EXERCISE - O

SINGLE CORRECT TYPE QUESTIONS

1. If $2\tan^2\theta = \sec^2\theta$, then the general solution of θ -

(A) $n\pi + \frac{\pi}{4}\ (n \in I)$ (B) $n\pi - \frac{\pi}{4}\ (n \in I)$ (C) $n\pi \pm \frac{\pi}{4}\ (n \in I)$ (D) $2n\pi \pm \frac{\pi}{4}\ (n \in I)$

MTE001

2. If $\frac{1-\cos 2\theta}{1+\cos 2\theta} = 3$, then the general solution of θ is –

(A) $2n\pi \pm \frac{\pi}{6}$ (B) $n\pi \pm \frac{\pi}{6}$ (C) $2n\pi \pm \frac{\pi}{3}$ (D) $n\pi \pm \frac{\pi}{3}$

where $n \in I$

MTE002

3. Let $A = \{\theta : \sin(\theta) = \tan(\theta)\}$ and $B = \{\theta : \cos(\theta) = 1\}$ be two sets. Then -

(A) $A = B$ (B) $A \subset B$ and $B - A \neq \phi$

(C) $A \not\subset B$ (D) $B \not\subset A$

MTE003

4. The solution set of $(5 + 4\cos\theta)(2\cos\theta + 1) = 0$ in the interval $[0,2\pi]$ is :

(A) $\left\{\frac{\pi}{3}, \frac{2\pi}{3}\right\}$ (B) $\left\{\frac{\pi}{3}, \pi\right\}$ (C) $\left\{\frac{2\pi}{3}, \frac{4\pi}{3}\right\}$ (D) $\left\{\frac{2\pi}{3}, \frac{5\pi}{3}\right\}$

MTE004

5. The general solution of equation $4\cos^2 x + 6\sin^2 x = 5$ is -

(A) $x = n\pi \pm \frac{\pi}{2}\ (n \in I)$ (B) $x = n\pi \pm \frac{\pi}{4}\ (n \in I)$

(C) $x = n\pi \pm \frac{3\pi}{2}\ (n \in I)$ (D) None of these

MTE005

6. If $\tan^2\theta - (1 + \sqrt{3})\tan\theta + \sqrt{3} = 0$, then the general value of θ is :

(A) $n\pi + \frac{\pi}{4}, n\pi + \frac{\pi}{3}$ (B) $n\pi - \frac{\pi}{4}, n\pi + \frac{\pi}{3}$

(C) $n\pi + \frac{\pi}{4}, n\pi - \frac{\pi}{3}$ (D) $n\pi - \frac{\pi}{4}, n\pi - \frac{\pi}{3}$

where $n \in I$

MTE006

7. The number of solutions of the equation $\sin 2x - 2\cos x + 4\sin x = 4$ in the interval $[0, 5\pi]$ is -

(A) 6 (B) 4 (C) 3 (D) 5

MTE007

8. The set of angles between 0 and 2π satisfying the equation $4\cos^2\theta - 2\sqrt{2}\cos\theta - 1 = 0$ is

(A) $\left\{\frac{\pi}{12}, \frac{5\pi}{12}, \frac{19\pi}{12}, \frac{23\pi}{12}\right\}$ (B) $\left\{\frac{\pi}{12}, \frac{7\pi}{12}, \frac{17\pi}{12}, \frac{23\pi}{12}\right\}$

(C) $\left\{\frac{5\pi}{12}, \frac{13\pi}{12}, \frac{19\pi}{12}\right\}$ (D) $\left\{\frac{\pi}{12}, \frac{7\pi}{12}, \frac{19\pi}{12}, \frac{23\pi}{12}\right\}$

MTE008

9. If $\tan\theta + \tan4\theta + \tan7\theta = \tan\theta\tan4\theta\tan7\theta$, then θ =

(A) $\frac{n\pi}{4}$ (B) $\frac{n\pi}{7}$

(C) $\frac{n\pi}{12}, n \neq (12m-6), n, m \in I$ (D) $n\pi$

where $n \in I$

MTE009

10. If $\frac{\tan2\theta+\tan\theta}{1-\tan\theta\tan2\theta}=0$, then the general value of θ is -

(A) $n\pi; n \in I$ (B) $\frac{n\pi}{3}; n \in I$ (C) $\frac{n\pi}{4}$ (D) $\frac{n\pi}{6}; n \in I$

where $n \in I$

MTE010

11. If $\tan\theta - \sqrt{2}\sec\theta = \sqrt{3}$, then the general solution of θ is -

(A) $n\pi + (-1)^n \frac{\pi}{4} - \frac{\pi}{3}$ (B) $n\pi + (-1)^n \frac{\pi}{3} - \frac{\pi}{4}$

(C) $n\pi + (-1)^n \frac{\pi}{3} + \frac{\pi}{4}$ (D) $n\pi + (-1)^n \frac{\pi}{4} + \frac{\pi}{3}$

where $n \in I$

MTE011

12. The most general values of x for which $\sin x + \cos x = \min\limits_{a\in R}\{1, a^2-4a+6\}$ is given by -

(A) $2n\pi$ (B) $2n\pi + \frac{\pi}{2}$ (C) $n\pi + (-1)^n.\frac{\pi}{4} - \frac{\pi}{4}$ (D) None of these

where $n \in I$

MTE012

13. If the equation $sin^4x - (k+2)sin^2x - (k+3) = 0$ has a solution then k must lie in the interval :

(A) $(-4,-2)$ (B) $[-3,2)$ (C) $(-4,-3)$ (D) $[-3,-2]$

MTE013

14. Number of values of x satisfying the equation $\log_2(\sin x) + \log_{1/2}(-\cos x) = 0$ in the interval $(-\pi, \pi]$ is equal to -

(A) 0 (B) 1 (C) 2 (D) 3

MTE014

15. If $x \in \left[-\frac{5\pi}{2}, \frac{5\pi}{2}\right]$, then the greatest positive solution of $1 + \sin^4 x = \cos^2 3x$ is -

(A) π (B) 2π (C) $\frac{5\pi}{2}$ (D) none of these

MTE015

16. The number of solutions of the equation $\sin x = x^2 + x + 1$ is-

(A) 0 (B) 1 (C) 2 (D) None

MTE016

17. The number of solutions of the equation $2\cos\left(\frac{x}{2}\right) = 3^x + 3^{-x}$ is -

(A) 1 (B) 2 (C) 3 (D) None

MTE017

18. The equation $2\cos^2\left(\frac{x}{2}\right)\sin^2 x = x^2 + x^{-2}, 0 < x \le \frac{\pi}{2}$ has

(A) one real solutions
(B) more than one real solutions
(C) no real solution
(D) none of the above

