

# SECOND REVISION EXAMINATION

TIME: 3 HOURS

MARKS: 100

CLASS: X

MATHS

PART-A

14 x 1 = 14

I. Choose the most suitable answer from the given four alternatives and write the option code with the corresponding answer:

1)  $A = \{a, b, p\}$ ,  $B = \{2, 3\}$ ,  $C = \{p, q, r, s\}$  then  $n[(A \cup C) \times B]$  is — a) 8 b) 20 c) 12 d) 16

2) If 6 times of 6<sup>th</sup> term of an A.P. is equal to 7 times the 7<sup>th</sup> term, then the 13<sup>th</sup> term of the A.P. is — a) 0 b) 6 c) 7 d) 13

3) The sum of the exponents of the prime factors in the prime factorization of 1729 is —

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

4)  $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$  is — a)  $\frac{9y}{7}$  b)  $\frac{9y^3}{(21y-21)}$

c)  $\frac{21y^2 - 42y + 21}{3y^3}$  d)  $\frac{7(y^2 - 2y + 1)}{y^2}$

5) Which of the following should be added to make  $x^4 + 64$  a perfect square —

a)  $4x^2$  b)  $16x^2$  c)  $8x^2$  d)  $-8x^2$

- 6) The values of  $a$  and  $b$  if  $4x^4 - 24x^3 + 76x^2 + ax + b$  is a perfect square are —
- a) 100, 120    b) 10, 12    c) -120, 100    d) 12, 10
- 7) If in triangles  $ABC$  and  $EDF$ ,  $\frac{AB}{DE} = \frac{BC}{FD}$  then they will be similar when —
- a)  $\angle B = \angle E$     b)  $\angle A = \angle D$     c)  $\angle B = \angle D$     d)  $\angle A = \angle F$
- 8) How many tangents can be drawn to the circle from an exterior point?
- a) one    b) two    c) infinite    d) zero.
- 9) If slope of the line  $PA$  is  $\frac{1}{\sqrt{3}}$  then the slope of the  $\perp$ r bisector of  $PA$  is —
- a)  $\sqrt{3}$     b)  $-\sqrt{3}$     c)  $\frac{1}{\sqrt{3}}$     d) 0
- 10) The point of intersection of  $3x - y = 4$  and  $x + y = 8$  is — a) (5, 3)    b) (2, 4)    c) (3, 5)    d) (4, 4)
- 11) If the ratio of the height of a tower and the length of its shadow is  $\sqrt{3} : 1$  then the angle of elevation of the sun has measure —
- a)  $45^\circ$     b)  $30^\circ$     c)  $90^\circ$     d)  $60^\circ$
- 12) The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is — a)  $60\pi \text{ cm}^2$   
b)  $68\pi \text{ cm}^2$     c)  $120\pi \text{ cm}^2$     d)  $136\pi \text{ cm}^2$

13) The total Surface area of a cylinder whose radius is  $\frac{1}{3}$  of its height is —

a)  $\frac{9\pi h^2}{8}$  Sq units      b)  $24\pi h^2$  Sq units

c)  $\frac{8\pi h^2}{9}$  Sq units      d)  $\frac{56\pi h^2}{9}$  Sq units

14) A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is —

a)  $\frac{3}{10}$       b)  $\frac{7}{10}$       c)  $\frac{3}{9}$       d)  $\frac{7}{9}$

### Part-II

II. Answer 10 Questions:

$10 \times 2 = 20$

Question No 28 is Compulsory

15) Let  $A = \{1, 2, 3, 4, \dots, 45\}$  and  $R$  be the relation defined as "is square of a number" on  $A$ . Write  $R$  as a subset of  $A \times A$ . Also find the domain and range of  $R$ .

16) Find the HCF of 867 and 255

17) Find  $a_8$  and  $a_{15}$ ,  $n$ th term is  $a_n = \begin{cases} \frac{n^2-1}{n+3} & ; n \text{ is even, } n \in \mathbb{N} \\ \frac{n^2}{2n+1} & ; n \text{ is odd, } n \in \mathbb{N} \end{cases}$

18) Find the LCM of  $x^4 - 1$  and  $x^2 - 2x + 1$

19) Simplify  $\frac{x^3}{x-y} + \frac{y^3}{y-x}$

20) Determine the nature of roots for  $9x^2 - 24x + 16 = 0$

21) If  $\triangle ABC \sim \triangle DEF$  such that area of  $\triangle ABC$  is  $9 \text{ cm}^2$  and the area of  $\triangle DEF$  is  $16 \text{ cm}^2$  and  $BC = 2.1 \text{ cm}$  find the length of  $EF$

22) A man goes  $18 \text{ m}$  due east and then  $24 \text{ m}$  due north. Find the distance of his current position from the starting point?

