



Estd. 1861

BOYS' HIGH SCHOOL AND COLLEGE
FIRST TERM EXAMINATION (2024-25)
CLASS - IX
MATHEMATICS

Time: $2\frac{1}{2}$ hours

M.M: 80

SECTION - A

(Attempt all questions from this section)

Q1. Choose the correct answers to the questions from the given options: [15]

(i) Determine the number from the following which has a terminating decimal representation

- (a) $\frac{4}{13}$
- (b) $\frac{7}{6}$
- (c) $\frac{4}{5}$
- (d) $\frac{8}{13}$

(ii) If the number of conversion periods ≥ 2 , then the compound interest is

- (a) greater than or equal to simple interest
- (b) equal to simple interest
- (c) less than simple interest
- (d) greater than simple interest

(iii) The value of $\{2-3(-1)^3\}^3$ is

- (a) 5
- (b) 125
- (c) $\frac{1}{5}$
- (d) -125

(iv) $(a-b)^3 + (b-c)^3 + (c-a)^3$ is equal to

- (a) $2a^3 + 2b^3 + 2c^3$
- (b) $(a-b)(b-c)(c-a)$
- (c) 0
- (d) $3(a-b)(b-c)(c-a)$

(v) If $x + \frac{1}{x} = 5$, then $x^2 + \frac{1}{x^2} =$

- (a) 25
- (b) 10
- (c) 23
- (d) 27

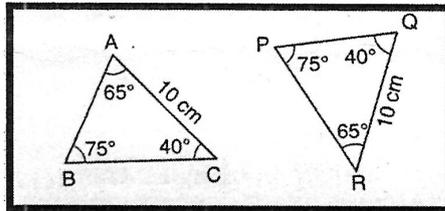
(vi) Simplify $\log_{10} 0.1$

- (a) -2
- (b) -1
- (c) 1
- (d) 0.1

(vii) In a ΔABC , if $\angle A = \angle B + \angle C$, then ΔABC is

- (a) an isosceles triangle
- (b) an equilateral triangle
- (c) right triangle
- (d) none of these

(viii) In the given figure, ΔABC and ΔPQR are shown. Which congruence criterion can be used to show that triangles are congruent?



- (a) SAS
- (b) SSS
- (c) ASA
- (d) AAA

(ix) Determine which of the following are the sides of a right-angled triangle

- (a) 7cm, 24cm, 25cm
- (b) 50cm, 80cm, 100cm
- (c) 8cm, 40cm, 41cm
- (d) 3cm, 5cm, 6cm

(x) D and E are the mid points of sides AB and AC respectively of ΔABC . If the perimeter of $\Delta ABC = 38$ cm. The perimeter of ΔADE is

- (a) 38cm
- (b) 19cm
- (c) 76cm
- (d) 9.5cm

(xi) Assertion(A): $\sqrt{3}$ is an irrational number.

Reason(R): The decimal expansion of $\sqrt{3}$ is non-terminating non-recurring.

- (a) A is true, R is false
- (b) A is false, R is true
- (c) Both A and R are true, and R is the correct reason for A
- (d) Both A and R are true, and R is the incorrect reason for A

(xii) A sum of money compounded annually doubles itself in 5 years. In how many years will it become four times of itself?

- (a) 10 years
- (b) 12 years



(c) 15 years

(d) 20 years

(xiii) A system of equations is:

$$2x - y = -2 \text{ and } \frac{1}{3}y = x.$$

Which pair of numbers is a solution of the given system?

(a) (0,2)

(c) (1,3)

(b) (2,6)

(d) (3,8)

(xiv) The factorization of $5x^2 - 9x - 2$ is

(a) $(5x-1)(x+2)$

(c) $(5x+1)(x-2)$

(b) $(5x-1)(x-2)$

(d) $(5x+1)(x+2)$

(xv) Which of the following is equivalent to $16^{-1/2}$?

(a) -8

(c) -4

(b) $\frac{1}{4}$

(d) $4^{-1/2}$

Question 2 :

(i) How much will ₹6000 amount to in 2 years at CI if the rates for successive years are 4% and 5%? [4]

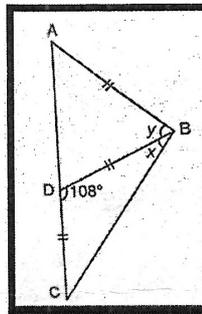
(ii) If $2x - 3y = 10$ and $xy = 10$, then find the value of $8x^3 - 27y^3$. [4]

(iii) Evaluate $\left(\frac{16}{81}\right)^{-3/4} \times \left(\frac{49}{9}\right)^{3/2} \div \left(\frac{343}{216}\right)^{2/3}$ [4]

Question 3 :

(i) Factorize: $x^4 - 81y^4$ [4]

