



UNIVERSAL EDUCATION CENTRE

JAYANT SHARMA (94145-37474 , 98181-63814)

SUMMATIVE ASSESSMENT –II

MATHEMATICS

Class – X

Time allowed: 3 hours

Maximum Marks: 90

General Instructions:

- All questions are compulsory.
- The question paper consists of 31 questions divided into four sections – A, B, C and D.
- 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.
- Use of calculator is not permitted.

Section A

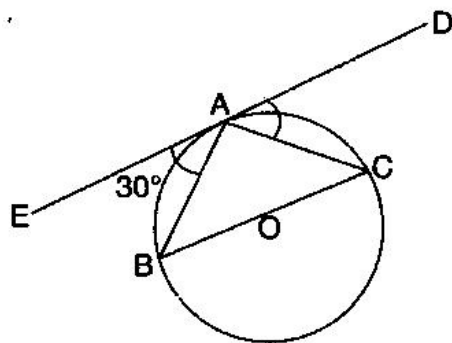
- In an AP, if $d = 4$, $n = 3$, $a_n = 10$, then a is:
(a) 1 (b) 4 (c) 3 (d) 2
- If the angle of elevation of a tower from a distance of 100 m from its foot is 60° , then the height of the tower is:
(a) $100\sqrt{3}$ m (b) $\frac{100}{\sqrt{3}}$ m (c) $50\sqrt{3}$ m (d) $\frac{50}{\sqrt{3}}$ m
- A game consists of tossing a one-rupee coin 3 times and noting its outcome each time. Hanif wins if all the tosses give the same result, i.e., three head or three tails and loses otherwise. The probability that Hanif will lose the game is:
(a) $\frac{3}{8}$ (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) $\frac{3}{4}$
- The distance between A (1, 3) and B(a,7) is 5. The possible values of a are:
(a) (4,-2) (b) (2, 4) (c) (3, 2) (d) (2,5)

Section B

- For what value of k , does $(k-12)x^2 + 2(k-12)x + 2 = 0$ have equal roots?
- In an AP, $a = 1$, $a_n = 20$ and $s_n = 441$, then find n .
- Let s denotes the semi-perimeter of a triangle ABC in which $BC = a$, $CA = b$, $AB = c$. If a circle touches the side BC, CA, AB at D,E,F respectively, then prove that $BD = s - b$.
- Find the diameter of a circle whose area is equal to the sum of the circumferences of the two circles of diameter 30 and 24 cm.
- The radius of a solid sphere is 3 cm. It is melted to form solid balls of radii 1 cm. How many solid balls will be obtained?
- The radii of the ends of a frustum of a cone 40 cm height are 20 cm and 11 cm. Find its slant height.

Section C

- Solve for x : $x - \frac{1}{x} = 3$, $x \neq 0$
- Find the sum of all two digit numbers greater than 50 which when divided by 7 leave a remainder of 4.
- Find $\angle CAD$ in the following figure:



14. From a window 15 meters high above the ground in a street, the angles of elevation and depression of the top and foot of another house on the opposite side of the street are 30° and 45° respectively.

Show that the height of the opposite house is 23.66 meters. (Take $\sqrt{3} = 1.732$)

15. A box contains 90 discs, which are numbered from 1 to 90. If one disc is drawn at random from the box, then find the probability that it bears:

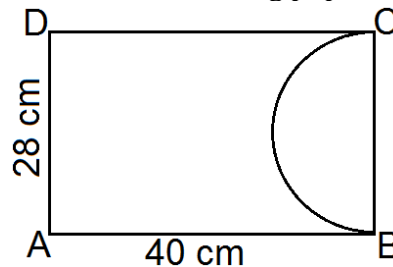
- (i) a two-digit number (ii) a perfect square (iii) a number divisible by 5.

