1M0520K23 (DAV.1 SECOND SESSION)

ವಿಷಯ ಸಂಕೇಶ M	ಸಮಯ	ಪ್ರಶೈಪತ್ರಿಕೆಯ		
		ವರ್ಷನ್ ಕೋಡ್	ಕ್ರಮ ಸಂಖ್ಯೆ	
	ಮ 2.30 ರಿಂದ 3.50 ರ ವರೆಗೆ	A-4	0323205	

ಒಟ್ಟು ಅವಧಿ	ಉತ್ತರಿಸಲು ಇರುವ ಗರಿಷ್ಟ ಅವಧಿ	ಗರಿಷ್ಟ ಅಂಕಗಳು	ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳು	ನಿಮ್ಮ ಸಿಇಟಿ ಸಂಖ್ಯೆಯನ್ನು ಬರೆಯಿರಿ			
80 ನಿಮಿಷಗಳು	70 වඩාක්ෆ්ර	60	60	23UGE			

ಮಾಡಿ

- ಕೊಠಡಿ ಮೇಲ್ಟೀಕಾರಕರಿಂದ ಈ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ನಿಮಗೆ ಮ. 2.30 ಸಾಗ್ರಾಮಿ ಚಲಾಗಿರುತ್ತದೆ.
 ಅಭ್ಯರ್ಥಿಗಳು ಸಿಇಟಿ ಸಂಖ್ಯೆಯನ್ನು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯ ಸಾಗ್ರಿಸಿದ ವೃತ್ತಗಳನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬಿದ್ದೀರೆಂದು ಖಾತ್ರಿಪಡಿಸಿಕೊಳ್ಳಿ.
- 3. ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯ ವರ್ಷನ್ ಕೋಡ್ ಅನ್ನು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಬರೆದು ಅದಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ವೃತ್ತಗಳನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬಬೇಕು.
- 4. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ವರ್ಷನ್ ಕೋಡ್ ಮತ್ತು ಕ್ರಮ ಸಂಖ್ಯೆಯನ್ನು ನಾಮಿನಲ್ ರೋಲ್ ನಲ್ಲಿ ತಪ್ಪಿಲ್ಲದೆ ಬರೆಯಬೇಕು.
- 5. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯ ಕೆಳಭಾಗದ ನಗದಿತ ಜಾಗದಲ್ಲಿ ಮೂರ್ಣ ಸಹಿ ಮಾಡಬೇಕು.

ಮಾಡದೇಡಿ

- I. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಮುದ್ರಿತವಾಗಿರುವ ಟೈಮಿಂಗ್ ಮಾರ್ಕನ್ನು ಕಿದ್ದಬಾರದು / ಹಾಳುಮಾಡಬಾರದು / ಅಳಿಸಬಾರದು.
- 2. ಮೂರನೇ ಬೆಲ್ ಮ. 2.40 ಕೈ ಆಗುತ್ತದೆ. ಅಲ್ಲಿಯವರೆಗೂ,
 - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಬಲಭಾಗದಲ್ಲಿರುವ ಸೀಲ್ ಅನ್ನು ತೆಗೆಯಬಾರದು.
 - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಒಳಗಡೆ ಇರುವ ಪ್ರಶ್ನೆಗಳನ್ನು ನೋಡಲು ಪ್ರಯತ್ನಿಸಬಾರದು ಅಥವಾ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸಲು ಪ್ರಾರಂಭಿ ಸವಾರದು.

MATHEMATICS

1. If
$$y = a \sin x + b \cos x$$
, then $y^2 + \left(\frac{dy}{dx}\right)^2$ is a

- (A) constant
- (C) function of y

- (B) function of x
- (D) function of x and y

2. If
$$f(x) = 1 + nx + \frac{n(n-1)}{2}x^2 + \frac{n(n-1)}{6}$$
 If $f(x) = 1 + nx + \frac{n(n-1)}{2}x^2 + \frac{n(n-1)}{6}$ (C) $n(n-1)2^{n-2}$ (D) $n(n-1)2^n$

- (A) 2ⁿ⁻¹

3. If
$$A = \begin{bmatrix} 1 & \tan \alpha/2 \\ -\tan \alpha/2 & 1 \end{bmatrix}$$
 and $AB = I$ then $B = \frac{1}{2}$
(A) $\sin^2 \alpha/2 \cdot A$ (B) $\cos^2 \alpha/2 \cdot A^T$ (C) $\cos^2 \alpha/2 \cdot A$

- (D) $\cos^2 \alpha/2 \cdot I$

(B)
$$(n-1)2^{n-1}$$

3. If
$$A = \begin{bmatrix} 1 & \tan \alpha/2 \\ -\tan \alpha/2 & 1 \end{bmatrix}$$
 and $AB = I$ then $B = I$

(A)
$$\sin^2 \alpha/2 \cdot A$$

(B)
$$\cos^2 \alpha/2 \cdot A^T$$
 (C) $\cos^2 \alpha/2 \cdot A$

(D)
$$\cos^2 \alpha/2 \cdot I$$

4. If
$$u = \sin^{-1}\left(\frac{2x}{1+x^2}\right)$$
 and $v = \tan^{-1}\left(\frac{2x}{1-x^2}\right)$ then $\frac{du}{dv}$ is

(B)
$$\frac{1}{2}$$

(D)
$$\frac{1-x^2}{1+x^2}$$

The function $f(x) = \cot x$ is discontinuous on every point of the set 5.

