D = b^2 + 4ac$ (B) $D = b^2 - 4ac$

    (C) $D = b - 4ac$ (D) $D = c^2 - 4ab$

4. The formula to find n^{th} term of an A.P. is _____.

    (A) $a_n = a + (n-1)d$ (B) $a_n = a - (n-1)d$

    (C) $a_n = a + (n+1)d$ (D) None

5. Formula to find area fo circle is _____.

    (A) $\pi r l$ (B) $\frac{\pi r^2 \theta}{360^\circ}$ (C) πr^2 (D) $2\pi r$

6. Which of the following cannot be the probability of an event ?

    (A) $\frac{2}{3}$ (B) 0.7   (C) 15%   (D) -1.5

7. The probability of an event that is certain to happen is _____.

    (A) 0   (B) -1   (C) 1   (D) $\frac{1}{2}$

8. The wickets taken by a bowler in 10 criket matches are follows:
    2, 6, 4, 5, 0, 2, 1, 3, 2, 3 Then mode will be _____.

    (A) 3   (B) 2   (C) 1   (D) 0

9. The H.C.F. of 15 and 35 is _____.

    (A) 5   (B) 7   (C) 105   (D) 15

10. If α and β are the zeroes of the polynomial $P(x) = ax^2 + bx + c(a \neq 0)$ then $\alpha + \beta =$

    _____

    (A) $-\dfrac{b}{a}$ (B) $\dfrac{b}{a}$ (C) $\dfrac{c}{a}$ (D) $-\dfrac{c}{a}$

11. The distance of the point $P(x, y)$ from the origin is _____.

    (A) $x^2 + y^2$ (B) $\sqrt{x^2 + y^2}$ (C) $x + y$ (D) None

12. If the perimeter and area of the circle are numerically equal then radius of the circle will
    be _____.

    (A) 2 units   (B) π units   (C) 4 units   (D) 7 units

★   **Write True or False for the following questions. (Question 13 to 18).**   [6]
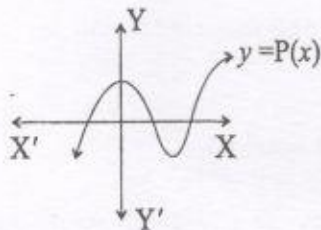
13. $\sqrt{5}$ is an irrational number.

14. Number of zeroes of polynomial $P(x) = x^3 - x$ are 3.

15. 2, 2, 2, 2, ... is an Arithmetic Progression.

16. The value of $\sin 60^\circ$ is $\dfrac{1}{2}$.

17. $Z = 2M - 3\bar{x}$

18. $P(E) + P(\bar{E}) = -1$

★   **Fill in the blanks (Questions 19 to 24)**   [6]

19. In the given figure $y = P(x)$, the number of the zeroes of $P(x)$ are _____. (2, 3, 4)

20. $\sin^2 \theta + \cos^2 \theta =$ _____ (0, 1, 2)

21. The tangent of a circle touches it at _____ point/points. (one, two, three)

22. 2, k, 26 are three consecutive terms of an A.P. then $k =$ _____ (12, 14, 20)

23. Formula to find volume of a 5 rupees coin is _____. $\left(\pi r^2, \pi r^2 h, \dfrac{1}{3}\pi r^2 h \right)$

24. If $\Sigma f_i x_i = 245$ and $\Sigma f_i = 100$ then Mean $(\bar{x}) =$ _____. (24.5, 2.45, 0.245)

Section-B

★   **Answer any 10 questions from following. (Questions 25 to 38) (Each 2 marks) [20]**

25. In an Arithmetic Progression $a = 5, d = 3, a_n = 50$ then find "n".

26. Find sum of A.P. 2, 7, 12, ... to 10 terms.

27. Find 30th term of A.P. 10, 7, 4 ....

28. The base raidus and height of cylinder are equal, if radius of cylinder is 7 cm find its volume.

29. 2 cubes each of volume 64 cm^3 are joined end to end. Find the surface area of the resulting cubiod.

