

VII (EM) ADTM

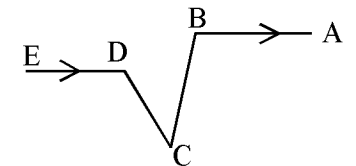
CENTRE FOR PEDAGOGICAL STUDIES IN MATHEMATICS (CPSM) ACHIEVEMENT-CUM-DIAGNOSTIC TEST IN MATHEMATICS - 2024

INSTRUCTION : Write your Name, Class, Roll No. etc. in the answersheet. Select the correct answer out of (a), (b), (c) and (d) of particular item and fill the specific rectangle ■ with blue/black ball pen denoting the correct answer. For example, if (c) is the correct answer to Q. No. X: blacken like this: Q. No. X: □□■□. Rough work is to be done on separate paper. Marks will be deducted for wrong answer. Don't waste time for answering a question which appears difficult to you, better try the next question.

1. What is the complement of $\frac{2}{5}$ of a right angle?
(a) 36° (b) 54° (c) 27° (d) 64°
2. The measures of three angles of an isosceles right angled triangle are
(a) $90^\circ, 45^\circ, 45^\circ$ (b) $90^\circ, 30^\circ, 30^\circ$
(c) $90^\circ, 60^\circ, 60^\circ$ (d) $90^\circ, 60^\circ, 30^\circ$
3. Fill in the blank. "In a right angled triangle the acute angles are _____"
(a) equal (b) Complementary
(c) Supplementary (d) none of these
4. In $\triangle ABC$, $\angle BAC = 84^\circ$, $\angle ABC = 5x^\circ$ and $\angle ACB = 3x^\circ$ find x.
(a) 16 (b) 24 (c) 10 (d) 12

Class-VII-(1)

5. The angle between the two diagonals of a quadrilateral is 90° , the quadrilateral is a
(a) rectangle (b) square
(c) parallelogram (d) isosceles trapezium
6. $\leftrightarrow \leftrightarrow$
AB \parallel CD, the transversal PQ intersects AB and CD at R and S respectively. A Straight line through S meets RB at T. If $\angle TRS = 115^\circ$ and $\angle RST : \angle TSD = 2:3$ find $\angle STB$.
(a) 65° (b) 39° (c) 141° (d) 115°
7. From a point inside an equilateral triangle the lengths of the perpendiculars on the sides are p, q and r respectively. The length of each side of the triangle is
(a) $\frac{2}{3}(p + q + r)$ (b) $\frac{2}{\sqrt{3}}(p + q + r)$
(c) $\frac{1}{6}(p + q + r)$ (d) $\frac{1}{3}(p + q + r)$
8. In the adjoining figure
 $\leftrightarrow \leftrightarrow$
AB \parallel DE, $\angle ABC = 122^\circ$
and $\angle CDE = 123^\circ$ Find $\angle BCD$
(a) 57° (b) 58°
(c) 65° (d) 115°



Class-VII-(2)

9. If two straight lines intersect such that the four vertical angles are equal, then each angle is

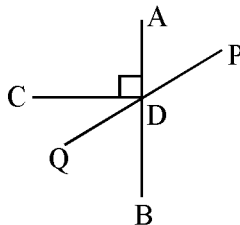
(a) 45° (b) 100° (c) 60° (d) 90°

10. In the adjoining figure

$$\angle ADC = 90^\circ, \angle CDQ = 37^\circ$$

Find $\angle PDB$

(a) 127° (b) 120°
(c) 143° (d) 133°



11. The supplement of five-sixth of a right angle is

(a) 15° (b) 115°
(c) 105° (d) 125°

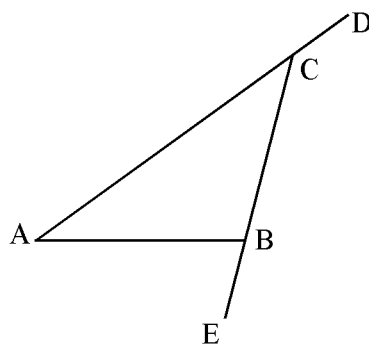
12. In the adjoining figure

$$\angle ABE = 4\theta, \angle CAB = 3\theta,$$

$$\angle ACB = \phi, \text{ and } \angle BCD = 11\theta$$

Find ϕ ,

(a) 45° (b) 60°
(c) 20° (d) 15°



13. The solid having ten plane surfaces is

(a) nonagon pyramid (b) nonagon prism
(c) octagonal pyramid (d) decagonal pyramid

Class-VII-(3)

14. A pyramid has 11 surfaces, the number of edges of the pyramid is

(a) 11 (b) 12 (c) 30 (d) 20

15. One side of a triangle is produced both ways and the measure of the exterior angles thus formed are 105° and 120° . The least angle of the triangle is

(a) 60° (b) 45° (c) 40° (d) 55°

16. The angle between the internal bisector and the external bisector of an angle is

(a) 45° (b) 60° (c) 90° (d) 180°

17. In $\triangle ABC$, $\angle A + \angle B = 135^\circ$ and $\angle B + \angle C = 120^\circ$, the measure of $\angle ABC$ is

(a) 90° (b) 65° (c) 60° (d) 75°

18. In $\triangle ABC$, $\angle ABC = 2\angle BAC$ and $\angle ACB = 3\angle BAC$, find the measure of the least angle of the triangle.

