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SAMPLE PAPER 01 FOR PERIODIC TEST II EXAM (2019-20)

SUBJECT: MATHEMATICS **MAX. MARKS : 80**

CLASS : X **DURATION : 3 HRS**

General Instructions:

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

(ii). This question paper contains 4**0** questions divided into four Sections A, B, C and D.

(iii). **Section A** comprises of 20 questions of **1 mark** each. **Section B** comprises of 6 questions of **2 marks** each. **Section C** comprises of 8 questions of **3 marks** each and **Section D** comprises of 6 questions of **4 marks** each.

(iv). There is no overall choice. However, an internal choice has been provided in two questions of 2 marks each, two questions of 3 marks each and two questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.

(v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 20 carry 1 mark each.

1. The angle of elevation of the top of a tower from a point on the ground, which is 20m away from the foot of the tower is 60^0. Find the height of the tower.

(a) $10\sqrt{3}$ m (b) $30\sqrt{3}$ m (c) $20\sqrt{3}$ m (d) none of these

2. If cos A = $\frac{24}{25}$, then the value of sinA is

(a) $\frac{7}{25}$ (b) $\frac{24}{25}$ (c) 1 (d) none of the these

3. The distance of A(5, –12) from the origin is

(a) 12 (b) 11 (c) 13 (d) 10

4. The areas of two similar triangles are in respectively 9 cm^2 and 16 cm^2. The ratio of their corresponding sides is

(a) 2 : 3 (b) 3 : 4 (c) 4 : 3 (d) 4 : 5

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

(a) 4 (b) – 4 (c) 2 (d) – 2

6. Which term of the AP 72, 63, 54, ……. is 0?

(a) 8th (b) 9th (c) 11^{th} (d) 12th

7. Euclid's division lemma state that for any positive integers a and b, there exist unique integers q and r such that a = bq + r where r must satisfy

(a) $1 < r < b$ *(b)* $0 < r \le b$ *(c)* $0 \le r < b$ *(d)* $0 < r < b$

8. Which of the following is not a quadratic equation?

(a) $x - \frac{3}{x} = 4$ (b) $3x - \frac{5}{x} = x^2$ (c) $x + \frac{1}{x} = 3$ (d) $x^2 - 3 = 4x^2 - 4x$

9. The value of c for which the pair of equations cx – y = 2 and 6x – 2y = 4 will have infinitely many solutions is

(a) 3 (b) – 3 (c) – 12 (d) no value

10. If α,β are the zeroes of the polynomials $f(x) = x^2 + 5x + 8$, then $\alpha \cdot \beta$

(a) 0 (b) 1 (c) –5 (d) 8

11. If the sum of the zeroes of the polynomial $f(x) = 2x^3 – 3kx^2 + 4x – 5$ is 6, then find the value value of k.

12. What is the HCF of smallest prime number and the smallest composite number ?

13. State Euclid's division lemma

14. Find the value of k for which the system of equations $x – 2y = 3$ and $3x + ky = 1$ has a unique solution.

15. If $\Delta ABC \sim \Delta PQR$, BC = 8 cm and QR = 6 cm, find the ratio of the areas of Δ ABC and Δ PQR.

16. If LCM (480, 672) = 3360, find HCF (480,672).

17. If 2x, x + 10, 3x + 2 are in A.P., find the value of x.

18. If the distance between the points (8, p) and (4, 3) is 5 then find the value of p.

19. In triangles ABC and DEF, $\angle A = \angle E = 40^0$, AB : ED = AC : EF and $\angle F = 65^0$, then find $\angle B$

20. If $\sin A = \frac{1}{2}$, find the value of $\frac{2\sec A}{1 + \tan^2 A}$.

SECTION – B

Questions 21 to 26 carry 2 marks each.

21. Using Euclid's division algorithm, find the HCF of 2160 and 3520.

OR

Given that $\sqrt{2}$ is irrational, prove that $(5 + 3\sqrt{2})$ is an irrational number.

