SUMMATIVE ASSESSMENT - III 2025 – 26

Model Question Paper

Set - B

Mathematics

Class – 10

Time : $2\frac{1}{2}$ **Hours**

Score : 80

Instructions

- Use the first 15 minutes to read the questions and think about the answers.
- There are 27 questions, split into five parts A, B, C, D, E.
- Answer all questions; 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.
- Answers 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 can be the difference of two terms of the arithmetic sequence 10, 16, 22, . . . ?

   A. 40

   B. 51

   C. 48

   D. 28

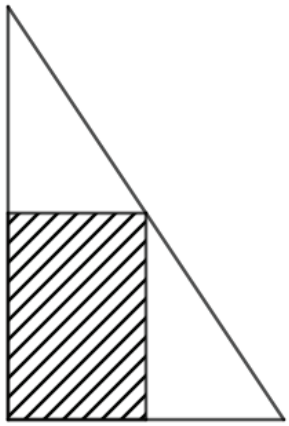
2. In the picture, the rectangle joining the midpoints of the sides of a right triangle is drawn. If a point is marked arbitrarily within the triangle, what is the probability that it will be within the rectangle?

   A. $\frac{1}{2}$

   B. $\frac{1}{3}$

   C. $\frac{2}{3}$

   D. $\frac{1}{4}$



3. The algebraic form of an arithmetic sequence is $x_n = 4n - 3$. What is the remainder on dividing any term of this sequence by 4?

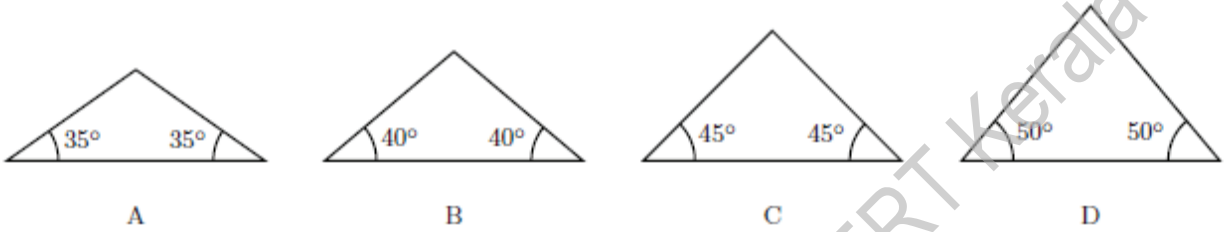
A. 3

B. -3

C. 4

D. 1

4. Which of the following triangles can be a lateral face of a square pyramid?



5. Which of the following are the coordinates of the points where the graph of the polynomial $x^2 - 4x$ intersects the x-axis?

A. (0, 0), (4,0)

B. (0, 0), (0, 4)

C. (4, 0), (4,-4)

D. (0, 0), (-4, 0)

6. The median daily wage of 25 workers in a factory is 1000 rupees. Read the following statements about their wages.

(i) The daily wage of every worker in this factory is more than 1000 rupees

(ii) 12 workers in this factory get 1000 rupees or more as daily wages

(iii) 12 workers in this factory get 1000 rupees or less as daily wages

(iv) 25000 rupees is needed to pay one day's wages for the workers in this factory

Now choose the correct answer from those given below

A. (i) and (ii) are true

B.(ii) and (iii) are true

C. (i) and (iv) are true

D. (ii) and (iv) are true

7. Read the two statements below

Statement 1 : (2, 1), (5, 3), (11, 7) are points on a straight line

Statement 2 : In a line not parallel to either axis, if we draw lines parallel to the axes through any pair of points, the right triangles thus formed are similar

Now choose the correct answer from those given below

A. Statement 1 is true, Statement 2 is false

B. Statement 2 is true, Statement 1 is false

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

8. Read the two statements below

Statement 1 : The tangents to a circle, from a point outside, are equal

Statement 2 : The tangent through a point on a circle is perpendicular to the diameter through that point

Now choose the correct answer from those given below

A. Statement 1 is true, Statement 2 is false

B. Statement 2 is true, Statement 1 is false

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 an arithmetic sequence of natural numbers, can a single term be an odd number? Why? (3)

10. **A**. The 5^{th} term of an arithmetic sequence is 10 and the 11^{th} term is 30

