STD – X **MARKS- 80**

Duration – 3 hrs. **SUB. - MATHS**

……..

General Instructions:

1. This question paper contains two parts A and B.

2. Both Part A and Part B have internal choices.

Part – A:

1. It consists three sections- I and II.

2. Section I has 16 questions of 1 mark each. Internal choice is provided in 5 questions.

3. Section II has 4 questions on case study. Each case study has 5 case-based sub-parts. An

Examinee is to attempt any 4 out of 5 sub-parts.

Part – B:

1. Question No 21 to 26 are Very short answer Type questions of 2 mark each,

2. Question No 27 to 33 are Short Answer Type questions of 3 marks each

3. Question No 34 to 36 are Long Answer Type questions of 5 marks each.

4. Internal choice is provided in 2 questions of 2 marks, 2 questions of 3 marks and 1 question of 5

PART – A

Section-I

Section I has 16 questions of 1 mark each. Internal choice is provided

In 5 questions.

1. If xy=150 and HCF(x,y)=5, then find the LCM(x,y).

OR

What LCM of smallest two digit composite number and smallest composite number.

2. for what value of P, will be represented by the following pair of linear equations be parallel.

$3x – y -5 =0$

$6x- 2y –p = 0$

3. if $x =3$ is one root of the quadratic equation $x^2- 2kx -6 =0$ then find the value of K.

4.Write the standard form of Pair of Linear Equations In Two Variables and Quadratic Equations.

5. Find the distance of a point P(x,y)from the origin.

6. In an A.P, the common difference is -4 and seventh term is 4, and then finds the first term.

OR

Find the sum of 8 multiple of 3.

7.If 5 chairs and 1 table costs Rs. 1500 and 7 chairs and 1 table costs Rs.2400. Form

Linear equations to represent this situation.

8. If the circumference of two concentric circles forming a ring are 88cm and 66 cm . Find the width of the ring.

OR

Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of larger circle which touches the smaller circle.

9. Find A, if $\text{Tan } 2A = \text{Cot } (A – 2A^0)$

OR

In the triangle ABC, write $\cos\left(\frac{B+C}{2}\right)$ in terms of angle A.

10. What is angle between the tangents at the end of the radii, if angle between two radii of a circle is 130^0?

11. If the perimeter of a circle is equal to that of a square, then what is the ratio of their areas?

OR

What is the area of the square that can be inscribed in a circle of radius is 8 cm.

12. The lengths of the diagonals of a rhombus are 16 cm and 12 cm. What is the length of the side of rhombus?

13. If triangle ABC similar to triangle QRP $\frac{ar\,(ABC)}{ar\,(PQR)} = \frac{9}{4}$, AB = 18 cm and BC = 15 cm . What is length of PR.?

14. If one zero of quadratic polynomial $x^2 + 3x + k$ is 2, then what is value of K.

15. The two positive integer's p and q can be expressed as $p= ab^2$ and $q = a^3b$: a, b being prime numbers.

What is the LCM (p,q).

16. In a circle of diameter 42cm, if an arc subtends an angle of 60˚ at the Centre where ∏=22/7

Then what will be the length of arc.

Section-II

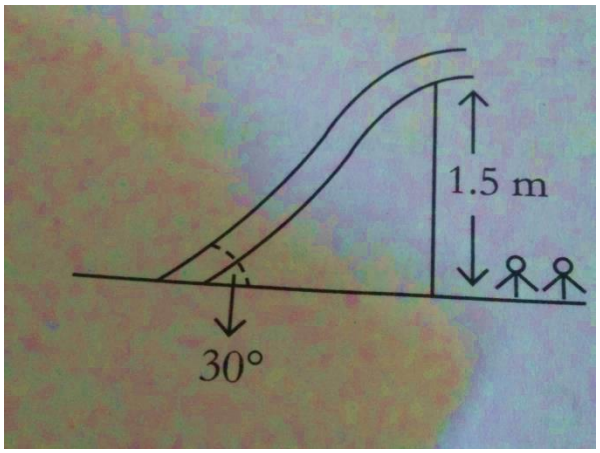
Case study based questions are compulsory. Attempt any four sub

parts of each question. Each subpart carries one mark.