30. A bag contains 3 red balls and 5 black balls. A ball drawn at random from the bag. What is the probability that the ball drawn is.
    i) red ?
    ii) not red ?

31. Find the Qudratic Polynomial whose sum of zero and product of zero are −3 and 2 respectively.

32. Find zeroes of Quadratic Polynomial $P(x) = x^2 + 7x + 10$.

33. Find roots of $2x^2 - x + \dfrac{1}{8} = 0$ by factorization method.

34. If $\sin A = \dfrac{3}{4}$ then find cos A and tan A.

35. Find the value of $2 \tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$.

36. The angle of elevation of the top of the tower from a point on the ground, which is 30 m away from the foot of the tower is 30°. Find the height of the tower.

37. Find the distance between A $(-5, 7)$ and $(-1, 3)$

38. For a grouped data, $l=40$, $h=15$, $f_1=7$, $f_0=3$ and $f_2=6$ then find mode.

Section : C

★ **Answer any 8 of the following (39 to 50) (Each 3 marks.)**   **[24]**

39. Find mean from following data :

Class interval	10-25	25-40	40-55	55-70	70-85	85-100
Number of students	2	3	7	6	6	6

40. The following table shows age of the patients admitted in a hospital. Find mode.

Age	5-15	15-25	25-35	35-45	45-55	55-65
Number of patients	6	11	21	23	14	5

41. Prove that the length of tangents drawn from an external point to a circle are equal.

42. Solve the linear pair of equations,
    $$\sqrt{2}x + \sqrt{3}y = 0$$
    $$\sqrt{3}x - \sqrt{8}y = 0$$

43. Five years age Bhavin was thrice as old as Vrutik, 10 yeas later Bhavin will be twice as old as Vrutik. How old are Bhavin and Vrutik ?

44. Find two consecutive odd positive integers sum of whose square is 290.

45. In A.P. given $a_{12} = 37$, $d = 3$ find "a" and "S_{12}".

46. Find the point on the X-axis which is equidistant from $(2, -5)$ and $(-2, 9)$.

47. If the points A $(6, 1)$, B $(8, 2)$, C $(9, 4)$ and D $(P, 3)$ are the vertices of a parallelogram, taken in order. Find the value of 'P'.

48. How many silver coins, 1.75 cm in diameter and of thickness 0.2 cm, must be melted to form a cuboid of dimensions 5.5 cm $\times$ 10 cm $\times$ 3.5 cm.

49. One card is drawn from a well shuffled deck of 52 card. Calculate the probability that the card will be
    i)   be an ace
    ii) not be an ace
    iii) red colour ace

50. A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box random. What is the probability that marble will be
    i)   red
    ii) white
    iii) not green

Section : D

★ Solve any 3 in detail (51 to 55) (Each 4 marks)   (12)

51. Prove that if a line is drawn parallel to one side of a triangle to interesect the other sides in distinct points, the other two sides are divided in the same ratio.

52. Write Pythagoras theorem and prove it.

53. Draw a line-segment of length 7.8 cm and divide it in the ratio 5 : 8. Measure two parts and write points of construction.

54. Draw a cricle of radius 6 cm. From a point 10 cm away from its centre, construct the pair of tangents to the circle and measure their length. Write steps of construction.

55. The median of the following data is 525. Find the value of x and y if total frequecy is 100.

Class Interval	Frequency
0 - 100	2
100 - 200	5
200 - 300	x
300 - 400	12
400 - 500	17
500 - 600	20
600 - 700	y
700 - 800	9
800 - 900	7
900 - 1000	4
Total	100

