Tsi11M

Tenkasi District

Common Second Revision Test - 2025

Standard 11

MATHEMATICS

Time Allowed: 3.00 Hours Maximum Marks: 90

I. Choose the best: **20×1=20**

1) If A = {(X,Y) Y = sin X, X∈R } and B = {(X,Y) : Y = sin X, X∈R} then A∩B contains

a) can't be determined b) no elements

c) infinitely many elements d) only one element

2) If the function f : [−3,3] → S defined by $f(x) = X^2$ is on to, then S is

a) [0,9] b) [−9,9] c) R d) [−3,3]

3) The value of $\log_{\sqrt{2}} 512$ is

a) 9 b) 16 c) 12 d) 18

4) $n_{C_0} + n_{C_1} + \ldots\ldots + n_{C_n} =$

a) 2^{n+1} b) 2^n c) 2^{n-1} d) 2n

5) There are n locks and n matching keys. If all the locks and keys are to be perfectly matched then the max. no. of trials is

a) n(n−1) b) n(n+1) c) n d) $\frac{n(n+1)}{2}$

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

a) 0 b) sin A + sin B + sin C

c) cos A + cos B + cos C d) 1

7) Which of the following is not true?

a) $\tan\theta = 25$ b) $\sin\theta = \frac{3}{4}$ c) $\sec\theta = \frac{1}{4}$ d) $\cos\theta = -1$

8) The co-efficient of x^5 in the series e^{-2x} is

a) $-\frac{4}{15}$ b) $\frac{2}{3}$ c) $\frac{4}{15}$ d) $\frac{3}{2}$

9) The sequence $\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}+\sqrt{2}}, \frac{1}{\sqrt{3}+2\sqrt{2}}, \ldots\ldots$ form an

a) Harmonic progression b) Arithmetic progression

c) Arithmetic - Geometric progression d) Geometric progression

10) The pt. lie on the locus of $3x^2 + 3y^2 - 8x - 12y + 17 = 0$

a) (1,2) b) (0,0) c) (0,−1) d) (−2,3)

11) If one of the lines given by $6X^2 - XY + 4CY^2 = 0$ is $3X + 4Y = 0$ then C equals to

a) 3 b) −3 c) 1 d) −1

12) If A is a square matrix, then which of the following is not symmetric

a) $A - A^T$ b) $A + A^T$ c) AA^T d) A^TA

13) If $A + I = \begin{bmatrix} 3 & -2 \\ 4 & 1 \end{bmatrix}$ then (A+I)(A−I) is equal to

a) $\begin{bmatrix} -5 & -4 \\ -8 & -9 \end{bmatrix}$ b) $\begin{bmatrix} -5 & -4 \\ 8 & -9 \end{bmatrix}$ c) $\begin{bmatrix} -5 & 4 \\ -8 & 9 \end{bmatrix}$ d) $\begin{bmatrix} 5 & 4 \\ 8 & 9 \end{bmatrix}$

14) If $|\bar{a}+\bar{b}| = 60$, $|\bar{a}-\bar{b}| = 40$ and $|\bar{b}| = 46$ then $|\bar{a}| = ?$

a) 32 b) 42 c) 12 d) 22

15) If $\bar{a}$ and $\bar{b}$ include an angle 120° and their magnitude are 2 and $\sqrt{3}$ then $\bar{a}.\bar{b} = ?$

a) $-\frac{\sqrt{3}}{2}$ b) $\sqrt{3}$ c) $-\sqrt{3}$ d) 2

16) $\lim_{x\to\infty} \frac{\sin X}{X} =$

a) ∞ b) 1 c) −∞ d) 0

17) If $Y = e^{\sin x}$ then $\frac{dY}{dX} =$

a) $\sin x\, e^{\sin x}$ b) $\cos x$ c) $\cos x\, e^{\sin x}$ d) $e^{\cos x}$

18) $\int \frac{\sin\sqrt{x}}{\sqrt{x}} dx =$

a) $-2\sin\sqrt{x} + C$ b) $2\cos\sqrt{x} + C$ c) $-2\cos\sqrt{x} + C$ d) $2\sin\sqrt{x} + C$

19) Ten coins are tossed. The probability of getting atleast 8 head is

a) $\frac{7}{16}$ b) $\frac{7}{64}$ c) $\frac{7}{128}$ d) $\frac{7}{32}$

20) $\int \frac{\sqrt{\tan x}}{\sin 2x} dx$ is

a) $\frac{1}{2}\sqrt{\tan x} + C$ b) $\sqrt{\tan x} + C$ c) $\frac{1}{4}\sqrt{\tan x} + C$ d) $2\sqrt{\tan x} + C$

II. Answer any seven questions. Question No.30 is compulsory. 7×2=14

21) Resolve the rational expression $\frac{1}{x^2 - a^2}$ into partial fraction.