(ii) Find the lettered angle in the given figure [4]



(iii) Solve for x, y: [5]

$$\frac{7}{x} + \frac{8}{y} = 2$$

$$\frac{2}{x} + \frac{12}{y} = 20$$

SECTION-B

(Attempt any four questions from this section)

Question 4

(i) If $a+b+c=6$ and $ab+bc+ca=11$, find $a^2+b^2+c^2$. [3]

(ii) Find the value of k: [3]

$$2^4 \times (0.5)^{-3} = 2^k$$

(iii) Find the value of the rational numbers a and b if [4]

$$\frac{3+\sqrt{2}}{3-\sqrt{2}} = a+b\sqrt{2}$$

Question 5 :

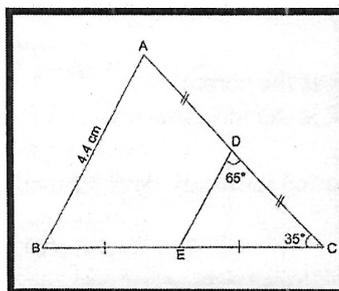
(i) Factorize: $1+125x^3$ [3]

(ii) Find the value of x: $\log_{16} 2 = x$ [3]

(iii) In $\triangle ABC$, D and E are the midpoints of AC and BC respectively. Find the values of [4]

(a) $\angle ABC$

(b) DE, if $AB=4.4\text{cm}$

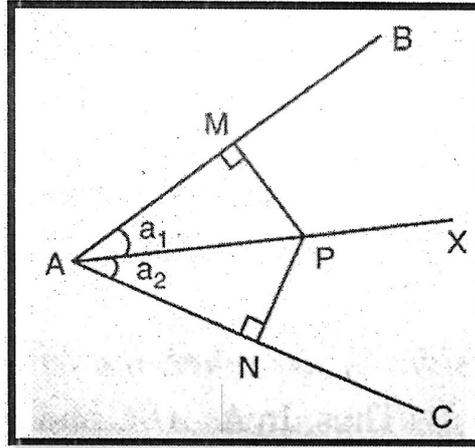


Question 6 :

- (i) Prove that: $\sqrt{x^{-1}y} \cdot \sqrt{y^{-1}z} \cdot \sqrt{z^{-1}x} = 1$ [3]
- (ii) Find the rate of compound interest on ₹4000 so that it can amount to ₹4,410 in 2 years. [3]
- (iii) If $a = \log 20$, $b = \log \frac{8}{3}$ and $c = 2 \log \frac{\sqrt{3}}{2}$ then [4]
 - (a) find $a-b-c$
 - (b) prove that $10^{a-b-c} = 10$

Question 7:

- (i) A fraction is such that when the denominator is increased by 1, it becomes $\frac{1}{2}$ and when the numerator is decreased by 2, it becomes $\frac{1}{3}$. Find the fraction. [5]
- (ii) AX is the bisector of $\angle BAC$; P is any point on AX. Prove that the perpendiculars drawn from P to AB and AC are equal. [5]



Question 8 :

- (i) A ladder, 17 feet long, touches a wall at a height of 15 feet from the ground. How far is the foot of the ladder from the wall? [3]
- (ii) Express as a single logarithm: [3]

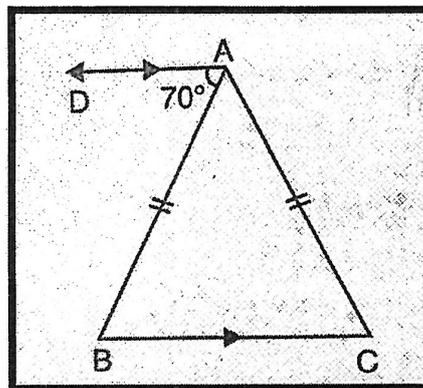
$$2 \log 3 - \frac{1}{2} \log 16 + \log 12$$
- (iii) The present value of a scooter is ₹7290. If its value decreases every year by 10%, then what was its value 3 years ago? [4]

Question 9 :

- (i) Express $0.\bar{8}$ as rational number. [3]
- (ii) Simplify: $(3x+5y)^2 + (3x-5y)^2$ [3]
- (iii) Simplify: $(\sqrt{11}+\sqrt{3})^{1/3} (\sqrt{11}-\sqrt{3})^{1/3}$ [4]

Question 10 :

- (i) In how many years will a sum of ₹1,200 amount to ₹1,323 at the compound interest rate of 5% p.a.? [3]
- (ii) In the given figure, $AB=AC$, DA is parallel to BC and $\angle DAB=70^\circ$. Find $\angle BAC$. [3]



- (iii) If $x+y=7$ and $x-y=3$, evaluate [4]
 - (a) xy
 - (b) x^2+y^2
