

SUMMATIVE ASSESSMENT – II, 2016-17

MATHEMATICS

Class – X

Time Allowed: 3 hours

Maximum Marks: 90

General Instructions:

1. All questions are **compulsory**.
2. 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.
3. There is no overall choice in this question paper.
4. Use of calculator is not permitted.

SECTION-A

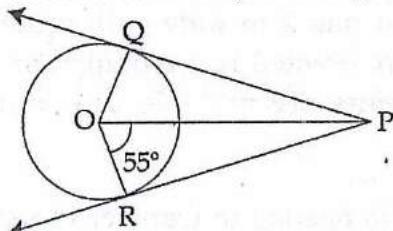
Question numbers 1 to 4 carry one mark each

1. If one root of the quadratic equation is $\frac{3 + 2\sqrt{5}}{4}$, then what will be the other root? 1
Handwritten: $\frac{3 - 2\sqrt{5}}{4}$
2. The shadow of a tree is $\sqrt{3}$ times its height. Find the angle of elevation of the sun. 1
Handwritten: 30°
3. A die is thrown once. Find the probability of getting a number less than or equal to 4. 1
Handwritten: $\frac{4}{6}$
4. If (1, 2), (4, 3), (x, 6) and (3, 5) are the vertices of a parallelogram taken in order, find value of x. 1
Handwritten: 6

SECTION-B

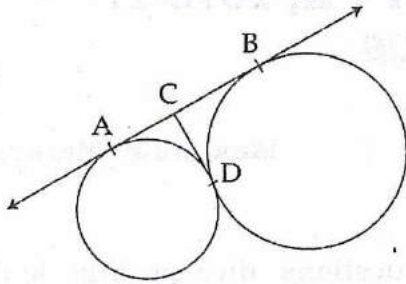
Question numbers 5 to 10 carry two marks each.

5. Write first four terms of the AP, when the first term is 1.25 and common difference is -0.25. 2
6. Find the positive values of k for which the equation $x^2 + 10kx + 16 = 0$ has no real roots. 2
7. In the adjoining figure PQ and PR are tangents from P to a circle with centre O. If $\angle POR = 55^\circ$, find $\angle QPR$. 2



8. Draw a line segment of length 6.5 cm. Find a point P on it which divides it in the ratio 3: 2. 2

9 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.



10 Find the perimeter of a protactor if its diameter is 21 cm

(Use $\pi = \frac{22}{7}$).

SECTION-C

Question numbers 11 to 20 carry three marks each.

11 How many terms of the AP : 9, 17, 25, must be taken to get a sum of 450? 10 3

12 Find the roots of the given equation :

$$2x - \frac{2}{x} = 6 ; x \neq 0 \quad \frac{6 \pm 2\sqrt{13}}{4}$$

13 Draw a circle of radius 6 cm. Construct a pair of tangents each measuring 8 cm from an external point to the circle. 3

14 The angle of elevation of the top of a vertical tower from a point on the ground is 60° . From another point 10 m vertically above the first, its angle of elevation is 45° . Find the height of the tower. $5(\sqrt{3}+1) = 13.65 \text{ m}$ 3

15 Sum of digits of a 2 digit number is 12 :

- (a) Find the probability that such a number is odd. $\frac{4}{7}$
- (b) Find the probability that such a number is less than 30. 0
- (c) Find the probability that such a number is divisible by 4. $\frac{2}{7}$

16 Show that the points A(1, 1), B(2, 3), C(3, 4) and D(2, 2) form a parallelogram ABCD. 3

17 Find the ratio in which the point (11, 15) divides the line segment joining the points (15, 5) and (9, 20). 2:1 3

18 A rectangular birthday cake has a length twice its breadth. It is surrounded by a ribbon all over its four sides covering an area of 1440 cm^2 . If the cake is 10 cm high, find its volume. 14400 cm^3 3

19 In summer vacations, a summer camp is organised for students where they stay in conical tents of radius 12 m. Each tent has 2 m wide path around it for movement. If the land where these tents are erected is a rectangular field of dimensions $1.4 \text{ km} \times 200 \text{ m}$, how many tents are possible in this field? 3

