PREVIEW QUESTION BANK(Single)

Module Name : NCET Language: ENGLISH
Section Name : 1319-Applied Mathematics
Exam Date : 29-Apr-2025 Batch : 09:00-12:00

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Ne M
Section : 1319-Applied Mathematics				
Topic : Topic 104				
Q.Type : Objective Question				
1	4481	***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	4482	***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	4483	***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	4484	***This is mandatory question.** 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	4.0	1.00

Q.Type : Objective Question

5	4485	***This is mandatory question.** If a, b and c are some real constants, then the value of the integral $\int_{-2}^{2}(ax^3 + bx + c)\,dx$ 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	4.0	1.00

(C) 3

(D) 4

Q.Type : Objective Question

6 | 4486 | 4.0 | 1.00

*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

Q.Type : Objective Question

7 | 4487 | 4.0 | 1.00

*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

Q.Type : Objective Question

8 | 4488 | 4.0 | 1.00

*This is mandatory question.

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 | 4489 | *This is mandatory question. | 4.0 | 1.00

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

Q.Type : Objective Question

10 | 4490 | *This is mandatory question. | 4.0 | 1.00

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. $2p = q$

(A) 1

(B) 2

(C) 3

(D) 4

Topic : Topic 105

Q.Type : Objective Question

11	4491	When 2^{51} is divided by 11, the remainder is 1. 1 2. 2 3. 5 4. 9 (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

12	4492	A man can row a boat in still water at a speed of 5 km/h. In a river flowing at the rate of 1 km/h, he starts his journey from a point A downstream to point B and comes back. If he takes 1 hour 15 minutes for this complete journey, then distance between point A and point B is : 1. 2.4 km 2. 3 km 3. 3.2 km 4. 4 km (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

13	4493	Water is mixed with pure milk in such a way that by selling the mixture at the cost price of pure milk, a gain of 20% is made. The ratio of milk to water in the mixture is: 1. 4:1 2. 5:2 3. 5:1 4. 3:1	4.0	1.00

(A) 1

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

14 | 4494 | 4.0 | 1.00

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

LIST-I		LIST-II	
A.	$A=\begin{bmatrix}3 & 2\\ 7 & 5\end{bmatrix}$	I.	$\lvert\text{adj}(A)\rvert=8$
B.	$A=\begin{bmatrix}2 & 3\\ 2 & 5\end{bmatrix}$	II.	$\lvert\text{adj}(A)\rvert=1$
C.	$A=\begin{bmatrix}2 & 0\\ 3 & 4\end{bmatrix}$	III.	$\lvert\text{adj}(A)\rvert=4$
D.	$A=\begin{bmatrix}6 & 7\\ 4 & 5\end{bmatrix}$	IV.	$\lvert\text{adj}(A)\rvert=2$

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

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

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

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

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

(A) 1

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

15 | 4495 | 4.0 | 1.00

If $\begin{bmatrix}x & 2 & 1\end{bmatrix}\begin{bmatrix}2 & 1 & 0\\ 1 & 0 & 2\\ 0 & -2 & -4\end{bmatrix}\begin{bmatrix}x\\ 4\\ -1\end{bmatrix}=O;\ O=[0]_{1\times1}$ then the sum of the squares of all possible values of x, is :

1. 5

2. 9

3. 17

4. 20

(A) 1

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

16 | 4496 | The demand function for a certain product is given by $p = 200 - x - x^2$, where x is the number of units and p is the price (in ₹) per unit. The marginal revenue when $x = 4$, is :

1. ₹ 48
2. ₹ 180
3. ₹ 144
4. ₹ 84

(A) 1

(B) 2

(C) 3

(D) 4 | 4.0 | 1.00

Q.Type : Objective Question

17 | 4497 | If M and m are the local maximum and local minimum values of the function $f(x) = 2x^3 + 6x^2 - 18x + 25$ respectively, then the value of $m + M$ is :

1. 62
2. 64
3. 79
4. 94

(A) 1

(B) 2

(C) 3

(D) 4 | 4.0 | 1.00

Q.Type : Objective Question

18 | 4498 | The area (in sq. units) of the region bounded by the curves $y = x^2 + 3$ and $y = 2x$ between $x = 0$ and $x = 5$ is :

