Class- X Session- 2020-21

Subject- Mathematics -Standard

Sample Question Paper -2

Time Allowed: 3 Hours **Maximum Marks: 80**

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 two 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 marks.

Part - A

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

1. The decimal form of $\frac{130}{2^2 5^7 7^5}$ is _____

OR

Find the largest number that will divide 398,436 and 542 leaving remainders 7,11 and 15.

2. Find the HCF of 8, 9, 25.

3. If one zero of the quadratic polynomial $x^2 + 3x + m$ is 2, Find the value of m

4. What solution does pair of equations $3x - 5y = 10$ and $-6x + 10y = 10$ have

5. Is $x^2 + x^3 + 9 = 0$ a quadratic equation? Justify

OR

Find the roots of the quadratic equation $6x^2 - x - 2 = 0$.

6. If the sum of three numbers in an A.P. is 9 and their product is 24, Find numbers.

7.Find $(n - 1)^{th}$ term of an A.P. 7,12,17, 22,...

OR

Find the 10th term from the end of the A.P. -5, -10, -15,..., -1000.

8.The distance of the point Q(2, 3) from the x-axis is

9.If the distance between the points (p, -1) and (3, 2) is 5, Find the value of p.

OR

Find the distance between the point P(1, 4) and Q(4, 0).

10. In triangles ABC and DEF, $\angle B = \angle E$, $\angle F = \angle C$ and AB = 3DE. Then, the two triangles are _____ and _____.

OR

O is a midpoint on side PQ of a ΔPQR right angled at R. Prove that PO = QO = RO

11. In ΔABC, $AB = 6\sqrt{3}$ cm, AC = 12 cm and BC = 6 cm. The angle B is _____.

12. A tangent is drawn from a point at a distance of 17 cm of center of circle of radius 8 cm. The length of its tangent is _____

13. The sides of a triangle are 30cm, 70cm and 80 cm. If an altitude is drawn upon the side of length 80 units, the larger segment cut off on this side is_____.

14. If $p \sin 45° \cos 45° = \tan^2 45° - \cos^2 30°$, then p = ____.

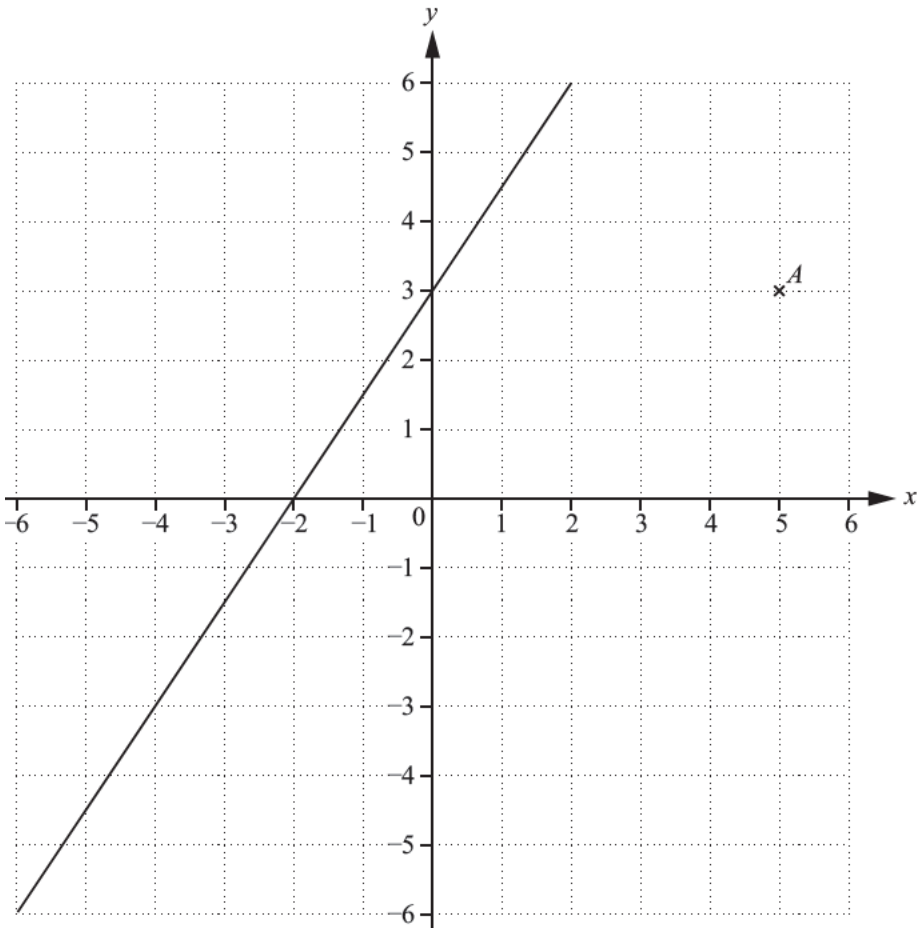
15. If sec A + tan A = x, then sec A = _____

