

**MATHS QUESTION PAPER**  
**CLASS-X**  
**(MARCH, 2011)**  
**PART-A**

*Time : 75 minutes*

*Maximum Marks : 50*

**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 alternatives (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 the given four answers and darken the circle with pen against the alphabet, against the number in OMR sheet.
- Each question carries **1** mark.

1. On walking 'a' metres on the hilly way, making an angle of  $30^\circ$  with the ground, one can reach the height 'b' metres from the ground. Then .....

[Space for  
Rough Work]

- (A)  $a = b$                               (B)  $2a = b$   
(C)  $2a = \sqrt{3} b$                         (D)  $a = 2b$

2. Formula to find the curved surface area of Sphere is .....

- (A)  $\pi r^2 h$                               (B)  $4\pi r^2$   
(C)  $3\pi r^2$                                 (D)  $2\pi r^2$

3. The angle of elevation of the top of the building from a point A on the ground is  $45^\circ$ . If the distance of the building from the point A is  $x$  and the height of the building is  $y$ , then .....

- (A)  $x = y$                                 (B)  $x < y$   
(C)  $x > y$                                 (D)  $x = 2y$

4. If  $n = 100$ ,  $\sum f_i d_i = 0$  and  $A = 15$ ,  
then the value of mean  $\bar{x} = \dots$
- (A) 100 (B) 115  
(C) 15 (D) 11.5
5. If  $n = 50$ ,  $A = 20$  and mean  $\bar{x} = 19.7$ ,  
then the value of  $\sum f_i d_i = \dots\dots\dots$
- (A) 35 (B) (-35)  
(C) 15 (D) (-15)
6.  $n = 100$ ,  $A = 12$ ,  $\bar{x} = 12$ ,  $\therefore \sum f_i d_i = \dots\dots\dots$
- (A) 12 (B) 0  
(C) 100 (D) (-12)
7.  $\bar{x} = \bar{y} + 3$ ,  $\therefore \bar{y} = \bar{x} + \dots\dots\dots$
- (A) 0 (B) 3  
(C) (-3) (D) 6
8. Under section 80C, investment in ..... upto fixed limit  
is exempted in income tax.
- (A) PPF (B) Bank FD  
(C) Shares (D) Mediclaim
9. Under section ..... of income tax, mediclaim premium  
is exempted.
- (A) 80 C (B) 88 C  
(C) 80 D (D) 88 D
10. Senior citizen has invested Rs. 90,000 annually, under  
section 80 C. He will get the exemption of Rs. .... from  
his income.
- (A) 1,00,000 (B) 1,85,000  
(C) 1,50,000 (D) 90,000

11. For A(4, 3) and B(8, 9); the mid point of AB = .....
- (A)  $\left(2, \frac{3}{2}\right)$  (B)  $\left(4, \frac{9}{2}\right)$   
(C) (6, 6) (D) (2, 3)
12. The distance between origin and point (x, y) is .....
- (A) x (B) y  
(C) x + y (D)  $\sqrt{x^2 + y^2}$
13. The centroid of a triangle with vertices A(3, 2), B(7, 5) and C(2, 2) is .....
- (A) (3, 4) (B) (4, 3)  
(C)  $\left(\frac{7}{2}, \frac{5}{2}\right)$  (D)  $\left(6, \frac{9}{2}\right)$
14. Sum of the ages of five persons, five years ago, was 50 years. The sum of the ages of the same persons will be ..... years after five years.
- (A) 100 (B) 75  
(C) 60 (D) 80
15. In a two digit number, number at unit's place is 'p' and number at ten's place is 'r'. The two digit number is
- (A)  $10x + y$  (B)  $10p + r$   
(C)  $10r + p$  (D)  $10y + x$
16. Solution set of  $x + y - 1 = 0$  and  $2x + 2y = 2$  is .....
- (A)  $\{(1, 0)\}$  (B)  $\{(0, 1)\}$   
(C) Null set (D) Infinite set

