INFINITY THINK BEYOND.....

AN EDUCATIONAL INSTITUTE

X MIND CURVE Mid Term Maths Test Series 2025-26

Test 03

By Deepika Bhati Teaching Mathematics Passionately since 2009

S no	Syllabus Covered	Chapters(In Half Yearly)	Marking Scheme
1.	Chapter 8	Trigonometry	27
2	Chapter 9	Application OF Trigonometry	13

Note: Students/Teachers can refer to this Sample Paper for practice purpose. However, students may find or experience different exam pattern as syllabus or marking scheme may vary school to school.

MM:40 | **GENERAL INSTRUCTIONS** | **Time1.5Hrs**

READ CAREFULLY ALL INSTRUCTIONS

1. **This Question Paper has 5 Sections A, B, C, D and E.**
2. **Section A has 10 MCQs carrying 1 mark each**
3. **Section B has 3 questions carrying 02 marks each.**
4. **Section C has 2 questions carrying 03 marks each.**
5. **Section D has 2 case based integrated units of assessment (04 marks each) with sub parts of the values of 1, 1 and 2 marks each respectively.**
6. **Section E has 2 questions carrying 05 marks each.**
7. **All Questions are compulsory.**
8. **This paper consists of 19 questions.**
   a. **Write your answers neatly and legibly.**
   b. **Ensure you have not left any question unanswered**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. If 3tanx=4 then sinx + cosx=

(a) 3/5 (b) 4/5 (c) 7/5 (d) None of these

2. If θ=30° $\frac{1-\tan^2\theta}{1+\tan^2\theta}$

(a) 1/2 (b) 1/3 (c) 2 (d) None of these

3. If $\sin\theta+\cos\theta=\sqrt{2}$, then $\tan\theta+\cot\theta$ =

(a)1 (b)2 (c)3 (d)4

4. If 5 tan β=4 , then $\frac{5\sin\beta-2\cos\beta}{5\sin\beta+2\cos\beta}$ =

(a) 1/3 (b)2/3 (c)3/5 (d)6

5. When the length of shadow of a vertical pole is equal to $\sqrt{3}$ times of its height , the angle of elevation of the sun's altitude is

(a)30^0 (b)45^0 (c)60^0 (d)15°

6. When the sun's altitude changes from 30^0 to 60^0 , the length of the shadow of a tower decreased by 70m. What is the height of the tower?

(a)35m (b) $35\sqrt{3}$ m (c)$105\sqrt{3}$ m (d) 70 m

7. If sinθ + cosecθ =2 , then value of $\sin^2\theta+\text{cosec}^2\theta$

(a)1 (b)0 (c)3 (d)2

8. $\cot^4\theta-\text{cosec}^4\theta+\cot^2\theta+\text{cosec}^2\theta$ =

(a)0 (b)1 (c)-1 (d)2

Question numbers 9 and 10 are Assertion and Reason based questions

Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true, but Reason (R) is false.

(d) Assertion (A) is false, but Reason (R) is true.

9. Assertion (A): If $\sin A=\frac{1}{3}$ $(0< A < 90^0)$, then the value of cos A is $\frac{2\sqrt{3}}{3}$

Reason (R): For every angle θ , $\sin^2\theta+\cos^2\theta=1$

10. **Assertion (A):**In right angled triangle , if $\tan\theta=\frac{3}{4}$ then $\sin\theta=\frac{3}{5}$

Reason (R): $\sin\theta \leq 1$ for $0^0 \leq \theta \leq 90^o$

SECTION – B
Questions 11 to 13 carry 2 mark each.

11.(A) If $4\cot^2 45^o-\sec^2 60^o+\sin^2 60^o+p=3/4$, then the find the value p.