16. If $\cos(\alpha + \beta) = 0$, then $\sin(\alpha - \beta)$ can be reduced to

Section-II

Case study-based questions are compulsory. Attempt any four sub parts of each question. Each subpart carries 1 mark

17. Case Study based-1 Coordinate geometry: The diagram shows a point A and the line $y = (3/2)x + 3$



a)Refer to graph above Write down the co-ordinates of point A.

(i) (3,5)(ii) (5,3)(iii)(5,-3)(iv) (-5,3)

b) The distance of the point A from the y-axis is
(i) 4 (ii) 15 (iii) 3 (iv) 5

c) The line ax + by = 10 is parallel to the above line the value of a and b is

(i) 6,-4 (ii) 3,-4 (iii)-6,-4 (iv)2,3

d) Find the co-ordinates of the point which at which line x=4 intersects the given line.

(i) (8,2) (ii) (4,9) (iii) (3,4) (iv) (4,8)

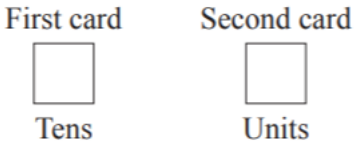
e) Point (x,y) reflection of point A on x axis is

(i) (5,-3) (ii)(3,-5) (iii) (4,5) (iv)(5,-4)

18. Case Study based-2 Probability: The numbers 2, 3, 3, 4, 4, 4 are written on six cards.

2	3	3	4	4	4

Two cards are chosen, at random, without replacement, to form a 2-digit number. The first card chosen shows the number of Tens. The second card chosen shows the number of Units.



a) If the number formed must be greater than 29. What is the probability of getting first card.

(i) (3/5)(ii) (5/6)(iii)(5/9)(iv) (2/6)

b) The probability of getting second card 0 is
(i) 4 (ii) 0 (iii) 3 (iv) 5

c) If the number formed must be less than 29. What is the probability of first card.

(i) 1/6 (ii) 3/6 (iii)5/6 (iv)0

d) If the number formed must be less than 29. What is the probability of second card.

(i) 1/6 (ii) 3/6 (iii)5/6 (iv)1

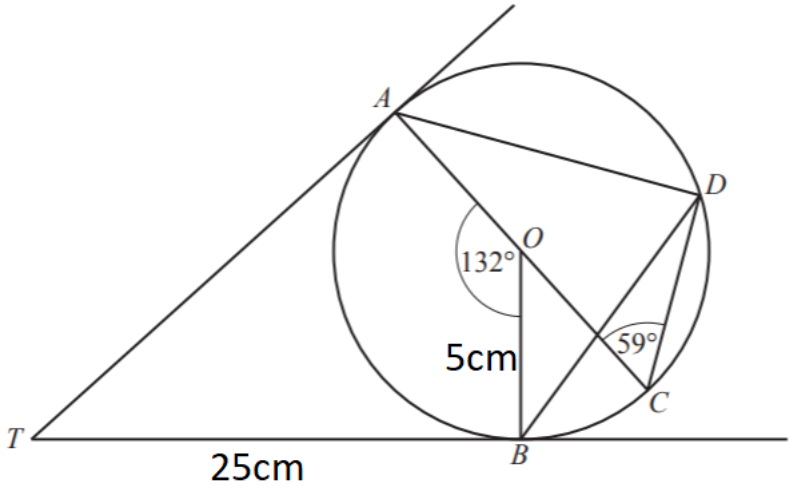
e) If the number to be formed less than highest two digit number probability of getting first card is

(i) 1/6 (ii) 5/6 (iii)1/3 (iv)1

19.Case Study based-3 Circles: In the diagram, the points A, B, C and D lie on the circle centre O.

TA and TB are tangents touching the circle at A and B respectively.

$\angle AOB = 132°$, $\angle ACD = 59°$ and AOC is a straight line..



a) What is ∠ATO?

(i) 24(ii) 48(iii)50(iv) 35

b) Perimeter of quadrilateral OATB is
(i) 60 (ii) 80 (iii) 30 (iv) 55

c) Area bounded by two tangents and radii OA and OB is divided into two equal areas. Each area is

(i) 38 (ii) 62.5 (iii)56.5 (iv)100

d) ∠CAD is.

