1XNE551

SUMMATIVE ASSESSMENT – II
MATHEMATICS Class – X

Time allowed : 3 hours **Maximum Marks : 90**

General Instructions :

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

(ii) The question paper consists of 31questions 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 third term of the following sequence : 1

$a_1 = a_2 = 2$; $a_n = a_{n-1} - 1$, where $n > 2$

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 A die is thrown. once Find the probability of getting an odd number. 1

4 Find the abscissa of the point which divides the join of $(-1, 7)$ and $(4, -3)$ in the ratio $2 : 3$. 1

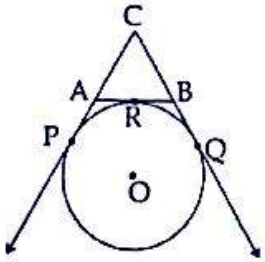
SECTION-B

Question numbers 5 to 10 carry two marks each.

5 If one root of the quadratic equation $2x^2 + kx - 6 = 0$ is 2, then find the value of $k + 1$. 2

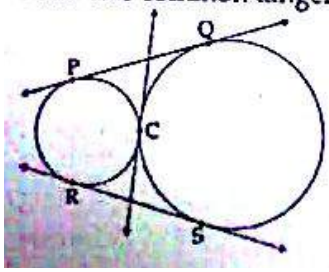
6 Find the 7^{th} term from the end of the AP : 32, 37, 42, 47, ... 237. 2

7 CP, CQ and AB are tangents to a circle with centre O. If CP = 11 cm and BR = 4 cm. Find BC. 2



8 Draw a line segment PQ = 7 cm and locate a point R on PQ such that $PR = \frac{3}{4}$ PQ. 2

9 Two circles touch each other externally at C. Prove that the common tangent at C bisects the other two common tangents. 2



10 An athlete runs on a circular track of radius 49 m and covers a distance of 3080 m along its bound. How many rounds has he taken to cover this distance ? (Use $\pi = \frac{22}{7}$) 10

SECTION-C

Question numbers 11 to 20 carry 3 marks each.

11 Solve the equation : $\sqrt{(3x^2 - 2)} = 2x - 1$. 1, 3

12 Find the sum of first 25 terms of an AP whose n^{th} term is given by $a_n = 2 - 3n$. −925

13 Construct a triangle PQR with sides PQ = 4 cm, QR = 5 cm and RP = 6 cm. Then, construct another triangle whose sides are $\frac{3}{4}$ of the corresponding sides of ΔPQR. 3

14 The angle of elevation of the top of a tower from certain point is 30°. If the observer moves 20 metres towards the tower, the angle of elevation of the top increases by 15°. Find the height of the tower. 3 $10(\sqrt{3}+1)$ m

15 A box is containing 55 flash cards showing different numbers on it. If a card is picked up at random from the box, the probability of getting an even number is $\frac{1}{11}$. How many cards have odd numbers written on it ? 3 50 cards

16 If the vertices of a ΔABC are A(6, −2), B(0, −6) and C(4, 8), find the coordinates of mid-points of its sides. 3 (3, −4) (2, 1) (5, 3)

17 The vertices of a triangle are $A(3, \sqrt{3})$, $B(3, -\sqrt{3})$ and C(0, 0). Find its perimeter. 3 $6\sqrt{3}$ units

18 The circumference of a circle exceeds the diameter by 16.8 cm. Find the radius of the circle. (Use $\pi = \frac{22}{7}$) 3 8.82 cm

19 A hemispherical depression of largest possible diameter is cut out from one face of a cubical wooden box of edge *l*. Determine the volume of the remaining solid. 3 $l^3\left(12 - \frac{\pi}{2}\right)$

20 A plot of land is in the form of a rectangle of dimensions 240 m × 180 m. A drainlet 10 m wide is dug all around it and the earth dug out is evenly spread over the plot, increasing its surface level by 25 cm. Find the depth of the drainlet. 3 12 1 m

SECTION-D

Question numbers 21 to 31 carry 4 marks each.

21 A pole has to be erected at a point on the boundary of a circular park of diameter 13 metres in such a way that the difference of its distances from two diametrically opposite gates A and B on the boundary is 7 metres. Is it possible to do so ? If yes, at what distances from the two gates should the pole be erected ? 4 5m & 12 m

22 The 6^{th} term of an AP is zero. Prove that its 21^{st} term is triple its 11^{th} term. 4

23 If the equation $(1 + m^2)x^2 + 2mcx + (c^2 - a^2) = 0$ has equal roots, prove that $c^2 = a^2(1 + m^2)$. 4

24 Two tangents are drawn to a circle with centre O, from a point P. If OP is equal to the diameter of the circle, show that ΔAPB is equilateral. 4

25 Construct a ΔABC in which AB = 6 cm, ∠B = 60° and AC = 7 cm. Construct a triangle similar to ΔABC, whose sides are $\frac{4}{7}$ of the corresponding sides of ΔABC. 4

26 The angle of elevation of a jet fighter from a point O on the ground is 60°. After a flight of 15 seconds, 4

the angle of elevation changes to 30°. If the jet is flying at a speed of 720 km/hour, find the constant height at which the jet is flying. $1500\sqrt{3}$ m

Ten playing cards - 4 aces, 2 red queens, a king of spade, a jack of club and 5 and 6 of diamonds, are well shuffled and are kept with their face downwards. One card is then picked up at random. 4

(i) What is the probability that the card is an ace ? $\frac{2}{5}$

(ii) What is the probability of drawing a red card ? $\frac{1}{2}$

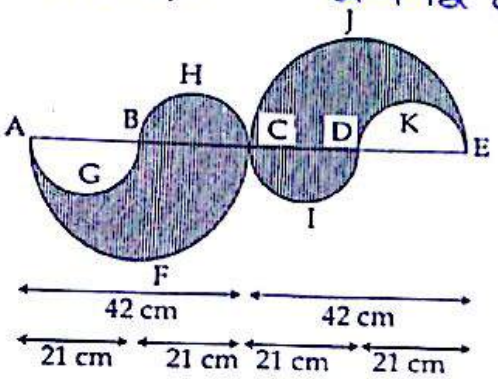
(iii) What is the probability that the drawn card is a jack of club. $\frac{1}{10}$

28

29 If the point P (3, 4) is equidistant from the points A (a + b, b − a) and B (a − b, a + b), then prove that $3b - 4a = 0$. 4

An NGO has decided to start a campaign about the consumer services, to spread awareness about the consumer courts and their benefits. For the same purpose, it makes some badges in the shape as shown in the figure, such that AB=BC=CD=DE =21 cm. 4

Find the area and perimeter of the badge (shaded region.) How consumer courts are helpful for the society ? 2772 cm² 264 cm.



30 The length of the minute and hour hands of a clock are 14 cm and 10.5 cm respectively. Find the difference in areas of the sectors described by the hands between 8 am and 8 : 40 am. 4 10.08 cm²

31 A cone, a hemisphere and a cylinder stand on equal bases and have same heights as the radii of the bases. Show that their volumes are in the ratio 1 : 2 : 3. 4

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