17.  $\triangle ABC \sim \triangle PQR$ . Perimetre of  $\triangle ABC$  is 35 and that of  $\triangle PQR$  is 28. If  $PR = 4\sqrt{10}$ , then  $AC = \dots\dots$
- (A)  $5\sqrt{2}$  (B)  $5\sqrt{10}$   
 (C)  $2\sqrt{5}$  (D)  $4\sqrt{10}$
18. Length of a diagonal of a Square is 10. Its area = .....
- (A) 100 (B)  $5\sqrt{2}$   
 (C) 50 (D) 25
19. In  $\triangle ABC$ ,  $m\angle B = 90^\circ$ .  $BM$  is an altitude on hypotenuse  $AC$ .  $AM = 16$ ,  $AC = 25$ ,  $\therefore BM = \dots\dots$
- (A) 12 (B) 20  
 (C)  $\sqrt{41}$  (D) 9
20. In a correspondence  $ABC \leftrightarrow RPQ$  between  $\triangle ABC$  and  $\triangle PQR$ , ..... is the angle corresponding o  $\angle B$ .
- (A)  $\angle P$  (B)  $\angle Q$   
 (C)  $\angle R$  (D)  $\angle B$
21. Bisector of  $\angle P$  intersects  $RQ$  in  $S$  in  $\triangle PQR$ .  $QS : RS = 4 : 5$ . If  $PQ = 4$ , then  $PR = \dots\dots$
- (A) 4 (B) 5  
 (C) 9 (D) 10
22.  $\triangle PQR \sim \triangle XYZ$  and  $PQ : QR : PR = 3 : 5 : 7$ . If the perimeter of  $\triangle XYZ$  is 22.5, then  $YZ = \dots\dots$
- (A) 4.5 (B) 7.5  
 (C) 10.5 (D) 15
23. In  $\triangle ABC$  and  $\triangle PQR$ ,  $m\angle A = m\angle R$  and  $\angle B \cong \angle Q$ . The correspondence ..... is similarity between them.
- (A)  $ABC \leftrightarrow PQR$  (B)  $ABC \leftrightarrow QRP$   
 (C)  $ABC \leftrightarrow RQP$  (D)  $ABC \leftrightarrow RPQ$

24.  $(1 - \cos \theta) (1 + \cos \theta) = \dots\dots\dots$
- (A)  $\operatorname{cosec}^2 \theta$                       (B)  $\cos^2 \theta$
- (C)  $2 - \cos^2 \theta$                       (D)  $\frac{1}{\operatorname{cosec}^2 \theta}$
25. If  $7 \cos^2 \theta + 3 \sin^2 \theta = 4$ , then  $\tan \theta = \dots\dots\dots$
- (A) 7                                      (B)  $\frac{7}{3}$
- (C) 3                                      (D)  $\sqrt{3}$
26.  $\sin^2 60^\circ - \tan 45^\circ + \cos^2 30^\circ - \cot 90^\circ = \dots\dots\dots$
- (A) 1                                      (B) 2
- (C)  $\frac{1}{2}$                                       (D) 3
27. Formula to find total surface area of Rs. 5 coin is  $\dots\dots\dots$
- (A)  $\pi r^2 h$                               (B)  $\pi r (r + h)$
- (C)  $2\pi r (r + h)$                       (D)  $\pi r l$
28. The radius of a Sphere is  $\dots\dots\dots$  cm, if its curved surface area is 616 sq. cm.
- (A) 6                                      (B) 7
- (C) 8                                      (D) 5
29. Volume of a Sphere with radius 1.5 cm is  $\dots\dots\dots$  cu.cm.
- (A)  $4.5 \pi$                               (B)  $5 \pi$
- (C)  $5.5 \pi$                               (D)  $4 \pi$

30. Sum of first  $n$  natural numbers = .....

- (A)  $\frac{n}{2}$  (B)  $\frac{n+1}{2}$   
(C)  $\frac{n(n+1)}{2}$  (D)  $\frac{n-1}{2}$

31. While purchasing in instalment scheme, the formula to find simple interest = .....

- (A)  $I = \frac{PRN}{100}$  (B)  $I = \frac{PR^2N}{100}$   
(C)  $I = \frac{P^2RN}{100}$  (D)  $I = \frac{PRN^2}{100}$

32. Simple interest on Rs. 500 at 10% is ..... for two years.

- (A) Rs. 100 (B) Rs. 110  
(C) Rs. 120 (D) Rs. 10

33. If  $\frac{(3x-3)^2}{(1-x)^2} = m$ , then  $m = \dots\dots\dots$

- (A) 3 (B) (-3)  
(C) 9 (D) (-9)

34.  $\alpha = \dots\dots$  is a solution of quadratic equation  $x^2 + 7x + 12 = 0$ .