MTE018

19. Given $a^2 + 2a + \text{cosec}^2\left(\frac{\pi}{2}(a+x)\right) = 0$ then, which of the following holds good ?

(A) $a = 1;\ \frac{x}{2} \in I$
(B) $a = -1;\ \frac{x}{2} \in I$
(C) $a \in R\ ;\ x \in \phi$
(D) a, x are finite but not possible to find

MTE019

20. The complete solution set of the inequality $\tan^2 x - 2\sqrt{2}\tan x + 1 \le 0$ is -

(A) $n\pi + \frac{\pi}{8} \le x \le \frac{3\pi}{8} + n\pi,\ n \in I$
(B) $n\pi + \frac{\pi}{4} \le x \le \frac{3\pi}{4} + n\pi,\ n \in I$
(C) $n\pi + \frac{\pi}{16} \le x \le \frac{3\pi}{8} + n\pi,\ n \in I$
(D) $n\pi + \frac{\pi}{3} \le x \le \frac{2\pi}{3} + n\pi,\ n \in I$

MTE020

MULTIPLE CORRECT TYPE QUESTIONS

21. The equation $2\sin\frac{x}{2}.\cos^2 x + \sin^2 x = 2\sin\frac{x}{2}.\sin^2 x + \cos^2 x$ has a root for which

(A) $\sin 2x = 1$
(B) $\sin 2x = -1$
(C) $\cos x = \frac{1}{2}$
(D) $\cos 2x = -\frac{1}{2}$

MTE041

22. Which of the following set of values of x satisfies the equation $2^{(2\sin^2 x - 3\sin x + 1)} + 2^{(2 - 2\sin^2 x + 3\sin x)} = 9$ is -

(A) $x = x\pi, n \in I$
(B) $x = 2n\pi + \frac{\pi}{2}, n \in I$
(C) $x = m\pi \pm \frac{\pi}{6}, n \in I$
(D) $x = n\pi \pm \frac{\pi}{3}, n \in I$

MTE042

23. If sum of all the solution of the equation $\cot x + \text{cosec}\, x + \sec x = \tan x$ in $[0, 2\pi]$ is $\frac{k\pi}{2}$, then the value of k is greater than

(A) 1
(B) 2
(C) 3
(D) 4

MTE043

24. The equation $\sin x + \cos(k + x) + \cos(k - x) = 2$ has real solution(s), then $\sin k$ can be

(A) $\frac{-3}{4}$
(B) $\frac{1}{4}$
(C) $\frac{1}{2}$
(D) $\frac{3}{4}$

MTE044

25. If $m > 0, n < 5, 0 < m + n < 10$ and $\frac{x^2+5}{2} = x - 2\cos(m + nx)$ has atleast one real root, then

(A) the greatest value of $(m + n)$ is 3π. (B) the greatest value of $(m + n)$ is 2π.

(C) the least value of $(m + n)$ is π. (D) the least value of $(m + n)$ is 2π.

MTE045

26. If $x^4 + 3\cos(ax^2 + bx + c) = 2(x^2 - 2)$ has two solutions with $a, b, c \in (2, 5)$ then

(A) $a + b + c = \pi$ (B) $a - b + c = \pi$

(C) $a + b + c = 3\pi$ (D) $a - b + c = 3\pi$

MTE046

27. The equation $\sin^6 x + \cos^6 x = a^2$ has real solution if

(A) $a \in (-1, 1)$ (B) $a \in \left(-1, -\frac{1}{2}\right)$

(C) $a \in \left(-1, \frac{1}{2}\right)$ (D) $a \in \left(\frac{1}{2}, 1\right)$

MTE047

28. $\cos 4x \cos 8x - \cos 5x \cos 9x = 0$ if

(A) $\cos 12x = \cos 14x$ (B) $\sin 13x = 0$

(C) $\sin x = 0$ (D) $\cos x = 0$

MTE048

COMPREHENSION TYPE QUESTIONS

Paragraph for Question No. 29 & 30

Let $f(x) = \cos x + \sin x - 1$ and $g(x) = \sin 2x - 2$.

29. Number of solutions of the equation $f(x) = g(x)$ in $x \in \left[-\pi, \frac{7\pi}{2}\right]$ is equal to

(A) 4 (B) 5 (C) 6 (D) 8

MTE049

30. If the equation $f(x) = k$ has atleast one real solution then the number of possible integral values of k is equal to

(A) 1 (B) 2 (C) 3 (D) 4

MTE050

Paragraph for Question No. 31 & 32

Let $f(x) = \sin^2 x - (a - 1)\sin x + 2(a - 3)$

On the basis of above information, answer the following questions :

31. If $x \in [0, \pi]$ and $f(x) = 0$ has exactly one real root, then $'a'$ lies in

(A) (3, 5) (B) (2, 4)

(C) (4, 5) (D) none of these

MTE051

32. If $f(x) = 0$ have two real roots in $(0, \pi)$, then $a \in$

(A) (1, 2) (B) (3, 4)

(C) $(3, 4) \cup \{5\}$ (D) (3, 5)

MTE052

MATRIX MATCH/MATCHING LIST TYPE QUESTION

33.

	List-I	**List-II**
(I)	Number of common solutions of the equations $2\cos^2 x - 3\cos x + 1 = 0$ and $\tan\left(\frac{3x}{4}\right)+1 = 0$, where $-\pi < x \le 3\pi$, is equal to	(P) 2
(II)	Number of solutions of the equation $\sin^2 x + 2\sin x - 4\cos x - \sin 2x = 0$ in $(0, 2\pi)$ is equal to	(Q) 12
(III)	If the sum of all possible values of $x \in (0, 2\pi)$ satisfying the equation $2\cos x \operatorname{cosec} x - 4\cos x - \operatorname{cosec} x = -2$ is equal to $\frac{k\pi}{4}$ $(k \in N)$, then the value of k is	(R) 4 (S) 3
(IV)	Let $x - y = \frac{1}{4}$ and $\cos(\pi x)\cdot\cos(\pi y) = \frac{1}{2\sqrt{2}}$ where $x, y \in (0, 2)$ then the number of ordered pair(s) (x, y) is equal to	(T) 1

(A) I → P; II → P; III → Q; IV → R
(B) I → T; II → P; III → S; IV → R
(C) I → R; II → P; III → S; IV → T
(D) I → Q; II → P; III → S; IV → T

MTE053

MATRIX MATCH/MATCHING LIST TYPE QUESTION

34.

