

MULTIPLE CHOICE Type Questions



By O.P. GUPTA (+919650350480)

Topics : Trigonometric Functions

Max. Marks : 45

☑ Select the correct option in the followings. Each question carries 1 mark.

01. The least value of $\sin x \cos x$ is
 (a) 1 (b) $-\frac{1}{2}$ (c) 0 (d) $\frac{1}{2}$
02. The value of $\cos 1^\circ \times \cos 2^\circ \times \cos 3^\circ \times \dots \times \cos 179^\circ$ is
 (a) $\frac{1}{\sqrt{2}}$ (b) 1 (c) 0 (d) -1
03. The value of $\frac{1 + \tan^2 15^\circ}{1 - \tan^2 15^\circ}$ is
 (a) $\frac{\sqrt{3}}{2}$ (b) $\sqrt{3}$ (c) $\frac{2}{\sqrt{3}}$ (d) 2
04. If $\sin \theta + \cos \theta = 1$, then the value of $\sin 2\theta$ is equal to
 (a) 1 (b) -1 (c) 2 (d) 0
05. If $\alpha + \beta = \frac{3\pi}{4}$, then value of $(1 - \tan \alpha)(1 - \tan \beta) =$
 (a) 1 (b) -2 (c) 2 (d) 0
06. If $\sin x = -\frac{1}{2}$, $x \in \left(\pi, \frac{3\pi}{2}\right)$, then the value of $\cos 3x$ is
 (a) 0 (b) 1 (c) $\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$
07. If $P = 2 \sin^2 x + \cos^2 x$, then P lies in the interval
 (a) [1, 3] (b) [1, 2] (c) [-1, 2] (d) None of these
08. If $0 < x < \frac{\pi}{4}$, then write the value of $\sqrt{1 - \sin 2x}$ is
 (a) $\cos x - \sin x$ (b) $\cos x + \sin x$ (c) $\sin x - \cos x$ (d) $(\sin x - \cos x)^2$
09. $\sec(-1485^\circ)$ equals
 (a) $-\frac{2}{\sqrt{3}}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\sqrt{2}$ (d) -2

10. $2\sin^2 x + 2\sin^2(x + 60^\circ) + 2\sin^2(x - 60^\circ) =$
 (a) $\frac{3}{2}$ (b) $\frac{1}{2}$ (c) 3 (d) $-\frac{3}{2}$
11. If $\cos x = -\frac{1}{4}$, $x \in \left(\pi, \frac{3\pi}{2}\right)$ then, $\cos \frac{x}{2} =$
 (a) $\sqrt{\frac{3}{8}}$ (b) $\frac{2\sqrt{2}}{3}$ (c) $-\frac{2\sqrt{2}}{3}$ (d) $-\sqrt{\frac{3}{8}}$
12. $\cos 2400^\circ =$
 (a) $-\frac{\sqrt{3}}{2}$ (b) $\frac{1}{2}$ (c) $-\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$
13. If $\tan 2x = \frac{2 \tan x}{m + n \tan^2 x}$ then, $m + n =$
 (a) 2 (b) -1 (c) 1 (d) 0
14. Radian equivalent of 315° is
 (a) $\frac{3\pi}{4}$ (b) $\frac{7\pi}{4}$ (c) $\frac{5\pi}{4}$ (d) $\frac{9\pi}{4}$
15. $\tan\left(-\frac{314\pi}{3}\right) =$
 (a) $-\sqrt{2}$ (b) $\sqrt{2}$ (c) 2 (d) $\sqrt{3}$
16. The radius of a circle whose arc of length 15π cm makes an angle of 135° at the centre, is
 (a) 10 cm (b) $22\frac{1}{2}$ cm (c) $11\frac{1}{4}$ cm (d) 20 cm
17. $\sqrt{2} \sin^2\left(-\frac{71\pi}{4}\right) =$
 (a) $-\frac{1}{\sqrt{2}}$ (b) $\frac{1}{\sqrt{2}}$ (c) -1 (d) 1
18. Let $y = |\sin x|$, $x \in$ Real numbers. Then
 (a) $-1 \leq y \leq 1$ (b) $-1 < y < 1$ (c) $0 < y < 1$ (d) $0 \leq y \leq 1$
19. Let $f(x) = \cot x$. Then $x \in$
 (a) \mathbb{R} (b) $\mathbb{R} - n\pi, n \in \mathbb{Z}$
 (c) $\mathbb{R} - (2n \pm 1)\pi, n \in \mathbb{Z}$ (d) $\mathbb{R} - (2n \pm 1)\frac{\pi}{2}, n \in \mathbb{Z}$
20. Maximum value of $f(x) = 12\sin x - 5\cos x$ is
 (a) 7 (b) 1 (c) 17 (d) 13