(a) 90° (b) 75° (c) 60° (d) 30°

19. The difference between the complementary and supplementary angles of an angle is

(a) 180° (b) 90° (c) 45° (d) 60°

Class-VII-(4)

20. In $\triangle ABC$, $\angle A : \angle B : \angle C = 1 : 2 : 3$, find $\angle B$
- (a) 30° (b) 45° (c) 60° (d) 90°
21. Factorize :
- $$x^2 + y^2 + yz + zx + 2xy$$
- (a) $(x + y)(x + y + z)$ (b) $(y + z)(x + y + z)$
- (c) $(z + x)(x + y + z)$ (d) $(x + y)(y + z)$
22. P is the third number of the series 188, 186, P, 174, 158, 126; The value of $\sqrt{P - 13}$ is
- (a) 14 (b) 12 (c) 13 (d) Non of these
23. $(-2ab^2)^0 =$
- (a) 0 (b) 1 (c) $-ab^2$ (d) ab^2
24. If $x = 2$ and $y = 3$, find $\frac{1}{x^x} + \frac{1}{y^y}$
- (a) $3\frac{15}{31}$ (b) 31 (c) $\frac{1}{31}$ (d) $\frac{31}{108}$
25. If $a = 3$, $b = 2$ and $c = 1$ then $\frac{a}{b} + \frac{b}{c} + \frac{c}{a} =$
- (a) 3 (b) $2\frac{5}{6}$ (c) $1\frac{5}{6}$ (d) 6

Class-VII-(5)

26. $p - [-q - \{-r - (p - \overline{q - r}) + p - q\}] =$
- (a) $p + q + r$ (b) $p + q - r$
- (c) $p - q - 2r$ (d) $p + q - 2r$
27. What should be subtracted from $a + b - c$ so that the difference will be $a + b + c$.
- (a) $2c$ (b) $-2c$
- (c) $-(a + b)$ (d) $2c$
28. If $x - \frac{1}{x} = 3$ then $\frac{x}{x^2 - x - 1} =$
- (a) 2 (b) $-\frac{1}{2}$ (c) $\frac{1}{2}$ (d) $\frac{1}{3}$
29. If $x + \frac{1}{x} = 3$ then $x^4 + \frac{1}{x^4} =$
- (a) 47 (b) 51 (c) 45 (d) 23
30. The sum of the present ages of x students of your class is 'a' years; after 2 years the sum of the ages of those students will be
- (a) $2(a + x)$ yrs. (b) $(a + ax)$ yrs.
- (c) $(a + x)$ yrs. (d) $(a + 2x)$ yrs.

Class-VII-(6)

31. $ab =$

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

(c) $\frac{(a+b)^2}{4} + \frac{(a-b)^2}{4}$ (d) $\frac{(a-b)^2}{4} - \frac{(a+b)^2}{4}$

32. The average of three numbers is x ; if the first number is a and the third number is $\frac{a}{2}$ then the second number is

(a) $3\left(x - \frac{a}{2}\right)$ (b) $3\left(x + \frac{a}{2}\right)$

(c) $3x - \frac{a}{2}$ (d) $3x + \frac{a}{2}$

33. Find x from the equation $\frac{x}{3} + \frac{3}{4} = \frac{x}{4} - \frac{4}{5}$

(a) -18 (b) $18\frac{3}{5}$ (c) 18 (d) $-18\frac{3}{5}$

34. If $a = b^2$, $b = c^3$ and $c = 2x^4$ then find a when $x = -1$

(a) 64 (b) -64 (c) 32 (d) 48

35. If $x + \frac{1}{x} = 5$, the value of $\frac{x}{1+x+x^2}$ is

(a) 1 (b) 6 (c) $\frac{1}{6}$ (d) $\frac{1}{3}$

Class-VII-(7)

36. Express $\left(a^2 - \frac{1}{b^2}\right)\left(b^2 - \frac{1}{a^2}\right)$ as a perfect square.

(a) $\left(ab + \frac{1}{ab}\right)^2$ (b) $\left(ab - \frac{1}{ab}\right)^2$

(c) $(ab - 1)^2$ (d) $\left(a^2b^2 - \frac{1}{a^2b^2}\right)^2$

37. If $(a+b)^2 = 64$ and $(a-b)^2 = 16$, find the value of ab .

(a) 20 (b) 8 (c) 16 (d) 12

38. For what value of t the expression $\frac{x^2}{y^2} + tx + \frac{y^2}{4}$ will be a perfect square?

(a) 4 (b) ± 2 (c) ± 1 (d) none of these

39. The sum of the ages of two boys is x years. What was the sum of their ages before y years?

(a) $(x - y)$ yrs. (b) $(x - 2y)$ yrs.

