CLASS : IX 9/2012

SUBJECT : MATHEMATICS (SET-I)

Time : 3 Hrs. **M.M.: 90**

General Instructions :

1. ***All questions are compulsory.***
2. ***The question paper consists of 34 questions divided into four sections A, B, C and D. Section-A comprises of 8 questions of 1 mark each; Section-B comprises of 6 questions of 2 marks each; Section-C comprises of 10 questions of 3 marks each and Section-D comprises of 10 questions of 4 marks each.***
3. ***Question numbers 1 to 8 in Section-A are multiple choices questions where you are required to select one correct option out of the given four.***
4. ***There is no overall choice. However, internal choice have been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four marks each. You have to attempt only one of the alternatives in all such questions.***
5. ***Use of calculator is not permitted.***

SECTION-A

Question numbers 1 to 8 carry one mark each. For each question, four alternative choices have been provided of which only one is correct. You have to select the correct choice.

Q1. The value of $(121)^{\frac{1}{3}} \times (11)^{\frac{1}{3}}$ is equal to : (1)

(a) 121 (b) 1331

(c) 11 (d) $\frac{1}{11}$

Q2. If $x^{11} + 101$ is divided by $x + 1$, the remainder is : (1)

(a) -1 (b) 102

(c) 0 (d) 100

Q3. In the polynomial $1 - \sqrt{11}x$, the coefficient of x is : (1)

(a) 1 (b) 11

(c) $-\sqrt{11}$ (d) $\sqrt{11}$

Q4. The factors of $a^7 + ab^6$ are : (1)

(a) $a, (a^6 + b^6)$ (b) $b, (a^6 + b^6)$

(c) $a^6, (a + b)$ (d) $b^6, (a + b)$

Q5. An exterior angle of a triangle is 105° and its two interior opposite angles are equal. Each of these equal angles is : (1)

(a) $37\frac{1^\circ}{2}$ (b) $52\frac{1^\circ}{2}$

(c) $72\frac{1^\circ}{2}$ (d) 75°

Q6. If r, s, t are the sides of a triangle, then which is true? (1)

(a) r = s + t (b) r - s > t

(c) r + s > t (d) t > r + s

Q7. The point whose ordinate is -3 and which lies on y-axis is : (1)

(a) (-3, 0) (b) (0, -3)

(c) (3, -3) (d) (-3, 3)

Q8. The point whose abscissa and ordinate have different signs will lie in : (1)

(a) I and II Quadrants (b) II and III Quadrants

(c) I and III Quadrants (d) II and IV Quadrants

SECTION-B

Question numbers 9 to 14 carry two marks each.

Q9. Write in simplest form : $8\sqrt{45} + 2\sqrt{50} - 3\sqrt{147}$ (2)

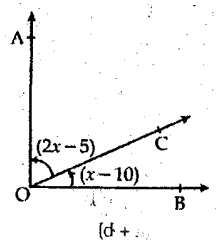
Q10. Without calculating the cubes, find the value of $(-11)^3 + (8)^3 + (3)^3$ (2)

Q11. Find the value of k, if $x + 2$ is a factor of $3x^2 + kx + 6$. (2)

Q12. If a point C lies between two points A and B such that AC = BC, then prove that

$AC = \frac{1}{2} AB$. (2)

Q13. In figure AO ⊥ OB. Find ∠AOC and ∠BOC. (2)

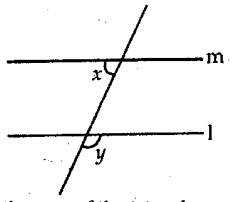


(d +

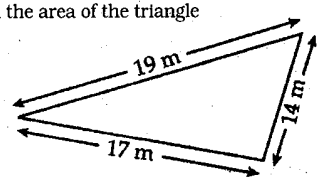
OR

(D-2)

In the given figure $x = 70°$ and $y = 120°$ check whether $l \parallel m$? Give reason. (2)



Q14. Find the area of the triangle (2)



SECTION-C

Question numbers 15 to 24 carry three marks each.

Q15. Represent $\sqrt{2}$ on the number line. (3)

Q16. Find four rational numbers between $\frac{1}{5}$ and $\frac{1}{6}$. (3)

OR

Simplify : $\left(\frac{81}{16}\right)^{\frac{-3}{4}} \times \left(\frac{25}{9}\right)^{\frac{-3}{2}} \times \left(\frac{2}{5}\right)^{-3}$ (3)

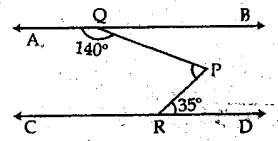
Q17. Factorise : $27x^3 + y^3 + z^3 - 9xyz$ (3)

OR

Rationalise the denominator of $\frac{1}{7 - 4\sqrt{3}}$ and find the value if $\sqrt{3} = 1.73$. (3)