(i) 16 (ii) 31 (iii)56 (iv)19

e) If the length of chord is 6cm , then area of ΔACD is

(i) 24 (ii) 25 (iii)13 (iv)15/2

20.Case Study based-4 Statistics: The following table gives the ages of 50 students of a class

Age Years	16-18	18-20	20-22	22-24	24-26
frequency	2	7	21	17	3

a)What is the mean of their ages?

(i) 21.48(ii) 22.4(iii)50(iv) 20

b) What will be the lower limit of the modal class?
(i) 18 (ii) 20 (iii) 30 (iv) 24

c) The sum of upper limits of median class and modal class is

(i) 44 (ii) 42 (iii)46 (iv)38

d) How many students are above 18 years of age?

(i) 2 (ii) 31 (iii)48 (iv)19

e) One of the methods for determining mode is

(i) Mode = 2 Median -3 Mean (ii) Mode = 3 Median – 2 Mean

(iii) Mode = 2 Mean – 3 Median (iv) Mode = 3 Mean – 2 Median

Part – B

All questions are compulsory. In case of internal choices, attempt any one.

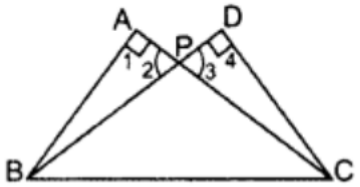
Q. Nos 21 to 26 carry 2 marks each.

21. Solve for x: $36x^2 - 12ax + (a^2 - b^2) = 0$.

22. If PQR is an equilateral triangle and PX ⊥ QR, find the value of PX^2.

OR

In the figure ABC and DBC are two right triangles. Prove that AP × PC = BP × PD.



23. Evaluate: tan 15°. tan 25°, tan 60°. tan 65°. tan 75° – tan 45°.

OR

If A, B and C are the interior angles of a ΔABC, show that sin (A+B)/2 = cos(C/2).

24. Area of a sector of a circle is 1/6 to the area of circle. Find the degree measure of its minor arc. [Take π = 22/7].

25. A card is drawn at random from a pack of 52 playing cards. Find the probability that the card drawn is neither an ace nor a king.

26. The mean of the following data is 18.75. Find the value of F;

Class marks	10	5	F	25	30
frequency	5	10	7	8	2

Q. Nos 27 to 33 carry 3 marks each.

27. Solve the following pair of equations by substitution method:

$7x - 15y = 2$

$x + 2y = 3$

OR

Solve for x

$2x^2 - x + 1/8 = 0$

28. Which term of the A.P. 3, 14, 25, 36, … will be 99 more than its 25th term?

OR

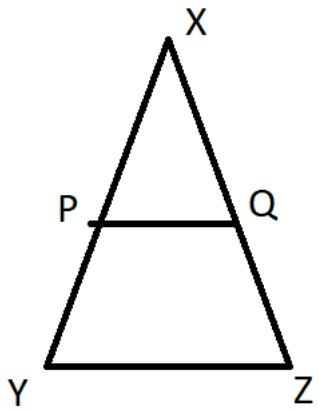
If the sum of first 7 terms of an A.P is 49 and that of its first 17 terms is 289, find the sum of first n terms of the A.P.

29. Find the value of p for which the roots of the equation. $px(6x + 10) + 25 = 0$, are equal?

30. If the point P(k – 1, 2) is equidistant from the points A(3, k) and B(k, 5), find the values of k.

31. Two triangles ABC and DBC are on the same base BC and on the same side of BC in which $\angle A = \angle D = 90^\circ$. If CA and BD must intersect each other at E. Show that AE.EC=BE.ED.

32. In fig. XP/PY=XQ/QZ=3, if the area of Δ XYZ is 32 cm^2, then find area of quad. PYZQ



33. Prove the following identity:
$(\text{cosec } A - \sin A)(\sec A - \cos A)(\tan A + \cot A) = 1$

Q. Nos 34 to 36 carry 5 marks each.

34. The length of a rope by which a cow is tethered is increased from 16m to 23m. How much additional area can the cow graze?

35. Find the HCF and LCM of 306 and 657 and verify that LCM × HCF = Product of the two numbers.

36. A boat goes 24 km upstream & 28 km downstream in 6 hours. In 6.5 hours, it can go 30 km upstream & 21 km downstream. Find the speed of stream and the speed of boat in still water.?

OR

Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars?