Set- A

SUMMATIVE ASSESSMENT - III 2025 – 26
Model Question Paper
Mathematics

Class – **10**

Time : 2½ Hours

Score : 80

Instructions

- Use the first 15 minutes to read the questions and think about the answer.
- There are 28 questions, split into five parts A, B, C, D, E.
- Answer all question: but in questions of the type A or B, you need to answer only one of those.
- You can answer the questions in any order, writing the correct question number.
- Trigonometric tables are given at the end and can be used wherever necessary.
- Answer must be explained, whenever necessary

Section – A

This section has 8 questions of 1 mark each. Select the correct answer from those given

1. Which of the numbers below is a term of the arithmetic sequence 2, 5, 8, …?
   - **A.** 22
   - **B.** 32
   - **C.** 42
   - **D.** 52
2. The scores of 8 students in an exam are given below:

   30, 36, 41, 44, 28, 33, 44, 40

   What is the median score?
   - **A.** 36
   - **B.** 44
   - **C.** 40
   - **D.** 38

3. Which of the points below is on the line through (2, 5), parallel to the x -axis?
   - **A.** (0, 5)
   - **B.** (2, 0)
   - **C.** (5, 0)
   - **D.** (5, 2)

4. The surface area of a sphere is 40 square centimetres. If it is cut into two equal hemispheres, what would be the surface area of each in square centimetres?
   A. 10
   B. 20
   C. 30
   D. 40
5. The algebraic form of an arithmetic sequence is $x_n = 4n + 1$. In this sequence, how much more than the 10^{th} term is the 15^{th} term?
   A. 5
   B. 4
   C. 41
   D. 20
6. What are the x-coordinates of the points where the graph of the polynomial $p(x) = x^2 - 6x + 8$ cuts the x-axis?
   A. 2, 4
   B. 4, 6
   C. -2, 8
   D. -2, -4
7. The equation of a line is $2x–y = 0$. Read the following statements given below

   i) (1,2) is a point on this line

   ii) (2,1) is a point on this line

   iii) The point where this line cuts the x-axis is (1, 0)

   iv) The y – coordinate of each point on this line is twice the x–coordinate

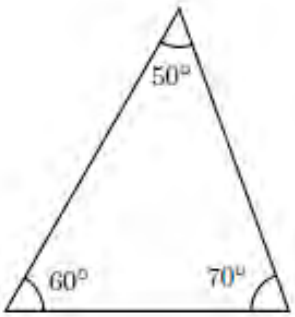
   Now choose the correct answer from those given below
   A. (i) and (iii) are true
   B. (i) and (iv) are true
   C. (ii) and (iii) are true
   D. (ii) and (iv) are true

8. Read the two statements below

Statement 1 : In a triangle with angles 50^o, 60^o, 70^o, the ratio of the sides is $\sin 50^o : \sin 60^o : \sin 70^o$

Statement 2 : The length of each side of a triangle is the product of the sine of the opposite angle and the diameter of the circumcircle.

Now choose the correct answer from those given below



A. Statement 1 is true, statement 2 is false

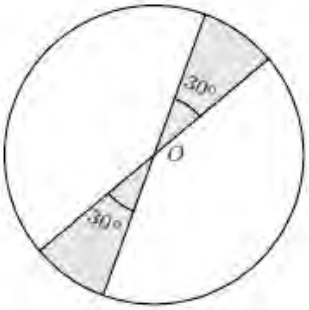
B. Statement 1 is false, statement 2 is true

C. Both statements are true and statement 2 is the reason of statement 1

D. Both statements are true and statement 2 is not the reason of statement 1

Section – B

9. In the figure, *O* is the centre of the circle. If a point is marked in this, what is the probability that it falls inside the shaded part? (2)



10. The fifth term of an arithmetic sequence is 70 and the ninth term is 50

(i) In this sequence by how much does each term decrease, when the position increases by one? (1)

(ii) At what position does the term 0 occur in this sequence? (2)

11. **A.** Three-digit numbers are formed using cards with the numbers 2, 3, 5 written on them.

(i) How many such numbers can be made? (1)

(ii) What is the probability that such a number is even? (1)

(iii) What is the probability that such a number is a multiple of 5? (1)

OR

B. A box contains 6 black beads and 4 white beads, and another box contains 7 black and 8 white beads.

(i) In how many ways can a pair of beads be chosen, one from each box? (1)

(ii) What is the probability of both being black? (1)

(iii) What is the probability that at least one is white? (1)

12. **A.** The 2nd term of an arithmetic sequence is 5 and the sum of the first 6 terms is 60.

