Tarrana IX-F
39

DELHI PUBLIC SCHOOL, CHANDIGARH

Summative Assessment-I (2011-12)

Class-IX
MATHEMATICS

2

TIME : 3 Hrs **Maximum Marks : 90**

General Instructions:

(i) All questions are compulsory.
(ii) 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.
(iii) Question numbers 1 to 8 in section-A are multiple choice questions where you are to select one correct option out of the given four.
(iv) 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.
(v) Use of calculator is not permitted.

SECTION - A

Question numbers 1 to 8 carry one mark each.

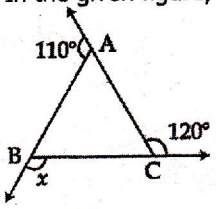
1. What is the remainder when $x^3 - 2x^2 + x + 1$ is divided by $(x - 1)$?
(A) 0 (B) –1 (C) 1 (D) 2

2. The value of $\frac{2^0 + 7^0}{5^0}$ is
(A) 2 (B) 0 (C) $\frac{9}{5}$ (D) $\frac{1}{5}$

3. $\frac{p}{q}$ form of the number $0.\overline{3}$ is
(A) $\frac{3}{10}$ (B) $\frac{3}{100}$ (C) $\frac{1}{3}$ (D) $\frac{1}{2}$

4. The area of an equilateral triangle is $16\sqrt{3}m^2$. Its perimeter (in metres) is
(A) 12 (B) 48 (C) 24 (D) 306

5. In the given figure, the value of x is



(A) 120° (B) 130° (C) 110° (D) 100°

6. Area of an isosceles right triangle is 8 cm^2. Its hypotenuse is

(A) $\sqrt{32}$ cm (B) 4 cm (C) $4\sqrt{3}$ cm (D) $2\sqrt{6}$ cm

7. If a polynomial f(x) is divided by x – a, then remainder is

(A) f(0) (B) f(a) (C) f(–a) (D) f(a) – f(0)

8. If ΔABC is congruent to ΔDEF by SSS congruence rule, then

(A) $\angle C < \angle F$ (B) $\angle B < \angle E$

(C) $\angle A < \angle D$ (D) $\angle A = \angle D, \angle B = \angle E, \angle C = \angle F$

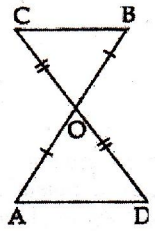
SECTION – B

Question numbers 9 to 14 carry two marks each.

9. In the figure, OA = OB and OD = OC. Show that

(i) $\Delta AOD \cong \Delta BOC$

(ii) AD || BC



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

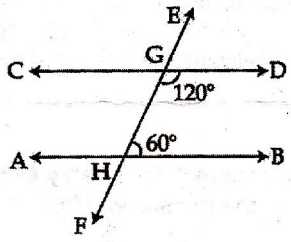
11. Plot the point P (2, –6) on a graph paper and from it draw PM and PN perpendiculars to x-axis and y-axis, respectively. Write the coordinates of the points M and N.

12. Simplify: $(\sqrt{3}+2)(\sqrt{3}-2)$

13. In ΔPQR, $\angle P = 70°$, $\angle Q = 30°$. Which side of this triangle is the longest? Give reason for your answer.

OR

In the given figure, is AB || CD? Justify your answer.

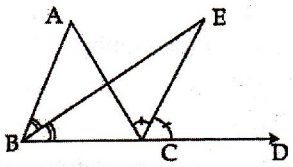


14. If (x – 1) is a factor of the polynomial $p(x) = 3x^4 - 4x^3 - ax + 2$ then find the value of 'a'?

SECTION-C

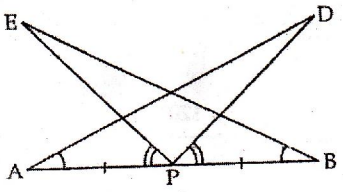
Question number 15 to 24 carry three marks each.

15. In the given figure, ABC is a triangle with BC produced to D. Also bisectors of $\angle ABC$ and $\angle ACD$ meet at E. Show that $\angle BEC = \frac{1}{2}\angle BAC$.



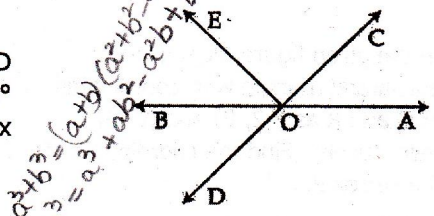
16. The degree measure of three angles of a triangle are x, y and z. If $z = \frac{x+y}{2}$ then find the value of z.