(i) What is the 23^{rd} term of this sequence? (1)

(ii) Calculate the sum of first 27 terms of this sequence? (2)

OR

B. The sum of 7^{th} term and 15^{th} term of an arithmetic sequence is 50

(i) What is the 11^{th} term? (1)

(ii) If the common difference of such an arithmetic sequence is 3, what is the 13^{th} term? What is the sum of the first 25 terms? (2)

11. **A**. A person is asked to say a two-digit number which is a multiple of 3

(i) What is the probability that it is an odd number? (2)

(ii) What is the probability that it is a multiple of 6? (1)

(iii) What is the probability that it is a multiple of 9? (1)

OR

B. Each of two boxes contains slips of paper with numbers 1 to 10 written on them. If one slip is taken from each box,

(i) What is the probability that the product of the numbers is a prime number? (2)

(ii) What is the probability that the product of the numbers is a power of 2? (2)

12. The table below shows the daily wages of 75 workers in a factory

Daily wages	Number of workers
500-600	10
600-700	22
700-800	20
800-900	15
900-1000	8

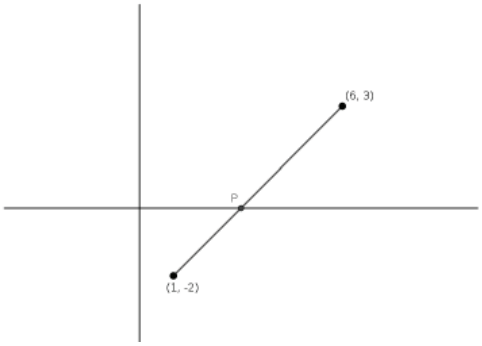
(i) If the workers are arranged according to their wages, what in the wage of the person whose position is taken as the median? (1)

(ii) Which is the median class? (1)

(iii) Calculate the median daily wage (3)

Section – C

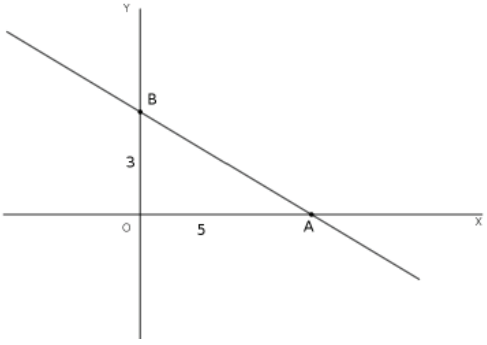
13. The line joining the points (1,−2) and (6, 3) intersects the *x*-axis at *P*. Calculate the coordinates of *P*. (2)



14. (i) Draw coordinate axes and mark the points with coordinates (1, 2), (2, 4), (5, 2) (3)

(ii) Draw a parallelogram taking these as three vertices. What are the coordinates of the fourth vertex? (2)

15. **A.** In the picture, a line intersects the axes at *A* and *B* with *OA* = 5 and *OB* = 3



(i) What are the coordinates of *A* and *B*? (1)

(ii) Calculate the slope of the line and write its equation (3)

(iii) Calculate the coordinates of the circumcentre of triangle *AOB* (1)

OR

B. Consider the circle drawn with the line joining (−1, 2) and (7, 8) as diameter

(i) Calculate the coordinates of the centre of the circle and its radius (2)

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

(iii) Is (0, 1) a point on the circle? (2)

Section – D

16. **A.** (i) Calculate 1 + 2 + 3 +....+ 20 (1)

(ii) Calculate 3 + 6 + 9 +....+ 60 (1)

(iii) Calculate the sum of the first 20 terms of the arithmetic sequence whose algebraic form is $x_n = 3n + 2$ (1)

OR

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

(i) Find the first term of the sequence and the sum of the first two terms (1)

(ii) Write the algebraic form of the arithmetic sequence (2)

17. The perimeter of a rectangle is 80 centimetres and its area is 396 square centimetres. Write the facts as a second degree equation. What are the lengths of its sides? (3)

18. (i) Write the algebraic form of the arithmetic sequence 7, 11, 15, . . . (1)

(ii) Prove that no perfect square is a term of this sequence (3)

19. (i) Write the polynomial $x^2 + x - 56$ as the product of two first degree polynomials (2)

(ii) Calculate the coordinates of the points where the graph of the polynomial $x^2 + x - 56$ intersects the x-axis (2)