	Column I	**Column II**
(A)	The number of real roots of the equation $\cos^7 x + \sin^4 x = 1$ in $(-\pi, \pi)$ is	(P) 1
		MTE054
(B)	The number of solutions of the equation $\lvert\cot x\rvert = \cot x + \frac{1}{\sin x}$ $(0 < x < \pi)$ is	(Q) 2
		MTE055
(C)	The number of solution(s) of equation in $(0, 3\pi)$ $\sin^2 x + 3\sec^2 x = -(\tan^2 x + \cot^2 x)$ is	(R) 0 (S) 3
		MTE056
(D)	The number of values of $x \in [-2\pi, 2\pi]$, which satisfy $\operatorname{cosec} x = 1 + \cot x$	(T) 5
		MTE057

EXERCISE - S

1. Number of principal solution(s) of the equation $4 \cdot 16^{\sin^2 x} = 2^{6\sin x}$ is

MTE021

2. The number of solutions of the equation $\tan^2 x - \sec^{10} x + 1 = 0$ in $(0, 10)$ is -

MTE022

3. If $0 \le x \le 3\pi$, $0 \le y \le 3\pi$ and $\cos x \,.\, \sin y = 1$, then the possible number of values of the ordered pair (x, y) is -

MTE023

4. If the equation $\cot^4 x - 2\text{cosec}^2 x + a^2 = 0$ has atleast one solution then, sum of all possible integral values of $'a'$ is equal to

MTE024

5. Number of integral solution(s) of the inequality $2\sin^2 x - 5\sin x + 2 > 0$ in $x \in [0, 2\pi]$, is -

MTE025

6. If $\sin \pi x + \cos \pi x = 0$, then the sum of all solutions in [0, 100] is

MTE058

7. If α, β $(\alpha - \beta \neq 2n\pi, n \in I)$ are different values of θ satisfying the equation $5\cos\theta - 12\sin\theta = 11$.

If the value of $\sin(\alpha + \beta) = -\frac{5k}{169}$, then the value of k is

MTE059

8. If $x \in \left(\pi, \frac{3\pi}{2}\right)$ then $4\cos^2\left(\frac{\pi}{4} - \frac{x}{2}\right) + \sqrt{4\sin^4 x + \sin^2 2x}$ is always equal to

MTE060

9. If the arithmetic mean of the roots of the equation $4\cos^3 x - 4\cos^2 x - \cos(\pi + x) - 1 = 0$ in the interval [0, 315] is equal to $k\pi$, then find the value of k

MTE061

10. In $(0, 6\pi)$, find the number of solutions of the equation $\tan\theta + \tan 2\theta + \tan 3\theta = \tan\theta \cdot \tan 2\theta \cdot \tan 3\theta$

MTE070

11. Find the number of solutions of the equation $\cos 6x + \tan^2 x + \cos 6x \,.\, \tan^2 x = 1$ in the interval $[0, 2\pi]$.

MTE071

12. Find the number of solutions of $\sin\theta + 2\sin 2\theta + 3\sin 3\theta + 4\sin 4\theta = 10$ in $(0, \pi)$.

MTE072

EXERCISE - JEE (Main) PYQ

1. The possible values of $\theta \in (0, \pi)$ such that $\sin(\theta) + \sin(4\theta) + \sin(7\theta) = 0$ are: **[AIEEE 2011]**

(1) $\frac{2\pi}{9}, \frac{\pi}{4}, \frac{4\pi}{9}, \frac{\pi}{2}, \frac{3\pi}{4}, \frac{8\pi}{9}$ (2) $\frac{\pi}{4}, \frac{5\pi}{12}, \frac{\pi}{2}, \frac{2\pi}{3}, \frac{3\pi}{4}, \frac{8\pi}{9}$

(3) $\frac{2\pi}{9}, \frac{\pi}{4}, \frac{\pi}{2}, \frac{2\pi}{3}, \frac{3\pi}{4}, \frac{35\pi}{36}$ (4) $\frac{2\pi}{9}, \frac{\pi}{4}, \frac{\pi}{2}, \frac{2\pi}{3}, \frac{3\pi}{4}, \frac{8\pi}{9}$

MTE026

2. In a ΔPQR, if $3\sin P + 4\cos Q = 6$ and $4\sin Q + 3\cos P = 1$, then the angle R is equal to : **[AIEEE 2012]**

(1) $\frac{3\pi}{4}$ (2) $\frac{5\pi}{6}$ (3) $\frac{\pi}{6}$ (4) $\frac{\pi}{4}$

MTE027

3. If $0 \le x < 2\pi$, then the number of real values of x, which satisfy the equation $\cos x + \cos 2x + \cos 3x + \cos 4x = 0$, is :- **[JEE (Main) 2016]**

(1) 9 (2) 3 (3) 5 (4) 7

MTE028

4. If sum of all the solutions of the equation $8\cos x \cdot \left(\cos\left(\frac{\pi}{6}+x\right).\cos\left(\frac{\pi}{6}-x\right)-\frac{1}{2}\right)=1$ in $[0, \pi]$ is $k\pi$, then k is equal to : **[JEE (Main) 2018]**

(1) $\frac{13}{9}$ (2) $\frac{8}{9}$ (3) $\frac{20}{9}$ (4) $\frac{2}{3}$

MTE029

5. The number of solutions of the equation $1+\sin^4 x=\cos^2 3x,\ x\in\left[-\frac{5\pi}{2}, \frac{5\pi}{2}\right]$ is : **[JEE (Main) 2019]**

(1) 5 (2) 4 (3) 7 (4) 3

MTE030

6. Let S be the set of all $\alpha \in R$ such that the equation, $\cos 2x + \alpha \sin x = 2\alpha - 7$ has a solution. Then S is equal to : **[JEE (Main) 2019]**

(1) [2, 6] (2) [3,7] (3) R (4) [1,4]

MTE031

7. If $\sin^4\alpha+4\cos^4\beta+2=4\sqrt{2}\sin\alpha\cos\beta\,;\ \alpha,\beta\in[0,\pi]$, then $\cos(\alpha+\beta)-\cos(\alpha-\beta)$ is equal to : **[JEE (Main) 2019]**

(1) 0 (2) $-\sqrt{2}$ (3) –1 (4) $\sqrt{2}$

MTE032

8. If the equation $\cos^4\theta + \sin^4\theta + \lambda = 0$ has real solutions for θ, then λ lies in the interval : **[JEE (Main) 2020]**