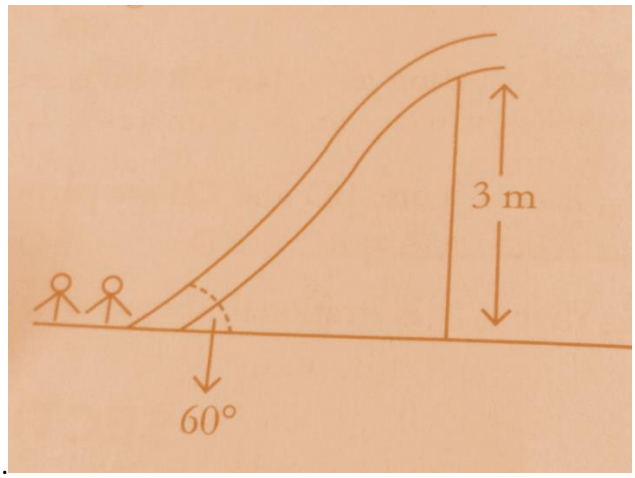
Case Study based-1

A residential welfare association of a colony plans to install two slides for the children to play in the park. The sides along with the stairs to reach the top of the slides make two triangles. For the children below the age of 5 years, it prefers to have a slide whose top is at the height 1.5 m and inclined an angle

Of 30^0 to the ground.



Whears for elder children , it wants to have a steep slide at a height of 3 m and inclined at angle 60^0 to the groun d.



a) What is the length of the slide for younger children?

1) 2m

2)3m

3)4m

4)5m.

b)What is the height of the slide for the elder children?

1) 1.5 m

2) 3 m

3)1.73 m

d) 2.43m

c) using Pythagoras theorem only, Calculate the length of the side for elder children.

1)2.73

2)4.46

3)1.73

4)3.46

d) What is the base length of triangle formed by the slide for elder children?

1) $\sqrt{3}$

2) 3

3) 2

4)$\sqrt{6}$

e) What is difference in their inclined angles in both slides?

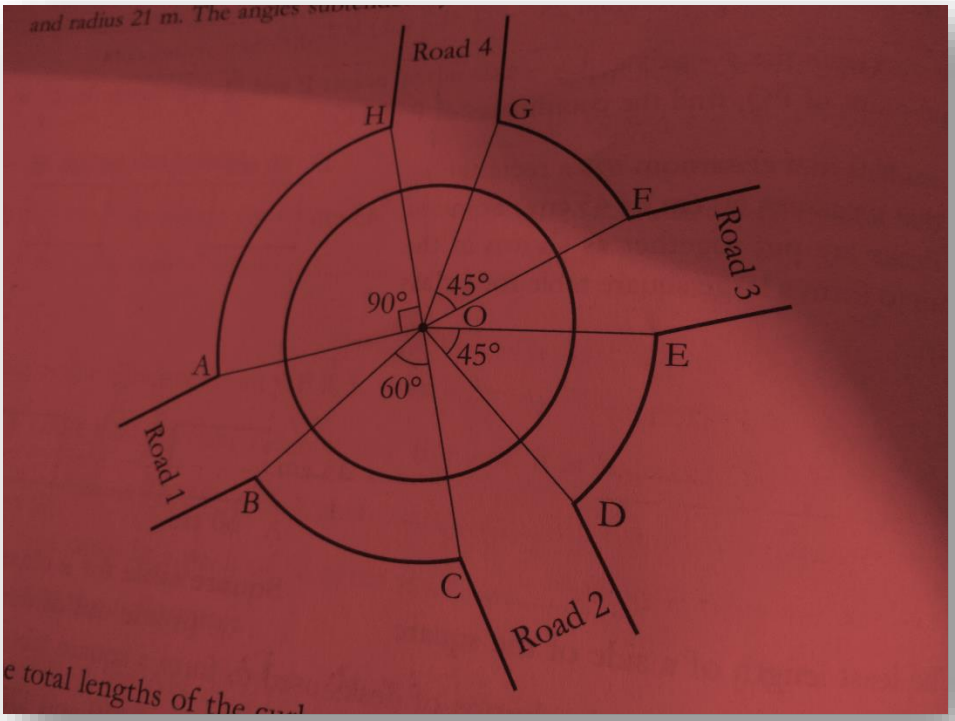
1) both are same.