(i) What is the sum of the 2nd and the 5th terms? (1)

(ii) What is the 5th term? (1)

(iii) What is the sum of the first 15 terms? (2)

OR

B.

(i) Write the sequence of natural numbers that leave remainder 3 or 8 when divided by 10 (1)

(ii) What is the remainder on dividing any term of this sequence by 5? (1)

(iii) Prove that this is an arithmetic sequence (2)

13. The table below gives 49 persons classified according to their weights:

Weight (kg)	Number of persons
30-40	5
40-50	7
50-60	9
60-70	10
70-80	10
80-90	8
Total	49

They are lined up according to their weights

(i) The weight of the person at which position is taken as the median? (1)

(ii) According to the assumptions used to calculate the median, what is the weight of the 22nd person? (2)

(iii) Calculate the median weight (1)

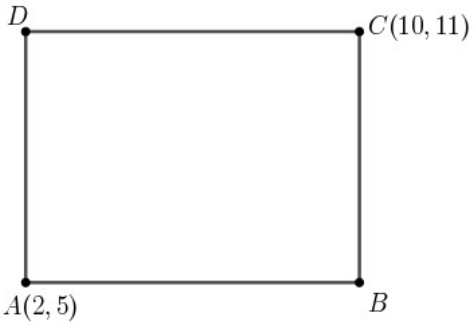
Section – C

14. The centre of a circle is (2, 1) and (8, 9) is a point on it.

(i) Calculate the radius of the circle (2)

(ii) Write the equation of the circle (1)

15. In the picture, *ABCD* is a rectangle with sides parallel to the axes

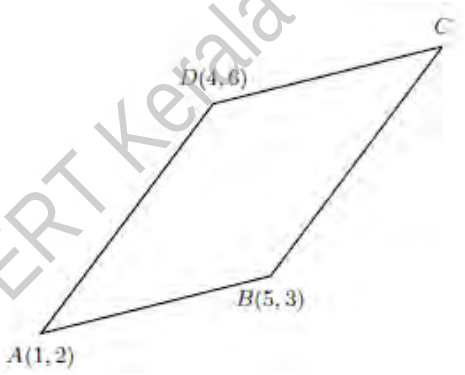


(i) Write the coordinates of the vertices *B* and *D* (2)

(ii) Calculate the length of *AB* (1)

(iii) Calculate the length of *AC* (1)

16. **A.** In the picture, *ABCD* is a parallelogram



(i) Calculate the coordinates of *C* (1)

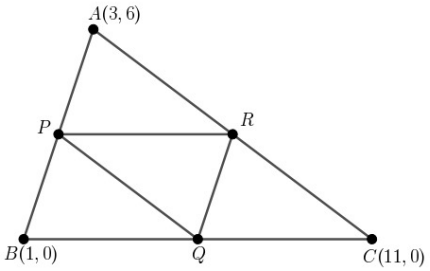
(ii) Calculate the slope of the diagonal AC (1)

(iii) Write the equation of the line through *A* and *C* (2)

(iv) Does this line passes through the origin? Why? (1)

OR

B. In the picture *P, Q, R* are the midpoints of the sides of the triangle *ABC*



(i) Calculate the coordinates of *P* and *Q* (2)

(ii) Calculate the coordinates of the point of intersection of *PR* and *AQ* (1)

(iii) Calculate the coordinates of the centroid of the triangle *PQR* (2)

Section – D

17. One of the perpendicular sides of a right triangle is 6 centimetres longer than the other and the area of the triangle is 56 square centimetres.

(i) Write these information as a second degree equation (1)

(ii) Calculate the length of the shortest side (2)

18. Consider the arithmetic sequences given below:

Sequence 1 : 5, 8, 11, . . .

Sequence 2 : 4, 7, 10, . . .

(i) What is the remainder on dividing each term of the first sequence by 3? (1)

(ii) What is the remainder on dividing each term of the second sequence by 3? (1)

(iii) Prove that the square of each term of the first sequence is a term of the second sequence (2)

19. **A.** The sum of the first n terms of an arithmetic sequence is $2n^2+3n$

(i) What is the sum of the first five terms? (1)

(ii) How many terms of the sequence, starting from the first, must be added to get 324? (3)

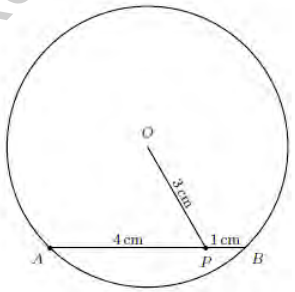
OR

B. (i) Prove that the sum of any number of consecutive terms of the sequence 4, 12, 20, . . . starting from the first term, is a perfect square. (3)

