PREVIEW QUESTION BANK(Single)

Module Name : NCET Language: ENGLISH
Section Name : 319-Mathematics
Exam Date : 29-Apr-2025 Batch : 09:00-12:00

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Ne M
Section : 319-Mathematics				
Topic : Topic 102				
Q.Type : Objective Question				
1	4453	***This is mandatory question.** The inverse matrix of a skew-symmetric matrix of odd order: 1. is a symmetric matrix 2. is a skew-symmetric matrix 3. is a diagonal matrix 4. does not exist (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00
Q.Type : Objective Question				
2	4454	***This is mandatory question.** Let A be a square matrix of order 3 such that det(adj A) = 16, then det(AA^T) is equal to: 1. – 4 2. – 16 3. 16 4. 4 (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00
Q.Type : Objective Question				
3	4455	***This is mandatory question.**	4.0	1.00

If $y = \log_e\left(\frac{x^2}{e^2}\right)$, where $x \neq 0$, then the value of $\frac{d^2y}{dx^2}$ at $x = e$ is equal to:

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

(A) 1

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

4	4456	***This is mandatory question.***	4.0	1.00

The largest open interval, in which the function $f(x) = \frac{x}{2} + \frac{2}{x}, x \neq 0$, decreases, is :

1. $(-2, 2) - \{ 0 \}$
2. $(-\infty, -2) \cup (2, \infty)$
3. $(-\infty, 0) \cup (0, \infty)$
4. $(-2, \infty)$

(A) 1

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

5	4457	***This is mandatory question.***	4.0	1.00

If a, b and c are some real constants, then the value of the integral $\int_{-2}^{2}\left(ax^3 + bx + c\right)dx$ depends on:

1. both a and b
2. both b and c
3. all a, b and c
4. c only

(A) 1

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

6 4458

***This is mandatory question.**

The area (in square units) of the region bounded between the line $x = 4$ and the curve $y^2 = 9x$, is :

1. 16
2. 32
3. 48
4. 64

(A) 1

(B) 2

(C) 3

(D) 4

4.0 1.00

Q.Type : Objective Question

7 4459

***This is mandatory question.**

Match the **LIST-I** with **LIST-II**

	LIST-I (Differential Equation)		LIST-II (Sum of order and degree)
A.	$\left(1+(y')^2\right)^{\frac{3}{2}} = y''$	I.	3
B.	$1+(y')^2 = y''$	II.	4
C.	$1+y' = e^x$	III.	6
D.	$(4y'''+y)^3 = \frac{1}{x}$	IV.	2

Choose the **correct** answer from the options given below:

1. A - I, B-II, C-III, D-IV
2. A-II, B-I, C-IV, D-III
3. A-III, B-IV, C-I, D-II
4. A-IV, B-III, C-II, D-I

(A) 1

(B) 2

(C) 3

(D) 4

4.0 1.00

Q.Type : Objective Question

8 4460

***This is mandatory question.**

4.0 1.00

If the probability distribution of a random variable X is given by

X	0	1	2	3	4
P(X)	$\frac{1}{10}$	$\frac{1}{2}$	r	$\frac{1}{10}$	$\frac{1}{5}$

Then the value of P $(1 < X \leq 3)$ is:

1. $\frac{1}{5}$

2. $\frac{1}{10}$

3. $\frac{3}{20}$

4. $\frac{3}{10}$

(A) 1

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

9	4461	*This is mandatory question. Let a random variable X take all the natural numbers as its values. If the probability that X takes the value k, is proportional to β^k $(0 < \beta < 1)$, then $P(X = 2)$ is equal to : 1. $1 - \beta$ 2. $\beta - 1$ 3. $\beta(1 - \beta)$ 4. $\beta(\beta - 1)$ (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.0(

