Set- C

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 27 questions, split into five parts A, B, C, D, E.
- Answer all question; but in questions of 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

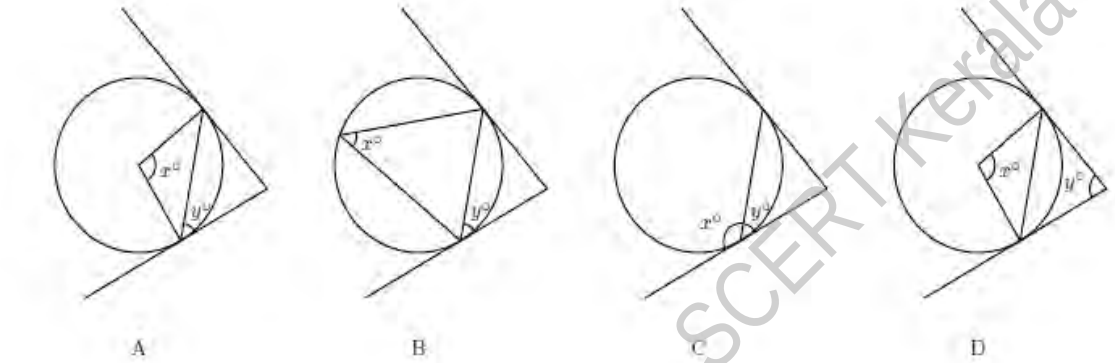
1. The 8^{th} term of an arithmetic sequence is 25 and the 12^{th} term is 30. What is the 16^{th} term of this sequence?
   A. 55
   B. 35
   C. 20
   D. 27.5

2. The marks a student got for 10 subjects are
   72, 45, 76, 46, 51, 48, 80, 64, 58, 56
   What is the median mark?

   A. 57
   B. 56
   C. 58
   D. 55

3. If $x^2 - 6x+8 = (x - a)(x - b)$ then what is $a + b$?
   A. 6
   B. -6
   C. 8
   D. -8

4. Four circles are shown below with a chord and tangents at its ends. In which picture is $y = \frac{1}{2}x$?



5. What are the coordinates of the point where the lines $x = 3$ and $y = 4$ intersect?
   A. (3, 0)
   B. (0, 4)
   C. (3, 4)
   D. (4, 3)

6. The algebraic form of an arithmetic sequence is $x_n = 5 - 3n$. Some statements about this sequence are given below.

   (i) All terms of this sequence are natural numbers

   (ii) If we subtract 3 from the 10^{th} term of this sequence, we get the 11^{th} term

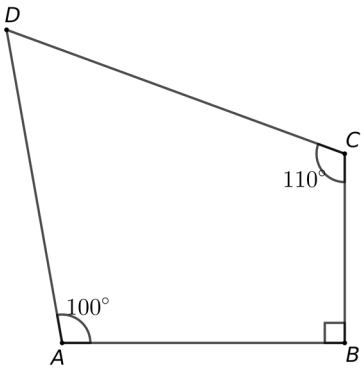
   (iii) If we add 5 to the 10^{th} term of this sequence, we get the 11^{th} term

   (iv) The largest number in this sequence is 2

   Choose the correct answer from those given below

   A. (i) and (ii) are true
   B. (iii) and (iv) are true
   C. (ii) and (iv) are true
   D. (i) and (iv) are true

7. Read the following statements about the picture on the right



(i) *C* is inside the circle passing through *A, B, D*

(ii) *A* is outside the circle passing through *B, C, D*

(iii) *B* is on the circle passing through *A, D, C*

(iv) *D* is outside the circle passing through *A, B, C*

Now choose the correct answer from those given below

A. (i) and (ii) are true

B. (ii) and (iii) are true

C. (iii) and (iv) are true

D. (i) and (iv) are true

8. Consider the two statements given below:

Statement 1 : The length of the perpendicular from any point on a side of an angle of 40^o is sin 40^o times the distance of the point from the vertex of the angle

Statement 2 : The sides of two triangles with the same angles are scaled by the same factor Which of the following are correct?

