GUJARAT BOARD CLASS 10 MATHS PREVIOUS YEAR QUESTION -2014

Gujarat State Board
Class X Mathematics
Board Paper March 2014

Time: 75 minutes **Total Marks: 50**

General Instructions:

1. There are **50** objective type questions in this part and all are compulsory.
2. The questions are serially numbered from **1** to **50** and each carries **1** mark.
3. You are supplied with separate OMR sheet with the alternative (A) ○, (B) ○, (C) ○ , (D) ○ against each question number. For each question, select the correct alternative and darken the circle ○ as ● completely with the pen against the alphabet corresponding to that alternative in the given OMR sheet

- From the following **1** to **50** questions, select the correct alternative from those given and darken the circle with pen against the alphabet, against number in OMR sheet.
- Each question carries **1** mark.

Part-A

1. In ΔPQR, the bisector of $\angle P$ intersects $\overline{QR}$ in D. If QD : RD = 4 : 7, PR = 14,
   Then PQ = ...
   (A) 4
   (B) 8
   (C) 12
   (D) 15

2. If cosec A = $\frac{4}{3}$ and A + B = 90, then sec B = ...
   (A) $\frac{16}{9}$ (B) $\frac{4}{3}$ (C) $\frac{3}{4}$ (D) $\frac{7}{3}$

3. From the top of a building h metre high, the angle of depression of an object on the ground has a measure θ. The distance of the object from the building is
   (A) $h\cos\theta$ metre
   (B) $h \sin \theta$ metre
   (C) $\tan \theta$ metre
   (D) $h \cot \theta$ metre

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4. For A (1, 2) and B (3, −2), the coordinates of the midpoint of AB are is .....
   (A) (2, 2)
   (B) (0, 0)
   (C) (2, 0)
   (D) (0, 2)

5. On walking ..... metres on a slope at an angle of measure 30° with the ground, one can reach the height 'a' metres from the ground.
   (A) $\frac{2a}{\sqrt{3}}$
   (B) $\frac{\sqrt{3}}{2}a$
   (C) $2a$
   (D) $\frac{a}{2}$

6. $\frac{\sin^4\theta - \cos^4\theta}{\sin^2\theta - \cos^2\theta} =$
   (A) 3
   (B) 2
   (C) 0
   (D) 1

7. From the natural number of single digit, the probability of getting an even number is .....
   (A) $\frac{5}{9}$
   (B) $\frac{5}{10}$
   (C) $\frac{4}{9}$
   (D) $\frac{1}{9}$

8. In ΔABC, correspondence $ABC \leftrightarrow BAC$ is similarity. From the following ..... is true.
   (A) $\angle C \cong \angle A$
   (B) $\angle B \cong \angle C$
   (C) $\angle A \cong \angle B$
   (D) $\angle A \cong \angle B \cong \angle C$

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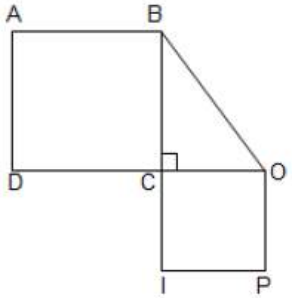
9. If $\sin 7\theta = \cos 2\theta$ for acute angles 7θ and 2θ, then $\theta =$ .....
   (A) 10
   (B) 90
   (C) 20
   (D) 30

10. In a two digit number, the digit at the units place is x and the digit at tens place is y. If y = 5, then the number is .....
   (A) 50x + 5
   (B) 5x
   (C) 30x + 5
   (D) x + 50

11. The chord of a $\odot(0, 5)$ touches $\odot(0, 3)$. The length of the chord is .....
   (A) 8
   (B) 6
   (C) 7
   (D) 2

12. The perimeter of an equilateral triangle is 6. The length of an altitude drawn on any of its sides is .....
   (A) $2\sqrt{3}$
   (B) $\frac{\sqrt{3}}{2}$
   (C) 2
   (D) $\sqrt{3}$

13. As shown in the following figure, the area of square ABCD is 16 cm^2 and the area of square CIPO is 9cm^2. If $\overline{BC} \perp \overline{CO}$ then the length of $\overline{BO}$ = ... cm.
   (A) 7
   (B) 25
   (C) 625
   (D) 5



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14. In a given A. P., $T_{25} - T_{20} = 15$. $\therefore$ d = ... for the A.P.
(A) 5
(B) 3
(C) 25
(D) 120

