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SAMPLE PAPER TEST 01 (2017-18)

SUBJECT: MATHEMATICS
CLASS : X

MAX. MARKS : 80
DURATION : 3 HRS

General Instruction:

- (i) All questions are compulsory.
- (ii) This question paper contains **30** questions divided into four Sections A, B, C and D.
- (iii) **Section A** comprises of 6 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 8 questions of **4 marks** each.
- (iv) There is no overall choice. However, an internal choice has been provided in four questions of 3 marks each and three 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 6 carry 1 mark each.

1. Let $\Delta ABC \sim \Delta DEF$ and their areas be, respectively, 64 cm^2 and 121 cm^2 . If $EF = 15.4 \text{ cm}$, find BC .
2. Find the coordinates of a point A, where AB is the diameter of a circle whose centre is $(2, -3)$ and B is $(1, 4)$.
3. If $\sin A = \frac{3}{5}$, find the value of $\tan A$.
4. Find the values of k for quadratic equation $2x^2 + kx + 3 = 0$, so that they have two equal roots.
5. If HCF of two numbers 96 and 404 is 4, then find LCM
6. Which term of the AP : 21, 18, 15, . . . is -81 ?

SECTION – B

Questions 6 to 12 carry 2 marks each.

7. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears (i) a two-digit number (ii) a perfect square number
8. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting (i) a king of red colour (ii) a face card
9. Using Euclid's division algorithm, find the HCF of 2160 and 3520.
10. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of ' m ' for which $y = mx + 3$.
11. In what ratio does the point $(-4, 6)$ divide the line segment joining the points $A(-6, 10)$ and $B(3, -8)$?
12. Find the sum of first 24 terms of the list of numbers whose n th term is given by $a_n = 3 + 2n$

SECTION – C

Questions 13 to 22 carry 3 marks each.

13. Prove that $2 + 3\sqrt{5}$ is an irrational number.
14. Prove that the parallelogram circumscribing a circle is a rhombus.

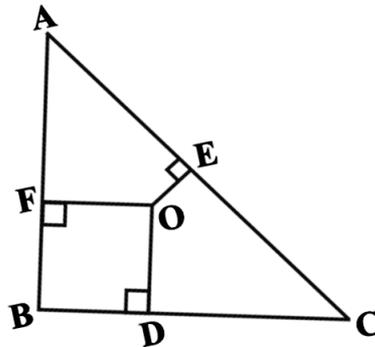
15. If $A(-5, 7)$, $B(-4, -5)$, $C(-1, -6)$ and $D(4, 5)$ are the vertices of a quadrilateral, find the area of the quadrilateral ABCD.

OR

Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are $(0, -1)$, $(2, 1)$ and $(0, 3)$. Find the ratio of this area to the area of the given triangle.

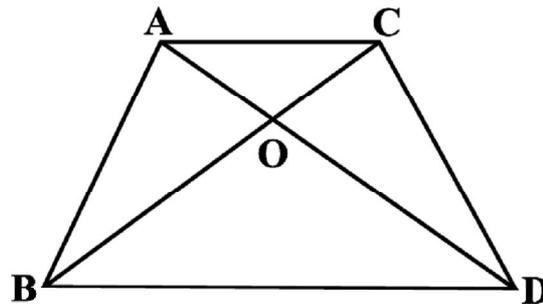
16. In the below figure, O is a point in the interior of a triangle ABC, $OD \perp BC$, $OE \perp AC$ and $OF \perp AB$. Show that

- (i) $OA^2 + OB^2 + OC^2 - OD^2 - OE^2 - OF^2 = AF^2 + BD^2 + CE^2$,
 (ii) $AF^2 + BD^2 + CE^2 = AE^2 + CD^2 + BF^2$.



OR

In the below figure, ABC and DBC are two triangles on the same base BC. If AD intersects BC at O, show that $\frac{ar(\triangle ABC)}{ar(\triangle DBC)} = \frac{AO}{DO}$

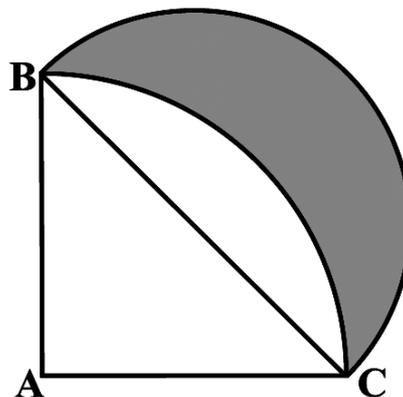


17. If $\tan(A + B) = \sqrt{3}$ and $\tan(A - B) = \frac{1}{\sqrt{3}}$; $0^\circ < A + B \leq 90^\circ$; $A > B$, find A and B.

OR

Prove that: $\frac{\cot A - \cos A}{\cot A + \cos A} = \frac{\operatorname{cosec} A - 1}{\operatorname{cosec} A + 1}$.

18. In the below figure, ABC is a quadrant of a circle of radius 14 cm and a semicircle is drawn with BC as diameter. Find the area of the shaded region.



19. A gulab jamun, contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 gulab jamuns, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm.

OR

Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 10 km/h. How much area will it irrigate in 30 minutes, if 8 cm of standing water is needed?

20. If two zeroes of the polynomial $2x^4 - 3x^3 - 3x^2 + 6x - 2$ are $\sqrt{2}$ and $-\sqrt{2}$, find the other zeroes of the polynomial.
21. The sum of the digits of a two-digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number.
22. Find the mode of the following frequency distribution:

Marks	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Number of students	15	30	45	12	18

SECTION – D

Questions 23 to 30 carry 4 marks each.

23. 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.
24. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

OR

An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Bangalore (without taking into consideration the time they stop at intermediate stations). If the average speed of the express train is 11km/h more than that of the passenger train, find the average speed of the two trains.

25. 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 right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

26. An ice-cream seller has two types of ice-cream containers: in the form of cylindrical shape and in the shape of a frustum. Both have the same height of 7 cm and the diameter of cylindrical container is 7 cm. Upper and lower radii of frustum are 3.5 cm and 3 cm respectively.
- (a) Calculate the volume of both the containers.
- (b) If the cost of the containers is the same and the seller prefers to sell ice-cream in the cylindrical container, then which value is depicted by the seller?
27. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms.

28. Draw a circle of radius 3 cm. Take two points P and Q on one of its extended diameter each at a distance of 7 cm from its centre. Draw tangents to the circle from these two points P and Q.

29. Prove that $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \csc A + \cot A$

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

C. I.	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	Total
F	5	x	20	15	y	5	100

OR

Draw more than ogive for the following frequency distribution:

Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Number of students	5	8	6	10	6	6

Also find the median from the graph.