Q18. If $f(x) = 3x^3 - 5x^2 + 7x - 11$, is $f(0) + f(1) = f(2)$? (3)

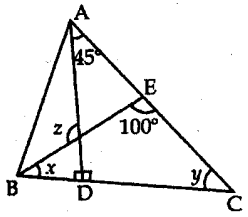
Q19. In the given figure, AB ∥ CD, ∠AQP = 140°, ∠PRD = 35°. Find ∠QPR and reflex ∠QPR. (3)



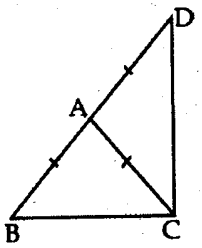
OR

(D-3)

In the given figure, AD ⊥ BC, ∠BEC = 100°, ∠DAC = 45°. Find the value of *x*, y and z. (3)

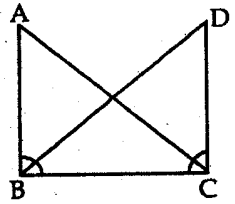


Q20. In the given figure, AB = AC and AB = AD. Prove that ∠BCD = 90°. (3)

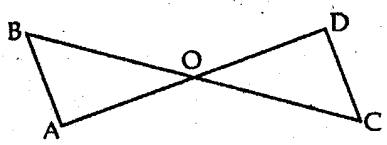


Q21. In the given figure AB = CD and ∠ABC = ∠DCB. Prove that : (3)

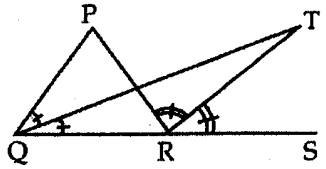
(i) ΔABC ≅ ΔDCB (ii) AC = DB



Q22. In the given figure, ∠B < ∠A and ∠C < ∠D. Show that AD < BC (3)



Q23. In the given figure, the side QR of a triangle PQR is produced to a point S. If the bisectors of ∠PQR and ∠PRS meet at a point T, prove that ∠QTR = $\frac{1}{2}$ ∠QPR. (3)



Q24. ΔABC is an isosceles triangle with AB = AC. The perimeter of the triangle is 36 cm and AB = 10 cm. What is the area of the triangle? (3)

SECTION-D

Q25. Express $1.\overline{32} + 0.\overline{35}$ in the form p/q where p and q are integers and q ≠ 0. (4)

OR

Find a and b if : $\frac{\sqrt{7}-1}{\sqrt{7}+1} - \frac{\sqrt{7}+1}{\sqrt{7}-1} = a + b\sqrt{7}$ (4)

Q26. Evaluate : $\frac{\left(\frac{9}{4}\right)^{-3/2} \times \left(\frac{125}{27}\right)^{-2/3} \times \left(\frac{3}{5}\right)^{-2}}{\left(\sqrt{2}\right)^{4}}$ (4)

Q27. By using factor theorem, factorise $x^3 + 13x^2 + 32x + 20$. (4)

Q28. If the polynomial $bz^3 + 4z^2 + 3z - 4$ and $z^3 - 4z + b$ leave the same remainder when divided by z - 3, find the value of b. (4)

Q29. Verify $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$. Hence, factorise $216x^3 - 125y^3$. (4)

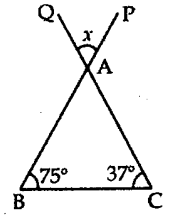
Q30. Plot the following points on the graph : (4)

Point	A	B	C	D	E	F
x	1	0	-2	-3	-3	5
y	-7	-5	0	-4	2	3

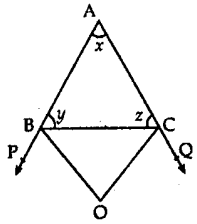
Write the points which lie on *x*-axis and y-axis.

Q31. (i) If two lines intersect each other prove that the vertically opposite angles are equal.

(ii) Using above, find the value of x in the given figure. (4)



Q32. The sides AB and AC of ΔABC are produced to points P and Q respectively. If bisectors BO and CO of $\angle CBP$ and $\angle BCQ$ respectively meet at point O then prove that $\angle BOC = 90° - \frac{1}{2}x$. (4)

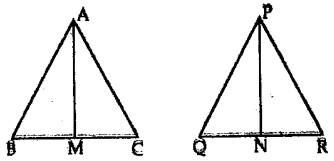


Q33. Prove that the angles of opposite to equal sides of a triangle are equal. (4)

OR

In the given figure two sides AB and AC and median AM of one triangle ABC are respectively equal to the sides PQ and QR and median PN of triangle PQR. Show that:

(i) $\Delta ABM \cong \Delta PQN$ (ii) $\Delta ABC \cong \Delta PQR$



Q34. Prove that two triangles are congruent, if any two angles and the included side of one triangle are equal to two angles and the included side of other triangle. (4)