UNIVERSAL EDUCATION CENTRE

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SUMMATIVE ASSESSMENT –II

MATHEMATICS

Class – X

Time allowed: 3 hours Maximum Marks: 90

General Instructions:

a) All questions are compulsory.

b) The question paper consists of 31 questions divided into four sections – A, B, C and D.

c) Section A contains 4 questions of 1 mark each which are multiple choice questions, Section B contains 6 questions of 2 marks each, Section C contains 10 questions of 3 marks each and Section D contains 11 questions of 4 marks each.

d) Use of calculator is not permitted.

Section A

1. For what value of p, are $2p - 1$, 7 and $3p$ three consecutive terms of an AP?

(a) 5 (b) 3 (c) – 3 (d) – 5

2. The coordinates of one end point of a diameter of a circle are (3, 5). If the coordinates of the centre be (6, 6), then find the coordinates of the other end of the diameter.

(a) (9, 7) (b) (– 9, – 7) (c) (– 9, 7) (d) (9, – 7)

3. A pole 6 m high casts a shadow $2\sqrt{3}$ m long on the ground. Find the angle of elevation of the Sun.

(a) 30° (b) 45° (c) 90° (d) 60°

4. A card is drawn from a well-shuffled pack of 52 cards. What is the probability that it is an ace of heart?

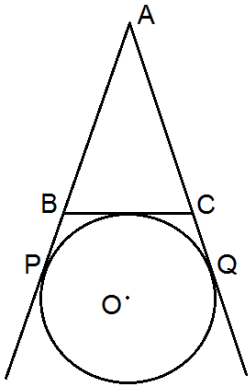
(a) $\frac{1}{13}$ (d) $\frac{1}{26}$ (c) $\frac{1}{52}$ (d)None of these

Section B

5. What is the nature of roots of the quadratic equation $4x^2 + 4\sqrt{3}x + 3 = 0$?

6. Find the sum of first six multiples of 3.

7. In the figure, find the perimeter of Δ ABC if AP = 10 cm.



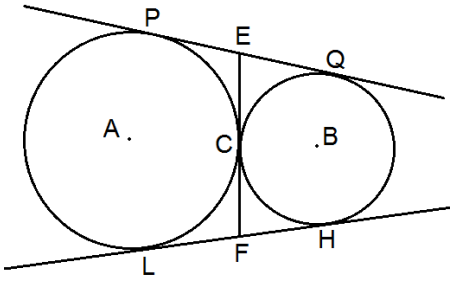
8. What is the angle subtended by an arc of length of 11 cm of a circle of radius 7 cm at the centre?

9. What is the slant height of the largest circular cone that can be cut from a cube of side 4 cm?

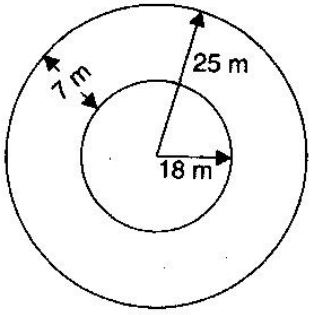
10. What is the ratio of volumes of a right circular cone and a right circular cylinder of the same base radius and same height?

Section C

11. Solve for x : $\frac{1}{x} - \frac{1}{x-3} = \frac{4}{3}$, $x \neq 0,3$
12. The sum of first n terms of an AP is $5n^2 - 3n$. Find the AP and hence find its 10^{th} term.
13. Show that the points $(7,10)$, $(-2,5)$ and $(3,-4)$ are the vertices of an isosceles right triangle.
14. In what ratio does the line $x - y - 2 = 0$ divide the line segment joining $(3,-1)$ and $(8,9)$?
15. A ladder 10 m long just reaches the top of a vertical wall. If the ladder makes an angle of 60° with the wall, then find the height of the wall.
16. In figure, two circles touch each other externally at C. Prove that the common tangent at C bisects the other two common tangents.