Section – E

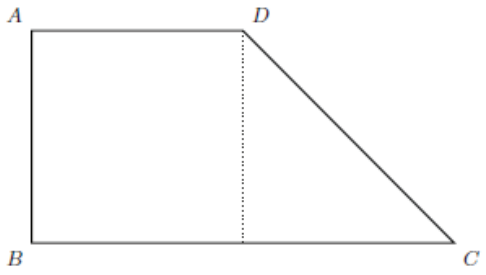
20. Calculate the inradius of the triangle with sides 8, 15, 17 centimetres (2)

21. In triangle ABC, we have $AB = 11$ centimetres, $AC = 8$ centimetres and $\angle A = 60^\circ$

(i) Calculate the height from AB to C (2)

(ii) Calculate the area of the triangle (1)

22. **A.** The quadrilateral ABCD in the picture is a square and its half joined together



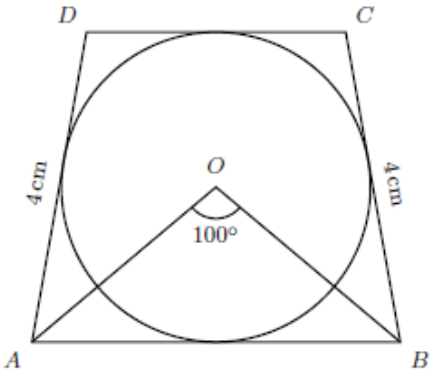
(i) Calculate $\angle C$, $\angle D$ (1)

(ii) If the circle through the points A, B, C is drawn, where would be the position of D relative to the circle? Why? (2)

(iii) What about the position of A relative to the circle through the points B, C, D? Why? (1)

OR

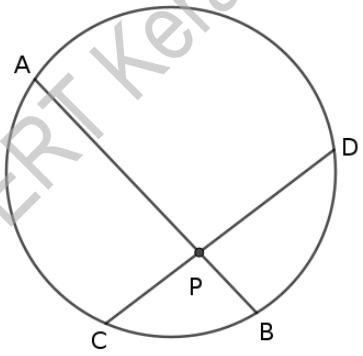
B. The picture shows an isosceles trapezium $ABCD$ and its incircle centred at O



(i) What is the sum of the lengths of the parallel sides? (1)

(ii) $\angle AOB = 100^o$. Calculate $\angle A$ and $\angle C$ of the trapezium (3)

23. i) In the picture, chords AB and CD of the circle intersect at P. Prove that $PA \times PB = PC \times PD$ (3)



(ii) In a circle of radius 8 centimetres, a point P is marked 3 centimetres away from the centre. Calculate the length of the chord through P which is perpendicular to the diameter through P (2)

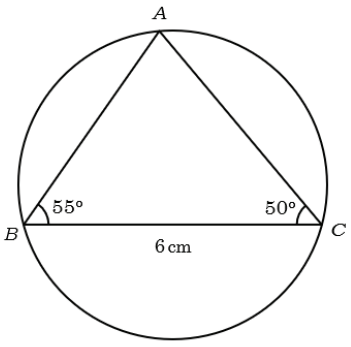
24. **A.** A man 1.6 metres tall, standing at the edge of a river bank, sees the top of a tree at the edge of the other bank at an angle of elevation of 70^o. Stepping back 20 metres, he sees it at an angle of elevation of 35^o

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

(ii) Calculate the width of the river and the height of the tree (4)

OR

B. The picture shows a triangle and its circumcircle



(i) What is the diameter of the circle? (2)

(ii) Calculate the lengths of the other two sides of the triangle correct to a millimetre (3)

25. **A.** Calculate the volumes of the largest square pyramid, cone and sphere which can be packed into a cubical box of sides 12 centimetres (5)

OR

B. (i) A sector of central angle 120^o is cut off from a circle of radius 18 centimetres and bent into a cone. Calculate the radius, slant height and the area of the curved surface cone (3)

(ii) Prove that for a cone made by bending a sector of central angle 120^o cut off from any circle, the area of the curved surface is three times the base area (2)

26. Draw a triangle with circumradius 3 centimetres and two of the angles 55^o and 65^o (3)

27. Draw a triangle of sides 7 centimetres, 8 centimetres, 9 centimetres and draw its incircle. (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