15. 3 years ago, the sum of the ages of a father and his son was 40 years. After 2 years, the sum of their ages will be.....
(A) 46 years
(B) 40 years
(C) 50 years
(D) 60 years

16. The ratio of the areas of two similar triangles is 25 : 16. The ratio of their perimeters is .....
(A) 625 : 256
(B) 5 : 6
(C) 25 : 16
(D) 5 : 4

17. If $y = \frac{2}{3}$ is a root of the quadratic equation $3y^2 - ky + 8 = 0$, then the value of k is .....
(A) 13
(B) −14
(C) 14
(D) −13

18. From the equations given below, a root of one equation is 3. The equation is.....
(A) $x^2 + x - 6 = 0$
(B) $x^2 - x - 6 = 0$
(C) $x^2 - x + 6 = 0$
(D) $x^2 + x + 6 = 0$

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19. If α, β, γ are the zeros of a polynomial $P(x) = ax^3 + bx^2 + cx + d$ $(a \neq 0)$ then $\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma} =$.....

(A) $-\frac{b}{a}$

(B) $-\frac{c}{d}$

(C) $\frac{c}{d}$

(D) $-\frac{c}{a}$

20. With the help of match-sticks, Zalak prepared a pattern as shown below. When 97 matchsticks are used, the serial number of the figure will be _____ .

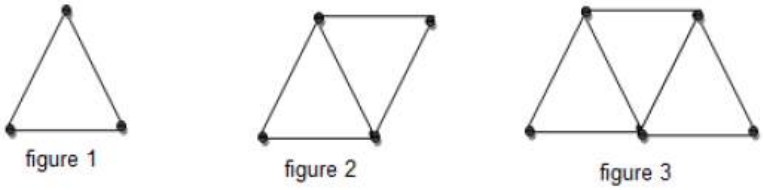

figure 1 figure 2 figure 3

(A) Figure 32
(B) Figure 95
(C) Figure 49
(D) Figure 48

21. The volume of a cylinder is 550 cm^3. If its radius is 5 cm, then its height is ..... cm.
(A) 12
(B) 9
(C) 7
(D) 14

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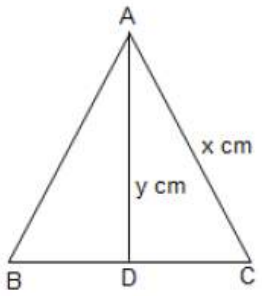
22. In the following figure ΔABC is an equilateral triangle and AC = x cm. $\overline{AD}$ is median on $\overline{BC}$, $D \in \overline{BC}$. If AD = y cm, then y = ... cm.



(A) $\sqrt{\frac{3}{2}.x}$

(B) $\frac{\sqrt{3}}{2}.x$

(C) $\frac{\sqrt{3x}}{2}$

(D) $\frac{3}{2}.x$

23. In any A.P., $S_n - 2\,S_{n-1} + S_{n-2} =$ .....$(n > 2)$.

(A) a + d

(B) 2d

(C) d

(D) a

24. The foot of the perpendicular drawn from P(−3, 2) to the y-axis is M. The coordinates of M are.....

(A) (0, 2)

(B) (3, 0)

(C) $\left(\frac{3}{2}, -1\right)$

(D) (−3, 2)

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25. If $7\cos^2\theta + 3\sin^2\theta = 4$, then $\cot\theta$ =
    (A) $\frac{7}{3}$
    (B) 7
    (C) $\sqrt{3}$
    (D) $\frac{1}{\sqrt{3}}$

26. The formula to find the total surface area of a Rs. 5 coin is .....
    (A) $\pi r^2 h$
    (B) $\pi r(r+h)$
    (C) $\pi r^3 h$
    (D) $2\pi r(h+r)$

27. If the area and the circumference of a circle are numerically equal, then the radius of the circle is .....
    (A) $\frac{5}{2}$
    (B) 2
    (C) 1
    (D) $\frac{2}{5}$

28. If the ratio of the areas of two circles is 1 : 4, then the ratio of their circumferences is.....
    (A) 1 : 4
    (B) 2 : 3
    (C) 1 : 2
    (D) 3 : 2