16. Find the coordinates of the point equidistant from three given points A (5, 3), B(5, -5) and C (1, -5).

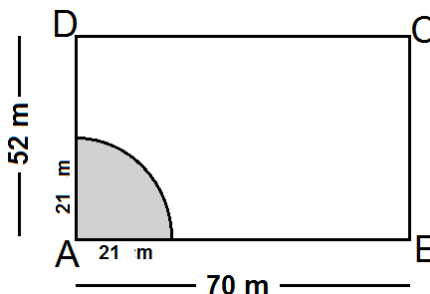
17. Find the value of p for which the points $(-5, 1)$, $(1, p)$ and $(4, -2)$ are collinear.

18. A sheet of paper is in the form of a rectangle ABCD in which AB = 40 cm and AD = 28 cm.

A semicircular portion with BC as diameter is cut off. Find the area of the remaining paper.



19. A horse is placed for grazing inside a rectangular field 70 m by 52 m and is tethered to one corner by a rope 21 m long. On how much area can it graze?



20. Water flows at the rate of 10 m per minute through a pipe having its diameter as 5 mm. How much time will it take to fill a conical vessel whose diameter of base is 40 cm and depth 24 cm?

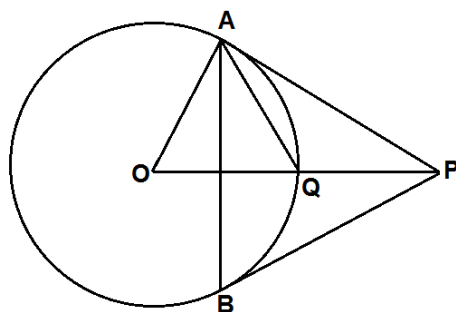
Section D

21. Solve for x : $p^2x^2 + (p^2 - q^2)x - q^2 = 0$

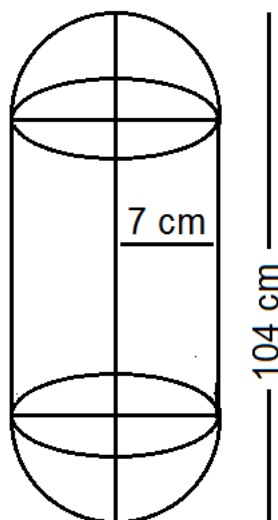
22. A motorboat whose speed in still water is 5 km/h, takes 1 hour more to go 12 km upstream than to return downstream to the same spot. Find the speed of the stream.

23. If m times the m^{th} term of an AP is equal to n times the n^{th} term, show that $(m + n)^{\text{th}}$ term of the AP is zero.

24. From a point P, two tangents PA and PB are drawn to a circle $C(O, r)$. If $OP = 2r$, then show that ΔAPB is equilateral.



25. Prove that the tangents drawn at the end of a diameter of a circle are parallel.
26. Construct a triangle similar to a given triangle XYZ with its sides equal to $\frac{3}{4}$ th of the corresponding sides of ΔXYZ . Write the steps of construction also.
27. On a horizontal plane there is a vertical tower with a flagpole on the top of the tower. At a point 9 meters away from the foot of the tower. The angle of elevation of the top and bottom of the flagpole are 60° and 30° respectively. Find the height of the tower and flagpole mounted on it.
28. In a single throw of two dice, find the probability of getting:
 (i) a total of 7 (ii) a total of 11 (iii) doublets (iv) six as a product.
29. Find the coordinates of the circum centre of the triangle whose vertices are (8,6), (8,-2) and (2,-2). Also, find the circum radius.
30. Ramlal wants to dig a well. He is confused whether he should dig the well in the form of cuboid of dimensiona (1 m x 1 m x 7m) or in the form of cylinder of diameter 1 m and height 7 m. The rate to dig the well is Rs.50 per m^3 . Finally he decides to dig the cylindrical well.
 Read the above passage and answer the following questions:
 (i) Find the cost to dig both wells. (ii) By Ramlal's decision, which value if depicted here?
 [Value Based Question]
31. A solid is composed of a cylinder with hemispherical ends. If the whole length of the solid is 104 cm and the radius of each hemispherical end is 7 cm, find the cost of polishing its surface at the rate of Rs.10 per m^2 .



ALL THE BEST