22. If $\sec A + \tan A = m$ and $\sec A – \tan A = n$, find the value of $\sqrt{mn}$.

OR

If A and B are angles of right angled triangle ABC, right angled at C, prove that

$\sin^2 A + \sin^2 B = 1$

23. Find the sum of first 8 multiples of 3.

24. Which term of the AP 21, 42, 63, 84, ... is 420?

25. If the point (0, 2) is equidistant from the points (3, k) and (k, 5), find the value of k.

26. Find the value of *k* if the points A(2, 3), B(4, *k*) and C(6, –3) are collinear.

SECTION – C

Questions 27 to 34 carry 3 marks each.

27. Find the quotient and remainder when $4x^3 + 2x^2 + 5x – 6$ is divided by $2x^2 + 3x + 1$.

28. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of 'm' for which $y = mx + 3$.

29. Show that the square of an odd positive integer can be of the form $6q + 1$ or $6q + 3$ for some integer q.

30. If (1, 2), (4, y), (x, 6) and (3, 5) are the vertices of a parallelogram taken in order, find x and y.

OR

Find the ratio in which the line segment joining the points (– 3, 10) and (6, – 8) is divided by (– 1, 6).

31. If the sum of the first 14 terms of an AP is 1050 and its first term is 10, find the 20th term.

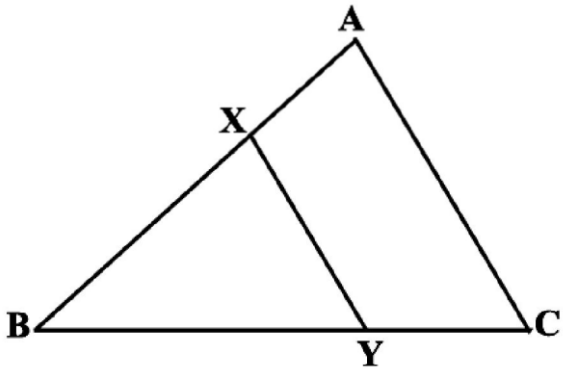
OR

A sum of Rs 700 is to be used to give seven cash prizes to students of a school for their overall academic performance. If each prize is Rs 20 less than its preceding prize, find the value of each of the prizes.

32. Find the roots of the equation $5x^2 - 6x - 2 = 0$, by using quadratic formula.

33. Prove that: $\frac{1}{\text{cosec}A - \cot A} - \frac{1}{\sin A} = \frac{1}{\sin A} - \frac{1}{\text{cosec}A + \cot A}$.

34. In the below figure, the line segment XY is parallel to side AC of Δ ABC and it divides the triangle into two parts of equal areas. Find the ratio $\frac{AX}{AB}$.



SECTION – D

Questions 35 to 40 carry 4 marks each.

35. Prove that "The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides."

OR

Prove that in a triangle, if the square of one side is equal to sum of the squares of the other two sides, the angle opposite the first side is a right angle.

36. Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars? While driving, the driver should maintain the speed limit as allowed. Comment

37. In a class test, the sum of Shefali's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in the two subjects.

38. Evaluate without using tables: $\dfrac{\sec\theta \operatorname{cosec}(90^0-\theta) - \tan\theta\cot(90^0-\theta) + (\sin^2 35^0 + \sin^2 55^0)}{\tan 10^0 \tan 20^0 \tan 45^0 \tan 70^0 \tan 80^0}$

OR

If $\operatorname{cosec}\theta - \sin\theta = a^3$ and $\sec\theta - \cos\theta = b^3$, prove that $a^2b^2(a^2+b^2) = 1$

39. If two zeroes of the polynomial $x^4 + 3x^3 - 20x^2 - 6x + 36$ are $\sqrt{2}$ and $-\sqrt{2}$, find the other zeroes of the polynomial.

40. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30°, which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60°. Find the time taken by the car to reach the foot of the tower from this point.