

Multiple Choice Questions

⇒ This topic includes in CET - 2018

[MHT-CET 2022]

(online - shift)

(Memory Based Questions)

- The general solution of $\sin x - 3 \sin 2x + \sin 3x = \cos x - 3 \cos 2x + \cos 3x$ is
 a) $n\pi + \frac{\pi}{8}$ b) $\frac{n\pi}{2} + \frac{\pi}{8}$ c) $(-1)^n \frac{n\pi}{2} + \frac{\pi}{8}$ d) $2n\pi + \cos^{-1} \frac{3}{2}$
- The value of $\cos 12^\circ + \cos 84^\circ + \cos 156^\circ + \cos 132^\circ$ is
 a) $\frac{1}{2}$ b) 1 c) $-\frac{1}{2}$ d) $\frac{1}{8}$
- $\sin(270^\circ - \theta) \sin(90^\circ - \theta) - \cos(270^\circ - \theta) \cos(90^\circ + \theta)$ is
 a) 0 b) 1 c) -1 d) 2
- The value of $(\cos \alpha + \cos \beta)^2 + (\sin \alpha + \sin \beta)^2$ is
 a) $2 \cos^2 \left(\frac{\alpha - \beta}{2} \right)$ b) $4 \cos^2 \left(\frac{\alpha - \beta}{2} \right)$ c) $4 \sin^2 \left(\frac{\alpha - \beta}{2} \right)$ d) $2 \sin^2 \left(\frac{\alpha - \beta}{2} \right)$
- Let $(\cos \alpha + \beta) = \frac{4}{5}$ and $\sin(\alpha - \beta) = \frac{5}{13}$, where $0 \leq \alpha, \beta \leq \frac{\pi}{4}$ then $\tan 2\alpha =$
 a) $\frac{25}{16}$ b) $\frac{19}{13}$ c) $\frac{20}{7}$ d) $\frac{56}{33}$
- The value of $\cos^2 10^\circ - \cos 10^\circ \cdot \cos 50^\circ + \cos^2 50^\circ$ is
 a) $\frac{3}{2}$ b) $\frac{3}{4} (1 + \cos 20^\circ)$ c) $\frac{3}{4}$ d) $\frac{3}{2} + \cos 20^\circ$
- If $\tan A = \frac{1}{2}$, $\tan B = \frac{1}{3}$ then $\tan(A + 2B)$ has the value
 a) 1 b) 2 c) 3 d) 4
- $\frac{\sin^2(-160^\circ)}{\sin^2 70^\circ} + \frac{\sin(180^\circ - \theta)}{\sin \theta} =$
 a) $\tan^2(20^\circ)$ b) $\cot^2(20^\circ)$ c) $\sec^2(20^\circ)$ d) $\operatorname{cosec}^2(20^\circ)$
- Let AD and BC be two vertical poles at A and B respectively on a horizontal ground. If $AD = 8$ m, $BC = 11$ m and $AB = 10$ m. Then the distance (in meters) of point M on AB from the point A such that $MD^2 + MC^2$ is minimum is
 a) 8 b) 7 c) 4 d) 5

10. $\cos^2 48^\circ - \sin^2 12^\circ = \dots$, if $\sin 18^\circ = \frac{\sqrt{5}-1}{4}$

a) $\frac{\sqrt{5}}{8} - 1$

b) $\frac{\sqrt{5}-1}{8}$

c) $\frac{\sqrt{5}}{8} + 1$

d) $\frac{\sqrt{5}+1}{8}$

[MHT-CET 2021]

(online - shift)

(Memory Based Questions)

11. If θ lies in first quadrant and $5 \tan \theta = 4$, then $\frac{5 \sin \theta - 3 \cos \theta}{\sin \theta + 2 \cos \theta}$ is equal to

a) $\frac{5}{14}$

b) $\frac{3}{14}$

c) $\frac{1}{14}$

d) 0

12. The value of $\tan 3A - \tan 2A - \tan A$ is

a) $\tan 3A \tan 2A \tan A$

b) $-\tan 3A \tan 2A \tan A$

c) $\tan A \tan 2A - \tan 2A \tan 3A$

d) $\tan 3A \tan A - \tan 2A \tan 3A$

13. Find the value of $\cos \left(\frac{x}{2} \right)$, if $\tan x = \frac{5}{12}$ and x lies in third quadrant.

a) $\frac{5}{\sqrt{13}}$

b) $\frac{5}{\sqrt{26}}$

c) $\frac{5}{13}$

d) $\sqrt{\frac{1}{26}}$

14. The expression $\left(\frac{\cos A + \cos B}{\sin A - \sin B} \right)^n + \left(\frac{\sin A + \sin B}{\cos A - \cos B} \right)^n =$