(A)
$$\left\{x = \frac{n\pi}{2}; n \in Z\right\}$$

(B)
$$\{x = n\pi; n \in Z\}$$

(3, 2) wants to shoot down the jet when it is nearest to him. Then the nearest distance is

(A)
$$\sqrt{5}$$
 units

(B)
$$\sqrt{3}$$
 units

(C)
$$\sqrt{6}$$
 units

8.
$$\int_{2}^{8} \frac{5^{\sqrt{10-x}}}{5^{\sqrt{x}} + 5^{\sqrt{10-x}}} dx =$$

NTD

9.
$$\int \sqrt{\csc x - \sin x} \, dx =$$

(A)
$$\frac{2}{\sqrt{\sin x}} + C$$

(B)
$$\sqrt{\sin x} + C$$

$$(C) \frac{\sqrt{\sin x}}{2} + C$$

$$\int \sqrt{\csc x - \sin x} \, dx =$$
(A) $\frac{2}{\sqrt{\sin x}} + C$ (B) $\sqrt{\sin x} + C$ (C) $\frac{\sqrt{\sin x}}{2} + C$ (D) $2\sqrt{\sin x} + C$

If f(x) and g(x) are two functions with $g(x) = x - \frac{1}{x}$ and fog $f(x) = x^3 - \frac{1}{x^3}$ then $f'(x) = \frac{1}{x^3}$

11.	A circular plate of radius 5 cm is heated. Du 0.05 cm/sec. The rate at which its area is increased.	te to expansion, its radius increases at the rate of treasing when the radius is 5.2 cm is
	(A) $0.52 \pi \text{cm}^2/\text{sec}$	(B) $5.2 \pi \text{cm}^2/\text{sec}$
-	(C) $27.4 \pi \text{cm}^2/\text{sec}$	(D) $5.05 \pi \text{cm}^2/\text{sec}$
12	The distance 's' in meters travelled by a par	ticle in 't' seconds is given by $s = \frac{2t^3}{3} - 18t + \frac{5}{3}$
12.	The distance 8 in meters travened by a part	dele in 1 seconds 12 g
	The acceleration when the particle correct (A) 18 m ² /sec. (B) 3 m ² /sec.	rest is (C) 10 m ² /sec. (D) 12 m ² /sec.
13.	A particle moves along the curve $\frac{x^2}{16} + \frac{y^2}{4} = \frac{y^2}{4}$	1. When the rate of change of abscissa is 4 tim
	that of its ordinate, then the quadrant in which	ch the particle lies is
	(A) II or III (B) I or III	