- (A) 7 (B) 4  
(C) (-3) (D) 3

35. Value of discriminant  $D$  is ..... for the quadratic equation  $5x^2 - 6x + 1 = 0$ .

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

36. If one of the roots of the equation  $kx^2 + 3x - 4 = 0$  is  $x = 2$ , then the value of  $k = \dots\dots\dots$

- (A)  $\frac{1}{2}$  (B)  $\left(-\frac{1}{2}\right)$   
(C) 2 (D) (-2)

37. Any angle inscribed in a semi-circle is of measure .....
- (A)  $30^\circ$  (B)  $90^\circ$   
(C)  $120^\circ$  (D)  $60^\circ$
38. If  $\odot(P, 5)$  and  $\odot(Q, 4)$  touch each other externally, then  $PQ = \dots\dots\dots$
- (A) 5 (B) 9  
(C) 1 (D) 7
39. If cyclic quadrilateral is a parallelogram, then it is .....
- (A) Rhombus (B) Rectangle  
(C) Square (D) Trapezium
40. If  $\odot(P, 5)$  and  $\odot(Q, r)$  are congruent circles, then .....
- (A)  $r = 5, P \neq Q$  (B)  $r = 5, P = Q$   
(C)  $r \neq 5, P = Q$  (D)  $r \neq 5, P \neq Q$
41. If  $\odot(P, 3)$  and  $\odot(Q, r)$  are concentric circles, then .....
- (A)  $P = Q, r = 3$  (B)  $P \neq Q, r = 3$   
(C)  $P \neq Q, r \neq 3$  (D)  $P = Q, r \neq 3$
42. Intersection set of all the radii of a Circle is .....
- (A)  $\phi$  (B) {Centre of circle}  
(C) Circle (D) Interior of circle
43. The length of semi-circular arc of  $\odot(O, 5)$  is .....
- (A)  $2\pi$  (B)  $\pi$   
(C)  $5\pi$  (D)  $10\pi$

44.  $p(x) = -x^2$  and  $q(x) = x^3$ . Their  $h(x) = \dots$
- (A)  $x^3$  (B)  $(-x^2)$   
 (C)  $x^6$  (D)  $(-x^5)$
45. If  $p(x) = 12(x - 1)$  and  $q(x) = 17(x + 1)$ ,  
 then  $h(x) = \dots$
- (A) 1 (B)  $x - 1$   
 (C)  $x + 1$  (D)  $x^2 - 1$
46. From the following, ..... is not a polynomial in  $x$ .
- (A)  $\sqrt{x} - 5$  (B)  $3x^2 - \sqrt{5}$   
 (C)  $\frac{3}{2}x^2 - x - 2$  (D)  $5x^2 - x + 1$
47. From the following, ..... is rational expression,  
 but not a polynomial.
- (A)  $\frac{x-5}{x-3}$  (B)  $\frac{x^2-9}{x-3}$   
 (C)  $\frac{x^3-8}{x^2+2x+4}$  (D)  $\frac{x-3}{3-x}$
48. If  $\frac{a-1}{p(a)} = \frac{a^2+a+1}{a^3-1}$ , then  $p(a) = \dots$
- (A) 1 (B)  $a^2 - 1$   
 (C)  $a + 1$  (D)  $(a - 1)^2$
49. Remainder is ....., when  $x^{31} + 1$  is divided by  $x - 1$ .
- (A) 3 (B) 2  
 (C) 4 (D) 1
50. H.C.F. of  $p(x) = x^2 + 1$  and  $q(x) = x^2 - 1$  is .....
- (A)  $(x^2 - 1)$  (B)  $x^2$   
 (C) 1 (D)  $(x^2 + 1)$



## PART - B

*Time : 2 Hours*

*Maximum Marks : 50*

### **Instructions :-**

- (1) There are **four** sections in this part of the question paper and total **1 to 17** questions are there.
- (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 questions from 1 to 8 in short.*

