This Question Paper contains 16 Printed Pages.

Maths

પ્રશ્ન પેપરનો સેટ નંબર Set No. of Question Paper
8

Sl. No.

N-12(E)

803326 (MARCH, 2012)

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.

[Space for Rough Work]

1. Opposite angles of Cyclic quadrilateral which is also a rectangle can not be .....
(A) Complementary angles.
(B) Supplementary angles.
(C) Congruent angles.
(D) Right angles.

2. If ⊙(P, 4) and ⊙(Q, 2) touch each other internally,
then PQ = ...
(A) 1 (B) 5
(C) $\sqrt{13}$ (D) 2

3. The volume of a hemisphere having radius 3 cm is ... cm^3.
(A) 12π (B) 14π
(C) 18π (D) 21π

4. The formula to find volume of a Cone is .....
(A) $\frac{1}{3}\pi r^2 h$ (B) $\frac{4}{3}\pi r^2 h$
(C) $\pi r^2 h$ (D) $\frac{1}{3}\pi r^3$

5. The simple interest on Rs. 20,000 for 1 month at the rate of ..... % is Rs.200.

(A) 12 (B) 18

(C) 20 (D) 24

[Space for Rough Work]

6. The full amount which is to be paid at the time of purchase is called the .....

(A) Instalment

(B) Interest

(C) Cash price

(D) Profit

7. $9 + 19 + 29 + ... + 99 =$ .....

(A) 460 (B) 450

(C) 540 (D) 455

8. The cash price of a watch is Rs. 525. In an instalment scheme, cash down payment is Rs. 225, followed by a monthly instalment of Rs. 310. The interest earned by the shopkeeper is .....

(A) Rs. 300

(B) Rs. 10

(C) Rs. 20

(D) Rs. 30

9. The quadratic equation ..... has its roots 3 and – 2.

(A) $x^2 + x + 6 = 0$

(B) $x^2 + 5x - 6 = 0$

(C) $x^2 + x - 6 = 0$

(D) $x^2 - x - 6 = 0$

10. For ΔPQR and ΔABC correspondence $PQR \leftrightarrow BAC$ is a similarity. If $m\angle P : m\angle Q : m\angle R = 2 : 3 : 4$, then $m\angle A : m\angle B : m\angle C =$ .....

(A) 2 : 3 : 4

(B) 3 : 2 : 4

(C) 4 : 3 : 2

(D) 2 : 4 : 3

[Space for Rough Work]

11. In the formula of Mean, $\bar{x} = A + \frac{\sum f_i d_i}{n} \times c$, then $c =$ .....

(A) Deviation

(B) Class

(C) Class length

(D) Assumed mean

12. The sum of frequencies of a frequency distribution is 50. If $\sum f_i x_i = 122$, the value of mean is .....

(A) 2.44

(B) 24.4

(C) 1.22

(D) 12.2

13. The mean of given data is 50. If each observation is increased by 10 and then divided by 6, ... is the value of new mean.

(A) 10

(B) 60

(C) 5.6

(D) 50

14. The co-ordinates of the midpoint of the line segment joining the points (12, 10) and (0, 8) are .....

(A) (9, 6)

(B) (6, 9)

(C) (12, 0)

(D) (10, 8)

[Space for Rough Work]

15. A pole stands erect on the ground. A wire tied to the top of the pole is affixed at a point on the ground. If the length of the wire is 7m and the wire makes an angle of measure 30° with the ground, then the height of the pole is .....

(A) 7 m

(B) 3.5 m

(C) 14 m

(D) 3 m

16. As observed from the top of the Light house, the angles of depression of two ships A and B anchored in the sea are found to be 25° and 40° respectively, then from the Light house .....

(A) A and B are at equal distance.

(B) The distance of B is more than A.

(C) The distance of A is more than B.

(D) The relation about the distances of A and B can not be determined.

17. If A and B are acute angles and $\tan A = 1$ and $\sin B = \frac{1}{\sqrt{2}}$, then $\cos (A+B)$ = ...

(A) 0

(B) 1

(C) $\sqrt{2}$

(D) $\frac{1}{\sqrt{2}}$

18. $\frac{\sin^4\theta - \cos^4\theta}{\sin^2\theta - \cos^2\theta}$ = ...

(A) 1

(B) 2

(C) 3

(D) 4

19. $\frac{1}{\tan^2\theta} + 1$ = ...

(A) $\text{cosec}^2\theta$

(B) $\sec^2\theta$

(C) $\cot^2\theta$

(D) $\cos^2\theta$

20. The surface area of a football having radius 10 cm is .....

(A) 400π cm^2

(B) 52π cm^2

(C) 103π cm^2

(D) 414π cm^2

21. 1 litre = ... cm^3

(A) 10

(B) 1000

(C) 100

(D) 10000

[Space for Rough Work]

[Space for Rough Work]

22. $\frac{(2x-2)^2}{(1-x)^2} = m$, then m = ...

(A) -2

(B) 2

(C) -4

(D) 4

23. (0, 0), (3·1, 0) and (0, 4·5) are the vertices of a ..... triangle.