15.
$$\int \frac{1}{1+3\sin^2 x + 8\cos^2 x} \, dx =$$

(A)
$$6 \tan^{-1} \left(\frac{2 \tan x}{3} \right) + C$$

(C)
$$\tan^{-1}\left(\frac{2\tan x}{3}\right) + C$$

(B)
$$\frac{1}{6} \tan^{-1} (2 \tan x) + C$$

$$(D) \frac{1}{6} \tan^{-1} \left(\frac{2 \tan x}{3} \right) + C$$

16.
$$\int_{-2}^{0} (x^3 + 3x^2 + 3x + 3 + (x+1)\cos(x)) dx =$$

- (A) 1
- (B) 0

(C) 3

(D) 4

17.
$$\int_{0}^{\pi} \frac{x \tan x}{\sec x \cdot \csc x} dx =$$

(A)
$$6 \tan^{-1} \left(\frac{2 \tan x}{3} \right) + C$$

(B)
$$\frac{1}{6} \tan^{-1} (2 \tan x) + C$$

(C)
$$\tan^{-1}\left(\frac{2\tan x}{3}\right) + C$$

(D)
$$\frac{1}{6} \tan^{-1} \left(\frac{2 \tan x}{3} \right) + C$$

16.
$$\int_{-2}^{0} (x^3 + 3x^2 + 3x + 3 + (x+1)\cos(x+1)) dx =$$

(A) 1

(B) 0

NTD (C) 3

(D) 4

17.
$$\int_{0}^{\pi} \frac{x \tan x}{\sec x \cdot \csc x} dx =$$

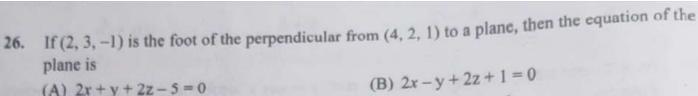
(A) $\pi^{2}/2$

(B) $\pi/4$

(C) $\pi^2/4$

(D) π/2

20.	In the interval $(0, \pi/2)$ is), area lying between	en the curves $y = \tan x$ ar	$x = \cot x$ and the X-ax	1.15
	(A) log 2 sq. units		(B) 3 log 2 sq. uni	its	
	(C) 2 log 2 sq. units		(D) 4 log 2 sq. uni	its	
21.	The area of the region	bounded by the lin	the $y = x + 1$, and the lines	3x = 3 and $x = 5$ is	
	(A) 7 sq. units		(B) 10 sq. units		
	(C) $\frac{7}{2}$ sq. units	N	(D) $\frac{11}{2}$ sq. units		
22.		t and x co-ordinat	e of the point is equal	on the curve, the product to the y co-ordinate of	
	(A) $(\sqrt{3}, 0)$	(B) (2, 2)	(C) (3, 0)	(D) (-1, 2)	
22	The decree of the 1:00-	antial amotion			



(A)
$$2x + y + 2z - 5 = 0$$

(B)
$$2x - y + 2z + 1 = 0$$

(C)
$$2x + y + 2z - 1 = 0$$

(D)
$$2x - y + 2z = 0$$

27.
$$|\vec{a} \times \vec{b}|^2 + |\vec{a} \cdot \vec{b}|^2 = 144$$
 and $|\vec{a}| = 4$ then $|\vec{b}|$ is equal to

28. If
$$\vec{a} + 2 \vec{b} + 3 \vec{c} = \vec{0}$$
 and

$$\left(\overrightarrow{a} \times \overrightarrow{b}\right) + \left(\overrightarrow{b} \times \overrightarrow{c}\right) + \left(\overrightarrow{c} \times \overrightarrow{a}\right) = \lambda \left(\overrightarrow{b} \times \overrightarrow{c}\right)$$

then the value of λ is equal to

- 28. If $\vec{a} + 2 \vec{b} + 3 \vec{c} = \vec{0}$ and $\left(\overrightarrow{a} \times \overrightarrow{b}\right) + \left(\overrightarrow{b} \times \overrightarrow{c}\right) + \left(\overrightarrow{c} \times \overrightarrow{a}\right) = \lambda \left(\overrightarrow{b} \times \overrightarrow{c}\right)$ then the value of λ is equal to

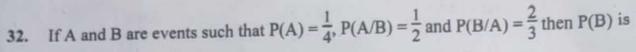
 - (A) 6

(C) 3

- (D) 4
- If a line makes an angle of $\frac{\pi}{3}$ with each X and Y axis then the acute angle made by Z-axis is

- (A) $\frac{\pi}{4}$ (B) $\frac{\pi}{6}$ (D) $\frac{\pi}{2}$

- The length of perpendicular drawn from the point (3, -1, 11) to the line $\frac{x}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ is 30.
 - (A) $\sqrt{53}$
- (B) $\sqrt{66}$
- (C) $\sqrt{29}$ (D) $\sqrt{33}$



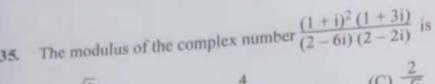
(A) $\frac{1}{2}$

- (B) $\frac{1}{6}$ (C) $\frac{1}{3}$
- (D) $\frac{2}{3}$
- A bag contains 2n + 1 coins. It is known that n of these coins have head on both sides 33. whereas the other n + 1 coins are fair. One coin is selected at random and tossed. If the probability that toss results in heads is $\frac{31}{42}$, then the value of n is
 - (A) 10
- (B) 5
- NTD_{(C) 6}

- (D) 8
- Let $A = \{x, y, z, u\}$ and $B = \{a, b\}$. A function $f : A \rightarrow B$ is selected randomly. The 34. probability that the function is an onto function is
 - (A) $\frac{1}{35}$

(B) $\frac{7}{8}$

- (C) $\frac{1}{8}$
- (D) $\frac{5}{8}$



(A)
$$\frac{\sqrt{2}}{4}$$

(B)
$$\frac{4}{\sqrt{2}}$$

$$(C) \; \frac{2}{\sqrt{2}}$$

(D)
$$\frac{1}{\sqrt{2}}$$

Given that a, b and x are real numbers and a < b, x < 0 then 36.