29. The product of the zeroes of polynomial $x^2 - 4x + 3$ is .....
    (A) 4
    (B) 1
    (C) −4
    (D) 3

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30. When the length of the shadow of a pole is equal to the height of the pole, the angle of elevation of the Sun has a measure of.....
(A) 30°
(B) 45°
(C) 60°
(D) 75°

31. The area of a minor sector of ⊙(P, 30) is 300 cm^2. The length of the corresponding arc in ..... cm.
(A) 20
(B) 10
(C) 30
(D) 40

32. The volume of a sphere with radius 3cm is ..... cm^3.
(A) 14π
(B) 18π
(C) 2π
(D) 36π

33. Two consecutive even numbers can be.....
(A) x, x + 1
(B) x, x + 2
(C) x, x – 1x
(D) x, 2x

34. The area of a sector formed by two mutually perpendicular radii in ⊙ (0, 5 cm) is..... cm^2.
(A) 4π
(B) 25π
(C) $\frac{4}{25}\pi$
(D) $\frac{25}{4}\pi$

35. □ ABCD is cyclic. If m ∠ B = 60° then, m ∠ D = ...
(A) 120°
(B) 100°
(C) 30°
(D) 90°

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36. The sum of two numbers is 10 and their positive difference is 2. The bigger number is .....
(A) 8
(B) 4
(C) 2
(D) 6

37. If ..... then the roots of the quadratic equation are equal.
(A) $D = 0$
(B) $D \neq 0$
(C) $D < 0$
(D) $D > 0$

38. In usual notations, $Z - M =$ ..... $(M - \bar{x})$
(A) 3
(B) 2
(C) 4
(D) 1

39. If $P(C) = \frac{2}{7}$, then $P(\bar{C}) =$ .....
(A) $\frac{5}{7}$
(B) $\frac{2}{7}$
(C) 0
(D) 1

40. For $2x + 3y = 7$ and $3x + 2y = 3$, $x - y =$ .....
(A) 4
(B) -4
(C) 10
(D) 21

41. Distance between the points $(2, -3)$ and $(5, a)$ is 5. Hence $a =$ .....
(A) -1
(B) 6
(C) 1
(D) 7

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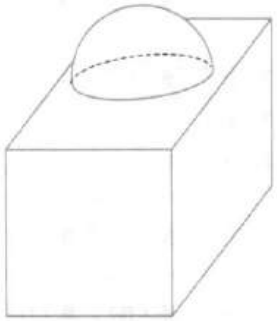
42. The modal class of the following frequency distribution is .....

Class	0-10	10-20	20-30	30-40	40-50
Frequency	7	15	13	17	10

(A) 20-30
(B) 10-20
(C) 30-40
(D) 40-50

43. A show-piece, as shown in the figure, is made of a cube and a hemisphere. If the measure of the total surface area of the cube is represented by A, the curved surface area of the hemisphere is represented by B and the area of the base of the hemisphere is represented by C, then ..... is true for the total surface area of the show-piece.

(A) A + B + C
(B) A + B – C
(C) B + C – A
(D) A + C – B



44. The distance between A(−6, 7) and B (−1, −5) is .....

(A) 12
(B) 13
(C) 7
(D) $\sqrt{37}$

45. The discriminant (D) of the equation $5x - 6 + \frac{1}{x} = 0$ is .....

(A) 4
(B) $\sqrt{56}$
(C) 16
(D) 56

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46. In the formula of mean, $\bar{x} = A + \frac{\sum f_i d_i}{\sum f_i}$, d_i = ...

(A) $f_i - A$

(B) $A - x_i$

(C) $A - f$

(D) $x_i - A$

47. For $\sqrt{4+\sqrt{83}}$, the correct option is .....

(A) does not exist as quadratic surd

(B) does not exist as real numbers

(C) $2+\sqrt{83}$

(D) $\sqrt{83}-2$

48. $2^m . 5^n$ $(m, n \in N)$ ends with

(A) 5

(B) 0

(C) 25

(D) 125

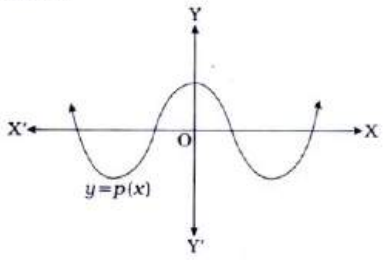
49. From the graph given below, y = P(x) has ..... zeros.