(1) $\left[-\frac{3}{2}, -\frac{5}{4}\right]$ (2) $\left(-\frac{1}{2}, -\frac{1}{4}\right]$ (3) $\left(-\frac{5}{4}, -1\right)$ (4) $\left[-1, -\frac{1}{2}\right]$

MTE033

9. All possible values of $\theta \in [0, 2\pi]$ for which $\sin 2\theta + \tan 2\theta > 0$ lie in : **[JEE (Main) 2021]**

(1) $\left(0,\frac{\pi}{2}\right)\cup\left(\pi,\frac{3\pi}{2}\right)$ (2) $\left(0,\frac{\pi}{2}\right)\cup\left(\frac{\pi}{2},\frac{3\pi}{4}\right)\cup\left(\pi,\frac{7\pi}{6}\right)$

(3) $\left(0,\frac{\pi}{4}\right)\cup\left(\frac{\pi}{2},\frac{3\pi}{4}\right)\cup\left(\frac{3\pi}{2},\frac{11\pi}{6}\right)$ (4) $\left(0,\frac{\pi}{4}\right)\cup\left(\frac{\pi}{2},\frac{3\pi}{4}\right)\cup\left(\pi,\frac{5\pi}{4}\right)\cup\left(\frac{3\pi}{2},\frac{7\pi}{4}\right)$

MTE034

10. If n is the number of solutions of the equation $2\cos x\left(4\sin\left(\frac{\pi}{4}+x\right)\sin\left(\frac{\pi}{4}-x\right)-1\right)=1, x \in [0,\pi]$ and S is the sum of all these solutions, then the ordered pair (n, S) is : **[JEE (Main) 2021]**

(1) $(3, 13\pi/9)$ (2) $(2, 2\pi/3)$ (3) $(2, 8\pi/9)$ (4) $(3, 5\pi/3)$

MTE035

11. The number of roots of the equation, $(81)^{\sin^2 x}+(81)^{\cos^2 x}=30$ in the interval $[0,\pi]$ is equal to : **[JEE (Main) 2021]**

(1) 3 (2) 4 (3) 8 (4) 2

MTE036

12. The number of solutions of the equation $\cos\left(x+\frac{\pi}{3}\right)\cos\left(\frac{\pi}{3}-x\right)=\frac{1}{4}\cos^2 2x$, $x \in [-3\pi, 3\pi]$ is : **[JEE (Main) 2022]**

(1) 8 (2) 5 (3) 6 (4) 7

MTE037

13. Let $S=\left\{\theta\in[-\pi,\pi]-\left\{\pm\frac{\pi}{2}\right\}:\sin\theta\tan\theta+\tan\theta=\sin 2\theta\right\}$. If $T=\sum_{\theta\in S}\cos 2\theta$, then $T + n(S)$ is equal **[JEE (Main) 2022]**

(1) $7+\sqrt{3}$ (2) 9 (3) $8+\sqrt{3}$ (4) 10

MTE038

14. Let $S=\left\{\theta\in\left(0,\frac{\pi}{2}\right):\sum_{m=1}^{9}\sec\left(\theta+(m-1)\frac{\pi}{6}\right)\sec\left(\theta+\frac{m\pi}{6}\right)=-\frac{8}{\sqrt{3}}\right\}$ Then **[JEE (Main) 2022]**

(1) $S=\left\{\frac{\pi}{12}\right\}$ (2) $S=\left\{\frac{2\pi}{3}\right\}$ (3) $\sum_{\theta\in S}\theta=\frac{\pi}{2}$ (4) $\sum_{\theta\in S}\theta=\frac{3\pi}{4}$

MTE039

15. The number of elements in the set $S=\left\{x\in\mathbb{R}:2\cos\left(\frac{x^2+x}{6}\right)=4^x+4^{-x}\right\}$ is: **[JEE (Main) 2022]**

(1) 1 (2) 3 (3) 0 (4) infinite

MTE040

16. The number of elements in the set $S=\{\theta\in[0,2\pi]:3\cos^4\theta-5\cos^2\theta-2\sin^6\theta+2=0\}$ is **[JEE (Main) 2023]**

(1) 10 (2) 8 (3) 9 (4) 12

MTE073

17. If m and n respectively are the numbers of positive and negative values of θ in the interval $[-\pi, \pi]$ that satisfy the equation $\cos 2\theta \cos\frac{\theta}{2} = \cos 3\theta \cos\frac{9\theta}{2}$, then mn is equal to. **[JEE (Main) 2023]**

MTE074

18. If the solution of the equation $\log_{\cos x} \cot x + 4\log_{\sin x} \tan x = 1, x \in \left(0, \frac{\pi}{2}\right)$, is $\sin^{-1}\left(\frac{\alpha+\sqrt{\beta}}{2}\right)$, where α, β are integers and $\sqrt{\beta} \notin Q$ then $\alpha+\beta$ is equal to: **[JEE (Main) 2023]**

(1) 3 (2) 5 (3) 6 (4) 4

MTE075

19. Let $S = \left\{x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right) : 9^{1-\tan^2 x} + 9^{\tan^2 x} = 10\right\}$ and $\beta = \sum_{x \in s} \tan^2\left(\frac{x}{3}\right)$, then $\frac{1}{6}(\beta-14)^2$ is equal to **[JEE (Main) 2023]**

(1) 32 (2) 8 (3) 64 (4) 16

MTE076

20. Let $S = \{\theta \in [0, 2\pi) : \tan(\pi\cos\theta) + \tan(\pi\sin\theta) = 0\}$. Then $\sum_{\theta \in S} \sin^2\left(\theta + \frac{\pi}{4}\right)$ is equal to **[JEE (Main) 2023]**

MTE077

EXERCISE - JEE (Advanced) PYQ

1. For $x \in (0,\pi)$, the equation $\sin x + 2\sin 2x - \sin 3x = 3$ has **[JEE (Advanced) 2014]**

(A) infinitely many solutions (B) three solutions

(C) one solution (D) no solution

MTE062

2. The number of distinct solutions of equation $\frac{5}{4}\cos^2 2x + \cos^4 x + \sin^4 x + \cos^6 x + \sin^6 x = 2$ in the interval $[0, 2\pi]$ is **[JEE (Advanced) 2015]**

MTE063

3. Let $S = \left\{x \in (-\pi,\pi) : x \neq 0, \pm\frac{\pi}{2}\right\}$. The sum of all distinct solution of the equation $\sqrt{3}\sec x + \operatorname{cosec} x + 2(\tan x - \cot x) = 0$ in the set S is equal to - **[JEE (Advanced) 2016]**

(A) $-\frac{7\pi}{9}$ (B) $-\frac{2\pi}{9}$ (C) 0 (D) $\frac{5\pi}{9}$

MTE064

4. Let a, b, c be three non-zero real numbers such that the equation $\sqrt{3}a\cos x + 2b\sin x = c$, $x \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ has two distinct real roots α and β with $\alpha + \beta = \frac{\pi}{3}$. Then the value of $\frac{b}{a}$ is _____

[JEE (Advanced) 2018]

MTE065

Answer the following by appropriately matching the lists based on the information given in the paragraph

Let $f(x) = \sin(\pi\cos x)$ and $g(x) = \cos(2\pi\sin x)$ be two functions defined for $x > 0$. Define the following sets whose elements are written in the increasing order :

$X = \{x : f(x) = 0\}$, $Y = \{x : f'(x) = 0\}$

$Z = \{x : g(x) = 0\}$, $W = \{x : g'(x) = 0\}$.