21. For $f(x) = \sin x - \cos x - \sqrt{2}$, the range is
 (a) $[-2\sqrt{2}, 0]$ (b) $[-\sqrt{2}, 0]$ (c) $[0, \sqrt{2}]$ (d) $[-\sqrt{2}, 1]$
22. $\operatorname{cosec}\left(-\frac{19\pi}{6}\right) =$
 (a) $-\frac{2}{\sqrt{3}}$ (b) $\frac{2}{\sqrt{3}}$ (c) 2 (d) -2
23. If $\cos \theta + \sec \theta = 2$, then $\cos^2 \theta + \sec^2 \theta$ is equal to
 (a) 1 (b) 4 (c) 2 (d) 0
24. If $f(x) = \cos^2 x + 1$, then
 (a) $2 \leq f(x) \leq 1$ (b) $0 < f(x) < 1$ (c) $0 \leq f(x) \leq 1$ (d) $1 \leq f(x) \leq 2$
25. If $\tan \theta = \frac{1}{2}$ and $\tan \phi = \frac{1}{3}$, then $\tan(\theta + \phi) =$
 (a) 45° (b) 1 (c) 0 (d) 135°
26. Which of the following is incorrect?
 (a) $\sin \theta = -\frac{1}{5}$ (b) $\cos \theta = 1$ (c) $\sec \theta = 2$ (d) $\operatorname{cosec} \theta = -\frac{1}{2}$
27. The value of $\cot 75^\circ - \tan 75^\circ$ is
 (a) $2\sqrt{3}$ (b) $2 + \sqrt{3}$ (c) $-2\sqrt{3}$ (d) $2 - \sqrt{3}$
28. Which of the following is correct?
 (a) $\sin 1^\circ > \sin 1$ (b) $\sin 1^\circ = \frac{\pi}{18^\circ} \sin 1$ (c) $\sin 1^\circ = \sin 1$ (d) $\sin 1^\circ < \sin 1$
29. The minimum value of $2 \cos x + 3 \sin x$ is
 (a) -13 (b) 13 (c) $-\sqrt{13}$ (d) $\sqrt{13}$
30. $\frac{\sin x + \sin y}{2} =$
 (a) $\cos \frac{x+y}{2} \sin \frac{x-y}{2}$ (b) $\sin \frac{x+y}{2} \cos \frac{x-y}{2}$
 (c) $\sin \frac{x+y}{2} \sin \frac{x-y}{2}$ (d) $\cos \frac{x+y}{2} \cos \frac{x-y}{2}$
31. If $\sin \theta = \cos \theta$, then the value of $\tan \theta$ is
 (a) 1 (b) $\frac{1}{2}$ (c) 0 (d) $\frac{1}{\sqrt{2}}$
32. If $p = \sin 15^\circ + \cos 15^\circ$, then $(2p^2 + 1) =$
 (a) 3 (b) 2 (c) 1 (d) 4

33. $\frac{3 \tan 20^\circ - \tan^3 20^\circ}{1 - 3 \tan^2 20^\circ} =$
 (a) 0 (b) -1 (c) $\sqrt{3}$ (d) 1
34. Domain of $\sec x$ is $x \in$
 (a) $\mathbb{R} - n\pi, n \in \mathbb{Z}$ (b) $\mathbb{R} - (2n \pm 1)\pi, n \in \mathbb{Z}$
 (c) \mathbb{R} (d) $\mathbb{R} - (2n \pm 1)\frac{\pi}{2}, n \in \mathbb{Z}$
35. Range of $\operatorname{cosec} x$ is
 (a) \mathbb{R} (b) $[-1, 1]$ (c) $(-1, 1)$ (d) $(-\infty, -1] \cup [1, \infty)$
36. $1^\circ =$
 (a) $60''$ (b) $60'$ (c) $\frac{1}{60'}$ (d) $\frac{1}{60''}$
37. A wheel of a vehicle makes 360 revolutions in a time period of one minute. Through how many radians does it turn in 1.5 seconds?
 (a) 18π (b) 12π (c) 2π (d) 9π
38. Value of $\tan \frac{5\pi}{12}$ is
 (a) $\frac{\sqrt{3}-1}{\sqrt{3}+1}$ (b) $\frac{\sqrt{3}+1}{\sqrt{3}-1}$ (c) $\frac{1+\sqrt{3}}{1-\sqrt{3}}$ (d) $\frac{1-\sqrt{3}}{1+\sqrt{3}}$
39. $\sin 15^\circ - \cos 15^\circ =$
 (a) $\frac{1}{\sqrt{2}}$ (b) 1 (c) $\frac{1}{\sqrt{3}}$ (d) $-\frac{1}{\sqrt{2}}$
40. If $\sec x = -\frac{13}{12}, \frac{\pi}{2} < x < \pi$, then the value of $\sin 2x$ is
 (a) $-\frac{120}{169}$ (b) $\frac{120}{169}$ (c) $\frac{120}{119}$ (d) $-\frac{120}{119}$
41. If $0 < \theta < \frac{\pi}{4}$, then $\sqrt{2 - \sqrt{2 + 2 \cos 4\theta}} =$
 (a) $-2 \sin \theta$ (b) $-2 \cos \theta$ (c) $2 \sin \theta$ (d) $2 \cos \theta$
42. If $x = y \cos \frac{2\pi}{3} = z \cos \frac{4\pi}{3}$, then the value of $xy + yz + zx$ is
 (a) 1 (b) 0 (c) -1 (d) $\sqrt{2}$