(Use $\pi = \frac{22}{7}$)

20 A rectangular tank 15 m long and 11 m broad is needed to transfer the entire liquid from a full cylindrical tank of internal diameter 21 m and length 5 m. 3

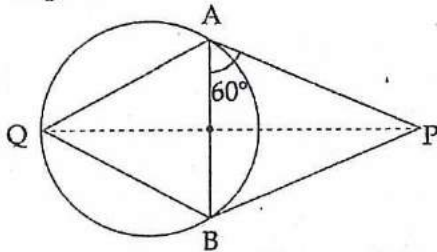
Find the least height of the tank that will serve the purpose. (Use $\pi = \frac{22}{7}$) 10.5 m

SECTION-D

Question numbers 21 to 31 carry four marks each.

- 21 Find the sum of the integers between 100 and 200 that are 4
 (i) divisible by 6. *2550*
 (ii) not divisible by 6. *12600*
- 22 If I had travelled by cycle 2 km/hour faster, I would have taken 20 minutes 4
 less to cover a distance of 4 km. Find the original speed of my cycling. *(km)/hr*
- 23 If in an AP, ratio of 4th term and 9th term is 1 : 3, find the ratio of 12th term 4
 and 5th term. *3:1*

- 24 PA and PB are the tangents to a circle which circumscribes an equilateral 4
 $\triangle ABQ$. If $\angle PAB = 60^\circ$, as shown in the figure, prove that QP bisects AB at right angles.

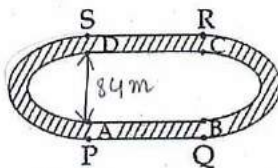


- 25 Draw a right triangle ABC in which AC = 9 cm, BC = 6 cm and $\angle B = 90^\circ$. 4
 Construct another triangle whose sides are $\frac{3}{2}$ times the corresponding sides of $\triangle ABC$.
- 26 A 2 m tall boy is standing at some distance from a 29 m tall building. The 4
 angle of elevation, from his eyes to the top of the building increases from 30° to 60° , as he walks towards the building. Find the distance he walked towards the building. *18.53 = 31.14*

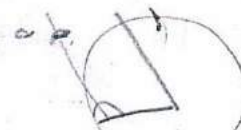
- 27 The king, queen and jack of hearts are removed from a deck of 52 cards. Then 4
 the cards are well-shuffled. One card is drawn at random from the remaining cards. Find the probability of getting
 (A) a heart. *$\frac{10}{49}$* (B) a king. *$\frac{2}{49}$*
 (C) a club. *$\frac{13}{49}$* (D) a six of hearts. *$\frac{1}{49}$*

- 28 Find the distances between a point on the x-axis and the points A (5, 4) and 4
 B (-2, 3) which are equidistant from this point. Also, find the area of the triangle formed by these points. *n=2 P(2,0), 12.5 sq units*

- 29 *check* An athletic track 21m wide consists of two straight sections 150 m long 4
 joining semi-circular ends whose diameters are 84 m each (see figure). Find the area of the track. (Use $\pi = \frac{22}{7}$ and $\sqrt{3} = 1.73$)



13230 m²



30

Check

A solid is in the form of a right circular cone mounted on a hemisphere. The radius of the hemisphere is 2.1 cm and the height of the cone is 4 cm. The solid is placed in a cylindrical bucket full of water in such a way that the whole solid is submerged in water. If the radius of the cylinder is 5 cm and its height is 9.8 cm, find the volume of water left in the cylindrical bucket.

(Use $\pi \frac{22}{7}$) 732.716 cm^3

31

A girl prepares a poster in a poster making competition on "Save animals" on a rectangular sheet whose dimensions are $60 \text{ cm} \times 45 \text{ cm}$. At each corner of the sheet, she draws a quadrant of radius 21 cm in which she shows the ways to save Animals. At the centre, she draws a square of side 15 cm and writes a slogan "Save animals" in it. Find the area of the remaining sheet.

Write suggestions for saving animals. 1089 cm^2

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