Now choose the correct answer from those given below

A. Statement 1 is true and Statement 2 is false

B. Statement 1 is false and Statement 2 is true

C. Statement 1 and Statement 2 are true and Statement 2 is the reason of Statement 1

D. Statement 1 and Statement 2 are true and Statement 2 is not the reason of Statement 1

Section – B

9. If two dice with numbers 1 to 6 marked on their faces are rolled together, what is the probability that the sum of numbers turning up is 9? (2)

10. **A.** The sum of the 2^{nd} and 18^{th} terms of an arithmetic sequence is 40
    (i) What is the sum of the 7^{th} and 13^{th} terms? (1)
    (ii) What is the 10^{th} term? (2)

OR

B. The sum of the 4^{th}, 5^{th} and 6^{th} terms of an arithmetic sequence is 90

(i) What is the 5^{th} term? (1)

(ii) What is the sum of the first 9 terms? (1)

(iii) If the common difference of such an arithmetic sequence is 5, then what is its first term? (1)

11. **A.** A box contains paper slips bearing numbers 1 to 10 and another box contains slips bearing multiples of 3 below 25. One slip is to be taken from each box

(i) In how many ways can this be done? (1)

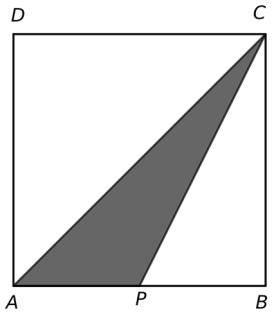
(ii) What is the probability that one number is a multiple of 3 and the other is a multiple of 9? (2)

OR

B. In the picture, *ABCD* is a square and P is the mid - point of *AB*. *A* point is marked arbitrarily within the square

(i) What is the probability that it would be within the shaded part? (2)

(ii) What is the probability that it would be outside the shaded part? (1)



12.

(i) Write the sequence of numbers which leave remainder 1 or 3 when divided by 4 (1)

(ii) Is it an arithmetic sequence? Why? (2)

13. The table below classifies some households according to their consumption of electricity

Electricity use (Unit)	**Number of houses**
0-50	5
50-100	15
100-150	25
150-200	50
200-250	20
250-300	10
Total	125

(i) The consumption of household at which position is considered the median? (1)

(ii) According to the assumptions used to compute the median, how much is the consumption of the 46^{th} household? (2)

(iii) Compute the median usage of electricity (2)

Section – C

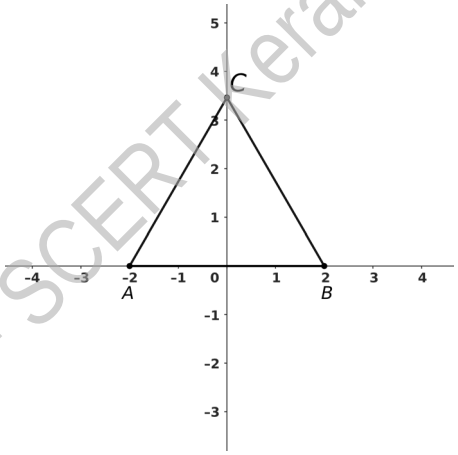
14. Calculate the slope of the line joining (1, 0) and (0, 1). Write the coordinates of another point on this line (2)

15.

(i) In the picture, ABC is an equilateral triangle

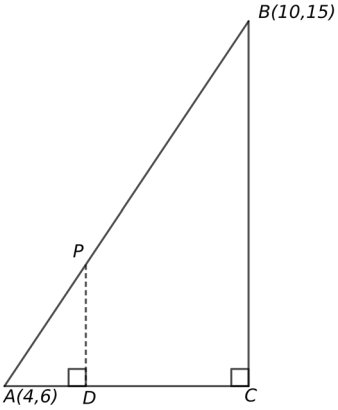
(a) What is the length of a side of the triangle? (1)

(b) Calculate the coordinates of C (1)



(ii) Draw coordinate axes and draw the equilateral triangle with (2, 1), (−2, 1) as two vertices (3)

16. **A.** In the picture, the point *P* divides the line *AB* in the ratio 1 : 2



(i) Calculate the lengths *AC* and *BC* (2)

(ii) Calculate the lengths *AD* and *PD* (2)

(iii) Calculate the coordinates of *P* (1)

OR

B. (1, 1) is a point on a circle centred at (4, 5)

(i) What is the radius of this circle? (2)

(ii) What is the equation of the circle? (1)

(iii) Calculate the coordinates of one of the points where this circle cuts the *x*-axis (2)

Section – D

17. The sum of two numbers is 20 and their product is 95

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

(ii) Calculate the numbers (2)

18. (i) Calculate the sum of the first n terms of the arithmetic sequence with n^{th} term $5n+1$ (2)

(ii) How much more is the sum of the first 20 terms of the arithmetic sequence with n^{th} term $5n + 4$ than the sum of the first 20 terms of the sequence? (1)

19. Prove that the arithmetic sequence with first term $\frac{1}{3}$ and common difference $\frac{2}{3}$ contains all odd numbers; prove also that this sequence contains no even number (4)

20. **A.** (i) Write $x^2 - x - 56$ as the product of two first degree polynomials (2)

