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SAMPLE PAPER 01 FOR PERIODIC TEST 02 (2025-26)

(Quadratic Equations, AP, Triangles and Coordinate Geometry)

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

CLASS : X **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.

(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.

(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

(iv). There is no overall choice.

(v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. If (a, b) is the mid point of the line segment joining the points A (10, –6) and B (k, 4) and a – 2b = 18, the values of k is

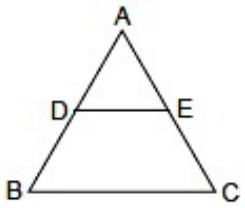
(a) 30 (b) 22 (c) 4 (d) 40

2. Which of the following equations has no real roots ?

(a) $x^2 - 4x + 3\sqrt{2} = 0$ (b) $x^2 + 4x - 3\sqrt{2} = 0$

(c) $x^2 - 4x - 3\sqrt{2} = 0$ (d) $3x^2 + 4\sqrt{3}x + 4 = 0$

3. In the given figure, $\frac{AD}{BD} = \frac{AE}{EC}$ and ∠ADE = 70°, ∠BAC = 50°, then angle ∠BCA =



(a) 70° (b) 50° (c) 80° (d) 60°

4. Which of the following are the roots of the quadratic equation, $x^2 - 9x + 20 = 0$?

(a) 3, 4 (b) 4, 5 (c) 5, 6 (d) 6, 7

5. If p – 1, p + 3, 3p – 1 are in AP, then p is equal to _____.

(a) 3 (b) 4 (c) 2 (d) none of these

6. If the distance between the points (4, p) and (1, 0) is 5 units, then the value of p is

(a) 4 only (b) ± 4 (c) –4 only (d) 0

7. If the 2nd term of an AP is 13 and the 5th term is 25, what is its 7th term?

(a) 30 (b) 33 (c) 37 (d) 38

8. If in two triangles ABC and PQR, $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$, then

(a) ΔPQR ~ ΔCAB (b) ΔPQR ~ ΔABC (c) ΔCBA ~ ΔPQR (d) ΔBCA ~ ΔPQR

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

9. **Assertion (A) :** The value of $k = 2$, if one root of the quadratic equation $6x^2 - x - k = 0$ is 2/3.
Reason (R) : The quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ has two roots.

10. **Assertion (A):** The value of n, if a = 10, d = 5, an = 95 is 20
Reason (R): The formula of general term an is an = a + (n - 1)d.

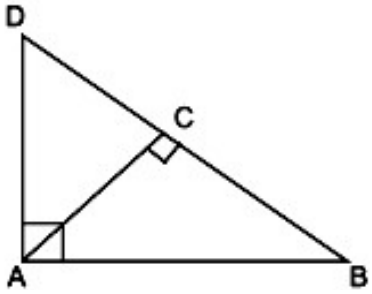
SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Find the point on x-axis which is equidistant from the points (2, – 5) and (–2, 9).

12. Solve the quadratic equation: $x^2 + 2\sqrt{2}x - 6 = 0$ for x.

13. In figure, ΔABD is a right triangle, right angled at A and AC ⊥ BD. Prove that $AB^2 = BC.BD$.



14. Find the value of 'k' for which the quadratic equation $2kx^2 - 40x + 25 = 0$ has real and equal roots.

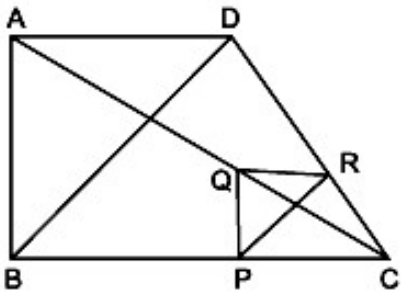
SECTION – C

Questions 15 to 17 carry 3 marks each.

15. If α and β are roots of the quadratic equation $x^2 - 7x + 10 = 0$, find the quadratic equation whose roots are α^2 and β^2.

16. Find the value of the middle term of the following AP: –6, –2, 2, ..., 58.

17. In figure, two triangles ABC and DBC lie on the same side of base BC. P is a point on BC such that PQ || BA and PR || BD. Prove that QR || AD.