1. $\frac{95}{3}$
2. $\frac{170}{3}$
3. $\frac{155}{3}$
4. $\frac{260}{3}$

(A) 1 | 4.0 | 1.00

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

19	4499	If $y = y(x)$ is a solution of the differential equation $\frac{dy}{dx} = \frac{3e^{2x} + 3e^{4x}}{e^{x} + e^{-x}}$ such that $y(0) = 1$. Then $y(1)$ is : 1. e^2 2. e^3 3. e^4 4. e^{-1} (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

20	4500	A die is tossed twice. If a success is defined as 'getting an odd number,' then the variance of the number of successes is 1. 1 2. $\frac{1}{2}$ 3. $\frac{1}{3}$ 4. $\frac{1}{4}$ (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

21	4501		4.0	1.00

The random variable X follows Poisson distribution. If $P(X = 1) = 2P(X = 2)$, then the value of $P(X = 0)$ is :

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

(A) 1

(B) 2

(C) 3

(D) 4

Q.Type : Objective Question

22	4502	In a binomial distribution consisting of five independent trials, if $P(X = 1) = 0.4096$ and $P(X = 2) = 0.2048$, then the value of $P(X = 3)$ is : 1. $\frac{64}{625}$ 2. $\frac{16}{625}$ 3. $\frac{32}{625}$ 4. $\frac{128}{625}$ (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

23	4503	The three - year moving averages of the following data : 35, 70, 36, 59, 62, 60, 71 are : 1. 47, 55, 52.33, 60.33, 64.33 2. 47, 55, 52.33, 63.33, 64.33 3. 47, 54, 52.33, 60.33, 64.33 4. 48, 54, 52.33, 60.33, 65.33 (A) 1 (B) 2	4.0	1.00

(C) 3

(D) 4

Q.Type : Objective Question

24	4504	The following data is from a simple random sample: 5, 8, 10, 7, 10, 14. The point estimate of the population standard deviation is 1. $2\sqrt{2}$ 2. $\sqrt{9 \cdot 6}$ 3. 9 4. $\sqrt{6}$ (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

25	4505	Consider the following hypothesis test: $H_0 : \mu \leq 25$ $H_a : \mu > 25$ A sample of size 49 provided a sample mean of 26.4. If the population standard deviation is 6, then the value of the test statistic is : 1. 2.63 2. 1.63 3. 3.63 4. 0.63 (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

26	4506	If money is worth 8% compounded annually, the present value of a perpetuity of ₹ 4,000 payable at the beginning of each year is: 1. ₹ 52,000 2. ₹ 48,000 3. ₹ 54,000 4. ₹ 50,000 (A) 1	4.0	1.00

(B) 2

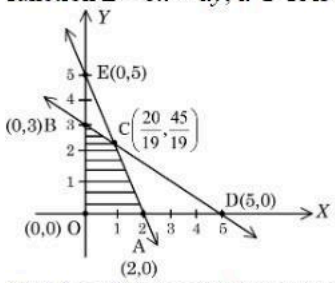
(C) 3

(D) 4

Q.Type : Objective Question

27	4507	A firm anticipates a capital expenditure of ₹ 1,61,220 for a new equipment in 5 years. The amount, which should be deposited quarterly in a sinking fund carrying 12% per annum compounded quarterly to provide for the purpose, is: (Use $(1.03)^{20} = 1.8061$) 1. ₹ 9,000 2. ₹ 6,000 3. ₹ 8,000 4. ₹ 4,000 (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00

Q.Type : Objective Question

28	4508	The feasible region of a linear programming problem (LPP) with objective function $Z = 5x + ay$, $a \in \mathbb{R}$ is shown in the figure below:  If value of Z at point B is 9, the maximum value of Z is : 1. $\frac{190}{19}$ 2. $\frac{235}{19}$ 3. $\frac{245}{19}$ 4. $\frac{200}{19}$ (A) 1 (B) 2 (C) 3 (D) 4	4.0	1.00