List-I contains the sets X, Y, Z and W. List -II contains some information regarding these sets.

	List-I		**List-II**
(I)	X	(P)	$\supseteq\left\{\frac{\pi}{2}, \frac{3\pi}{2}, 4\pi, 7\pi\right\}$
(II)	Y	(Q)	an arithmetic progression
(III)	Z	(R)	NOT an arithmetic progression
(IV)	W	(S)	$\supseteq\left\{\frac{\pi}{6}, \frac{7\pi}{6}, \frac{13\pi}{6}\right\}$
		(T)	$\supseteq\left\{\frac{\pi}{3}, \frac{2\pi}{3}, \pi\right\}$
		(U)	$\supseteq\left\{\frac{\pi}{6}, \frac{3\pi}{4}\right\}$

5. Which of the following is the only CORRECT combination? **[JEE (Advanced) 2019]**

(A) (II), (R), (S) (B) (I), (P), (R)

(C) (II), (Q), (T) (D) (I), (Q), (U)

MTE066

6. Which of the following is the only CORRECT combination? **[JEE (Advanced) 2019]**

(A) (IV), (Q), (T) (B) (IV), (P), (R), (S)

(C) (III), (R), (U) (D) (III), (P), (Q), (U)

MTE067

7. Let $f: [0, 2] \to \mathbb{R}$ be the function defined by

$f(x) = (3 - \sin(2\pi x)) \sin\left(\pi x - \frac{\pi}{4}\right) - \sin\left(3\pi x + \frac{\pi}{4}\right)$ **[JEE (Advanced) 2020]**

If $\alpha, \beta \in [0, 2]$ are such that $\{x \in [0, 2]: f(x) \geq 0\} = [\alpha, \beta]$, then the value of $\beta - \alpha$ is ____

MTE068

8. Consider the following lists :

	List-I		**List-II**
(I)	$\left\{x \in \left[-\frac{2\pi}{3}, \frac{2\pi}{3}\right]: \cos x + \sin x = 1\right\}$	(P)	has two elements
(II)	$\left\{x \in \left[-\frac{5\pi}{18}, \frac{5\pi}{18}\right]: \sqrt{3}\tan 3x = 1\right\}$	(Q)	has three elements
(III)	$\left\{x \in \left[-\frac{6\pi}{5}, \frac{6\pi}{5}\right]: 2\cos(2x) = \sqrt{3}\right\}$	(R)	has four elements
(IV)	$\left\{x \in \left[-\frac{7\pi}{4}, \frac{7\pi}{4}\right]: \sin x - \cos x = 1\right\}$	(S)	has five elements
		(T)	has six elements

The correct option is : **[JEE (Advanced) 2022]**

(A) (I) $\to$ (P); (II) $\to$ (S); (III) $\to$ (P); (IV) $\to$ (S)

(B) (I) $\to$ (P); (II) $\to$ (P); (III) $\to$ (T); (IV) $\to$ (R)

(C) (I) $\to$ (Q); (II) $\to$ (P); (III) $\to$ (T); (IV) $\to$ (S)

(D) (I) $\to$ (Q); (II) $\to$ (S); (III) $\to$ (P); (IV) $\to$ (R)

MTE069

JEE (Main) Practice Paper

This paper is for yourself practice and assessment the discussion of this paper is optional though you can see PDF solutions or video solutions or solutions in hardcopy whichever is provided.

SECTION–A

- This section contains **TWENTY** questions.
- Each question has **FOUR** options (1), (2), (3) and (4). **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the ORS.
- For each question, marks will be awarded in one of the following categories:

Full Marks : +4, if only the bubble corresponding to the correct option is darkened.
Zero Marks : 0, if none of the bubbles is darkened.
Negative Marks : –1 in all other cases.

---

1. The general solution of the equation $\tan x + \tan\left(x+\frac{\pi}{3}\right) + \tan\left(x+\frac{2\pi}{3}\right) = 3$ is

(1) $\frac{n\pi}{4}+\frac{\pi}{12}, n \in I$ (2) $\frac{n\pi}{3}+\frac{\pi}{6}, n \in I$ (3) $\frac{n\pi}{3}+\frac{\pi}{12}, n \in I$ (4) $\frac{n\pi}{3}+\frac{\pi}{4}, n \in I$

MTE078

2. The solution of inequality $4^{\tan x} - 3.2^{\tan x} + 2 \le 0$ is

(1) $x \in \left[n\pi, n\pi+\frac{\pi}{4}\right]; n \in I$ (2) $x \in \left[n\pi, n\pi-\frac{\pi}{4}\right]; n \in I$

(3) $x \in \left[n\pi, n\pi+\frac{\pi}{6}\right]; n \in I$ (4) $x \in \left[n\pi, n\pi-\frac{\pi}{6}\right]; n \in I$

MTE079

3. $\sin^2 x - \cos 2x = 2 - \sin 2x$ if

(1) $x = \frac{n\pi}{2}, n \in \text{I}$ (2) $x = n\pi + (-1)^n \tan^{-1}\left(\frac{3}{2}\right), n \in \text{I}$

(3) $x = \frac{\pi}{2}(2n+1), n \in \text{I}$ (4) $x = n\pi + (-1)^n \sin^{-1}\frac{2}{3}, n \in \text{I}$

MTE080

4. The general solution of the equation $\cos x + \sec x = 2$ is given by -

(1) $2n\pi ; n \in I$ (2) $n\pi ; n \in I$ (3) $\frac{n\pi}{4}; n \in I$ (4) $\frac{n\pi}{2}; n \in I$

MTE081

5. If $2\tan^2 x - 5\sec x - 1 = 0$ has 7 different roots in $\left[0, \frac{n\pi}{2}\right], n \in N$, then greatest value of n is