◆

QUESTION PAPER : 14 - MARCH 2022 : SHORT ANSWERS

Section-A

1. (A) Infinity

2. (A) 2

3. (B) $D = b^2 - 4ac$

4. (A) $a_n = a + (n-1)d$

5. (C) πr^2

6. (D) -1.5

7. (D) $\dfrac{1}{2}$

8. (B) 2

9. (A) 5

10. (A) $-\dfrac{b}{a}$

11. (B) $\sqrt{x^2 + y^2}$

12. (A) 2 units

13. True (✓)

14. True (✓)

15. True (✓)

16. False (✗)

17. False (✗)

18. False (✗)

19. 3

20. 1

21. one

22. 14

23. $\pi r^2 h$

24. 2.45

25. $N = 16$

26. $S_{10} = 245$

27. 30th term is -77

28. 1078 cm³

29. 116 cm²

30. $\dfrac{3}{8}$

31. $n^2 + 3n + 2$

32. $n = -5$ or $n = -2$

33. $x = \dfrac{1}{4}$

34. $\dfrac{3}{\sqrt{7}}$

35. 2

36. $AB = 10\sqrt{3}$

37. $4\sqrt{2}$

38. 52

39. $\overline{X} = 62$

40. $Z = 36.81$

41.

42. $x = 0; y = 0$

43. Bhavan = 50 year; Vrutik = 20

44. 11 and 13

45. $a = 4; S_{12} = 246$

46. P $(-7, 0)$

47. $P = 7$

48. 400

49. $\dfrac{1}{13}; \dfrac{12}{13}; \dfrac{1}{26}$

50. $\dfrac{5}{17}; \dfrac{8}{17}; \dfrac{13}{17}$

55. $x = 9, y = 15$

◆

Q.PAPER	**Mathematics (Basic)**	
15	**QUESTION PAPER - 15**	**Std.-10**
Time : 3 Hours	**JULY-2022 (018)E**	Total Marks : 80

Instructions :

(1) Write in a clear legible handwriting.
(2) This question paper has five sections A, B, C, D & E and Question Numbers from 1 to 55.
(3) All section are compulsory. General options are given.
(4) The numbers to the right represent the marks of the questions.
(5) Draw neat diagrams wherever necessary.
(6) New sections should be writtne in a new page. Write the answers in numerical order.
(7) Calculator is not allowed.

Section-A

★ Do as Directed. (Questions 1 to 24) (each one mark)   [24]
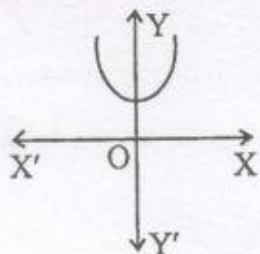★ Choose the correct option from the following to make each statement true. (1 to 12)

1. The decimal expansion of _____ is non-terminating and recurring.

    (A) $\dfrac{6}{15}$ (B) $\dfrac{2}{15}$ (C) $\dfrac{3}{8}$ (D) $\dfrac{4}{8}$

2. Mean of first ten natural numbers = _____

    (A) 5.5   (B) 6.5   (C) 5.05   (D) 5

3. The graph of $y = P(x)$ is given below. The number of zeroes of $P(x)$ is _____

    (A) 1   (B) 2   (C) 3   (D) 0

4. The lines representing the pair of equations _____, _____ are parallel.

    (A) $x + 2y - 4 = 0, 2x + 4y - 12 = 0$ (B) $2x + 3y - 9 = 0, 4x + 6y - 18 = 0$

    (C) $x - 2y = 0, 3x + 4y - 20 = 0$ (D) $9x + 3y + 12 = 0, 18x + 6y + 24 = 0$

5. The discriminant $(b^2 - 4ac)$ of the quadratic equation $3x^2 - 6x + 2 = 0$ is _____.

    (A) -12 (B) 12   (C) -60 (D) 60

6. For an A.P., if $a = 7$, $d = 3$ and $n = 8$ then $a_n = $ _____

    (A) 25   (B) 26   (C) 27   (D) 28

7. The distance of M (x, y) from the origin O(0, 0) is _____.

    (A) $x^2 + y^2$ (B) $\sqrt{x^2 + y^2}$

    (C) $\sqrt{x^2 - y^2}$ (D) $|x - y|$

8. $\sqrt{1 + \tan^2 \theta}$ = _____

   (A) $1 + \tan \theta$ (B) $\sec^2 \theta$ (C) $\sec \theta$ (D) $\operatorname{cosec} \theta$