Or

(B)Evaluate $2\cos^2 45^o-3\tan^2 45^o+4\sin^2 90^o$

12. If $\sin(A+B)=1$ and $2\cos(A-B)=\sqrt{3}$, $0^0 < A+B \leq 90^0$ AND A>B , then find the measure of angles A and B

13. (A) If $\tan(A+B)=\frac{\tan A+\tan B}{1-\tan A\tan B}$ such that $\tan A=\frac{1}{2}$, $\tan B=\frac{1}{3}$, find the value of A+B.

Or

(B) If $\cos A=\frac{4}{5}$ Find the value of (i)$\sec^2 A-\tan^2 A$ (ii) $\frac{1-sin^2 A}{1+sin^2 A}$

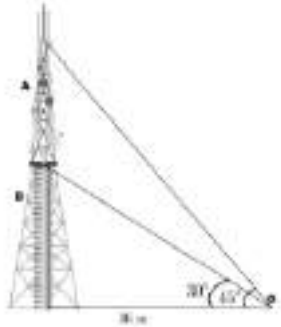
SECTION – C
Questions 14 to 15 carry 3 mark each

14. Find the acute angle θ when $\frac{cos\theta-\sin\theta}{cos\theta+\sin\theta}=\frac{1-\sqrt{3}}{1+\sqrt{3}}$

15 . The angle of elevation of the top of a building 30 m high from the foot of another building in the same plane is 60°, and also the angle of elevation of the top of the second building from the foot of the first tower is 30°, then find the distance between the two buildings and height of second building.

SECTION – D
Questions 16 & 17 carry 4 mark each.

16. Radio towers are used for transmitting a range of communication services including radio and television. The tower will either act as an antenna itself or support one or more antennas on its structure, including microwave dishes. There are 2 main types: guyed and self-supporting structures. On a similar concept, a radio station tower was built in two sections A and B. Tower is supported by wires from a point O. Distance between the base of the tower and point O is 36 m. From point O, the angle of elevation of the top of section B is 30° and the angle of elevation of the top of section A is 45°.



On the basis of information given, answer the following questions.

(i)What is the height of the section B?

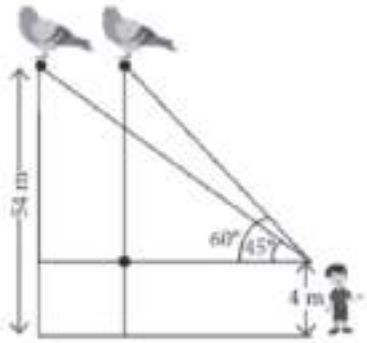
(ii)What is the length of the wire structure from the point O to the top of section B?

(iii)(A) What is the height of the section A?

OR

(B) What is the length of the wire structure from the point O to the top of section A?

17. A boy 4m tall spots a pigeon sitting on the top of a pole of height 54m from the ground. The angle of elevation of the pigeon from the eyes of boy at any instant is 60°. The pigeon flies away horizontally in such a way that it remained at a constant height from the ground. After 8 seconds, the angle of elevation of the pigeon from the same point is 45° (take √3=1.73)



(i) Find the distance of first position of the pigeon from the eyes of the boy.

(ii) Find the distance between the boy and the first pole(before fly).

(iii)(A) How much distance the pigeon covers in 8 seconds?

Or

(B) Find the speed of pigeon in m/s?

SECTION – E

Questions 18 & 19 carry 5 mark each

18. (A) If tan A = n tanB and sin A = m sinB, prove that $\cos^2 A = \frac{m^2-1}{n^2-1}$

Or

(B) Prove that : $\frac{\cos^4 x - \sin^4 x}{1-\tan x} = \frac{\cot x + 1}{\sec x \operatorname{cosec} x}$

19.(A) $\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + \tan\theta + \cot\theta$

Or

(B) Prove that $\frac{\tan^2 A}{\tan^2 A - 1} + \frac{\operatorname{cosec}^2 A}{\sec^2 A - \operatorname{cosec}^2 A} = \frac{1}{1-2\cos^2 A}$

END

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