(c) $(x + 2y)$ yrs. (d) $(x + y)$ yrs.

40. If $a = 3K$ and $b = 2K$, find the value of $4a^2 - 12ab + 9b^2$

(a) $144K^2$ (b) K^2 (c) 0 (d) 1

Class-VII-(8)

41. The sum of the squares of two positive numbers is 601, if one of them be 5, then the other number is

- (a) 34 (b) 28 (c) 26 (d) 24

42. $1 \div [1 + 1 \div \{1 + 1 \div (1 + 1 \div \overline{1 + 1 \div 2})\}] =$

- (a) $\frac{8}{13}$ (b) $\frac{13}{8}$ (c) $\frac{4}{13}$ (d) $\frac{1}{13}$

43. The number nearest to 5000 which is exactly divisible by 24, 32, 36 and 48 is

- (a) 4808 (b) 5174
(c) 5184 (d) 4896

44. $2 \cdot 3\dot{7}\dot{5} + 0 \cdot 8\dot{1}7\dot{3} + 4 \cdot 31 =$

- (a) $7 \cdot 5023$ (b) $7 \cdot 50307489$
(c) $7 \cdot 50\dot{3}0748\dot{9}$ (d) $7 \cdot 50\dot{3}0\dot{7}$

45. Express $3\frac{7}{15}$ as a recurring decimal

- (a) $3 \cdot 46\dot{7}$ (b) $3 \cdot 4\dot{6}$
(c) $3 \cdot 4\dot{6}$ (d) $3 \cdot 4\dot{7}$

46. Find the simple interest at the end of $3\frac{1}{2}$ years at the rate of $8\frac{1}{3}\%$ on Rs. 6450.

- (a) Rs. 1881 (b) Rs. 1881.25
(c) Rs. 1880 (d) Rs. 8331.25

47. What sum will amount to Rs. 840 in 5 years at $6\frac{2}{3}\%$?

- (a) Rs. 650 (b) Rs. 600
(c) Rs. 720 (d) Rs. 630

48. The sum of the squares of two numbers is 601, if one of them is 5, find the other.

- (a) 24 (b) 26 (c) 28 (d) 18

49. The L.C.M. and H.C.F. of two fractions are $6\frac{2}{3}$ and $\frac{2}{9}$ respectively. If one fraction is $3\frac{1}{3}$ find the other

- (a) $\frac{2}{3}$ (b) $\frac{40}{27}$ (c) $\frac{4}{9}$ (d) $\frac{16}{9}$

50. One number is twice the other, the product of the numbers is 2048. The sum of those two numbers is

- (a) 96 (b) 64 (c) 128 (d) 108

51. The greatest number of five digits which is a perfect square is

- (a) 99225 (b) 99099
(c) 99956 (d) 99856

52. The unit digit of $(125)^5 + (346)^6$ is

- (a) 2 (b) 1 (c) 5 (d) 6

53. The unit digit of $11^2 + 121^3 + 1221^4 + 12221^5$ is

- (a) 1 (b) 5 (c) 4 (d) 3

54. Which is the greatest of the following.

$$4\frac{1}{2} \div 3\frac{1}{3}, 4\frac{1}{2} \times 3\frac{1}{3}, 4\frac{1}{2} - 3\frac{1}{3}, 4\frac{1}{2} + 3\frac{1}{3}$$

- (a) $4\frac{1}{2} \div 3\frac{1}{3}$ (b) $4\frac{1}{2} \times 3\frac{1}{3}$
(c) $4\frac{1}{2} - 3\frac{1}{3}$ (d) $4\frac{1}{2} + 3\frac{1}{3}$

55. Determine the difference between 2 metre square and 2 square metre.

- (a) no difference (b) 4 sq.m.
(c) 1 sq.m. (d) 2 sq.m.