Question numbers 43 to 45 are Assertion and Reason based questions. Two statements are given, one labelled **Assertion (A)** and the other labelled **Reason (R)**. Select the correct answer 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 and 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.

43. **Assertion (A) :** For the function $f(x) = 3 - 7 \cos 5x$, the range of $f(x)$ is $[-4, 10]$.

Reason (R) : For all $\theta \in \mathbb{R}$ (set of real numbers), we always have $-1 \leq \cos \theta \leq 1$.

44. **Assertion (A) :** If $(1 + \tan x)(1 + \tan 4x) = 2$, $x \in \left(0, \frac{\pi}{16}\right)$, then $x = \frac{\pi}{20}$.

Reason (R) : If $\alpha = 36^\circ$ and $\beta = 9^\circ$, then $\tan \alpha + \tan \beta + \tan \alpha \tan \beta \neq 1$.

45. **Assertion (A) :** $\cos\left(\frac{3\pi}{2} + x\right) \cos(2\pi + x) \left[\cot\left(\frac{3\pi}{2} - x\right) + \cot(2\pi + x) \right] = 1$.

Reason (R) : π Radians = 180° .

ORDER NOW @

Flipkart amazon

CLASS XI

Based on NCERT Textbooks & Latest CBSE Syllabus for 2023-24

Mathmission

COMPLETE THEORY WITH EXAMPLES
SUBJECTIVE TYPE QUESTIONS
COMPETENCY FOCUSED QUESTIONS
MULTIPLE CHOICE QUESTIONS
ASSERTION - REASON QUESTIONS
CASE STUDY QUESTIONS
PASSAGE - BASED QUESTIONS

O.P. GUPTA
INDIRA AWARD WINNER

SOLUTIONS OF MATHMISSION

FOR CBSE EXAMS (2023-24)

O.P. GUPTA
INDIRA AWARD WINNER

For Discounted Price Order on WhatsApp

9650350480

We have released Set of 2 Books for CBSE XI (Academic session 2023-24).

1. MATHMISSION FOR XI

- ☑ COMPLETE THEORY & EXAMPLES
- ☑ SUBJECTIVE TYPE QUESTIONS
- ☑ COMPETENCY FOCUSED QUESTIONS
 - ✦ Multiple Choice Questions
 - ✦ Assertion-Reason Questions
 - ✦ Case-Study Questions
 - ✦ Passage-Based Questions

2. SOLUTIONS OF MATHMISSION

- ☑ Step-by-step Detailed Solutions (For all Exercises of MATHMISSION)

This document contains MCQs for Mathematics (041) of class XI.

✦ Answers / Solutions shall be available on **YouTube channel – Mathematicia By O.P. Gupta**
You can **share this document** with other students!

✍ *With a lot of Blessings!*

O.P. GUPTA

Author & Math Mentor

Indira Award Winner

📖 The O.P. Gupta Advanced Math Classes
@ **Think Academy**, Near Dhansa Bus Stand
Metro Station Gate No.3, Najafgarh, Delhi

📞 Telegram / WhatsApp : +919650350480

📺 YouTube.com/MathematiciaByOPGupta

Exclusive coaching for Maths (041)
By **O.P. GUPTA**

- ☑ CBSE XII
- ☑ CBSE XI
- ☑ CUET
- ☑ JEE - MAIN
- ☑ NDA