(1) 8 (2) 10 (3) 13 (4) 15

MTE082

6. Total number of solution of $16^{\cos^2 x} + 16^{\sin^2 x} = 10$ in $x \in [0, 3\pi]$ is equal to-

(1) 4 (2) 8 (3) 12 (4) 16

MTE083

7. General solution of equation $\sqrt{3}\sin\theta - \cos\theta = \sqrt{2}$ is

(1) $n\pi + \frac{\pi}{6} + (-1)^n \frac{\pi}{4}, n \in I$ (2) $2n\pi + \frac{\pi}{6} + (-1)^n \frac{\pi}{4}, n \in I$

(3) $2n\pi, n \in I$ (4) $n\pi - \frac{\pi}{6} + (-1)^n \frac{\pi}{4}, n \in I$

MTE084

8. General solution of equation $5\sin\theta + 2\cos\theta = 5$ is

(1) $2n\pi - \frac{\pi}{2}, n \in I$ (2) $2n\pi - 2\alpha$ where $\alpha = \tan^{-1}\frac{2}{7}, n \in I$

(3) $2n\pi + \frac{\pi}{2}, n \in I$ (4) $2n\pi + 2\alpha$ where $\alpha = \tan^{-1}\frac{2}{7}, n \in I$

MTE085

9. The most general solution of $\tan\theta = -1$ and $\cos\theta = \frac{1}{\sqrt{2}}$ is :

(1) $n\pi + \frac{7\pi}{4}, n \in I$ (2) $n\pi + (-1)^n \frac{7\pi}{4}, n \in I$ (3) $2n\pi + \frac{7\pi}{4}, n \in I$ (4) $n\pi + (-1)^n \frac{\pi}{4}, n \in I$

MTE086

10. Number of solutions of $\sqrt{\tan\theta} = 2\sin\theta, \theta \in [0, 2\pi]$ is equal to

(1) 2 (2) 4 (3) 5 (4) 6

MTE087

11. The solution of the equation $\log_2(\sin x + \cos x) - \log_2(\cos x) + 1 = 0$:

(1) $\tan^{-1}\left(-\frac{1}{2}\right)$ (2) 0 (3) $\tan^{-1}\left(\frac{1}{2}\right)$ (4) $\frac{\pi}{4}$

MTE088

12. $\sin x + \sin 2x + \sin 3x = 0$ if

(1) $\sin x = \frac{1}{2}$ (2) $\sin 2x = 0$ (3) $\sin 3x = \frac{\sqrt{3}}{2}$ (4) $\cos x = \frac{1}{2}$

MTE089

13. The solution set of the equation $4\sin\theta.\cos\theta - 2\cos\theta - 2\sqrt{3}\sin\theta + \sqrt{3} = 0$ in the interval $(0, 2\pi)$ is

(1) $\left\{\frac{3\pi}{4}, \frac{7\pi}{4}\right\}$ (2) $\left\{\frac{\pi}{3}, \frac{5\pi}{3}\right\}$ (3) $\left\{\frac{3\pi}{4}, \pi, \frac{\pi}{3}, \frac{5\pi}{3}\right\}$ (4) $\left\{\frac{\pi}{6}, \frac{5\pi}{6}, \frac{11\pi}{6}\right\}$

MTE090

14. The general solution of the equation $\sin^{50} x - \cos^{50} x = 1$ is-

(1) $2n\pi + \frac{\pi}{2}, n \in I$ (2) $2n\pi + \frac{\pi}{3}, n \in I$ (3) $n\pi + \frac{\pi}{2}, n \in I$ (4) $n\pi + \frac{\pi}{3}, n \in I$

MTE091

15. The general solution of the equation $7\cos^2 x + \sin x \cos x - 3 = 0$ is given by-

(1) $n\pi + \frac{\pi}{2}, n \in I$ (2) $n\pi - \frac{\pi}{4}, n \in I$

(3) $n\pi + \tan^{-1}\frac{4}{3}, n \in I$ (4) $n\pi - \frac{\pi}{4}, k\pi + \tan^{-1}\frac{4}{3}, n \in I$

MTE092

16. The solution of inequality $\cos 2x \le \cos x$ is

(1) $x \in \left[2n\pi - \frac{\pi}{3}, 2n\pi + \frac{\pi}{3}\right], n \in I$ (2) $x \in \left[2n\pi - \frac{2\pi}{3}, 2n\pi + \frac{2\pi}{3}\right], n \in I$

(3) $x \in \left[2n\pi, 2n\pi + \frac{2\pi}{3}\right], n \in I$ (4) $x \in \left[2n\pi - \frac{2\pi}{3}, 2n\pi\right], n \in I$

MTE093

17. Which of the following set of values of x satisfy the inequation $\tan^2 x - (1+\sqrt{3})\tan x + \sqrt{3} < 0$

(1) $\left(\frac{(4n+1)\pi}{4}, \frac{(3n+1)\pi}{3}\right), n \in I$ (2) $\left(\frac{(2n+1)\pi}{4}, \frac{(2n+1)\pi}{3}\right), n \in I$

(3) $\left(\frac{(4n+1)\pi}{4}, \frac{(4n+1)\pi}{3}\right), n \in I$ (4) $\left(n\pi + \frac{\pi}{4}, n\pi + \frac{\pi}{2}\right), n \in I$

MTE094

18. The general solution of the equation $\tan^2\alpha + 2\sqrt{3}\tan\alpha = 1$ is given by:

(1) $\alpha = \frac{n\pi}{2}, n \in I$ (2) $\alpha = (2n+1)\frac{\pi}{2}, n \in I$

(3) $\alpha = (6n+1)\frac{\pi}{12}, n \in I$ (4) $\alpha = \frac{n\pi}{12}, n \in I$

MTE095

19. The complete solution set of the equation $1 + 2\,\text{cosec}\, x = -\frac{\sec^2\frac{x}{2}}{2}$ is

(1) $2n\pi - \frac{\pi}{2}, n \in I$ (2) $n\pi - \frac{\pi}{2}, n \in I$ (3) $2n\pi + \frac{\pi}{2}, n \in I$ (4) $n\pi + \frac{\pi}{2}, n \in I$

MTE096

20. The solution of $|\cos x| = \cos x - 2\sin x$ is

(1) $x = n\pi, n \in I$ (2) $x = n\pi + \frac{\pi}{4}, n \in I$

(3) $x = n\pi + (-1)^n \frac{\pi}{4}, n \in I$ (4) $x = (2n+1)\pi + \frac{\pi}{4}, n \in I$

MTE097

SECTION-B

- This section will have **TEN** questions. Candidate can choose to attempt any 5 question out of these 10 questions. In case if candidate attempts more than 5 questions, first 5 attempted questions will be considered for marking.
- The answer to each question is a **NUMERICAL VALUE.**
- For each question, enter the correct numerical value (Answer should be rounded off to the nearest integer).
- Answer to each question will be evaluated according to the following marking scheme:

  Full Marks : +4, if only correct answer is given.
  Zero Marks : 0, if no answer is given.
  Negative Marks : -1 for incorrect answer

1. The number of solutions of the given equation $\tan\theta+\sec\theta=\sqrt{3}$, where $0<\theta<2\pi$ is

MTE098

2. $\cos(\alpha-\beta)=1$ and $\cos(\alpha+\beta)=\frac{1}{e}$, where $\alpha,\beta\in[-\pi,\pi]$. Then number of ordered pairs (α,β) which satisfy both the equations.