9. The angle subtended by a minute hand of a clock at the centre of the clock in 10 minute is _____.

   (A) 30^0 (B) 45^0 (C) 60^0 (D) 90^0

10. The formula to find the volume of a sphere is _____.

   (A) $\frac{4}{3}\pi r^3$ (B) $\frac{2}{3}\pi r^3$ (C) $\frac{4}{3}\pi r^2$ (D) $4\pi r^2$

11. If the zeroes of the quadratic polynomial $P(x) = ax^2 + bx + c \, (a \neq 0)$ α and β, then $\alpha\beta$ = _____

   (A) $\frac{c}{a}$ (B) $-\frac{c}{a}$ (C) $-\frac{b}{a}$ (D) $\frac{b}{a}$

12. The probability of an event cannot be _____

   (A) $\frac{2}{3}$ (B) -1.5 (C) 15% (D) 0.7

★ **State whether the following statements (from 13 to 18) are true or false.**

13. $\sqrt{3}x + 5$ is a linear polynomial.

14. The common difference of A.P. 10, 8, 6, 4, ... is 2.

15. $\sin A = \cos A$ for all values of A.

16. These is only one tangent at a point of the circle.

17. 3 (Mean) = Mode + 2 (Median).

18. The sum of the probabilities of all the elementary events of an experiment is 1.

★ **Fill in the blanks by selecting the proper alternatives given in brackets. (from 19 to 24)**

19. HCF (12, 21) = _____ (1, 3, 7)

20. The graph of $P(x) = x^2 + 3x + 2$ is a _____ (ray, line, parabola)

21. A circle can have _____ parallel trangents at the most. (two, three, infinitely many)

22. If the perimeter and the area of a circle are numerically equal, then the radius of the circle is _____. (π, 4, 2)

23. The class mark of the class 30-40 is _____. (30, 35, 40)

24. The probability of Sun setting in the west is _____. (−1, 0, 1)

Section-B

★ **Answer any ten of the following questions from 25 to 38. (Each questions carries 2 marks)**   [20]

25. Find a quadratic polynomial, the sum and the product of whose zeroes are 0 and −3.

26. Divide $x^2 + 7x + 10$ by $x + 5$ and write the quotient and the remainder.

27. Find the roots of the quadratic equation $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$ by factorization.

28. In a flower bed, there are 25 rose plants in the first row, 23 in the second, 21 in the third and so on. There are 5 rose plants in the last row. How many rows are there in the flower bed ?

29. Find the sum of first 10 terms of the A.P. $-10, -5, 0, 5, \ldots$,

30. Find a point on the y-axis which is equidistant from the points $P(6, 5)$ and $Q(-4, 3)$.

31. Evaluate : $2 \tan^2 45^0 - \cos^2 30^0 + \sin^2 60^0$.

32. If $\sin\theta = \dfrac{3}{4}$, calculate $\cos\theta$ and $\tan\theta$.

33. The angle of elevation of the top of a tower from a point on the ground, which is 60 m away from the foot of the tower is 30°. Find the height of the tower.

34. A tangent PA at a point P of a circle of radius 5 cm meets a line through the centre 'O' at a point A, so that OA = 12 cm. Find PA.

35. Two cubes each of side 5 cm are joined end to end. Find the surface area of the resulting cuboid.

36. A cone of height 24 cm and radius of base 6 cm is made up of modelling clay. Rahul reshapes it in the form of a sphere. Find the radius of the sphere.

37. Find the mode of the following data.

Class interval	10-25	25-40	40-55	55-70	70-85	85-100
Number of students	2	3	7	6	6	6

38. Two players Sania and Sangeeta play a tennis match. it is known that, the probability of Sania winning the match is 0.57. What is the probability of Sangeeta winning the match ?

