- Please check that this question paper contains 3 printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 30 questions.

General Instructions: -

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into three sections A, B ,C and D . Section A contains 10 questions of 1 marks each, Section B is of 5 questions of 2 marks each, Section C is of 10 questions of 3 marks each and Section D is of 5questions of 6 marks each.
3. Write the serial number of the question before attempting it.
4. If you wish to answer any question already answered, cancel the previous answer.
5. In questions where internal choices is provided. You must attempt only one choice.

SECTION A

1. Given that H.C.F (54,336) =6, find L.C.M (54,336).

2. If $\left(x + \dfrac{1}{2} \right)$ is a factor of the polynomial $8x^3 - ax^2 - x + 2,$ find a.

3. Find out whether the following pair of linear equations is consistent or not. . $\dfrac{3}{2}x + \dfrac{5}{3}y = 7$
   $$9x + 10y = 14$$

4. Find the 10th term from the end of the A.P. 5,10,15,………485 .

5. If $\theta = 30^0,$ verify that $\cos 2\theta = \dfrac{1 - \tan^2 \theta}{1 + \tan^2 \theta}$

6. O is the centre of the two concentric circles. AB is a chord of the larger circle with radius 5 cm, touching the smaller circle with radius 3 cm at P. Find AB.

7. ΔABC and ΔPQR are similar. The area of ΔABC is $64cm^2$ and the area ΔPQR is 121 cm^2 .If QR = 15.4 cm, find BC.

8. The perimeter and the area of a circle are numerically equal. Find the radius of the circle.

9. Mean of a frequency distribution is 22 and median is 24.Find the mode of the distribution.

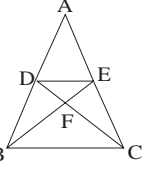10. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting a face card.

SECTION B

11. On dividing $x^3 - 3x^2 + x + 2$ by a polynomial $g(x)$, the quotient and remainder were (x-2) and $4 - 2x$, respectively. Find g(x).

12. Without using trigonometric tables, find the value of $\dfrac{\sin^2 63^0 + \sin^2 27}{\cos ec^2 17^0 - \tan^2 73^0} - 2 \tan 48^0 \tan 45^0 \tan 42^0.$

OR

If A, B and C are the angles of a ΔABC, show that $\sec \dfrac{B+C}{2} = \cos ec \dfrac{A}{2}$.

13. In figure, if $\Delta ABE \cong \Delta ACD$, Show that $\Delta ADE \sim \Delta ABC$.

14. Find the ratio in which the line segment joining A(5-6) and B (-1,-4) is divided by the y-axis. Also find the coordinates of the point of division.

15. Kartakay tosses two different coins simultaneously .What is the probability that he gets
 (i) exactly one head ? (ii) at least one head ?

SECTION C

16. If P is a prime number, prove that $\sqrt{P}$ is irrational.

OR

Use Euclid's division lemma to show that the cube of any positive integer is of the form 9m, 9m + 1 or 9m + 8.

17. Solve the following equation for x : $abx^2 + (b^2 - ac)x - bc = 0$.

18. Draw the graphs of the equations x – y +1 = 0 and 3x + 2y -12 = 0. Find the area of the triangle formed by these lines and the x-axis.

19. Find the sum of all three digit numbers which are divisible by 4 and 3.

OR

 200 logs are stacked in the following manner.20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on. In how many rows are the 200 logs placed and how many logs are there in the top
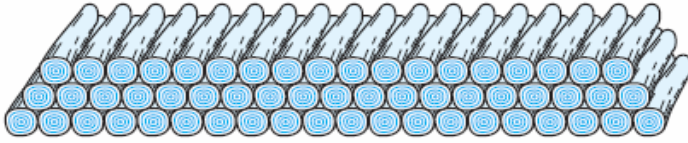
row?

20. Prove that : $\dfrac{\tan \theta}{1 - \cot \theta} + \dfrac{\cot \theta}{1 - \tan \theta} = 1 + \sec \theta \cos ec\theta$.

OR

Prove that : $\dfrac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} = \sec \theta + \tan \theta$.

21. Find the point on the x-axis which is equidistant from the points (2,-5) and (-2,9).Hence find the area of triangle formed by these points.

22. Show that the points (7,10),(-2,5) and (3,-4) are the vertices of an isosceles right triangle.

23. Draw a triangle ABC with BC = 7cm, $\angle B = 45^0$, $\angle A = 105^0$. Then, construct a triangle whose sides are $\dfrac{4}{3}$ times the corresponding sides of ΔABC.

24. In given figure XY and $X'Y'$ are two parallel tangents to a circle with centre O and another tangent AB

    with   point   of   contact   C   intersects   XY   at   A   and $X'Y'$ at   B.   Prove   that

$\angle AOB = 90^0$.
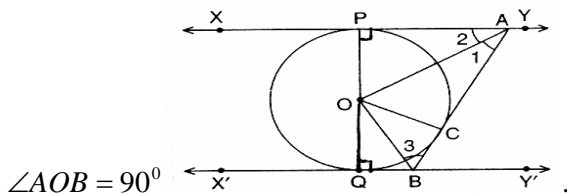
25. In fig. ABC is a quadrant of a circle of radius 14cm and a semicircle is drawn with BC as diameter. Find
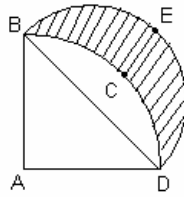
the area of the shaded region.

SECTION D

26. Five year ago, Nuri was thrice as old as Sonu.Ten years later,Nuri will be twice as old as Sonu. How old are Nuri and Sonu?

OR

Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank seperately. Find the time in which each tap can separately fill the tank.

27. From the top of a 7m high building, the angle of elevation of the top of a cable tower is 60^0 and the angle of depression of its foot is 45^0. Determine the height of the tower.

28. State and prove Pythagoras theorem. Using this theorem prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.

29. A container, opened from the top and made up of metal sheet, is in the form of a frustum of a cone of height 16cm with radii of its lower and upper ends as 8cm and 20cm, respectively.Find the cost of the milk which can completely fill the container at the rate of Rs 20 per litre.Also find the cost of metal sheet used to make the container, If it costs Rs 8 per 100 cm^2.

OR

A vessel is in the form of an inverted cone.Its height is 8cm and the radius of its top, which is open ,is 5cm.It is filled with water up to the brim. When lead shot, each of which is a sphere of radius 0.5cm are dropped into the vessel ,one fourth of the water flows out. Find the number of lead shots dropped in the vessel.

30. If the median of the distribution given below is 28.5, find the value of x and y.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	Total
Frequency	5	x	20	15	y	5	60

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