SIR .CV. RAMAN COACHING CENTRE – IDAPPADI, SALEM – 637101

Xl- MATHS ONE MARK TEST QUESTION PAPER- 2025

PREPARED BY Dr.G.THIRUMOORTHI,M.Sc,B.Ed,Ph.D,PHYSICS

thiruphysics1994@gmail.com ,8610560810,8883610465,

TOTAL MARK : 30 M ,TIME : 30 MINUTES

SECTION – A (30 x 1 = 30 m)

ANSWERE ALL QUESTIONS :

CHOOSE THE CORRECT BEST ANSWER :

1.If $f(x) = |x-2| + |x+2|, x \in \mathbb{R}$, then

(1) $f(x) = \begin{cases} -2x & \text{if } x \in (-\infty, -2] \\ 4 & \text{if } x \in (-2, 2] \\ 2x & \text{if } x \in (2, \infty) \end{cases}$

(2) $f(x) = \begin{cases} 2x & \text{if } x \in (-\infty, -2] \\ 4x & \text{if } x \in (-2, 2] \\ -2x & \text{if } x \in (2, \infty) \end{cases}$

(3) $f(x) = \begin{cases} -2x & \text{if } x \in (-\infty, -2] \\ -4x & \text{if } x \in (-2, 2] \\ 2x & \text{if } x \in (2, \infty) \end{cases}$

(4) $f(x) = \begin{cases} -2x & \text{if } x \in (-\infty, -2] \\ 2x & \text{if } x \in (-2, 2] \\ 2x & \text{if } x \in (2, \infty) \end{cases}$

2.If $n((A \times B) \cap (A \times C)) = 8$ and $n(B \cap C) = 2$, then $n(A)$ is

(1) 6 (2) 4 (3) 8 (4) 16

3.If $n(A) = 2$ and $n(B \cup C) = 3$, then $n[(A \times B) \cup (A \times C)]$ is

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

4. The range of the function $\frac{1}{1-2\sin x}$ is

(1) $(-\infty,-1)\cup(\frac{1}{3},\infty)$ (2) $(-1,\frac{1}{3})$ (3) $[-1,\frac{1}{3}]$ (4) $(-\infty,-1]\cup[\frac{1}{3},\infty)$.

5.If $A=\{(x,y):y=e^x,x\in R\}$ and $B=\{(x,y):y=e^{-x},x\in R\}$ then $n(A\cap B)$ is

(1) Infinity (2) 0 (3) 1 (4) 2

6. The inverse of $f(x)=\begin{cases} x & \text{if } x<1 \\ x^2 & \text{if } 1\le x\le 4 \\ 8\sqrt{x} & \text{if } x>4 \end{cases}$ is

(1) $f^{-1}(x)=\begin{cases} x & \text{if } x<1 \\ \sqrt{x} & \text{if } 1\le x\le 16 \\ \frac{x^2}{64} & \text{if } x>16 \end{cases}$

(2) $f^{-1}(x)=\begin{cases} -x & \text{if } x<1 \\ \sqrt{x} & \text{if } 1\le x\le 16 \\ \frac{x^2}{64} & \text{if } x>16 \end{cases}$

(3) $f^{-1}(x)=\begin{cases} x^2 & \text{if } x<1 \\ \sqrt{x} & \text{if } 1\le x\le 16 \\ \frac{x^2}{64} & \text{if } x>16 \end{cases}$

(4) $f^{-1}(x)=\begin{cases} 2x & \text{if } x<1 \\ \sqrt{x} & \text{if } 1\le x\le 16 \\ \frac{x^2}{8} & \text{if } x>16 \end{cases}$

7.Let $f:\mathbb{R}\to\mathbb{R}$ be defined by $f(x)=1-|x|$. Then the range of f is

(1) $\mathbb{R}$ (2) $(1,\infty)$ (3) $(-1,\infty)$ (4) $(-\infty,1]$

8.If $|x+2|\le 9$, then x belongs to

(1) $(-\infty,-7)$ (2) $[-11,7]$ (3) $(-\infty,-7)\cup[11,\infty)$ (4) $(-11,7)$

9.If $\frac{|x-2|}{x-2}\ge 0$, then x belongs to

(1) $[2,\infty)$ (2) $(2,\infty)$ (3) $(-\infty,2)$ (4) $(-2,\infty)$

10.The values of $\log_{\sqrt{2}} 512$ is n

(1) 16 (2) 18 (3) 9 (4) 12

11.If $\frac{kx}{(x+2)(x-1)} = \frac{2}{x+2} + \frac{1}{x-1}$, then the value of k is

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

12.The values of $\log_3 11 \cdot \log_{11} 13 \cdot \log_{13} 15 \cdot \log_{15} 27 \cdot \log_{27} 81$ is

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

13. $\frac{1}{\cos 80^\circ} - \frac{\sqrt{3}}{\sin 80^\circ} =$

(1) $\sqrt{2}$ (2) $\sqrt{3}$ (3) 2 (4) 4

14. $\left(1+\cos\frac{\pi}{8}\right)\left(1+\cos\frac{3\pi}{8}\right)\left(1+\cos\frac{5\pi}{8}\right)\left(1+\cos\frac{7\pi}{8}\right) =$