17. AB is a line segment and P is its mid-point. D and E are points on the same side of AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$. Show that $\Delta DAP \cong \Delta EBP$.



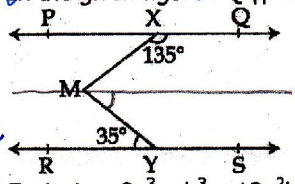
18. Simplify: $3\sqrt{45} - \sqrt{125} + \sqrt{200} - \sqrt{50}$

19. In the given figure, lines AB and CD intersect at O. If $\angle AOE + \angle BOE = 70°$ and $\angle BOD = 40°$, find $\angle BOE$ and reflex $\angle EOC$.



OR

In the given figure PQ || RS, $\angle MXQ = 135°$ and $\angle MYR = 35°$. Find $\angle XMY$.



20. Factorise: $8a^3 - b^3 - 12a^2b + 6ab^2$

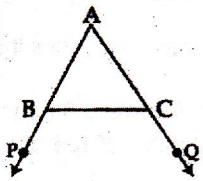
21. *Represent $\sqrt{2}$ on the number line.*

OR

Express $18.\overline{48}$ in the form of $\frac{p}{q}$ where p and q are integers, $q \neq 0$.

22. Manisha has a garden in the shape of a rhombus. The perimeter of the garden is 40m and its diagonal is 16m. She wants to divide it into two equal parts and use these parts in rotation. Find the area of each part of the garden.

23. In the given figure, sides AB and AC of ΔABC are extended to points P and Q respectively. Also $\angle PBC < \angle QCB$. Show that AC > AB.



24. If $x + \frac{1}{x} = 7$, then find the value of $x^3 + \frac{1}{x^3}$

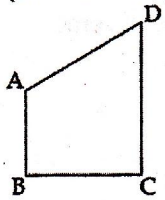
OR

Factorise: $x^3 - 3x^2 - 10x + 24$

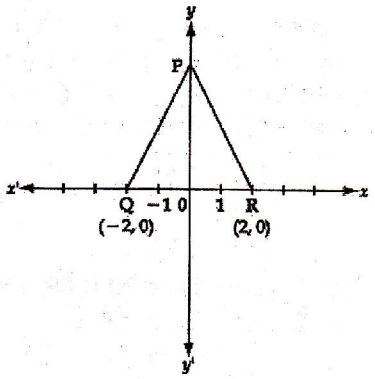
SECTION–D

Question numbers 25 to 34 carry four marks each.

25. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD (as shown in figure below). Show that $\angle A > \angle C$.



26. In the given figure, PQR is an equilateral triangle with coordinates of Q and R as (–2, 0) and (2, 0) respectively. Find the coordinates of the vertex P.



27. Rationalise the denominator of $\frac{4}{2+\sqrt{3}+\sqrt{7}}$

OR

Simplify:- $\frac{1}{\sqrt{3}+\sqrt{2}}+\frac{1}{\sqrt{5}-\sqrt{3}}-\frac{2}{\sqrt{3}-\sqrt{2}}$

28. If $ax^3 + bx^2 + x - 6$ has $x + 2$ as a factor and leaves remainder 4 when divided by $x - 2$, find the values of a and b.

29. Prove that the sum of angles of a triangle is 180°.

30. (i) Expand $\left(\frac{1}{4}a-\frac{1}{2}b+1\right)^2$

(ii) Evaluate $(102)^3$, using suitable identity.

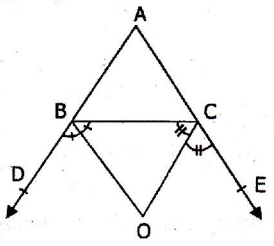
OR

Factorise: $a^3 - b^3 + 1 + 3ab$.

31. Find the rational numbers 'a' and 'b': $\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a+b\sqrt{3}$

32. Prove that if two lines intersect each other, then the vertically opposite angles are equal.

33. In the following figure, the sides AB and AC of ΔABC are produced to D and E respectively. If the bisectors of $\angle CBD$ and $\angle BCE$ meet at O, then show that $\angle BOC = 90° - \frac{1}{2}\angle A$.



34. If –4 is a zero of the polynomial $p(x) = x^3 - x^2 - 14x + 24$, find the other zeros.