10th Class **Time: 3 hrs.** **Topic: Practice Paper - 3** **M.M. = 80**

General Instructions:

All the questions are compulsory.

Section - A

Question numbers 1 to 6 carry one mark each.

1. The decimal expansion of $\frac{51}{2^3 \times 5^2}$ will terminate after how many decimal places?

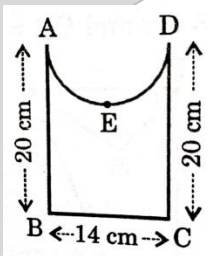
2. Find b in terms of a and c, such that a, b and c are in an A.P.

3. A(4, -6), B(3, -2) and C(5, 2) are the vertices of a ΔABC and AD is its median. Find the coordinates of the mid-point of AD.

4. If ratio of corresponding sides of two similar triangles is 5:6, then find ratio of their areas.

5. Evaluate: $\sin^2 19° + \sin^2 71°$

6. Find the perimeter of the given figure, where AED is a semi-circle and ABCD is a rectangle.



Section - B

Question numbers 7 to 12 carry two marks each.

7. Show that $5\sqrt{6}$ is an irrational number.

8. Find the nth term of the AP: 7, 13, 19, 25, …..

9. Find co-ordinates of any one point lying on the perpendicular bisector of line segment joining the points $\left(-\frac{1}{2}, 5\right) \& \left(\frac{11}{2}, 3\right)$.

10. A 15cm long test tube having diameter of 3.6cm has water upto to a height of 6cm. 20 spherical drops of oil of radius 9mm are dropped into it. What length of the test tube remains empty?

11. Cards marked with numbers 4 to 50 are placed in a box and mixed thoroughly. A card is drawn from the box. Find the probability that the number on the taken out card is (A) a prime number less than 20 (B) a number, which is a perfect square.

12. The median of the following frequency distribution is 28.5. Find the values of x and y, if sum of frequencies is 58.

Class	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	2	x	20	15	7	y

Section – C

Question numbers 13 to 22 carry three marks each.

13. Prove that $\sqrt{5}$ is an irrational number.

OR

Use Euclid's division algorithm to find the HCF of 10224 and 9648.

14. Solve the following pair of equations by reducing them to a pair of linear equation: $\frac{1}{x} - \frac{4}{y} = 2; \frac{1}{x} + \frac{3}{y} = 9$

15. If the roots of the quadratic equation $(a-b)x^2 + (b-c)x + (c-a) = 0$ are equal, prove that 2a = b + c.

16. Find the roots of the quadratic equation $3x^2 - 2\sqrt{6}x + 2 = 0$.

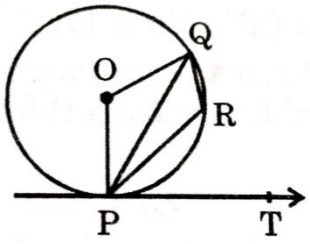
OR

Write all the values of k for which the quadratic equation $2x^2 + kx + 8 = 0,$ has equal roots. Also, find the roots.

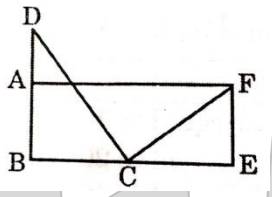
17. Show that the triangle formed by the points A(5, -1), B(-3, 2) and C(1, 6) is an isosceles triangles.

Time: 3 hrs. **Topic: Practice Paper - 3** **M.M. = 80**

18. PQ is a chord of a circle with centre O and PT is tangent at P such that $\angle QPT = 60°$. Find $\angle POQ$.

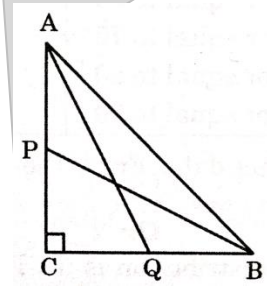


19. ABEF is a rectangle. C is the middle point of BE. If AB = 9cm, DF = 25cm, BD = 16cm and BE = 24cm, then prove that $\angle DCF = 90°$.



OR

In the given figure, P and Q are the mid-points of the sides CA and CB respectively of ΔABC right angled at C. Prove that $4\left(AQ^2 + BP^2\right) = 5AB^2$.



20. In the given figure, the radii of two concentric circles with centre O are 7cm and 14cm and $\angle AOC = 60°$. Find the area of the shaded region.

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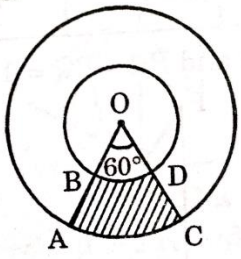


OR

The radius of the wheels of a bus is 70cm. How many revolutions per minute must a wheel make in order to move at a speed of 66km/h?