a) $2 \cot^n \left(\frac{A-B}{2} \right)$ if 'n' is even

b) 0 if 'n' is even

c) $2 \cot^n \left(\frac{A-B}{2} \right)$ if 'n' is odd

d) 3 if 'n' is odd

15. The value of $\sin 18^\circ$ is

a) $\frac{4}{\sqrt{5}-1}$

b) $\frac{\sqrt{5}-1}{4}$

c) $\frac{\sqrt{5}+1}{4}$

d) $\frac{4}{\sqrt{5}+1}$

16. If $x \in \left(0, \frac{\pi}{2} \right)$ and x satisfies the equation $\sin x \cos x = \frac{1}{4}$, then the values of x are

a) $\frac{\pi}{12}, \frac{5\pi}{12}$

b) $\frac{\pi}{8}, \frac{3\pi}{8}$

c) $\frac{\pi}{8}, \frac{\pi}{4}$

d) $\frac{\pi}{6}, \frac{\pi}{12}$

17. If $\frac{\cos(A+B)}{\cos(A-B)} = \frac{\sin(C+D)}{\sin(C-D)}$, then $\tan A \tan B \tan C = \dots$
- a) 0 b) $\tan D$ c) $\cot D$ d) $-\tan D$
18. If $3 \sin \theta = 2 \sin 3\theta$ and $0 < \theta < \pi$, then $\sin \theta = \dots$
- a) $\frac{\sqrt{2}}{\sqrt{5}}$ b) $\frac{\sqrt{3}}{2\sqrt{2}}$ c) $\frac{\sqrt{2}}{3}$ d) $\frac{\sqrt{3}}{\sqrt{5}}$
19. With usual notation in $\triangle ABC$, if $\frac{\sin A}{\sin C} = \frac{\sin(A-B)}{\sin(B-C)}$, then a^2, b^2, c^2 are in
- a) Not in AP b) HP c) AP d) GP
20. $\tan A + 2 \tan 2A + 4 \tan 4A + 8 \cot 8A = \dots$
- a) $\tan 2A$ b) $\cot A$ c) $\tan A$ d) $\cot 2A$

[MHT-CET 2020]

(online - shift)

(Memory Based Questions)

21. If $\sin \theta = -\frac{12}{13}$, $\cos \phi = -\frac{4}{5}$, and θ, ϕ lie in the third quadrant, then $\tan(\theta - \phi) =$
- a) $-\frac{56}{33}$ b) $\frac{33}{56}$ c) $-\frac{33}{56}$ d) $\frac{56}{33}$
22. If $a = \sin 175^\circ + \cos 175^\circ$, then
- a) $a > 0$ b) $a < 0$ c) $a = 0$ d) $a = 1$
23. If $\sec x + \tan x = 3$, where $x \in \left(0, \frac{\pi}{2}\right)$, then $\sin x = \dots$
- a) $\frac{4}{5}$ b) $\frac{3}{5}$ c) -1 d) $\frac{1}{5}$
24. If A and B are supplementary angles, then $\sin^2 \frac{A}{2} + \sin^2 \frac{B}{2} = \dots$
- a) $\frac{1}{2}$ b) $\frac{1}{3}$ c) 1 d) 0
25. If $\sin x + \operatorname{cosec} x = 3$, then the value of $\sin^4 x + \operatorname{cosec}^4 x$ is
- a) 49 b) 47 c) 07 d) 74
26. $\frac{\sin A + \sin 7A + \sin 13A}{\cos A + \cos 7A + \cos 13A} = \dots$
- a) $\cot 6A$ b) $\cot 7A$ c) $\tan 7A$ d) $\tan 6A$

27. $\frac{\cos 12^\circ - \sin 12^\circ}{\cos 12^\circ + \sin 12^\circ} + \frac{\sin 147^\circ}{\cos 147^\circ} = \dots$

a) 1

b) -1

c) 0

d) -2

28. $\sqrt{2 + \sqrt{2 + 2 \cos 4\theta}} = \dots$

a) $\sqrt{2} \cos \theta$

b) $\frac{\cos \theta}{2}$

c) $2 \cos \theta$

d) $\frac{\cos \theta}{\sqrt{2}}$

29. If $A + B + C = 180^\circ$, then the value of $\tan \left(\frac{A}{2} \right) \tan \left(\frac{B}{2} \right) + \tan \left(\frac{B}{2} \right) \tan \left(\frac{C}{2} \right) + \tan \left(\frac{C}{2} \right) \tan \left(\frac{A}{2} \right)$ is

a) 2

b) 1

c) -2

d) -1

30. In a triangle ABC, if $\frac{\sin A - \sin C}{\cos C - \cos A} = \cot B$, then A, B, C are in

a) Harmonic progression

b) G.P.

c) A.G.P.

d) A.P.