*Each question carries 2 marks.*

1. Find the solution set of the following pair of linear equations. **2**  
 $2x + y = 35$  ..... (1)  
 $3x + 4y = 65$  ..... (2)

2. Find the discriminant of the quadratic equation  $x^2 + 5x + 1 = 0$ . **2**

3. Find the sum of first 11 terms of an Arithmetic Progression  
2, 9, 16, 23, ..... **2**

**OR**

3. Find the 60th term of an Arithmetic Progression  
10, 20, 30, 40, .....

4. The cash price of a bicycle is Rs. 1,000. In instalment scheme, cash **2**  
down payment is of Rs. 450 and two monthly instalments of Rs. 300 each.  
Find the rate of interest charged in the instalment scheme.

5. The cost price of a wrist-watch is Rs. 800. It can be purchased by paying **2**  
Rs. 425 as cash down payment and the remaining amount to be paid after  
two months, giving interest of Rs. 35. Find the value of the instalment.

6.  $\Delta PQR \sim \Delta MNO$ .  $PQ = 8$ ,  $MN = 6$  in  $\Delta PQR$  and  $\Delta MNO$  respectively. 2  
If the area of  $\Delta PQR$  is 72 unit, then find the area of  $\Delta MNO$ .

7. Using trigonometric identities, prove that 2  
 $\sec^2 \theta + \operatorname{cosec}^2 \theta = \sec^2 \theta \cdot \operatorname{cosec}^2 \theta$

**OR**

7. Prove that  $\tan 5^\circ \cdot \tan 25^\circ \cdot \tan 45^\circ \cdot \tan 65^\circ \cdot \tan 85^\circ = 1$

8. Find the distance between the points (7, 5) and (2, 5). 2

### SECTION - B

*Answer the following questions from No. 9 to 12 with calculations.*

*(Each question is of 3 marks)*

9. Find H.C.F. and L.C.M. of the polynomials  $p(x) = x^3 - 8$ , 3  
 $q(x) = x^3 + 8$  and  $r(x) = x^4 + 4x^2 + 16$ .

10. Simplify : 3

$$\frac{x+4}{x^2+2x-8} + \frac{x-4}{x^2-2x-8} + \frac{2x}{4-x^2}$$

**OR**

10. Simplify :

$$\frac{a^4 - (a-2)^2}{(a^2+2)^2 - a^2} + \frac{a^2 - (a^2-2)^2}{a^2(a+1)^2 - 4} + \frac{a^2(a-1)^2 - 4}{a^4 - (a+2)^2}$$

11. While selling a Calculator for Rs. 56, the profit in percentage is equal to 3  
its cost price in rupees. Find the cost price of the Calculator.

12. A flag-staff of height  $h$  stands on the top of the tower. If the angles of 3  
elevation of the top and bottom of the flag-staff are respectively  $\alpha$  and  $\beta$  from a point on the ground, prove that the height of the tower is

$$\frac{h \tan \beta}{\tan \alpha - \tan \beta}, \text{ where } \alpha > \beta.$$

### SECTION - C

Solve the following questions from No. 13 to 15, as per the instruction.

(Each carries 4 marks)

13. Find the missing frequency for the following frequency distribution, if its Mean is 43.75. 4

Class	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

14. Prove that square of the length of the hypotenuse of a right-angled triangle is the sum of the squares of the lengths of the other two sides. 4

15. Find the curved surface area of a Sphere, whose diameter is 10 cm. ( $\pi = 3.14$ ) 4

**OR**

15. How many litres of water can be stored in cylindrical tank with radius 1.4 m and height 4 m ?

### SECTION -D

Solve the following questions from No. 16 to 17. (Each carries 5 marks)

16. Prove that “Angles in a segment corresponding to minor arc are congruent”. 5

**OR**

16. Prove that “Angle made by a chord with tangent at one end point of the chord and the angle subtended by the chord in the alternate segment are congruent”.

17. Using the centre of a Circle, draw a tangent to the circle through a point in the exterior of circle. How many such tangents are drawn ? Here, radius = 3 cm and the distance of the point, in the exterior of their circle, from the centre is 7 cm. 5