(A) 1

(B) 5

(C) 3

(D) 4



50. The zero of the polynomial P(x) = $\sqrt{5}x - 5$ is .....

(A) $\sqrt{5}$

(B) $-\sqrt{5}$

(C) $\frac{\sqrt{5}}{5}$

(D) -5

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Time: 2 Hours **Total Marks: 50**

Part-B

Instructions:

1. There are **Four** sections in this part with questions from **1** to **17**.
2. **All** the questions are **compulsory**. Internal options are given.
3. Draw figures wherever required. Retain all the lines of construction.
4. The numbers at right side represent the marks of the question.

SECTION A

Answer the following very short answer questions: [**2** marks each] **16**

1. Find the square root of $6 + 4\sqrt{2}$.

2. Find the sum of the zeroes and the product of the zeroes of the quadratic polynomial $p(x) = 3x^2 + 7x + 4$, without finding the zeroes.

3. Solve the following pair of equations by cross-multiplication method:
   $2x - 5y = 4$, $3x - 8y = 5$

4. Add the following:
   $(-100) + (-92) + (-84) + \ldots + 92$

OR

4. In a given A.P. $a = 8$, $T_n = 33$, $S_n = 123$. Find d and n.

5. In ΔABC, $m\angle B = 90°$, $\overline{BM} \perp \overline{AC}$, $M \in AC$. If $AM - MC = 7$ and $AB^2 - BC^2 = 175$, then find AC.

6. Find the distance between A $(a + b, b - a)$ and B $(a - b, a + b)$.

7. If $A + B = 90°$, then prove that
   $$\sqrt{\frac{\tan A \tan B + \tan A \cot B}{\sin A \sec B}} = \sec A$$

OR

7. Prove that: $\sqrt{\frac{1 - \sin\theta}{1 + \sin\theta}} = \sec\theta - \tan\theta$

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8. The mean of a data is $\bar{x} = 35.8$. If $\sum f_i u_i = 4$, $\sum f_i = 50$ and $c = 10$, then find the assumed mean (A).

SECTION B

Solve the following: [**3** marks each] **12**

9. Solve the given pair of linear equations:

$$\frac{3}{\sqrt{x}}+\frac{4}{\sqrt{y}} = 2, \frac{5}{\sqrt{x}}+\frac{7}{\sqrt{y}} = \frac{41}{12} \quad (x > 0, y > 0)$$

10. The angles of elevation of the top of a tower from two points at a distance **a** and **b** from the base, and in the same straight line with it, are complementary. Prove that the height of the tower is $\sqrt{ab}$.

11. There are 5 red, 2 yellow and 3 white roses in a flowerpot. One rose is selected from it at random. What is the probability that the selected rose is (1) red (2) yellow (3) not white colour?

12. Find the mean of the following frequency distribution:

Class	0-50	50-100	100-150	150-200	200-250	250-300	300-350
Frequency	10	15	30	20	15	8	2

OR

12. Find the median of the following frequency distribution:

Class	0-100	100-200	200-300	300-400	400-500	500-600
Frequency	64	62	84	72	66	52

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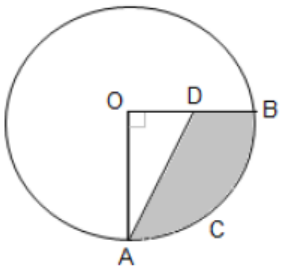
SECTION C

Solve the following: [**4** marks each] **12**

13. Prove that a tangent to a circle is perpendicular to the radius drawn from the point of contact.

14. OA and OB are two mutually perpendicular radii of a circle with radius 10.5 cm. $D \in OB$ and OD = 6 cm. Find the area of the shaded region in the figure given below:



15. The cost of painting the surface of a sphere is Rs. 1526 at the rate of Rs. 6 per m^2. Find the radius of the sphere. ($\pi = 3.14$)

OR

15. A well of diameter 7 m and 30 m deep is dug and the soil obtained by digging the well is evenly spread out to form a platform of size 30 m × 10 m. Find the height of the platform.

SECTION D

16. $\odot$ (P, 4 cm) is given. Draw a pair of tangents through A, which is in the exterior of the $\odot$ (P, 4 cm) such that the measure of the angle between the tangents is 60°. Write the construction steps.

17. Prove that the areas of two similar acute triangles are proportional to the squares of the corresponding sides.

OR

17. In ΔABC, $m\angle B = 90°$. Prove that $AC^2 = AB^2 + BC^2$.