17. A path of 7 meters width runs around outside a circular park whose radius is 18 meters. Find the area of the park. Take $\pi = \frac{22}{7}$



18. A wire is looped in the form of a circle of radius 28 cm. It is rebent into a square form. Determine the sides of the square. Take $\pi = \frac{22}{7}$
19. A hemispherical bowl of internal diameter 36 cm is full of some liquid. This liquid is to be filled in cylindrical bottles of radius 3 cm and height 6 cm. Find the number of bottles needed to empty the bowl.
20. A bag contains 6 red balls and some blue balls. If the probability of drawing a blue ball from the bag is twice that of a red ball, then find the number of blue balls in the bag.

Section D

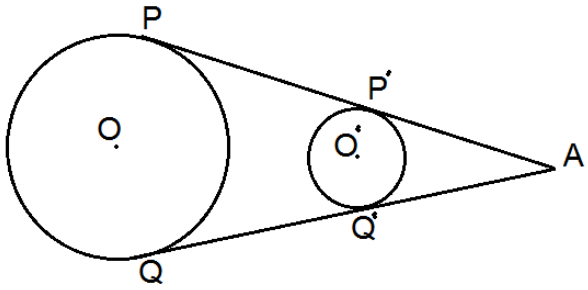
21. Solve for x : $\frac{1}{x+3} + \frac{1}{2x-1} = \frac{11}{7x+9}$, $x \neq -3, \frac{1}{2}, \frac{-9}{7}$

22. Due to some technical problem, an aeroplane started late by one hour from its starting point. The pilot decided to increase the speed of the aeroplane by 100 km/h from its usual speed, to cover a journey of 1200 km in time.
Read the above passage and answer the following questions:
(i) Find the usual speed of the aeroplane.
(ii) What value (quality) of the pilot is represented in the question?
[Value Based Question]

23. Find the sum of all natural numbers between 250 and 1000, which are exactly divisible by 3.
24. If $(-2,-1)$, $(a,0)$, $(4,b)$ and $(1,2)$ are the vertices of a parallelogram, then find the value of a and b.

25. A boy standing on a horizontal plane finds a bird flying at a distance of 100 m from him at an elevation of 30°. A girl standing on the roof of 20 meter high building find the angle of elevation of the same bird to be 45°. Both the boy and the girl are on opposite sides of the bird. Find the distance of bird from the girl.

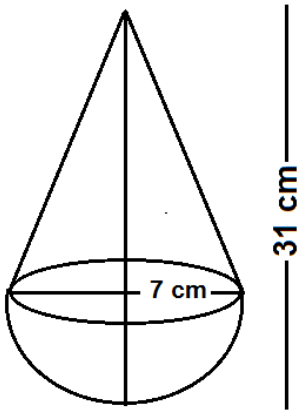
26. Prove that the lengths of tangents drawn from an external point to a circle are equal. Using the above, prove that PP' = QQ' in the figure.



27. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

28. Construct a Δ ABC in which AB = 6.5 cm, ∠B = 60° and BC = 5.5 cm. Also construct a triangle AB'C' similar to Δ ABC, whose each side is $\frac{3}{2}$ times the corresponding sides of the Δ ABC.

29. A toy is in the form of a cone mounted on a hemisphere of common base radius 7 cm. The total height of the toy is 31 cm. Find the total surface area of the toy. Use $\pi = \frac{22}{7}$



30. A sphere, of diameter 12 cm, is dropped in a right circular cylindrical vessel, partly filled with water. If the sphere is completely submerged in water, the water level in the cylindrical vessel rises by $3\frac{5}{9}$ cm. Find the diameter of the cylindrical vessel.

31. A box contains 20 balls bearing numbers 1, 2, 3, 4, ... 20. A ball is drawn at random from the box. What is the probability that the number on the balls is:
(i) an odd number
(ii) divisible by 2 or 3
(iii) prime number
(iv) not divisible by 10.

ALL THE BEST