Section : C

★ **Solve any eight of the following questions from 39 to 50.**   [24]
   [Each question carries 3 marks]

39. Solve the pair of equations : $2x + 3y = 7, 3x - 4y = 2$ by elimination method.

40. The sum and the difference of two numbers are 18 and 2 respectively. Find the numbers.

41. The sum of the reciprocals of Jayesh's ages (in years) 3 years ago and 5 years from now is $\dfrac{1}{3}$. Find his present age.

42. Find the sum of first 51 terms of an A.P. whose second and thrid terms are 14 and 18 respectively.

43. How many three digit numbers are divisible by 7 ?

44. Find the area of the triangle whose vertices are P $(1, -1)$, Q $(-4, 6)$ and R$(-3, -5)$.

45. If A$(1, 2)$, B$(4, y)$, C$(x, 6)$ and D$(3, 5)$ are the vertices of a parallelogram taken in order, find x and y.

46. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

47. Find the mean of the following data.

Class interval	100-150	150-200	200-250	250-300	300-350
Frequence	4	5	12	2	2

48. Find the median of the following data.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequence	5	8	20	15	7	5

49. One card is drawn from a well shuffled deck of 52 card. Calculate the probability of getting

i) a king of red colour   ii) a face card   iii) a spade

50. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears.

i) a two digit number   ii) a perfect square number   iii) a number divisibled by 5.

Section : D

★ **Solve any three of the following questions from 51 to 55.**   (12)
[Each question carries 4 marks]

51. In triangle ABC, $\angle B=90°$. Prove that $AC^2 = AB^2 + BC^2$.

52. If the square of one side of a triangle is equal to the sum of the squares of the other two sides, then prove that the angle opposite to the first side is a right angle.

53. Draw a line segment of length 7 cm and divide it in the ratio 3 : 5. Write the steps of construction.

54. Draw two tangents to a circle of radius 5 cm, which are inclinded at an angle of $60°$ to each other.

55. The median of the following data is 8.05. Find the value of a and b, if the total frequency is 100.

Class interval	1-4	4-7	7-10	10-13	13-16	16-19
Frequence	6	a	40	16	b	4

| QUESTION PAPER : 15 - JULY 2022 : SHORT ANSWERS |

Section-A

1.   (B) $\dfrac{2}{15}$

2.   (A) 5.5

3.   (D) 0

4.   (A) $x + 2y - 4 = 0, 2x + 4y - 12 = 0$

5.   (B) 12

6.   (D) 28

7.   (B) $\sqrt{x^2 + y^2}$

8.   (C) $\sec\theta$

9.   (C) 60°

10.   (A) $\dfrac{4}{3}\pi r^3$

11.   (A) $\dfrac{c}{a}$

12.   (B) -1.5

13.   True ($\checkmark$)

14.   False ($\times$)

15.   False ($\times$)

16.   True ($\checkmark$)

17.   False ($\times$)

18.   True ($\checkmark$)

19.   3

20.   Parabola

21.   two

22.   2

23.   35

24.   1

25. $x^2 - 3$

26.   Quotient = $x + 2$; remaindes = 0

27. $-\sqrt{2}$ and $-\dfrac{5}{\sqrt{2}}$

28.   11 Row

29. $S_{10} = 125$

30.   (0, 9)

31.   2

32. $\dfrac{3}{\sqrt{7}}$

33.   height of tower $20\sqrt{3}$

34. $\sqrt{119}$ cm

35.   250 cm^2

36.   6 cm

37.   mode = 52

38. $P(A) = 0.57; P(B) = 0.43$

39.   2 and 1

40.   10 and 8

41.   Age 7 year

42. $S_{51} = 5610$

43.   n = 128

44.   24 unit

45.   x = 6; y = 3

46.   214.5 cm^2

47.   mean = 211

48.   median = 28.5

49.   (i) $\dfrac{1}{26}$ (ii) $\dfrac{3}{13}$ (iii) $\dfrac{1}{4}$

50.   90 (i) $\dfrac{9}{10}$ (ii) $\dfrac{1}{10}$ (iii) $\dfrac{1}{5}$

51. $AC^2 = AB^2 + BC^2$

52. $\angle B = 90^\circ$

55.   b = 4

◆