Q.Type : Objective Question

10	4462	*This is mandatory question. The corner points of the feasible region of a Linear Programing Problem (LPP) are (0,3), (1,1) and (3,0) and the objective function is $Z = px + qy$, $p > 0$ and $q > 0$. If the minimum value of Z occurs at (3,0) and (1,1), then : 1. $q = 3p$ 2. $p = 3q$ 3. $2q = p$ 4. $2p = q$	4.0	1.0(

(A) 1

(B) 2

(C) 3

(D) 4

Topic : Topic 103

Q.Type : Objective Question

11	4463	Let R be a relation on the set of natural numbers defined as $R = \{(a, b) : a \leq b^2\}$. Then R is: 1. both reflexive and symmetric but not transitive 2. both reflexive and transitive but not symmetric 3. reflexive but neither symmetric nor transitive 4. neither reflexive nor symmetric nor transitive (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

12	4464	The domain of the function $f(x) = \frac{-2}{3}\operatorname{cosec}^{-1}(2x-1)$ is : 1. [0, 1] 2. (0, 1) 3. $(-\infty, 0] \cup [1, \infty)$ 4. $(-\infty, -1] \cup [1, \infty)$ (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

13	4465		4.0	1.00

		Let $A=\begin{bmatrix}2 & -3\\ 3 & 4\end{bmatrix}$ be a matrix such that $A^2-6A+17I=O$, where I is an identity matrix of order 2×2 and O is a zero matrix of order 2×2. Then A^{-1} is equal to: 1. $\frac{1}{17}(6I-A)$ 2. $\frac{1}{17}(6A-I)$ 3. $\frac{1}{17}(6I+A)$ 4. $\frac{1}{17}(6A+I)$ (A) 1 (B) 2 (C) 3 (D) 4		

Q.Type : Objective Question

14	4466	If $A=\begin{bmatrix}1 & 4 & 9\\ 4 & 9 & 16\\ 9 & 16 & 25\end{bmatrix}$, then the value of det(3A) is : 1. –216 2. 216 3. –72 4. 72 (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

15	4467	If the system of equations $2x+y-z=2$ $x-y+2z=5$ $3x-2y+\mu z=-1$ possesses a unique solution, then: 1. $\mu=\frac{13}{3}$ 2. $\mu\neq\frac{13}{3}$ 3. $\mu=\frac{-13}{3}$ 4. $\mu\neq\frac{-13}{3}$	4.0	1.00

(A) 1

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

16	4468	If the function f defined by $f(x)=\begin{cases} ax-1, \text{ if } x\le 5 \\ bx+5, \text{ if } x>5 \end{cases}$ is continuous at $x=5$, then 1. $a-b=\frac{6}{5}$ 2. $a-b=\frac{5}{6}$ 3. $a+b=\frac{6}{5}$ 4. $a+b=\frac{5}{6}$ (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.0(

Q.Type : Objective Question

17	4469	If $x=3\sin^3\theta, y=3\cos^3\theta$, then $\frac{d^2y}{dx^2}$ is equal to: 1. $9\,\text{cosec}^2\theta$ 2. $\frac{1}{3}\sec\theta\,\text{cosec}^2\theta$ 3. $\frac{1}{9}\sec\theta\,\text{cosec}^4\theta$ 4. $-\frac{1}{9}\sec^2\theta\,\text{cosec}^3\theta$ (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.0(

Q.Type : Objective Question

18	4470		4.0	1.0(

The minimum value of the function $f(x)=x\log_e x, x>0$, is:

1. e
2. $\frac{1}{e}$
3. $-e$
4. $-\frac{1}{e}$

(A) 1

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

19	4471	$\int \frac{1}{\sqrt{x^2+6x-7}}dx$ is equal to : 1. $\log_e\left\|(x-3)+\sqrt{x^2+6x-7}\right\|+C$; where C is constant of integration 2. $\frac{1}{4}\log_e\left\|(x-3)+\sqrt{x^2+6x-7}\right\|+C$; where C is constant of integration 3. $\log_e\left\|(x+3)+\sqrt{x^2+6x-7}\right\|+C$; where C is constant of integration 4. $\frac{1}{4}\log_e\left\|(x+3)+\sqrt{x^2+6x-7}\right\|+C$; where C is constant of integration (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.0(