21. Two different dice are thrown together. Find the probability that the numbers obtained (i) have a sum less than 7 (ii) have a product less than 16 (iii) is a doublet of odd numbers.

22. If $x = p\sec\theta + q\tan\theta \,\&\, y = p\tan\theta + q\sec\theta$, prove that $x^2 - y^2 = p^2 - q^2$.

Section – D

Question numbers 23 to 30 carry four marks each.

23. Solve the pair of linear equations $3x + y = -1 \,\&\, -2x + 3y = 19$. Hence, find the value of m, if their point of intersection lies on the line y = mx + 3.

24. A man started his job with a certain monthly salary and earned a fixed increment every year. His salary was rupee 15,000 after 4 years of service and rupee 18,000 after 10 years of service. What was his starting salary and his annual increment? What character you can imbibe from his life?

Time: 3 hrs. **Topic: Practice Paper - 3** **M.M. = 80**

25. Draw a right triangle in which the sides containing the right angle are 5cm and 4cm. Construct a similar triangle whose sides are $\frac{5}{3}$ times the corresponding sides of the above triangle.

26. The diagonal BD of a parallelogram ABCD intersects the segment AE at the point F, where E is any point on the side BC. Prove that $DF \times EF \times = FB \times FA$.

27. How many cubic centimeters of metal are there in an open metallic box whose external dimensions are 36cm, 25cm and 16cm, the metal being 2cm thick throughout? If 1 cubic cm of metal weighs 15g, find the weight of the open box.

OR

A bucket made up of a metal sheet is in the form of a frustum of a cone of height 16cm with radii of its lower and upper circular ends as 8cm and 20cm respectively. Find how many square metre of metal is used for making the bucket.

28. Given below are ages of 100 people in a locality:

Age (in years)	No. of people
More than or equal to 10	100
More than or equal to 20	91
More than or equal to 30	80
More than or equal to 40	63
More than or equal to 50	37
More than or equal to 60	24
More than or equal to 70	16
More than or equal to 80	5
More than or equal to 90	1

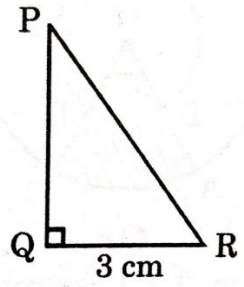
Draw a 'more than type' ogive for this data. From the ogive, find median and verify it by actual calculations.

OR

The mode of the following frequency distribution is 55. Find the values of f_1 & f_2.

Class interval	0-15	15-30	30-45	45-60	60-75	75-90	Total
Frequency	6	7	f_1	15	10	f_2	51

29. In ΔPQR, right angled at Q, OR = 3cm and PR – PQ = 1cm. Determine the values of $\sin R, \cos R$ & $\tan R$.



30. If $\sec\theta - \tan\theta = \sqrt{2}\tan\theta$, then show that $\sec\theta + \tan\theta = \sqrt{2}\sec\theta$.

OR

Evaluate $\frac{\sec^2(90^\circ - \theta) - \cot^2\theta}{2(\sin^2 25^\circ + \sin 65^\circ)} + \frac{2\cos^2 60^\circ \tan^2 28^\circ \tan^2 62^\circ}{3(\sec^2 43^\circ - \cot^2 47^\circ)} + \frac{\cot 40^\circ}{\tan 50^\circ}$

DREAM

Career Makers

10th Class *U can't dream to matriculate without DREAM*

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Answers Key:

1. Three places 2. $b=\frac{a+c}{2}$ **3. (4, -3) 4. 25:36 5. 1 6. 76cm 8. 6n + 1 9.** $\left(\frac{5}{2},4\right)$ **10. 3cm 11.** $(A)\frac{6}{47},(B)\frac{6}{47}$ **12.** $x=10,y=4$ **13. Or 144 14.** $x=\frac{1}{6},y=1$ **16.** $\frac{\sqrt{6}}{3},\frac{\sqrt{6}}{3}$ **Or** $k=\pm 8,$ **Roots=** ± 2 **18.** $120°$ **20.** $77cm^2$ **Or 250 revolutions 21. (i)** $\frac{11}{36},$ **(ii)** $\frac{25}{36},$ **(iii)** $\frac{1}{12}$ **23.** $x=-2,y=5;m=-1$ **24. Starting salary = rupee 13,000; Annual increment = rupee 500. He is not interested in changing the job frequently. He wants to become an expert in his field.**

27. $4992cm^3,74880g$ **Or** $1961\frac{1}{7}cm^2$ **28. Median = 136 OR** $f_1=5,f_2=8$ **29.** $\frac{4}{5},\frac{3}{5}\&\frac{4}{3}$ **30.** $\frac{5}{3}$