Class-VII-(11)

56. The H.C.F. of two numbers is x and L.C.M. of those two numbers is y, if one of the numbers is z then the other is

- (a) $\frac{xy}{z}$ (b) $\frac{zx}{y}$ (c) $\frac{yz}{x}$ (d) xyz

57. Express 54 Km per hour in metres per second

- (a) 10 m/sec. (b) 7.5 m/sec.
(c) 15 m/sec. (d) 30m/sec.

58. Three years ago the average age of A and B was 18 years. With C joining them now the average age becomes 22 years. How old is C now?

- (a) 24 yrs. (b) 27 yrs. (c) 28 yrs. (d) 30 yrs.

59. Find the missing term of the series 1, 4, 27, 16, ?, 36.

- (a) 25 (b) 87 (c) 120 (d) 125

60. The ratio of two numbers is 3 : 5, but if each is increased by 10, the ratio becomes 5 : 7. The numbers are

- (a) 13, 22 (b) 15, 25 (c) 3, 5 (d) 30, 50

61. What percent of $\frac{2}{7}$ is $\frac{1}{35}$?

- (a) 5% (b) 10% (c) 20% (d) 15%

Class-VII-(12)

62. One litre of water is evaporated from 6 litres of a solution containing 5% salt. The percentage of salt in the remaining solution is

- (a) $4\frac{4}{9}\%$ (b) 5% (c) 6% (d) $5\frac{5}{7}\%$

63. How many numbers between 200 and 600 are divisible by 4, 5 and 6.

- (a) 8 (b) 7 (c) 6 (d) 5

64. When n is divided by 4, the remainder 3; What will be the remainder when $2n$ is divided by 4 ?

- (a) 3 (b) 2 (c) 1 (d) 0

65. The length of a rectangle is increased by 10% and its breadth is decreased by 10%. Then the area of the new rectangle is

- (a) neither increased nor decreased
(b) increased by 1%
(c) decreased by 1%
(d) decreased by 10%

66. If each side of a square is increased by 10%, find the increase percent in its area.

- (a) 10% (b) 20% (c) 19% (d) 21%

67. A six digit number is formed by repeating a three digit number, [for example 256256 or 679679 etc.] Any number of this form is always exactly divisible by

- (a) 7 only (b) 11 only (c) 13 only (d) 1001

68. The smallest number to be added to 1000 so that 45 divides the sum exactly is

- (a) 35 (b) 20 (c) 10 (d) 80

69. What is the unit's digit of the product of all prime numbers between 1 and 100?

- (a) 1 (b) 2 (c) 3 (d) 0

70. Consider the following statements :

The number 23 is

- A. a prime number.
B. a real number.
C. an irrational number
D. a rational number.

of these state ments :

- (a) A, B, D are correct (b) A, B, C are correct
(c) B, C, D are correct (d) A, C, D are correct.

71. Which of the following numbers is divisible by 15?

- (a) 30560 (b) 29515
(c) 17325 (d) 23755

72. The digit in the unit's place in the product $459 \times 46 \times 28* \times 484$ is 2. The digit to come in place of * is

- (a) 3 (b) 7 or 2 (c) 5 (d) 4 or 2

73. The least perfect square number which is divisible by 3, 4, 5, 6 and 8 is

- (a) 900 (b) 1600
(c) 2400 (d) 3600

74. What fraction of $\frac{4}{7}$ must be added to itself to make the sum $1\frac{1}{14}$?

- (a) $\frac{7}{8}$ (b) $\frac{4}{7}$ (c) $\frac{1}{2}$ (d) $\frac{15}{14}$

75. If $x = 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{2}}}}$, then $2x + \frac{7}{4} =$

- (a) 6 (b) 5 (c) 4 (d) 3

Class-VII-(15)

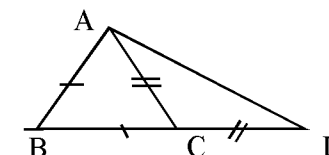
76. How many degrees are there in an angle which is equal to one-fifth of its supplement?

- (a) 15° (b) 30° (c) 75° (d) 150°

77. Two complementary angles are such that two times the measure of one is equal to three times the measure of the other. The measure of the larger angle is

- (a) 72° (b) 36° (c) 54° (d) 30°

78. In the adjoining figure
 $\angle ABC = 70^\circ$, find $\angle ADC$
[given $AB = BC$ and $AC = CD$]



- (a) 45° (b) 55° (c) 30° (d) 27.5°

79. If 8 men or 12 women can do a piece of work in 10 days then number of days required by 4 men and 4 women to finish the work is

- (a) 15 days (b) 12 days
(c) 10 days (d) 8 days.

80. A certain sum of money amounts to Rs. 756 in 2 years and to Rs. 873 in $3\frac{1}{2}$ years. What is the rate of interest per annum?

- (a) 12% (b) 15% (c) 13% (d) 11%

Class-VII-(16)