

- Please check this paper contains 5 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 31 questions

SUMMATIVE ASSESSMENT – II

MATHEMATICS – SAMPLE PAPER -2017

General Instructions

- All questions are compulsory
- The question paper consist of 31 questions divided in to four sections – A , B , C and D
- Section A contains 4 questions of one mark each .Section B contains 6 questions of 2 marks each section C contains 10 questions of 3 marks and Section D contains 11 questions of four marks each
- Use of calculator is not permitted

SECTION A

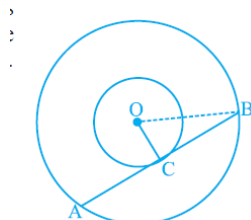
Question n umber s 1 to 4 carry 4 marks each

- A natural number is chosen at random from amongst the first 100. Find the probability that the number is divisible by 3 and 5
- If the 5th term of an AP is 16, what is the sum of third and seventh term of the AP
- AB is a diameter of a circle and AC is its chord such that $\angle BAC = 30^\circ$. If the tangent at C intersects AB extended at D, then Prove that $BC = BD$.
- Two men on either side of the 30 m tower observes the top of the tower at an angle of 60° , find the distance between them

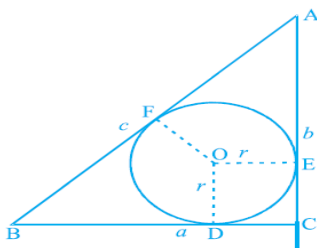
SECTION – B

Question numbers 5 to 10 carry 2 marks each

- If the point (5, 4) and (x, y) are equidistant from (4,5) show that $x^2+y^2-8x-10y+39 = 0$
- The sum of n terms of two arithmetic progressions are in the ratio $(3n + 8) : (7n + 15)$. Find the ratio of their 12th terms.
- If d_1, d_2 ($d_2 > d_1$) be the diameters of two concentric circles and c be the length of a chord of a circle which is tangent to the other circle, prove that $d_2^2 = c^2 + d_1^2$.



8. If P $(9a - 2, -b)$ divides line segment joining A $(3a + 1, -3)$ and B $(8a, 5)$ in the ratio 3 : 1, find the values of a and b.
9. If a, b, c are the sides of a right triangle where c is the hypotenuse, prove that the radius r of the circle which touches the sides of the triangle is given by $\frac{a + b - c}{2}$

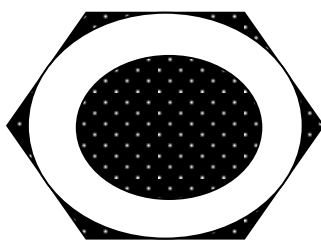


10. Solve $(a+b)^2x^2 + 8(a^2-b^2)x + 16(a-b)^2 = 0$

SECTION C

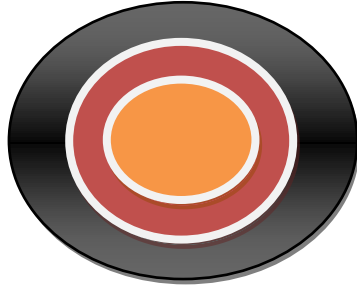
Question number 11 to 20 carry 3 marks each

11. There are 1000 sealed envelopes in a box, 10 of them contain a cash prize of Rs 100 each, 100 of them contain a cash prize of Rs 50 each and 200 of them contain a cash prize of Rs 10 each and rest do not contain any cash prize. If they are well shuffled and an envelope is picked up out, a) What is the probability that it contains cash prize? b) What is the probability that it contains the maximum amount as cash prize? c) What is the probability that it contains “Try again”?
12. Two Concentric circles of radii 14 cm and 21cm are circumscribed by a regular hexagon. Find the area of the shaded portion



13. A solid cylinder of diameter 12cm and height 15 cm is melted and recast into 12 toys in the shape of a right circular cone mounted on a hemisphere. Find the radius of the hemisphere and the total height of the toy if height of the cone is 3 times the radius.

14. A metallic right circular cone 20 cm high and whose vertical angle is 60° is cut into 2 parts at the middle of $\frac{1}{16}$ its height by a plane parallel to its base. If the frustum so obtained be drawn into a wire of diameter \quad cm, find the length of the wire to the nearest metre.
15. An archery target has three regions formed by three concentric circles as shown in Fig. . If the diameters of the concentric circles are in the ratio 1: 2:3, then find the ratio of the areas of three regions.