31. If A, B, C, D are the angles of a cyclic quadrilateral taken in order, then $\cos A + \cos B + \cos C + \cos D = \dots$

a) -1

b) $\frac{1}{2}$

c) 0

d) 1

[MHT-CET 2023]

(Memory Based Questions)

32. $\tan \left(\frac{\pi}{8} \right) =$

a) $2 + \sqrt{2}$

b) $2 - \sqrt{2}$

c) $\sqrt{2} + 1$

d) $\sqrt{2} - 1$

33. If $\sin 18^\circ = \frac{\sqrt{5}-1}{4}$, then what is the value of

$\cos^2 48^\circ - \sin^2 12^\circ$

a) $\frac{\sqrt{5}-1}{8}$

b) $\frac{\sqrt{5}+1}{8}$

c) $\frac{\sqrt{5}-8}{8}$

d) $\frac{\sqrt{5}+8}{8}$

34. If $\tan \theta = \frac{\sin x - \cos x}{\sin x + \cos x}$, $0 \leq x \leq \frac{\pi}{2}$, then $\cos 2\theta =$

a) $\sin x$

b) $\cos x$

c) $\sin 2x$

d) $\cos 2x$

35. If $a \cos 2\theta + b \sin 2\theta = c$ has α and β as its roots, then $\tan \alpha + \tan \beta =$

a) $\frac{a}{b+c}$

b) $\frac{b}{c+a}$

c) $\frac{2a}{b+c}$

d) $\frac{2b}{c+a}$

36. The value of $36(4 \cos^2 9^\circ - 1)(4 \cos^2 27^\circ - 1)(4 \cos^2 81^\circ - 1)(4 \cos^2 243^\circ - 1)$ is
a) 18 b) 27 c) 36 d) 54
37. If $(1 + \sqrt{1+x}) \tan x = 1 + \sqrt{1-x}$, then $\sin 4x =$
a) $-4x$ b) $-x$ c) x d) $4x$
38. If $\cos x + \cos y - \cos(x+y) = \frac{3}{2}$, then
a) $x = y$ b) $x = -y$ c) $x = 2y$ d) $2x = y$
39. $\sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 80^\circ =$
a) $\frac{3}{2}$ b) $\frac{3}{4}$ c) $\frac{3}{8}$ d) $\frac{3}{16}$
40. $\cos x \cos 7x - \cos 5x \cos 13x =$
a) $2 \sin 6x \cos 12x$ b) $2 \sin 6x \sin 12x$
c) $2 \sin^2 6x \cos 6x$ d) $2 \cos^2 6x \cos 12x$
41. If $\sin(\theta - \alpha)$, $\sin \theta$ and $\sin(\theta + \alpha)$ are in HP, then $\cos 2\theta =$
a) $1 + 4 \cos^2\left(\frac{\alpha}{2}\right)$ b) $1 - 4 \cos^2\left(\frac{\alpha}{2}\right)$
c) $-1 + 4 \cos^2\left(\frac{\alpha}{2}\right)$ d) $-1 - 4 \cos^2\left(\frac{\alpha}{2}\right)$
42. $96 \cos\left(\frac{\pi}{33}\right) \cos\left(\frac{2\pi}{33}\right) \cos\left(\frac{4\pi}{33}\right) \cos\left(\frac{8\pi}{33}\right) \cos\left(\frac{16\pi}{33}\right) =$
a) 4 b) 3 c) 2 d) 1
43. If $\cos 2B = \frac{\cos(A+C)}{\cos(A-C)}$, then $\tan A$, $\tan B$, $\tan C$ are in
a) AP b) GP c) HP d) AGP
44. In triangle ABC, if $\tan A + \tan B + \tan C = 6$ and $\tan A \tan B = 2$, then $\tan C =$
a) 1 b) 2 c) 3 d) 4

[MHT-CET 2024]

(Memory Based Questions)

45. If $2 \sin^2 x + 3 \sin x - 2 > 0$ and $x^2 - x - 2 < 0$, then x lies in the interval
- a) $(-1, 2)$ b) $\left(-1, \frac{5\pi}{6}\right)$ c) $\left(\frac{\pi}{6}, 2\right)$ d) $\left(\frac{\pi}{6}, \frac{5\pi}{6}\right)$
46. If $\alpha + \beta = \frac{\pi}{2}$ and $\beta + \gamma = \alpha$, then $\tan \alpha =$
- a) $\tan \beta + \tan \gamma$ b) $2 \tan \beta + \tan \gamma$ c) $\tan \beta + 2 \tan \gamma$ d) $2 \tan \beta + 2 \tan \gamma$
47. If $\tan A - \tan B = x$ and $\cot B - \cot A = y$, then $\cot(A - B) =$
- a) $\frac{1}{y} - \frac{1}{x}$ b) $\frac{1}{x} - \frac{1}{y}$ c) $\frac{1}{x} + \frac{1}{y}$ d) $\frac{xy}{x - y}$