23) The line through the points  $(-2, a)$  and  $(9, 3)$  has slope  $-\frac{1}{2}$ . Find the value of  $a$

24) Find the equation of a line whose intercepts on the  $x$  and  $y$  axes are given below.  $-5$  and  $\frac{3}{4}$

25) A tower stands vertically on the ground. From a point on the ground which is  $48 \text{ m}$  away from the foot of the tower, the angle of elevation of the top of the tower is  $30^\circ$ . Find the height of the tower.

26) Find the diameter of a sphere whose surface area is  $154 \text{ m}^2$ .

- 27) In a two children family find the probability that there is atleast one girl in a family.
- 28) The volume of a solid right circular cone is  $11088 \text{ cm}^3$ . If its height is  $24 \text{ cm}$ , then find the radius of the cone.

Part-III

IV. Answer 10 questions:

$$10 \times 5 = 50$$

question no 42 is compulsory.

- 29) Represent each of the given relations by (a) an arrow diagram (b) a graph and (c) a set of roster form wherever possible  
 $\{(x, y) / y = x + 3, x, y \text{ are natural numbers} < 10\}$
- 30) In an A.P. Sum of four consecutive terms is 28 and their sum of their squares is 276. Find the four numbers.
- 31) Determine the general term of an A.P. whose 7th term is  $-1$  and 16th term is  $17$ .
- 32) There are 12 pieces of 5, 10 and 20 rupee currencies whose total value is ₹105. When first 2 sorts are interchanged in their numbers

its value will be increased by ₹ 20. Find the number of currencies in each sort.

33) The hypotenuse of a right angled triangle is 25 cm and its perimeter 56 cm. Find the length of the smallest side.

34) If  $\alpha, \beta$  are the roots of the equation  $2x^2 - x - 1 = 0$  then form the equation whose roots are  $\alpha^2\beta, \beta^2\alpha$

35) An insect 8 m away initially from the foot of a lamp post which is 6 m tall, crawls towards it moving through a distance. If its distance from the top of the lamp post is equal to the distance it has moved, how far is the insect away from the foot of the lamp post?

36) Let  $A(3, -4), B(9, -4), C(5, -7), D(7, -7)$ . Show that ABCD is a trapezium.

37) Find the equation of the median altitude of  $\triangle ABC$  through A where the vertices are  $A(6, 2), B(-5, -1)$  and  $C(1, 9)$

38) Three coins are tossed once. Find the probability of getting at most 2 tails or at least 2 heads.

39) From the top of the tower 60 m high the angles of depression of the top and bottom of a vertical lamp post are observed to be  $38^\circ$  and  $60^\circ$ . Find the height of the lamp post.  
( $\tan 38^\circ = 0.7813$ ,  $\sqrt{3} = 1.732$ )

40) From the top of a tree of height 13 m the angle of elevation and depression of the top and bottom of another tree are  $45^\circ$  and  $30^\circ$ . Find the height of the second tree. ( $\sqrt{3} = 1.732$ )

41) A solid iron cylinder has total surface area of 1848 sqm. Its curved surface area is five-sixth of its total surface area. Find the radius and height of the iron cylinder.

42) A toy is in the shape of a cylinder surmounted by a hemisphere. The height of the toy is 25 cm. Find the total surface area of the toy if its common diameter is 12 cm.

### Part-IV

10 . Answer the both questions 2 x 8 = 16  
 Choosing either of the alternatives

43) a) Draw a triangle ABC of base  $BC = 8\text{ cm}$   
 $\angle A = 60^\circ$  and the bisector of  $\angle A$  meets  
BC at D such that  $BD = 6\text{ cm}$ .

(or)

b) Draw a tangent at any point R on the  
circle of radius  $3.4\text{ cm}$  and centre at P?

44) a) Draw the graph of  $y = (x-1)(x+3)$   
and hence solve  $x^2 - x - 6 = 0$ .

(or)

b) Draw the graph of  $y = x^2 + x - 2$   
and hence solve  $x^2 + x - 2 = 0$ .

— ALL THE BEST