(ii) What should be x to make $2x^2 - 2x - 112 = 0$ (2)

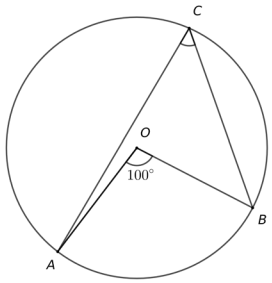
OR

B. What are the coordinates of the points where the graph of $3x^2 + 2x - 5$ intersects the x-axis? (4)

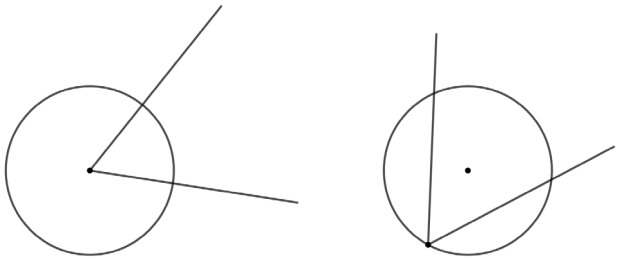
Section – E

21. A boy 1.5 metres tall, standing at the top of a building 20 metres high sees a car parked on the road at an angle of depression 30^o. How far away from the bottom of the building is the car parked? (3)

22. **A.** (i) In the picture, A, B, C are points on the circle centred at O. How much is $\angle ACB$? (1)



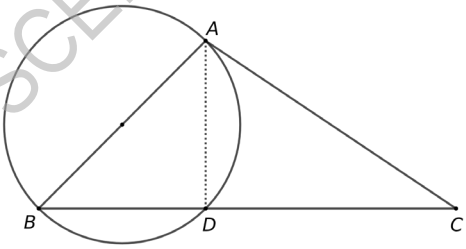
(ii) When the corner of a bent wire is placed at the centre of a circle, $\frac{1}{6}^{th}$ of the circle was included within it. If this corner is placed at some point on the circle, what fraction of the circle would be included within it? (3)



OR

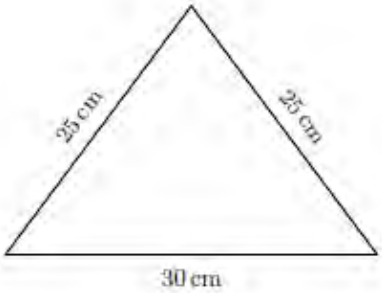
B.

(i) In the picture, the circle with diameter *AB* cuts *BC* at *D*. How much is $\angle ADB$? (1)



(ii) Prove that the circles drawn with the equal sides of an isosceles triangle as diameters pass through the midpoint of the third side (3)

23. **A**. (i) A square pyramid is made with each lateral face as in the figure. Calculate its slant height and height (2)



(ii) Can a square pyramid be made with the lengths of the sides of each lateral face 40 centimetres, 25 centimetres, 25 centimetres? (2)

OR

B. (i) The radius of a sphere is 6 centimetres. What is its volume? (1)

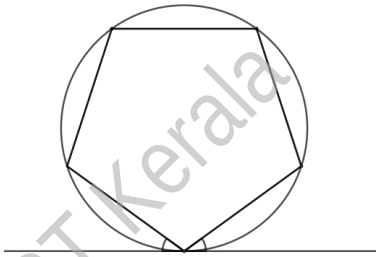
(ii) What is the ratio of the volume of a sphere and the volume of a sphere with $\frac{1}{3}$ of its radius? (2)

(iii) By melting a sphere of radius 5 centimetres and recasting, how many spheres of $\frac{1}{3}^{rd}$ the radius can be made? (1)

24. (i) Calculate the area of a triangle with two sides 8 centimetres, 6 centimetres and the angle between them 40^o (3)

(ii) A triangle is to be drawn with one side 8 centimetres and the angle at one of its ends 40^o. What is the minimum length of the side opposite to this angle? (2)

25. **A**.(i) The picture shows a regular pentagon and the tangent to its circumcircle through one of the vertices. Calculate the angles (marked in the picture) between the tangent and the sides of the pentagon through the point of contact (3)



(ii) Prove that in any regular polygon, the tangent to the circumcircle at a vertex makes equal angles with the two sides through this vertex (2)

OR

B. (i) Calculate the inradius of an equilateral triangle of sides 4 centimetres (2)

(ii) Prove that in any equilateral triangle the inradius is half the circumradius (3)

26. Draw a rectangle of sides 6 centimetres and 3 centimetres. Draw a square of the same area (4)

27. Draw a circle of radius 2 centimetres. Draw a triangle with all sides touching this circle and with two angles 50^o and 60^o (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