(ii) Write another Arithmetic sequence such that the sum of any number of consecutive terms from the first term is always a perfect square (1)

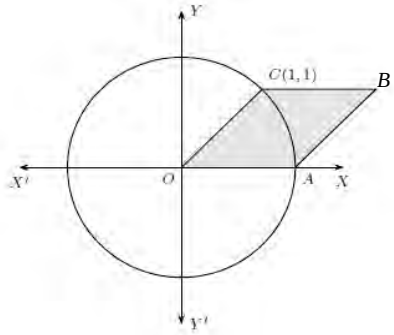
Section – E

20. In the picture, *AB* is a chord through the point *P* inside the circle centred at *O*. What is the radius of the circle?



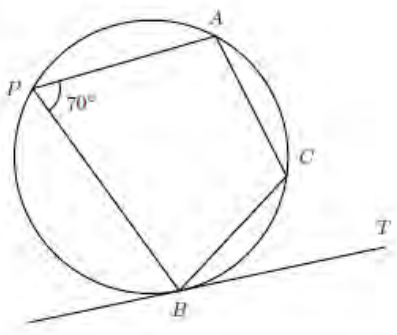
(2)

21. *A* is the point of intersection of the circle with centred at the origin and x- axis. Circle is passes through the point *C*(1, 1). Calculate the area of the parallelogram *OABC*.



(3)

22. *A, B, C, P* are points on the circle in the picture, with *AC = BC*, and *BT* is the tangent at *B*. Calculate the angles below



(i) $\angle ACB$ (1)

(ii) $\angle CBT$ (2)

23. **A.** A boy sees the top of a building at an angle of elevation 35°. Walking 10 metres towards the building, he sees it at an angle of elevation 70°.

(i) Draw a rough sketch showing these details (1)

(ii) Calculate the height of the building (3)

OR

B. Two buildings stand 15 metre apart on a flat terrain. A person standing on top of the less tall building sees the foot of the taller building at an angle of depression 30° and the top at an elevation of 40°

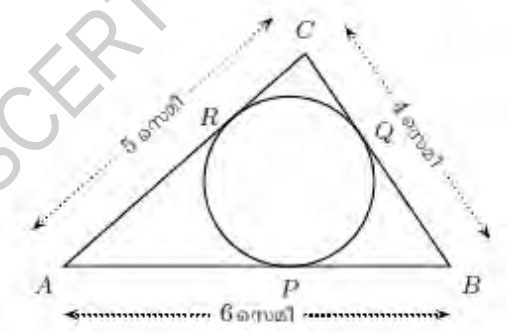
(i) Draw a rough sketch showing these details (1)

(ii) Calculate the height of the tall building (3)

24. **A. (I)** The incircle of triangle *ABC* touches its sides at *P, Q, R*.

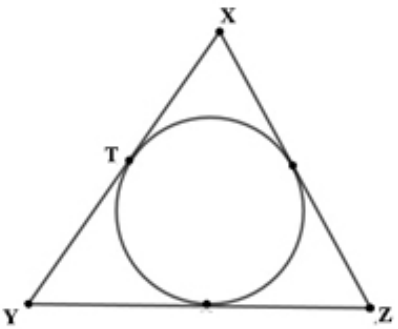
(i) Denoting the length of *AP* by *x*, write the expressions for the lengths of *BQ* and *CR* (1)

(ii) Calculate the length of *AP* (1)



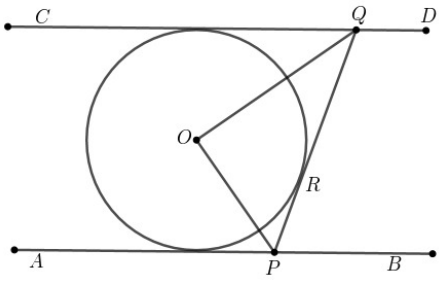
(II) The incircle of triangle *XYZ* touches the side *XY* at *T*.