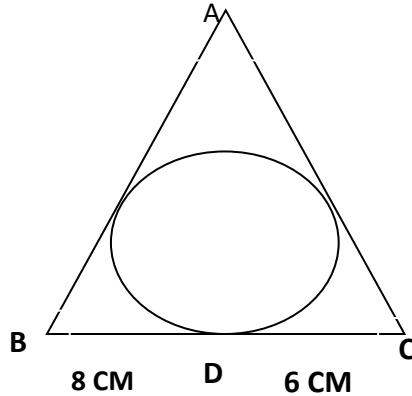
16. 500 persons are taking a dip into a cuboidal pond which is 80 m long and 50 m broad. What is the rise of water level in the pond, if the average displacement of the water by a person is 0.04m^3 ?
17. If the points A (1, -2), B (2, 3) C (a, 2) and D (- 4, -3) form a parallelogram, find the value of a and height of the parallelogram taking AB as base.
18. From the top of a 96 m high tower the angles of depression of two cars on a road at the same level as the base of the tower and on same side of it are $\tan A = \frac{3}{4}$ and $\tan B = \frac{1}{3}$
19. Between 1 and 31, m numbers have been inserted in such a way that the resulting sequence is an A. P. and the ratio of 7th and (m - 1)th numbers is 5 : 9. Find the value of m.
20. On a pillar 9 cubits high is perched a peacock. From a distance 27 cubits a snake is coming to its hole at the bottom of the pillar .Seeing the snake the peacock pounces upon it .if their speeds are equal ,at what distance from the hole is the snake caught ?

SECTION D

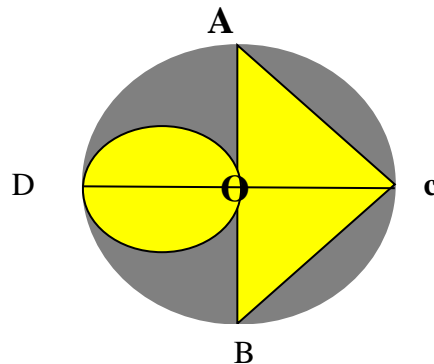
Question numbers 21 to 31 carry 4 marks each .

21. The angry Arjun carried some arrows for fighting with Bheeshm. With half the arrows ,he cut down the arrows thrown by Bheeshm on him and with six other arrows he killed the rath driver of Bheeshm. With one arrow each he knocked respectively the rath, flag, and the bow of Bheeshm. Finally with one more than four times the square root of arrows he laid down Bheeshm unconscious on an arrow bed . Find the total number of arrows Arjun had .

22. At the foot of a mountain the elevation of the summit is 45° . After ascending 2000m towards the mountain up a slope of 30° inclination the elevation is found to be 60° . Find the height of the mountain.
23. A triangle ABC is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC into which BC is divided by the point of contact D are of lengths 8 cm and 6 cm respectively (see Fig.). Find the sides AB and AC.

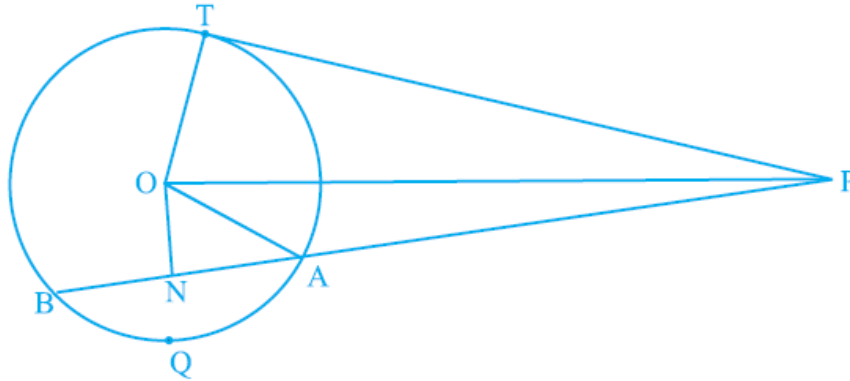


24. Find the centre, radius and area of a circle passing through the points $(6, -6)$, $(3, -7)$ and $(3, 3)$.
25. A bucket is in the form of a frustum of a cone of height 30 cm with radii of its lower and upper ends as 10 cm and 20 cm, respectively. Find the capacity and surface area of the bucket. Also, find the cost of milk which can completely fill the container, at the rate of Rs 25 per litre
26. The king of diamond , queen of hearts and jack of clubs are removed from a well shuffled pack of cards . One card is selected randomly from the remaining cards. Find the probability of getting i) a heart ii) a king iii) a face card iv) the 10 of hearts
27. In Fig, AB and CD are two diameters of a circle (with centre O) perpendicular to each other and OD is the diameter of the smaller circle. If $OA = 7$ cm, find the area of the yellow region.



28. In the following Figure , from an external point P, a tangent PT and a line segment PAB is drawn to a circle with centre O. ON is perpendicular on the chord AB. Prove that :

(i) $PA \cdot PB = PN^2 - AN^2$ (ii) $PN^2 - AN^2 = OP^2 - OT^2$ (iii) $PA \cdot PB = PT^2$



29. Given a rhombus ABCD in which $AB = 4$ cm and $\angle ABC = 60^\circ$, divide it into two triangles say, ABC and ADC. Construct the triangle $AB'C'$ similar to ΔABC with scale factor $\frac{2}{3}$

30. At present Asha's age (in years) is 2 more than the square of her daughter Nisha's age. When Nisha grows to her mother's present age, Asha's age would be one year less than 10 times the present age of Nisha. Find the present ages of both Asha and Nisha.

31. The difference between any two consecutive interior angles of a polygon is 5° . If the smallest angle is 120° , find the number of the sides of the polygon.