MTE099

3. Number of values of θ between 0° and 90° which satisfy the equation $\sec^2\theta\cdot\operatorname{cosec}^2\theta+2\operatorname{cosec}^2\theta=8$

MTE100

4. Find the number of all values of $\theta\in[0,10.5]$ satisfying the equation $\cos 6\theta+\cos 4\theta+\cos 2\theta+1=0$.

MTE101

5. The number of values of x in the interval $[0,5\pi]$ satisfying the equation $3\sin^2 x-7\sin x+2=0$ is

MTE102

6. If $0\le x\le 3\pi$, $0\le y\le 3\pi$ and $\cos x\cdot\sin y=1$, then find the possible number of values of the ordered pair (x,y)

MTE103

7. Find the number of values of θ satisfying the equation $\sin3\theta=4\sin\theta.\sin2\theta.\sin4\theta$ in $0\le\theta\le2\pi$

MTE104

8. The number of pairs (x,y) satisfying the equations $\sin x+\sin y=\sin(x+y)$ and $|x|+|y|=1$ is

MTE105

9. Find the number of values of x in $(0,2\pi)$ satisfying the equation $\cot x-2\sin 2x=1$.

MTE106

10. Number of solution(s) of equation $\sin^2x+\sin^2 2x=\frac{1}{2}+\cos^2 3x$ in $[0,\pi]$ is-

MTE107

JEE (Advanced) Practice Paper

This paper is for yourself practice and assessment the discussion of this paper is optional though you can see PDF solutions or video solutions or solutions in hardcopy whichever is provided.

SECTION-I

- This section contains **TEN** questions.
- Each question has **FOUR** options for correct answer(*s*). **ONE OR MORE THAN ONE** of these four option(*s*) is (are) correct option(*s*).
- For each question, choose the correct option(*s*) to answer the question.
- Answer to each question will be evaluated according to the following marking scheme:

Full Marks	: +4	if only (all) the correct option(*s*) is (are) chosen.
Partial Marks	: +3	if all the four options are correct but ONLY three options are chosen.
Partial Marks	: +2	if three or more options are correct but ONLY two options are chosen, both of which are correct options.
Partial Marks	: +1	if two or more options are correct but ONLY one option is chosen and it is a correct option.
Zero Marks	: 0	if none of the options is chosen (i.e. the question is unanswered).
Negative Marks	: –2	in all other cases.

For Example : If first, third and fourth are the **ONLY** three correct options for a question with second option being an incorrect option; selecting only all the three correct options will result in +4 marks. Selecting only two of the three correct options (e.g. the first and fourth options), without selecting any incorrect option (second option in this case), will result in +2 marks. Selecting only one of the three correct options (either first or third or fourth option), without selecting any incorrect option (second option in this case), will result in +1 marks. Selecting any incorrect option(*s*) (second option in this case), with or without selection of any correct option(*s*) will result in –2 marks.

---

1. $\sin x, \sin 2x, \sin 3x$ are in A.P if

(A) $x = n\pi/2, n \in I$ (B) $x = n\pi, n \in I$ (C) $x = 2n\pi, n \in I$ (D) $x = (2n+1)\pi, n \in I$

MTE108

2. $\sin x + \sin 2x + \sin 3x = 0$ if

(A) $\sin x = 1/2$ (B) $\sin 2x = 0$ (C) $\sin 3x = \sqrt{3}/2$ (D) $\cos x = -1/2$

MTE109

3. Using four values of θ satisfying the equation $8\cos^4\theta + 15\cos^2\theta - 2 = 0$ in the interval $(0,4\pi)$, an arithmetic progression is formed, then :

(A) The common difference of A.P. may be π. (B) The common difference of A.P. may be 2π.

(C) Exactly two different A.P. can be formed. (D) Four different A.P. can be formed.

MTE110

4. $\sin x - \cos^2 x - 1$ assumes the least value for the set of values of x given by:

(A) $x = n\pi + (-1)^{n+1}(\pi/6), n \in I$ (B) $x = n\pi + (-1)^n(\pi/6), n \in I$

(C) $x = n\pi + (-1)^n(\pi/3), n \in I$ (D) $x = n\pi - (-1)^n(\pi/6), n \in I$

MTE111

5. The general solution of the equation $\cos x \cdot \cos 6x = -1$, is :

(A) $x = (2n+1)\pi, n \in I$ (B) $x = 2n\pi, n \in I$

(C) $x = (2n-1)\pi, n \in I$ (D) none of these

MTE112

6. Which of the following set of values of x satisfy the inequation $\sin 3x < \sin x$.

(A) $\left(\frac{(8n-1)\pi}{4}, 2n\pi\right), n \in I$ (B) $\left(\frac{(8n-1)\pi}{4}, \frac{(8n+1)\pi}{4}\right), n \in I$

(C) $\left(\frac{(8n+1)\pi}{4}, \frac{(8n+3)\pi}{4}\right), n \in I$ (D) $\left((2n+1)\pi, \frac{(8n+5)\pi}{4}\right), n \in I$

MTE113

7. The equation $2\sin\frac{x}{2} \cdot \cos^2 x + \sin^2 x = 2\sin\frac{x}{2} \cdot \sin^2 x + \cos^2 x$ has a root for which

(A) $\sin 2x = 1$ (B) $\sin 2x = -1$ (C) $\cos x = \frac{1}{2}$ (D) $\cos 2x = -\frac{1}{2}$

MTE114

8. Let $x = a\pi$ be the solution of the equation $\sec x + \operatorname{cosec} x = \sin x + \cos x$ where $x \in [0, 2\pi]$, then identify the correct statement(s) -