Prove that $XY + XZ - YZ = 2XT$ (2)



OR

B. In the picture, *AB* and *CD* are parallel tangents to the circle centered at *O*. The tangent from the point *P* on *AB* meets *CD* at *Q*



(i) Prove that OP is the bisector of $\angle APQ$ (1)

(ii) Prove that $\angle POQ = 90^\circ$ (3)

25. **A.** A square pyramid is made with a square of sides 12 centimetres and four isosceles triangles of equal sides 10 centimetres. Calculate its volume (5)

OR

B. A sector of central angle 216º is cut off from a circle of radius 15 centimetres and bent into a cone

(i) Calculate the slant height, base radius and height of this cone. (3)

(ii) Calculate the volume of this cone. (2)

26. Draw a triangle of circumradius 3.5 centimetres and two of the angles $32\frac{1}{2}^{o}$ and 40º. (3)

27. Draw a rectangle of area 15 square centimetres and a square of the same area. (4)

28. Draw a circle of radius 4 centimetres and mark a point 7 centimetres from the centre. Draw the tangents to the circle from this point. (4)

Trigonometric tables

കോൺ	sin	cos	tan
1	0.0175	0.9998	0.0175
2	0.0349	0.9994	0.0349
3	0.0523	0.9986	0.0524
4	0.0698	0.9976	0.0699
5	0.0872	0.9962	0.0875
6	0.1045	0.9945	0.1051
7	0.1219	0.9925	0.1228
8	0.1392	0.9903	0.1405
9	0.1564	0.9877	0.1584
10	0.1736	0.9848	0.1763
11	0.1908	0.9816	0.1944
12	0.2079	0.9781	0.2126
13	0.2250	0.9744	0.2309
14	0.2419	0.9703	0.2493
15	0.2588	0.9659	0.2679
16	0.2756	0.9613	0.2867
17	0.2924	0.9563	0.3057
18	0.3090	0.9511	0.3249
19	0.3256	0.9455	0.3443
20	0.3420	0.9397	0.364
21	0.3584	0.9336	0.3839
22	0.3746	0.9272	0.404
23	0.3907	0.9205	0.4245
24	0.4067	0.9135	0.4452
25	0.4226	0.9063	0.4663
26	0.4384	0.8988	0.4877
27	0.4540	0.8910	0.5095
28	0.4695	0.8829	0.5317
29	0.4848	0.8746	0.5543
30	0.5000	0.8660	0.5774
31	0.5150	0.8572	0.6009
32	0.5299	0.8480	0.6249
33	0.5446	0.8387	0.6494
34	0.5592	0.8290	0.6745
35	0.5736	0.8192	0.7002
36	0.5878	0.8090	0.7265
37	0.6018	0.7986	0.7536
38	0.6157	0.7880	0.7813
39	0.6293	0.7771	0.8098
40	0.6428	0.7660	0.8391
41	0.6561	0.7547	0.8693
42	0.6691	0.7431	0.9004
43	0.6820	0.7314	0.9325
44	0.6947	0.7193	0.9657
45	0.7071	0.7071	1.0000

കോൺ	sin	cos	tan
46	0.7193	0.6947	1.0355
47	0.7314	0.6820	1.0724
48	0.7431	0.6691	1.1106
49	0.7547	0.6561	1.1504
50	0.7660	0.6428	1.1918
51	0.7771	0.6293	1.2349
52	0.7880	0.6157	1.2799
53	0.7986	0.6018	1.3270
54	0.8090	0.5878	1.3764
55	0.8192	0.5736	1.4281
56	0.8290	0.5592	1.4826
57	0.8387	0.5446	1.5399
58	0.8480	0.5299	1.6003
59	0.8572	0.5150	1.6643
60	0.8660	0.5000	1.7321
61	0.8746	0.4848	1.8040
62	0.8829	0.4695	1.8807
63	0.8910	0.4540	1.9626
64	0.8988	0.4384	2.0503
65	0.9063	0.4226	2.1445
66	0.9135	0.4067	2.2460
67	0.9205	0.3907	2.3559
68	0.9272	0.3746	2.4751
69	0.9336	0.3584	2.6051
70	0.9397	0.3420	2.7475
71	0.9455	0.3256	2.9042
72	0.9511	0.3090	3.0777
73	0.9563	0.2924	3.2709
74	0.9613	0.2756	3.4874
75	0.9659	0.2588	3.7321
76	0.9703	0.2419	4.0108
77	0.9744	0.2250	4.3315
78	0.9781	0.2079	4.7046
79	0.9816	0.1908	5.1446
80	0.9848	0.1736	5.6713
81	0.9877	0.1564	6.3138
82	0.9903	0.1392	7.1154
83	0.9925	0.1219	8.1443
84	0.9945	0.1045	9.5144
85	0.9962	0.0872	11.4301
86	0.9976	0.0698	14.3007
87	0.9986	0.0523	19.0811
88	0.9994	0.0349	28.6363
89	0.9998	0.0175	57.2900