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CLASSROOM CONTACT PROGRAMME

(ACADEMIC SESSION 2023-2024)

XI – JEE

Test Type: Chapter wise Test **Date: 05/10/2023**

MATHEMATICS

Duration of test 75 min and questions Paper contains 30 questions. The maximum marks are 100.

This Question paper contain Physics which is further divided into two sections.

Section –A contains 20 Questions Section B contains 10 questions. Please ensure that the Questions paper you have received contains ALL THE QUESTIONS in each Part.

In Section A all the 20 Questions are compulsory and in Section B Contain 10 Question, out of these 10 Questions, candidates can choose to attempt any 5 Questions.

Each Question has four choices (a), (b), (c), (d) out of which only one is correct & Carry 4 marks each 1 mark will be deducted for each wrong answer.

If you want to attempt any question then circle should be properly darkened as shown below, otherwise leave blank.

Name of Candidate ……ID. No ……

Candidate's Signature: ……Invigilator's Signature: ……..

DO MORE AND MORE PRACTICE, BECAUSE PRACTICE IS THE ONLY WAY TO ACCURACY.

MATHEMATICS

SECTION – A

1. If $sec\theta + tan\theta = p$, then $tan\theta$ is equal to

(a) $\frac{2p}{p^2-1}$ (b) $\frac{p^2-1}{2p}$

(c) $\frac{p^2+1}{2p}$ (d) $\frac{2p}{p^2+1}$

2. Which of the following is correct

(a) $tan1 > tan2$ (b) $tan1 = tan2$

(c) $tan1 < tan2$ (d) $tan1 = 1$

3. $(m+2)sin\theta + (2m-1)cos\theta = 2m+1$, if

(a) $tan\theta = \frac{3}{4}$ (b) $tan\theta = \frac{4}{3}$

(c) $tan\theta = \frac{2m}{m^2+1}$ (d) None of these

4. If $sinA, cosA$ and $tanA$ are in G.P., then $cos^3A + cos^2A$ is equal to

(a) 1 (b) 2

(c) 4 (d) None of these

5. If θ lies in the second quadrant, then the value of $\sqrt{\left(\frac{1-sin\theta}{1+sin\theta}\right)} + \sqrt{\left(\frac{1+sin\theta}{1-sin\theta}\right)}$

(a) $2sec\theta$ (b) $-2sec\theta$

(c) $2cosec\theta$ (d) None of these

6. The value of $6(sin^6\theta + cos^6\theta) - 9(sin^4\theta + cos^4\theta) + 4$ is

(a) –3 (b) 0 (c) 1 (d) 3

7. The sum $S = sin\theta + sin2\theta + ... + sin n\theta$, equals

(a) $sin\frac{1}{2}(n+1)\theta sin\frac{1}{2}n\theta / sin\frac{\theta}{2}$

(b) $cos\frac{1}{2}(n+1)\theta sin\frac{1}{2}n\theta / sin\frac{\theta}{2}$

(c) $sin\frac{1}{2}(n+1)\theta cos\frac{1}{2}n\theta / sin\frac{\theta}{2}$

(d) $cos\frac{1}{2}(n+1)\theta cos\frac{1}{2}n\theta / sin\frac{\theta}{2}$

8. If $x = cos10°cos20°cos40°$, then the value of x is

(a) $\frac{1}{4}tan10°$ (b) $\frac{1}{8}cot10°$

(c) $\frac{1}{8}cosec10°$ (d) $\frac{1}{8}sec10°$

9. Minimum value of $5sin^2\theta + 4cos^2\theta$ is

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

10. If $\frac{3\pi}{4} < \alpha < \pi$, then $\sqrt{cosec^2\alpha + 2cot\alpha}$ is equal to

(a) $1 + cot\alpha$ (b) $1 - cot\alpha$

(c) $-1 - cot\alpha$ (d) $-1 + cot\alpha$

11. $1 + cos56^o + cos58^o - cos66^o =$

(a) $2cos28^o cos29^o cos33^o$

(b) $4cos28^o cos29^o cos33^o$

(c) $4cos28^o cos29^o sin33^o$

(d) $2cos28^o cos29^o sin33^o$

12. If $sin^2\theta - 2cos\theta + \frac{1}{4} = 0$, then the general value of θ is

(a) $n\pi \pm \frac{\pi}{3}$ (b) $2n\pi \pm \frac{\pi}{3}$

(c) $2n\pi \pm \frac{\pi}{6}$ (d) $n\pi \pm \frac{\pi}{6}$

13. If $cos7\theta = cos\theta - sin4\theta$, then the general value of θ is

(a) $\frac{n\pi}{4}, \frac{n\pi}{3} + \frac{\pi}{18}$ (b) $\frac{n\pi}{3}, \frac{n\pi}{3} + (-1)^n\frac{\pi}{18}$