(1) $\frac{1}{8}$ (2) $\frac{1}{2}$ (3) $\frac{1}{\sqrt{3}}$ (4) $\frac{1}{\sqrt{2}}$

15.If $\pi < 2\theta < \frac{3\pi}{2}$, then $\sqrt{2+\sqrt{2+2\cos 4\theta}}$ equals to

(1) $-2\cos\theta$ (2) $-2\sin\theta$ (3) $2\cos\theta$ (4) $2\sin\theta$

16.If $\tan 40^\circ = \lambda$, then $\frac{\tan 140^\circ - \tan 130^\circ}{1+\tan 140^\circ \tan 130^\circ} =$

(1) $\frac{1-\lambda^2}{\lambda}$ (2) $\frac{1+\lambda^2}{\lambda}$ (3) $\frac{1+\lambda^2}{2\lambda}$ (4) $\frac{1-\lambda^2}{2\lambda}$

17. $\cos 1^\circ + \cos 2^\circ + \cos 3^\circ + \ldots + \cos 179^\circ =$

(1) 0 (2) 1 (3) -1 (4) 89

18.Let $f_k(x) = \frac{1}{k}\left[\sin^k x + \cos^k x\right]$ where $x \in R$ and $k \geq 1$. Then $f_4(x) - f_6(x) =$

(1) $\frac{1}{4}$ (2) $\frac{1}{12}$ (3) $\frac{1}{6}$ (4) $\frac{1}{3}$

19. $\frac{\sin(A-B)}{\cos A\cos B}+\frac{\sin(B-C)}{\cos B\cos C}+\frac{\sin(C-A)}{\cos C\cos A}$ is

(1) $\sin A+\sin B+\sin C$ (2) 1 (3) 0 (4) $\cos A+\cos B+\cos C$

20. $\frac{\cos 6x+6\cos 4x+15\cos 2x+10}{\cos 5x+5\cos 3x+10\cos x}$ is equal to

(1) $cos2x$ (2) $\cos x$ (3) $\cos 3x$ (4) $2\cos x$

21.The number of ways in which a host lady invite 8 people for a party of 8 out of 12 people of whom two do not want to attend the party together is

(1) $2\times{}^{11}C_7+{}^{10}C_8$ (2) ${}^{11}C_7+{}^{10}C_8$ (3) ${}^{12}C_8-{}^{10}C_6$ (4) ${}^{10}C_6+2!$.

22. The number of ways in which the following prize be given to a class of 30 boys first and second in mathematics, first and second in physics, first in chemistry and first in English is

(1) $30^4\times 29^2$ (2) $30^3\times 29^3$ (3) $30^2\times 29^4$ (4) 30×29^5.

23. The number of five digit telephone numbers having at least one of their digits repeated is

(1) 90000 (2) 10000 (3) 30240 4) 69760

24. ${}^{(n-1)}C_r+{}^{(n-1)}C_{(r-1)}$ is

(1) ${}^{(n+1)}C_r$ (2) ${}^{(n-1)}C_r$ (3) ${}^{n}C_r$ (4)${}^{n}C_{r-1}$.

25.The product of first *n* odd natural numbers equals

(1) ${}^{2n}C_n\times{}^{n}P_n$ (2) $(\frac{1}{2})^n\times{}^{2n}C_n\times{}^{n}P_n$ (3)$(\frac{1}{4})^n\times{}^{2n}C_n\times{}^{2n}P_n$ (4)${}^{n}C_n\times{}^{n}P_n$

26.The values of $1-\frac{1}{2}\left(\frac{2}{3}\right)+\frac{1}{3}\left(\frac{2}{3}\right)^2-\frac{1}{4}\left(\frac{2}{3}\right)^3+\cdots$ is

(1) $\log\left(\frac{5}{3}\right)$ (2) $\frac{3}{2}\log\left(\frac{5}{3}\right)$ (3) $\frac{5}{3}\log\left(\frac{5}{3}\right)$ (4) $\frac{2}{3}\log\left(\frac{2}{3}\right)$.

27.The values of $\frac{1}{2!}+\frac{1}{4!}+\frac{1}{6!}+\cdots$ is

(1) $\frac{e^2+1}{2e}$ (2) $\frac{(e+1)^2}{2e}$ (3) $\frac{(e-1)^2}{2e}$ (4) $\frac{e^2-1}{2e}$.

28. The sum up to *n* terms of the series $\frac{1}{\sqrt{1}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{5}}+\frac{1}{\sqrt{5}+\sqrt{7}}+\cdots$ is

(1) $\sqrt{2n+1}$ (2) $\frac{\sqrt{2n+1}}{2}$ (3) $\sqrt{2n+1}-1$ (4) $\frac{\sqrt{2n+1}-1}{2}$.

29. The n_{th} term of the sequence $\frac{1}{2}, \frac{3}{4}, \frac{7}{8}, \frac{15}{16}, \cdots$ is

(1) $2^n - n - 1$ (2) $1 - 2^{-n}$ (3) $2^{-n} + n - 1$ (4) 2^{n-1}.

30. The sequence $\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}+\sqrt{2}}, \frac{1}{\sqrt{3}+2\sqrt{2}}, \cdots$ form an

(1) AP (2) GP (3) HP (4) AGP.

ALL THE BEST

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