(A) Equilateral

(B) Right angled

(C) Isosceles

(D) Acute angled

24. $(-3, -2)$ is in ..... quadrant.

(A) first

(B) second

(C) third

(D) fourth

25. Tangents $\overline{PA}$ and $\overline{PB}$ are drawn from P to $\odot(O, 5)$ and PA = 5, then PB = ...

(A) 4

(B) $\sqrt{10}$

(C) 5

(D) 10

26. The solution set of $2x + 3y + 5 = 0$ and $4x + 6y + 10 = 0$ is .....

(A) $\{(2, 3)\}$

(B) Empty set

(C) infinite

(D) $\{(3, 5)\}$

[Space for Rough Work]

27. If $x + 4$ is one factor of polynomial $x^2 + 7x + m$, then m = ...

(A) 3

(B) 12

(C) 4

(D) 7

28. How is the equation $5y = -2x + 3$ written in standard form ?

(A) $2x + 5y + 3 = 0$

(B) $2x + 5y - 3 = 0$

(C) $2x - 5y = 3$

(D) $2x - 5y - 3 = 0$

29. In a two digit number, if the digit at its unit's place is $(2x - 1)$ and the digit at its ten's place is $(2x+1)$, then the number is .....

(A) $22x + 9$

(B) $19 + 22x$

(C) $22x - 9$

(D) $9x - 22$

30. $\Sigma(x_i - \bar{x}) =$ .....

(A) 10

(B) $\bar{x}$

(C) Σx_i

(D) 0

[Space for Rough Work

31. At the end of the year if more tax is paid from the income of a person, then he gets the money back in the form of .....

(A) T.D.S.

(B) Surcharge

(C) Refund

(D) Education Tax

32. The investment in ..... is not exempted from income under section 80C.

(A) PF

(B) GPF

(C) Mediclaim

(D) LIC

33. Every taxpayer has to pay ..... % of income tax as education cess.

(A) 2

(B) 10

(C) 20

(D) 30

34. If $\Delta XYZ \sim \Delta FDE$, then sides $\overline{XY}$, $\overline{DF}$, $\overline{XZ}$ and ..... are in proportion.

(A) $\overline{DE}$

(B) $\overline{EF}$

(C) $\overline{DF}$

(D) $\overline{YZ}$

35. For ΔDEF and ΔPQR, if $m\angle D = m\angle R$ and ....., then the triangles are similar.

(A) $\frac{DE}{PQ} = \frac{EF}{QR}$ (B) $\frac{DE}{PQ} = \frac{DF}{PR}$

(C) $\frac{DE}{QR} = \frac{EF}{RP}$ (D) $\frac{DE}{PR} = \frac{DF}{RQ}$

36. If for ΔXYZ and ΔMNO, $\frac{XY}{MN} = \frac{XZ}{NO} = \frac{YZ}{MO}$, then ..... is similarity.

(A) $XYZ \leftrightarrow MNO$

(B) $XYZ \leftrightarrow NMO$

(C) $XYZ \leftrightarrow OMN$

(D) $XYZ \leftrightarrow MON$

37. Lengths of diagonals of a Rhombus are 10 and 24. Lengths of its sides are .....

(A) 26

(B) 13

(C) 52

(D) 34

[Space for Rough Work]

[Space for Rough W

38. The reduced form of $\frac{x^3}{x-2} + \frac{8}{2-x}$ is .....

(A) $x^2 + 2x + 4$ (B) $x^2 - 2x + 4$

(C) $x - 2$ (D) $2 - x$

39. The H.C.F. of $p(x) = x^2 - 1$, $q(x) = x^2 + x$ and $r(x) = (x + 1)^2$ is .....

(A) $(x + 1)(x^2 - x)$ (B) $(x + 1)^2$

(C) $(x + 1)$ (D) $(x^2 - x)(x^2 + x)$

40. In the following , ... is not a polynomial in x.

(A) $4x^2 + \sqrt{7}$ (B) $3x^2 - x - 1$

(C) $3x^2 - 5\sqrt{x} + 2$ (D) $3x - 1$

41. The L.C.M. of $(2x^2)^2$, $12x^3 \div 4x^2$ and $\sqrt{2x^2 \times 8x^4}$ is .....

(A) $4x^4$ (B) $3x$

(C) $4x^2$ (D) $12x^4$

42. $\frac{x^3 - 1}{p(x)} = \frac{x^2 + x + 1}{x - 1}$, then $p(x)$ = ...

(A) 1 (B) $x^2 - 1$

(C) $x + 1$ (D) $(x - 1)^2$

43. $\angle APB$ and $\angle AQB$ are the angles of the same segment of $\odot(O, 4)$. If $m\angle APB = 60$, then $m\angle AQB =$.....