(c) $\frac{n\pi}{4}, \frac{n\pi}{3} + (-1)^n\frac{\pi}{18}$ (d) $\frac{n\pi}{6}, \frac{n\pi}{3} + (-1)^n\frac{\pi}{18}$

14. The general value of θ satisfying the equation $2sin^2\theta - 3sin\theta - 2 = 0$ is

(a) $n\pi + (-1)^n\frac{\pi}{6}$ (b) $n\pi + (-1)^n\frac{\pi}{2}$

(c) $n\pi + (-1)^n\frac{5\pi}{6}$ (d) $n\pi + (-1)^n\frac{7\pi}{6}$

15. General solution of $tan5\theta = cot2\theta$ is

(a) $\theta = \frac{n\pi}{7} + \frac{\pi}{14}$ (b) $\theta = \frac{n\pi}{7} + \frac{\pi}{5}$

(c) $\theta = \frac{n\pi}{7} + \frac{\pi}{2}$ (d) $\theta = \frac{n\pi}{7} + \frac{\pi}{3}, n \in Z$

16. If $tan\theta + tan2\theta + \sqrt{3}tan\theta tan2\theta = \sqrt{3}$, then

(a) $\theta = (6n+1)\pi/18, \forall n \in I$

(b) $\theta = (6n+1)\pi/9, \forall n \in I$

(c) $\theta = (3n+1)\pi/9, \forall n \in I$

(d) None of these

17. If $\frac{\tan 3\theta - 1}{\tan 3\theta + 1} = \sqrt{3}$, then the general value of θ is

(a) $\frac{n\pi}{3} + \frac{\pi}{12}$ (b) $\frac{n\pi}{3} + \frac{7\pi}{36}$

(c) $n\pi + \frac{7\pi}{12}$ (d) $n\pi + \frac{\pi}{12}$

18. The equation $\sin x + \cos x = 2$ has
(a) One solution
(b) Two solutions
(c) Infinite number of solutions
(d) No solutions

19. The number of values of θ in $[0, 2\pi]$ satisfying the equation $2\sin^2\theta = 4 + 3\cos\theta$ are
(a) 0 (b) 1 (c) 2 (d) 3

20. The most general value of θ which will satisfy both the equations $\sin\theta = -\frac{1}{2}$ and $\tan\theta = \frac{1}{\sqrt{3}}$ is

(a) $n\pi + (-1)^n \frac{\pi}{6}$ (b) $n\pi + \frac{\pi}{6}$

(c) $2n\pi \pm \frac{\pi}{6}$ (d) None of these

SECTION – B

INTEGER TYPE QUESTIONS

21. If n arithmetic means are inserted between a and 100 such that the ratio of the first mean to the last mean is 1 : 7 and a + n = 33, then the value of n is

22. If $3^{2\sin 2\alpha - 1}$, 14 and $3^{4 - 2\sin 2\alpha}$ are the first three terms of an A.P. for some α, then the sixth term of this A.P. is

23. Let $a_1 = 8, a_2, a_3 ..., a_n$ be an A.P. If the sum of its first four terms is 50 and the sum of its last four terms is 170, then the product of its middle two terms is 58K then the value of K is

24. The number of terms common to the two A.P.'s 3, 7, 11, ..., 407 and 2, 9, 16, ..., 709 is _____.

25. The value of $(0.16)^{\log_{2.5}\left(\frac{1}{3} + \frac{1}{3^2} + \frac{1}{3^3} + \ldots \text{to} \infty\right)}$ is equal to _____.

26. If $(20)^{19} + 2(21)(20)^{18} + 3(21)^2(20)^{17} + \ldots + 20(21)^{19} = k(20)^{19}$, then k is equal to 25K then the value of K is

27. If $\frac{1}{2\times3\times4} + \frac{1}{3\times4\times5} + \frac{1}{4\times5\times6} + \ldots + \frac{1}{100\times101\times102} = \frac{K}{101}$, then 9.4 K is equal to _____.

28. The value of $\tan 9^o - \tan 27^o - \tan 63^o + \tan 81^o$ is _____.

29. If $\sin^2(10^o)\sin(20^o)\sin(40^o)\sin(50^o)\sin(70^o) = \alpha - \frac{1}{16}\sin(10^o)$ then $16 + \alpha^{-1}$ is equal to _____.

30. The number of solutions of $|\cos x| = \sin x$, such that $-4\pi \le x \le 4\pi$ is