22) Find the co-efficient of X^5 in the expression of $\left(x - \frac{1}{x^3}\right)^{17}$

23) Find the equation of the straight line, if the perpendicular from the origin makes an angle of 120° with x-axis and the length of perpendicualr from the origin is 6 units.

24) $\tan(45^\circ - A) = \frac{1-\tan A}{1+\tan A}$.

25) Find $|\bar{a}\times\bar{b}|$, where $\bar{a} = 3\bar{i}+4\bar{j}$ and $\bar{b} = \bar{i}+\bar{j}+\bar{k}$.

26) Find F" if $f(x) = x\cos x$.

27) Find $\sqrt[3]{1001}$ approximately (two decimal places).

28) Evaluate : $\lim_{n\to\infty}(5^n+6^n)^{1/n}$.

29) a) The odds that the event A occurs is 5 to 7, then find P(A).

b) Suppose $P(B) = \frac{2}{5}$. Express the odds that the event B occurs.

30) Compute |A| if $A = \begin{bmatrix} 3 & 4 & 1 \\ 0 & -1 & 2 \\ 5 & -2 & 6 \end{bmatrix}$.

III. Answer any seven questions. Question No.40 is compulsory. 7×3=21

31) Find the range of $f(x) = \frac{1}{1-3\cos x}$.

32) In how many ways 5 boys and 4 girls can be seated in a row, so that no two girls are together?

33) Find the value of the product $\begin{vmatrix} \log_3 64 & \log_4 3 \\ \log_3 8 & \log_4 9 \end{vmatrix} \times \begin{vmatrix} \log_2 3 & \log_8 3 \\ \log_3 4 & \log_3 4 \end{vmatrix}$.

34) Differentiate the function w.r.t x $Y = x e^x \log x$.

35) Evaluate : $\int x e^x \, dx$.

36) Solve the equation $\sqrt{6-4x-x^2} = x+4$.

37) If θ is a parameter, find the equation of the locus of a moving point, whose co-ordinate are $x = a\cos^3\theta$, $y = a\sin^3\theta$.

38) The probability of an event A occuring is 0.5 and B occur is 0.3. If A and B are mutually exclusive events then the probability of
(i) $P(A\cup B)$ (ii) $P(A\cap B)$ (iii) $P(\bar{A}\cap B)$

39) S.T $\bar{a}\times(\bar{b}+\bar{c}) + \bar{b}\times(\bar{c}+\bar{a}) + \bar{c}\times(\bar{a}+\bar{b}) = \bar{0}$.

40) Find the value of cos 105°.

IV. Answer all the questions. 7×5=35

41) a) If $A + B + C = \frac{\pi}{2}$, Prove that $\cos 2A + \cos 2B + \cos 2C = 1 + 4\sin A \sin B \sin C$.

 (OR)

b) S.T the whose points vectors are $4\bar{i}+5\bar{j}+\bar{k}$, $-\bar{j}-\bar{k}$, $3\bar{i}+9\bar{j}+4\bar{k}$ and $-4\bar{i}+4\bar{j}+4\bar{k}$ are co-planar.

42) a) By the principle of mathematical induction, Prove that for $n \geq 1$,

$1^2 + 3^2 + 5^2 + \ldots + (2n-1)^2 = \frac{n(2n-1)(2n+1)}{3}$. **(OR)**

b) If $Y = \frac{\sin^{-1} X}{\sqrt{1-X^2}}$, S.T $(1-X^2)Y_2 - 3XY_1 - Y = 0$.

43) a) Prove that $\sqrt[3]{x^3+6} - \sqrt[3]{x^3+3}$ is approximately equal to $\frac{1}{x^2}$ when x is sufficiently large. **(OR)**

b) There are two identical urns containing respectively 6 black and 4 red balls, 2 black and 2 red balls. An urn is chosen at random and a ball is drawn from it. Find the probability that the ball is black.

44) a) Resolve into partial fractions $\frac{2x}{(x^2+1)(x-1)}$. **(OR)**

b) Express the matrix $A = \begin{bmatrix} 1 & 3 & 5 \\ -6 & 8 & 3 \\ -4 & 6 & 5 \end{bmatrix}$ as the sum of a symmetric and skew-symmetric matrices.

45) a) If the equation $\lambda X^2 - 10XY + 12Y^2 + 5X - 16Y - 3 = 0$ represents a pair of straight lines find

i) The value of λ and the separate equations of the lines

ii) Point of intersection of the lines

iii) Angle between the lines **(OR)**

b) Evaluate : $\int \frac{6x+5}{\sqrt{1-4x-4x^2}}\,dx$.

46) a) If $f : R \to R$ is defined by $f(x) = 2X - 3$, Prove that f is a bijection and find its inverse. **(OR)**

b) Evaluate : $\int \frac{3x+5}{x^2+4x+7}\,dx$.

47) a) State and prove Napier's formula. **(OR)**

b) Prove that $\lim_{\theta \to 0} \frac{\sin\theta}{\theta} = 1$.