(A) 30

(B) 60

(C) 90

(D) 120

[Space for Rough Work]

44. P is in the interior of $\odot(O, 3)$. Then OP = ... is possible.

(A) 3

(B) 5

(C) – 1

(D) 2

45. Union of all radii of a Circle is .....

(A) Circle

(B) Interior of the circle

(C) Radius

(D) {interior of circle} $\cup$ {circle}

46. Lower end of 17 m long staircase is 8 m away from wall. Upper end of staircase will touch the wall at ..... m height.

(A) 12

(B) 18

(C) 15

(D) 144

47. The quadratic equation ..... has a root $x = 3$.

(A) $x^2 - 8x + 15 = 0$

(B) $x^2 + 8x + 15 = 0$

(C) $x^2 - 8x - 15 = 0$

(D) $x^2 + 8x - 15 = 0$

[Space for Rough Work]

48. If D = 0 for the given quadratic equation,

then each root is equal to .....

(A) $\frac{b}{2a}$ (B) $\frac{2b}{a}$

(C) $-\frac{b}{2a}$ (D) $-\frac{2b}{a}$

49. ..... is the value of k, if one of the roots of the quadratic equation $x^2 + 6x + k = 0$ is 4.

(A) 20

(B) 40

(C) – 40

(D) 8

50. If ..... , the roots of the given quadratic equation are real and equal.

(A) D = 0 (B) D = 1

(C) D > 0 (D) D < 0

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(MARCH, 2012)

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**

$x + 4y = 3$; $3x = 2y + 2$

2. Find H.C.F. of the given polynomials **2**

$p(x) = x^4 - 4x^3 + 4x^2$

$q(x) = x^3 - 4x$

3. Find the L.C.M. of the polynomials

$3x^2 + 5x - 2$ and $3x^2 - 7x + 2$ **2**

4. How many terms are there in the Arithmetic Progression **2**

14, 21, 28, ..., 98 ?

OR

4. Find $T_{15} - T_{10}$ for the Arithmetic Progression

$35\frac{1}{2}, 45\frac{1}{2}, 55\frac{1}{2}, \ldots\ldots\ldots\ldots$

5. In ΔABC, $m\angle B = 90$. $\overline{BM}$ is an altitude. $BM = x + 2$, $AM = x + 7$ and $CM = x$. Find x. **2**

6. $\angle APB$ is an angle inscribed in a semi-circle. $AP = 9$ and $PB = 40$. Find the radius of the circle. **2**

7. Prove that : **2**

$(\sec\theta + \cos\theta)(\sec\theta - \cos\theta) = \tan^2\theta + \sin^2\theta$.

OR

7. Prove that :

$$\frac{\tan 38^\circ}{\cot 52^\circ} + \frac{\operatorname{cosec} 20^\circ}{\sec 70^\circ} = 2 .$$

8. The distance between the points $(3, a)$ and $(4, 1)$ is $\sqrt{10}$. Find the possible values of a. **2**

SECTION - B

*Answer the following questions from No. **9** to **12** with calculations.*
*(Each question is of **3** marks).*

9. Simplify : **3**

$$\left(\frac{x}{x-4} - \frac{4}{x+4}\right) \div \frac{x^3 - 64}{x^2 + 4x + 16} \times \frac{(x-4)^2}{x^2 + 16}$$

OR

9. Obtain the reduced form

$$\frac{x^2 - 3x + 2}{x^3 - 8} \div \frac{x^2 - 9}{x^2 + 7x + 12} \times \frac{x^3 + 2x^2 + 4x}{x^2 + 3x - 4}$$

10. The denominator of a non-zero ratio is 1 less than twice the numerator. **3**

If the sum of the ratio and its reciprocal is $2\frac{4}{15}$, find the ratio.

11. The cost of a Mixture-grinder is Rs. 1000. In an instalment scheme, cash down payment is Rs. 250, followed by four monthly instalments of Rs. 200 each. Find the rate of interest in instalment scheme. **3**

12. The distance between two poles of equal height is 200 m. From a point situated on the line-segment joining their bases, the angles of elevation of their tops are found to be 60 and 30. Find the height of the pole. **3**

SECTION - C

*Answer the following questions from No. **13** to **15**, as directed with the calculations. (Each question is of **4** marks).*

13. The mean of the following frequency distribution is 27. Find the missing frequency. **4**

x_i	5	15	25	35	45
f_i	20	10	f	30	20

OR

13. Marks obtained by 140 students are given in the following distribution. Find the mean by the method of assumed mean.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	20	24	40	36	20

14. A solid is composed of a cylinder with hemispherical both ends. If the total height of the solid is 78 cm and radius of the cylinder is 12 cm, find the capacity of gas filled in it. **4**

15. Prove that "Opposite angles of a Cyclic quadrilateral are supplementary angles". **4**

SECTION -D

*Answer the following questions from No. **16** to **17**. (Each question carries **5** marks).*

16. Prove that "If for ΔABC, $BC^2 = AB^2 + AC^2$, then $\angle A$ is right angle". **5**

OR

16. Prove that "Areas of two similar triangles are proportional to squares of corresponding sides."

17. Draw ΔABC such that AB = 7 cm, BC = 8 cm and CA = 5.5 cm. Draw its circumcircle and write the steps of construction. **5**