SUMMATIVE ASSESSMENT – II
MATHEMATICS
Class – X

Time allowed : 3 hours Date: 20-3-2015 Maximum Marks : 90

General Instructions :

(i) All questions are **compulsory**.

(ii) The question paper consists of **31**questions divided into four **sections A, B, C** and **D. Section-A** comprises of **4** 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 **11** questions of **4 marks** each.

(iii) There is no overall choice.

(iv) Use of calculator is not permitted.

SECTION-A

Question numbers **1** to **4** carry **one** mark each.

1 Find the nature of the roots of the quadratic equation $3x^2 - 2x - 5 = 0$ 1

2 The ratio of the length of a rod and its shadow is $1 : \frac{1}{\sqrt{3}}$. What is the angle of elevation of the source of light ? 1

3 What is the probability of occurrence of an event that is sure to happen ? 1

4 Find the radius of the circle whose endpoints of diameter are $(-4, 1)$ and $(2, -3)$. 1

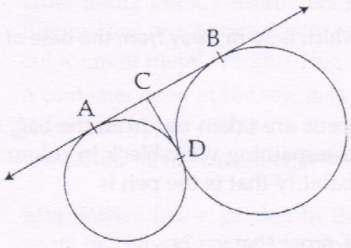
SECTION-B

Question numbers **5** to **10** carry **two** marks each.

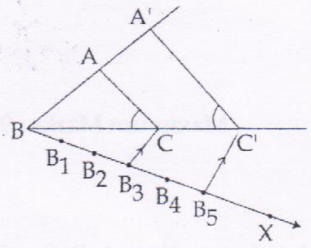
5 For what value of n, are the n^{th} terms of two AP's 63, 65, 67, ... and 3, 10, 17, ... equal ? 2

6 Find the roots of the quadratic equation : $\sqrt{7}\,x^2 - 6x - 13\sqrt{7} = 0$ 2

7 AB and CD are common tangents to two circles which intersect each other at C as shown in the figure. If AB = 6 cm, find CD. 2



....2.

8 

2

From the figure, find the ratio of ar (ΔABC) to ar (ΔA'BC') where B_1, B_2, B_3, ... are points on ray BX at equal distances and also $B_5C' \| B_3C$, $C'A' \| CA$.

9 Geometrically divide a line segment of length 8.4 cm in the ratio 5 : 2. 2

10 A circular piece of cloth is used to cover a circular seat of radius 1 m. Also, 40 cm of cloth all-around the seat is required for stiching purposes. Find the area of the cloth required. (Use $\pi = \frac{22}{7}$) 2

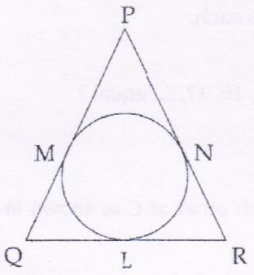
SECTION-C

Question numbers **11** to **20** carry **3** marks each.

11 Determine the AP whose third term is 16 and the difference of 5^{th} term from 7^{th} term is 12. 3

12 The perimeter of a rectangular plot is 62 m and its area 228 sq m. Find the dimension of the plot. 3

13 In ΔPQR of the given figure, if PQ = PR and the incircle of ΔPQR touches QR, RP and PQ is at L, N and M respectively prove that L bisects QR. 3



14 The angle of elevation of the top of a tower from a point, which is 30 m away from the base of the tower, is 30°. Find the height of the tower. 3

15 A bag contains 1000 pens with different colours. 100 pens are taken out from the bag, out of which 20 were red, 35 were green, 15 were blue and remaining were black in colour. A pen is picked up from these 100 pens. What is the probability that is the pen is 3

(a) not red (b) green

16 If the distance of P(x, y) from A(6, 2) and B(-2, 6) are equal, prove that $y = 2x$. 3

17 With the help of distance formula, show that the points A(4, 2), B(7, 5) and C(9, 7) do not form a triangle. 3

....3.

18 A conical hole is drilled in a circular cylinder of height 15 cm and radius 8 cm, which has same height and same base radius. Find the total surface area, after drilling of cone. (Use $\pi = 3.14$) 3

19 The circumference of a circle exceeds the diameter by 16.8 cm. Find the radius of the circle. (Use $\pi = \frac{22}{7}$) 3

20 A wall 24 m long. 0.4 m thick and 6 m high is constructed with the bricks each of dimensions 25 cm × 16 cm × 10 cm. If the mortar occupies $\frac{1}{10}^{th}$ of the volume of the wall, then find the number of bricks used in constructing the wall. 3

SECTION-D

Question numbers **21** to **31** carry **4** marks each.

21 How many 3 digit numbers are divisible by 7? 4

22 Solve for x: 4

$$\frac{5}{2x+3} = \frac{4}{x} - 3, \; x \neq 0, \frac{-3}{2}$$

23 If the sum of first 7 terms of an A.P. is 49 and that of 17 terms is 289, find the sum of first n terms. 4

24 Prove that the lengths of two tangents drawn from an external point to a circle are equal. 4

25 Draw a line segment PQ of length 9 cm. Taking P as centre, draw a circle of radius 5 cm and taking Q as centre, draw another circle of radius 3 cm. Construct tangents to each circle from the centre of the other circle. 4

26 The angle of elevation of a jet plane from a point A on the ground is 60°. After a flight of 15 seconds, the angle of elevation changes to 30°. If the jet plane is flying at a constant height of $1500\sqrt{3}$ m, find the speed of the jet plane. 4

27 A bag contains 3 Red, 2 White and x black balls. If the probability of drawing a non red ball is twice that of drawing a red ball, find the number of black balls. 4

28 If the points A(1, −2), B(2, 3), C(−3, 2) and D(−4, −3) form a parallelogram ABCD, find its area and height taking AB as base. 4

29 How many cubic centimetres of metal are there in an open metallic box whose external dimensions are 36 cm, 25 cm and 16.5 cm, the metal being 1.5 cm thick throughout ? If 1 cubic cm of metal weights 15 g, find the weight of the open box. 4

30 A container open at the top, is in the form of a frustum of a cone of height 24cm with radii of its lower and upper circular ends as 8cm and 20cm respectively. Find the cost of milk which can completely fill the container at the rate of Rs.21 per litre. 4

31 Mrs. Rajani has a garden in the shape of an equilateral triangle. She divided it into four parts by drawing three circular parts at the vertices of the triangle with radii each equal to the half of side of triangle for growing vegetables and flowers using Bio fertilizers.The area of the triangle is $144\sqrt{3}$ m^2. Find the area of part of the triangle not included in the circular parts. How Bio fertilizers are helpful over chemical fertilizers ? 4

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