CLASS : IX 9/2012

SUBJECT : MATHEMATICS (SET-II)

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 choice questions where you are required to select one correct option out of the given four.***
4. ***There is no overall choice. However, internal choices 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. $(a + \sqrt{b})(a - \sqrt{b})$ is equal to : (1)

(a) $b^2 - a^2$ (b) $a^2 - b^2$

(c) $a^2 - b$ (d) $b^2 - a$

Q2. If $a + b + c = 0$, then $a^3 + b^3 + c^3$ is : (1)

(a) 0 (b) abc

(c) 2abc (d) 3abc

Q3. If $p(x) = 3x^3 - 2x^2 - x + 4$ then $p(-1)$ is equal to : (1)

(a) -2 (b) 4

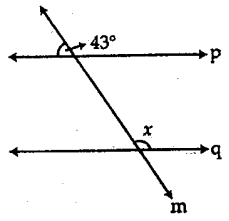
(c) 0 (d) 6

Q4. $\left(\sqrt{2} + \frac{1}{\sqrt{2}}\right)^2$ is equal to : (1)

(a) $4\sqrt{2}$ (b) $\frac{9}{2}$

(c) $\frac{4}{\sqrt{2}}$ (d) 9

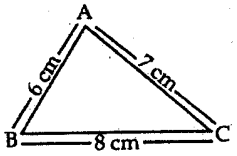
Q5. If p ∥ q then x is : (1)



(a) 137° (b) 117°

(c) 43° (d) 47°

Q6. In ΔABC : (1)



(a) ∠C > ∠B (b) ∠B < ∠A

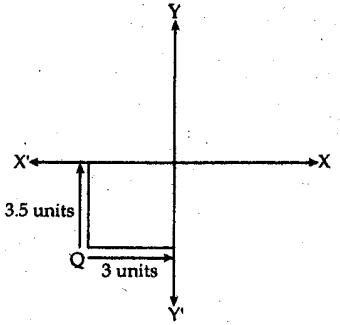
(c) ∠C > ∠A (d) ∠B > ∠A

Q7. If a point is on negative side of y-axis at a distance of 3 units from origin then, the co-ordinates of the point are : (1)

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

(c) (3, 0) (d) (-3, 0)

Q8. The co-ordinates of point Q are : (1)



(a) (3, 3.5) (b) (-3.5, -3)

(c) (-3, 3.5) (d) (-3, -3.5)

SECTION-B

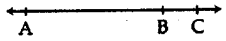
Question numbers 9 to 14 carry two marks each.

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

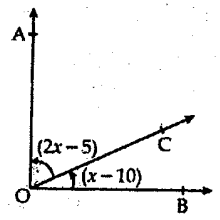
Q10. Find the value of k, such that $x - 1$ is a factor of $5x^3 + 4x^2 - 6x + 2k$. (2)

Q11. Find the value of the polynomial $x^2 - 9$ for $x = 97$. (2)

Q12. In the figure, A, B and C are three points on a line and B lies between A and C, then prove that AB + BC = AC. (2)

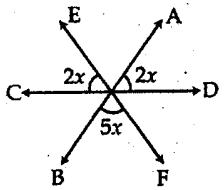


Q13. In figure, AO ⊥ OB. Find ∠AOC and ∠BOC. (2)



OR

In the given figure, AB, CD and EF are three lines concurrent at O. Find the value of x. (2)



Q14. Find the area of a triangle whose sides are 16 cm, 14 cm and 10 cm. (2)

SECTION-C

Question numbers 15 to 24 carry three marks each.

Q15. Simplify : $\left[5^2\left(8^{1/3} + 27^{1/3}\right)^3\right]^{1/5}$ (3)

OR

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

Q16. Rationalise the denominator of $\frac{1}{7-4\sqrt{3}}$ and find the value if $\sqrt{3} = 1.73$. (3)

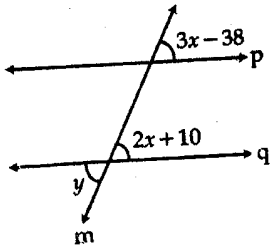
Q17. If $2x - 1$ is a factor of $4x^3 - 16x^2 + 10x + k$ then find the value of k. (3)

OR

Factorise : $64a^3 - 27b^3 - 144a^2b + 108ab^2$ (3)

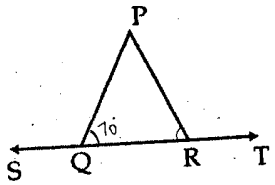
Q18. If $f(x) = 3x^3 - 5x^2 + 7x - 11$, is $f(0) + f(1) = f(2)$? (3)

Q19. What is the value of y, if p and q are parallel to each other. (3)

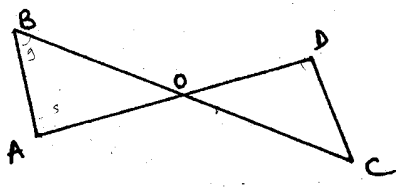


OR

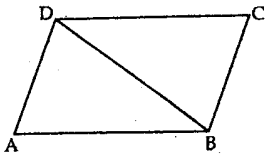
In the given figure, $\angle PQR = \angle PRQ$, then prove that $\angle PQS = \angle PRT$. Also find $\angle P$ if $\angle PQR = 70°$. (3)



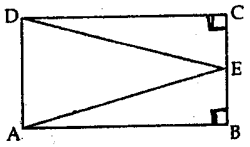
Q20. In the given figure, $\angle B < \angle A$ and $\angle C < \angle D$. Show that AD < BC. (3)



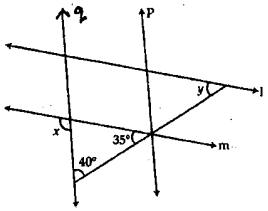
Q21. In the given figure AB = CD, $\angle ABD = \angle CDB$. Prove that AD = CB. (3)



Q22. In a rectangle ABCD, E is a point which bisects BC. Prove that AE = ED. (3)



Q23. In the figure, find x and y if $l \parallel m$, $p \parallel q$. (3)



Q24. Find the area of the quadrilateral ABCD, where AB = 7 cm, BC = 6 cm, CD = 12 cm, DA = 15 cm and AC = 9 cm. (3)

SECTION-D

Q25. Find a and b if : $\frac{\sqrt{7}-1}{\sqrt{7}+1} - \frac{\sqrt{7}+1}{\sqrt{7}-1} = a + b\sqrt{7}$ (4)

OR

Express $1.\overline{32} + 0.\overline{35}$ in the form p/q where p and q are integers and $q \neq 0$. (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. Factorise : $2x^3 - x^2 - 13x - 6$ (use factor theorem). (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)

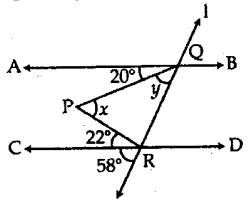
Q29. Verify $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$. Hence, factorise $216x^3 - 125y^3$. (4)

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. In the given figure, find the value of x and y if AB || CD. (4)

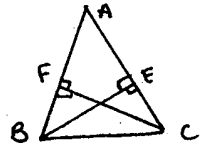


Q32. Prove that two triangles are congruent, if any two angles and the included side of one triangle are equal to two angles and the included side of other triangle. (4)

Q33. ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal. Show that : (4)

(i) $\Delta ABE \cong \Delta ACF$

(ii) AB = AC



OR

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

Q34. 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)