- Please check this 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 31 questions

SUMMATIVE ASSESSMENT – II

MATHEMATICS – SAMPLE PAPER -2017

General Instructions

i.   All questions are compulsory

ii.   The question paper consist of 31 questions divided in to four sections – A , B , C and D

iii. 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

iv.   Use of calculator is not permitted

SECTIONA

1. Find the 15th term of an A P; $x – 7, x – 2, x + 3,\ldots\ldots$.

2. The ratio of height of a tower and the length of its shadow on the ground is $\sqrt{3}$: 1, then find the angle of elevation of the sun.

3. Find the probability that a non-leap year selected at random will have 53 Tuesdays.

4. Find the distance between $A(\cos\theta , \sin\theta)$ and $B(\sin\theta , \cos\theta)$

SECTION B

5. If a and b are the roots of the quadratic equation $x^2 – p (x + 1) – c = 0$, then find the value of $(a+1)(b+1)$.

6. If the nth term of an AP is $(2n + 1)$, find the sum of first n terms of the AP.

7. AB is a diameter of a circle and AC is its chord such that $\angle BAC = 30^0$.If the tangent at C intersects AB at D, then prove that BC = BD.

8. Diameters of three concentric circles are in the ratio 1:2:3.The sum of the circumferences of these circles is 264 cm. Find the area enclosed between second and third circles.

9. The minute hand of a clock is 10cm long. Find the area on the face of the clock described by the minute hand between 9 am and 9.35 am.

10. The sum of length, breadth and height of a cuboid is 19cm and its diagonal is $5\sqrt{5}$ cm. Find its surface area.

SECTION C

11. Solve the equation; $1 + 4 + 7 + 10 + \ldots\ldots + x = 287$.

12. Find the roots of the quadratic equation: $a (a^2 + b^2) x^2 + b^2x – a = 0$

13. The base BC of an equilateral triangle ABC lies on Y axis and C is (0,- 3).If origin is the mid- point of BC ,find the coordinates of points A and B.

14. Find the ratio in which the line 3x +y – 9 =0 divides the line segment joining the points (1, 3) and (2, 7).

15. The length of a string between a kite and a point on the ground is 90 meters. If the string makes an angle θ with the ground level such that $\tan\theta = 15/8$,how high is the kite, assuming there is no slack in the string.

16. An iron pipe 20 cm long has exterior diameter is 25 cm. If thickness of the pipe is 1cm, find the total surface area of the pipe.

17. A cylindrical pipe has inner diameter of 4 cm and water flows through it at the rate of 20 m per minute. How long would it take to fill a conical tank, with diameter of base as 80 cm and depth72cm?

18. From a point P, two tangents PA and PB are drawn to a circle C (O, r).If OP = 2r, Show that ∆APB is equilateral.

19. A cube of 3×3×3 units painted with red color from all six faces and then it is cut into 27 small equal cubes of 1×1×1 unit each. A cube is taken at random. What is the probability that the cube is painted on three sides.

20. Draw a pair of tangents to a circle of radius 5.5cm, which are inclined to each other at an angle of 60^0.

SECTION D

21. Construct a ∆ABC in which AC = 6 cm, AB = 5 cm and $\angle BAC = 45°$. Construct another triangle similar to ∆ABC whose sides are $\frac{6}{5}$ of the corresponding sides of ∆ABC.

22. The length of the shadow of a tower standing on level ground is found to be 2x meters longer when Sun's altitude is 30^0 than when it was 40^0, prove that the height of the tower is ($\sqrt{3}$ + 1) x meters.

23. The ticket receipts at the show of a film amounted to Rs. 6,500 on the first day and showed a drop of Rs.110 every succeeding day. If the operational expenses of the show are Rs 1000 a day, Find on which day the show ceases to be profitable.

24. AC is a chord of a circle with center O. The tangents at C to the circle meets extended diameter AB at D. Show that BD = BC, if $\angle D = \angle A$.

25. Solve by the method of completing the squares: $5x^2 - 2x – 2 = 0$

26. In an equilateral triangle of side 24cm, a circle is inscribed touching its side. Find the area of the remaining portion of the triangle. ($\sqrt{3} = 1.732$)

27. An open metal bucket is in the shape of a frustum of a cone, mounted on a hollow cylindrical base made of the same metallic sheet. The diameters of the two circular ends of the bucket are 45 cm and 25 cm, the total vertical height of the bucket is 40 cm where the height of the cylindrical base is 6cm.Find the area of the metallic sheet used to make the bucket (ignore the handle of the bucket)

28. One dice and one coin are tossed simultaneously. Write the sample space and find the probabilities of (a) prime number of die (b) head   (c)head and even number

29. Prove that the coordinates of the centroid of a ∆ABC with vertices A(x_1,y_1), B(x_2,y_2), C(x_3,y_3) are given by ($\frac{x_1 + x_2 + x_3}{3}$, $\frac{y_1 + y_2 + y_3}{3}$)

30. The angle of elevation θ of the top of a light house, as seen by a person on the ground, is such that $\tan\theta = 5/12$. When the person moves a distance of 240 m towards the light house, the angle of elevation becomes ϕ such that $\tan\phi = 3/4$. Find the height of the light house.

31. The speed of a boat in still water is 11km/hour. It can go 12 km upstream and return downstream to the original point in 2 hours 45 minutes. Find the speed of the stream.

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