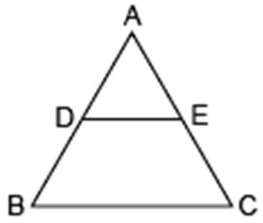


SECTION – D

Questions 18 carry 5 marks.

18. If a line is drawn parallel to one side of a triangle, the other two sides are divided in the same ratio, prove it. Use this result to prove the following :

In figure, D and E are points on AB and AC respectively, such that DE || BC. If AD = $\frac{1}{3}$ BD, AE = 4.5 cm, find EC.



SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. In the month of April to June 2022, the exports of passenger cars from India increased by 26% in the corresponding quarter of 2021–22, as per a report. A car manufacturing company planned to produce 1800 cars in 4th year and 2600 cars in 8th year. Assuming that the production increases uniformly by a fixed number every year.

Based on the above information answer the following questions.

(i) Find the production in the 1st year. (1)

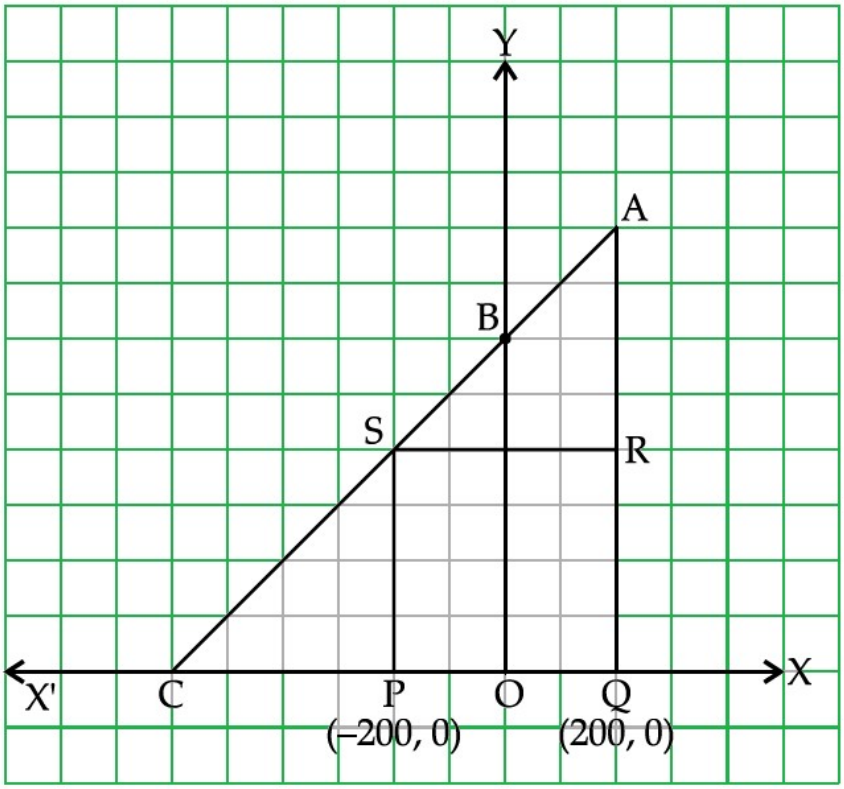
(ii) Find the production in the 12th year. (1)

(iii) Find the total production in first 10 years. (2)

OR

(iii) In how many years will the total production reach 31200 cars? (2)

20. Jagdhish has a field which is in the shape of a right angled triangle AQC. He wants to leave a space in the form of a square PQRS inside the field from growing wheat and the remaining for growing vegetables (as shown in the figure). In the field, there is a pole marked as O.



Based on the above information, answer the following questions:

(i) Taking O as origin, coordinates of P are (–200, 0) and of Q are (200, 0). PQRS being a square, what are the coordinates of R and S?

(ii) (a) What is the area of square PQRS ?

OR

(b) What is the length of diagonal PR in square PQRS?

(iii) If S divides CA in the ratio K : 1, what is the value of K, where point A is (200, 800) ?