2) 90^0

3) 45^0

4) 30^0

Case study 2



The diagram shows a roundabout at ction of four roads with equal width.

The central park is in the form of a circle with centre O and radius 14 m.

The curbs BC , DE , FG , and HA are in the form of arcs that lie on the circle with centre 0and radius

21 m. The angles subtended by the curbs at O are 60^0 , $45\ ^0$, 45^0 and 90^0.

1) what is the radius of central park?

a) 21m

b) 14m

c) 7 m

d) 12m

2) How many angles are formed at centre along with roads.

A)4

b) 6

c) 8

D)10

3) Name of curbs , Which are having same lengths.

a) AH, GF

b) GF, BD

C) GF,ED

d) ED, BC

4) Find the total lengths of the curbs

a) 77cm

b) 88cm

c) 66cm

d)99cm

5) How much, area of the circular road surrounded the central park.?

a) 119 sq cm

b) 770 sq cm

c) 880 sq.m

d) 775 sq .m

Case study 3

Peter throws two different dice together. He gets different result at different throws. He has no knowledge about probability. My dear friends help him to find the solution of their problems.

1) What is the sum of the probabilities of all elementary events of an experiment is P. then

a)$0< p < 1$

b)$0\leq p < 1$

c) P= 1

d) p =0

2) In a single throw of two dice, find the probability of getting a total of 10.

a) $\frac{1}{10}$

b)$\frac{1}{12}$

c)$\frac{1}{14}$

d)$\frac{1}{11}$

3) In a single throw of two dice what is probability of getting a total of 9 or 11.

a) $\frac{1}{5}$

b)$\frac{1}{6}$

c)$\frac{5}{6}$

d)$\frac{1}{2}$

4. If an event cannot occur, then its probability is

a) 1

b) 1/2

C) 0

d) None of these.

5) Two different dice are tossed together; find the probability of getting a doublet.

a) $\frac{1}{2}$

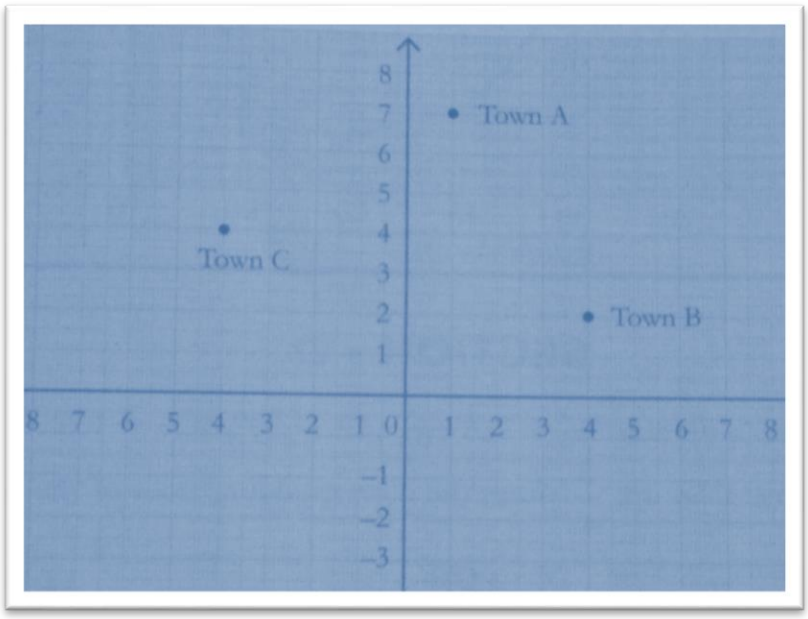
b)$\frac{1}{6}$

c)$\frac{5}{6}$

d)$\frac{1}{3}$

Case study -4

Two friends Seema and Aditya work in the same office at Delhi. In the Diwali vacations, both decided to go their hometowns represented Town A and Town B respectively in the figure given below. Town A and town B are connected by the trains from the same station C in Delhi. Based on given situation ,answer the following questions.



1)Who will travel more distance Seema or Aditya to reach to their home towns?

a) Seema

b) Aditya

C) Seema and Aditya travel same distance.

d) None of these.