Q.Type : Objective Question

20	4472	The area (in sq. units) of the region in the first quadrant bounded by the curves $y=\sqrt{x}$, $2y-x+3=0$ and the x-axis, is : 1. $\frac{9}{2}$ 2. 6 3. 9 4. $\frac{27}{2}$ (A) 1	4.0	1.0(

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

21	4473	If $y = y(x)$ is a solution of the differential equation $\left(x^2+1\right)\frac{dy}{dx} + 2xy = \frac{1}{x^2+1}$ such that $y(0) = 0$, then the value of $y(1)$ is: 1. $\frac{\pi}{2}$ 2. $\frac{\pi}{4}$ 3. $\frac{\pi}{8}$ 4. $\frac{\pi}{16}$ (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

22	4474	If vector $\vec{a} = \sqrt{2}\,\hat{i} + \hat{j} - \hat{k}$ makes angles α, β and γ with the positive directions of x-axis , y-axis and z axis respectively, then the value of 24 $(\alpha + \beta + \gamma)$ is : 1. 10π 2. 20π 3. 30π 4. 32π (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

23	4475		4.0	1.00

		Let $\vec{a}, \vec{b}$ and $\vec{c}$ be three vectors such that $\lvert\vec{a}\rvert = \lvert\vec{b}\rvert = 1, \lvert\vec{c}\rvert = 2$ and $\vec{d} = \vec{a} \times \vec{c}$. If $\vec{b} = \vec{d} \times \vec{a}$, then the acute angle between $\vec{a}$ and $\vec{c}$, is : 1. $\frac{\pi}{6}$ 2. $\frac{\pi}{4}$ 3. $\frac{\pi}{3}$ 4. $\frac{\pi}{8}$ (A) 1 (B) 2 (C) 3 (D) 4		

Q.Type : Objective Question

24	4476	The value of α, for which the lines $\frac{2-3x}{3} = \frac{2y-3}{\alpha} = \frac{1-z}{2}$ and $\frac{x+1}{2} = \frac{y+1}{3} = \frac{2z-1}{\alpha}$ are perpendicular to each other, is 1. 4 2. –4 3. $\frac{6}{5}$ 4. $\frac{-6}{5}$ (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

25	4477	The shortest distance between the lines whose vector equations are $\vec{r} = \hat{i} + \hat{j} + \lambda\left(2\hat{i} - \hat{j} + \hat{k}\right)$ and $\vec{r} = 2\hat{i} + \hat{j} - \hat{k} + \mu\left(3\hat{i} - 5\hat{j} + 2\hat{k}\right)$, is equal to: 1. $5\sqrt{2}$ 2. $\frac{10\sqrt{59}}{59}$ 3. $2\sqrt{2}$ 4. $\frac{4\sqrt{59}}{59}$	4.0	1.00

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

Q.Type : Objective Question

26	4478	The minimum value of $z=150x+200y$, subjected to the constraints $3x+5y\geq 30, x+y\geq 8;\ x,y\geq 0$, is : 1. 1350 2. 1250 3. 1150 4. 1450 (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.0(

Q.Type : Objective Question

27	4479	A problem in Mathematics is given to three students X, Y and Z whose chances of solving it are $\frac{1}{4},\frac{1}{5}$ and $\frac{1}{6}$ respectively. Then the probability that problem will be solved, is : 1. $\frac{1}{2}$ 2. $\frac{2}{3}$ 3. $\frac{3}{4}$ 4. $\frac{4}{5}$ (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.0(

Q.Type : Objective Question

28	4480		4.0	1.0(

A fair die is rolled repeatedly. The probability that the first time one occurs at the even throw, is :

1. $\frac{1}{36}$
2. $\frac{5}{11}$
3. $\frac{5}{36}$
4. $\frac{6}{11}$

(A) 1

(B) 2

(C) 3

(D) 4