(A) a must be greater than 1/2 (B) a must be less than 1

(C) a must be greater than 1 (D) a can not be an integer

MTE115

9. $5\sin^2 x + \sqrt{3}\sin x \cos x + 6\cos^2 x = 5$ if

(A) $\tan x = -1/\sqrt{3}$ (B) $\sin x = 0$

(C) $x = n\pi + \pi/2, n \in I$ (D) $x = n\pi + \pi/6, n \in I$

MTE116

10. $\sin^2 x + 2\sin x \cos x - 3\cos^2 x = 0$ if

(A) $\tan x = 3$ (B) $\tan x = -1$

(C) $x = n\pi + \pi/4, n \in I$ (D) $x = n\pi + \tan^{-1}(-3), n \in I$

MTE117

SECTION–II

- This section contains **TWO** paragraphs.
- Based on each paragraph, there are **TWO** questions.
- Each question has **FOUR** options (A), (B), (C) and (D) **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the ORS.
- For each question, marks will be awarded in one of the following categories :

Full Marks : +3 if only the bubble corresponding to the correct answer is darkened.

Zero Marks : 0 in all other cases.

Comprehension # 1 (Q. No. 11 & 12)

Consider system of equation in variables α, β,

$[\sin(\alpha-\beta)+\cos(\alpha+2\beta)\sin\beta]^2 = 4\cos\alpha\sin\beta\sin(\alpha+\beta)$ and $\tan\alpha = 3\tan\beta$.

11. If sum of all possible values of $\sin^2\beta$ is $\frac{a}{b}$ (where a and b are coprime numbers), then value of $2a + b$ is -

(A) 17 (B) 25 (C) 13 (D) 22

MTE118

12. Number of possible value(s) of β in $\beta \in [-\pi, 4\pi]$, is -

(A) 10 (B) 12 (C) 14 (D) 16

MTE119

Comprehension # 2 (Q. No. 13 & 14)

Consider $f(x)=\frac{1+\sin x+\sin^2 x+.....\text{upto infinite terms}}{1-\sin x+\sin^2 x-\sin^3 x+.....\text{upto infinite terms}}$ and $g(x)=\frac{4}{1+\tan^2 x}$, then

On the basis of above information, answer the following questions :

13. Number of value(s) of x satisfying $f(x) - g(x) = 0$, where $x \in [0, 3\pi]$ is

(A) 2 (B) 3 (C) 4 (D) 5

MTE120

14. Minimum value of $9f(x) + 16f(-x)$ is equal to

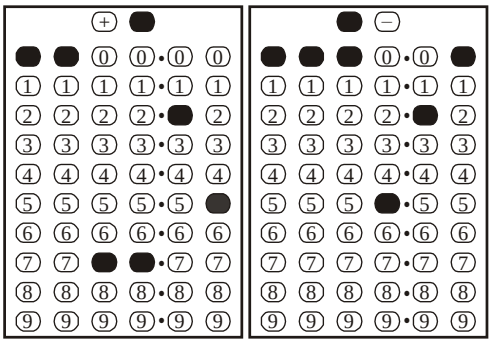
(A) 25 (B) 24 (C) $4\sqrt{3}$ (D) 12

MTE121

SECTION-III

- This section contains **FOUR** questions.
- The answer to each question is a **NUMERICAL VALUE**.
- For each question, enter the correct numerical value (in decimal notation, truncated/rounded-off to the **second decimal place**; e.g. 6.25, 7.00, –0.33, –.30, 30.27, –127.30, if answer is 11.36777..... then both 11.36 and 11.37 will be correct) by darken the corresponding bubbles in the ORS.

For Example : If answer is –77.25, 5.2 then fill the bubbles as follows.



- Answer to each question will be evaluated according to the following marking scheme:

Full Marks : +4 If ONLY the correct numerical value is entered as answer.

Zero Marks : 0 In all other cases.

15. Let $x_1, x_2, x_3 \ldots\ldots x_n$ be all solutions of the equation $\sin 3x\ (\sin 3x - \cos x) = \sin x(\sin x - \cos 3x)$ where $0 \le x_i \le 2\pi \forall i \in [1, n]$. If $\sum_{i=1}^{n} x_i = \frac{a\pi}{b}$ (where a and b are coprime), then $\left[\frac{a}{b}\right]$ is equal to ([.] denotes greatest integer function)

MTE122

16. Find the number of integral values of n so that $\sin x(\sin x + \cos x) = n$ has at least one solution.

MTE123

17. Find the number of solutions of $\sin x \cos x - 3\cos x + 4\sin x - 13 > 0$ in $[0, 2\pi]$.

MTE124

18. If $5\cos\theta$, 2 and $-\cos 3\theta$ are in A.P, then number of such value(s) of θ in $\left[-\frac{\pi}{2}, \frac{5\pi}{2}\right]$, is –

MTE125

ANSWER KEY

EXERCISE - O

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	C	D	C	C	B	A	C	B	C	B
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	D	C	D	B	B	A	A	C	B	A
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	A,B,C,D	B,C	A,B,C,D	B,C	A,C	B,C	B,D	A,B,C	C	C
Que.	31	32	33	34						
Ans.	A	B	A	$A \to S; B \to P; C \to R; D \to Q$						

EXERCISE - S

1.	**3**	**2.**	**3**	**3.**	**6**	**4.**	**0**	**5.**	**5**
6.	5025	**7.**	24	**8.**	2	**9.**	50	**10.**	17
11.	07	**12.**	0						

EXERCISE - JEE (Main) PYQ

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	1	3	4	1	1	1	2	4	4	1
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	2	4	2	3	1	3	25	4	1	2

EXERCISE - JEE (Advanced) PYQ

Que.	1	2	3	4	5	6	7	8	
Ans.	D	8	C	0.50	C	B	1.00	B	

JEE (Main) Practice Paper

	Q.	1	2	3	4	5	6	7	8	9	10
Section-A	A.	3	1	3	1	4	3	1	3	3	3
	Q.	11	12	13	14	15	16	17	18	19	20
	A.	1	2	4	3	4	2	1	3	1	4
Section-B	Q.	1	2	3	4	5	6	7	8	9	10
	A.	2	4	2	17	6	6	15	6	6	6

JEE (Advanced) Practice Paper

Section-I	**Q.**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	A.	A,B,C,D	B,D	A,D	A,D	A,C	A,C,D	A,B,C,D	A,D
	Q.	**9**	**10**						
	A.	A,C	C,D						
Section-II	**Q.**	**11**	**12**	**13**	**14**				
	A.	D	D	C	B				
Section-III	**Q.**	**15**	**16**	**17**	**18**				
	A.	8	2	0	6				