2)What is distance between Town A and Town C ?

a) 34 units

b) $\sqrt{34}$ units

c)35 units

d)$\sqrt{35}$ units.

3) Seema and Aditya planned to meet at a location D situated at a point D represented by the mid-poin

Of line joining the points represented by Town A and Town B. Find the coordinate of point D

a) (1 , 5)

b) ($\frac{5}{2}$, $\frac{9}{2}$)

c)($\frac{1}{2}$,$\frac{7}{2}$)

d) None of these.

4)By joining the points A, B and C which type of figure is obtained.

a) line segment

b) Triangle

c) Rectangle

d) Trapezium

5) After Diwali vacation , how much distance both travel to reach back at their work place.

a)$\sqrt{110}$ units

b))$\sqrt{104}$ units

c)$\sqrt{102}$ units

d)$\sqrt{103}$ units

PART – B

Q21) If LCM (480, 672) = 3360, find HCF (480,672).

Q22) Find the ratio in which the X axis divides the join of A(2 ,-3) and B(5,6)

0r Check whether (5, – 2), (6, 4) and (7, – 2) are the vertices of an isosceles triangle.

Q23) If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then find the value of *k*

Q24) Find the length of the tangent drawn to a circle of radius 3 cm, from a point distant 5 cm from the centre.

25) If $cosec\ \theta = \sqrt{10}$, Find , $sec\ \theta$ and $cot\ \theta$

0r Find the value of $\frac{2\tan 60}{1-tan^2 30}$

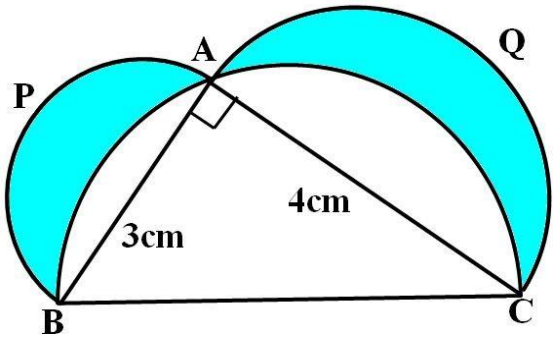
26) Distance of chord AB from the centre is 12cm,and the length of the chord is 10cm.Find the diameter of the circle.

Q27) Prove that $3 + 2\sqrt{5}$ is irrational.

Q28) Find the value of k for which the quadratic equation $(k - 12)x^2 + 2(k - 12)x + 2 = 0$ has two real equal roots.

0r If –5 is a root of the equation $2x^2 + px - 15 = 0$ and the equation $p(x^2 + x) + k = 0$ has equal roots, find the value of k.

Q29 In the given figure, ABC is right angled at A. Semicircles are drawn on AB, AC and BC as diameters. It is given that AB = 3cm and AC = 4cm. Find the area of the shaded region.



30) In an equilateral triangle ABC,D is a point on the side BC such that $BD = \frac{1}{3}BC$.Prove that $9AD^2 = 7AB^2$

0r

D is a point on the side BC of a triangle ABC such that ADC = BAC. Show that $CA^2 = CB.CD$.

31) The frequency distribution table of agriculture holdings in a village is given below:

Area of land (in hectors)	1-3	3-5	5-7	79	9-11	11-13
No. of families	20	45	80	55	40	12

Find the modal agriculture holdings of the village.

32) The angles of depression of the top and the bottom of an 8 m tall building from the top of a multistoried building are 30° and 45°, respectively. Find the height of the multistoried building and the distance between the two buildings.

33) Find the missing frequencies f_1 and f_2 in table given below; it is being given that the mean of the given frequency distribution is 145.

Class	100-120	120-140	140-160	160-180	180-200	Total
Frequency	10	f_1	f_2	15	5	80

34) From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45°, respectively. If the bridge is at a height of 3 m from the banks, find the width of the river.

0r

A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30°, which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60°. Find the time taken by the car to reach the foot of the tower from this point.

35) A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the following: (i) Area of minor sector (ii) Area of major sector (iii) Area of major segment (iv) Area of minor segment. (Use □ = 3.14)

36) A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km down-stream. Determine the speed of the stream and that of the boat in still water.