(A)
$$\frac{a}{x} \le \frac{b}{x}$$

(B)
$$\frac{a}{x} > \frac{b}{x}$$

(C)
$$\frac{a}{x} \ge \frac{b}{x}$$

(D)
$$\frac{a}{x} < \frac{b}{x}$$

NTD

Ten chairs are numbered as 1 to 10. Three women and two men wish to occupy one chair each. First the women choose the chairs marked 1 to 6, then the men choose the chairs from the remaining. The number of possible ways is (C) ${}^{6}P_{3} \times {}^{4}P_{2}$ (D) ${}^{6}C_{3} \times {}^{4}P_{2}$

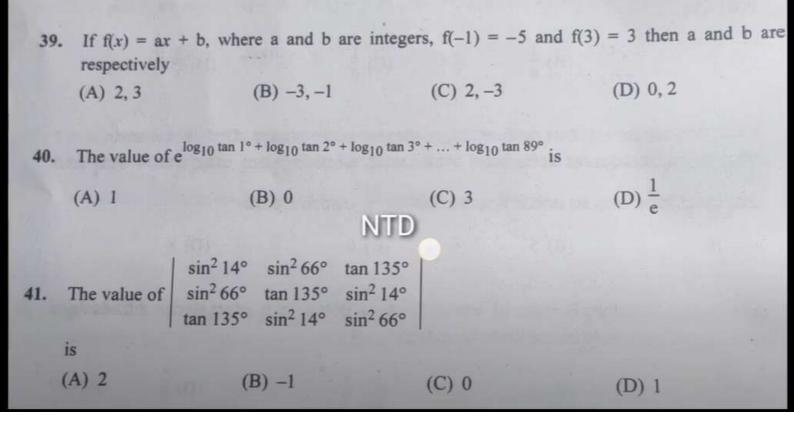
(A)
$${}^{6}P_{3} \times {}^{4}C_{2}$$

(B)
$${}^{6}C_{3} \times {}^{4}C_{2}$$

(C)
$${}^{6}P_{3} \times {}^{4}P_{2}$$

(D)
$${}^{6}C_{3} \times {}^{4}P_{2}$$

Which of the following is an empty set ? 38.



If n is even and the middle term in the expansion of $\left(x^2 + \frac{1}{x}\right)^n$ is 924 x^6 , then n is equal to

(A) 8

(B) 10 (C) 1

(D) 12

nth term of the series

$$1 + \frac{3}{7} + \frac{5}{7^2} + \frac{1}{7^2} + \dots$$
 is

(A) $\frac{2n+1}{7^{n-1}}$ (B) $\frac{2n-1}{7^{n-1}}$ (C) $\frac{2n+1}{7^n}$

 $(D) \frac{2n-1}{7^n}$

46. If $p\left(\frac{1}{q} + \frac{1}{r}\right)$, $q\left(\frac{1}{r} + \frac{1}{p}\right)$, $r\left(\frac{1}{p} + \frac{1}{q}\right)$ are in A.P., then p, q, r

$$1 + \frac{3}{7} + \frac{5}{7^2} + \frac{1}{7^2} + \dots$$
 is

- (A) $\frac{2n+1}{7^{n-1}}$ (B) $\frac{2n-1}{7^{n-1}}$ (C) $\frac{2n+1}{7^n}$ (D) $\frac{2n-1}{7^n}$

46. If $p\left(\frac{1}{q} + \frac{1}{r}\right)$, $q\left(\frac{1}{r} + \frac{1}{p}\right)$, $r\left(\frac{1}{p} + \frac{1}{q}\right)$ are in A.P., then p, q, r

(A) are not in G.P.

(B) are not in A.P.

(C) are in G.P.

NID(D) are in A.P.

A line passes through (2, 2) and is perpendicular to the line 3x + y = 3. Its y-intercept is 47.

(A) $\frac{4}{3}$

(B) $\frac{1}{3}$

(C) $\frac{2}{3}$

(D) 1

(A) $x \in [0, 4]$

50. The contrapositive of the statement

"If two lines do not intersect in the same plane then they are parallel." is

- (A) If two lines are parallel then they do not intersect in the same plane.
- (B) If two lines are not parallel then they intersect in the same plane.
- (C) If two lines are parallel then they intersect in the same plane.
- (D) If two lines are not parallel then they do not intersect in the same plane.
- 51. The mean of 100 observations is 50 and their standard deviation is 5. Then the sum of squares of all observations is
 - (A) 255000
- (B) 50000
- (C) 252500
- (D) 250000
- 52. $f: R \to R$ and $g: [0, \infty) \to R$ are defined by $f(x) = x^2$ and $g(x) = \sqrt{x}$. Which one of the following is not true?
 - (A) (anf) (-2) = 2
- (B) (gof)(4) = 4
- (C) (fog) (-4) = 4
- (D) (fog)(2) = 2

(C)	If two lines are	parallel	then	they	intersect	ın	tne	same	prane.	

The mean of 100 observations is 50 and their standard deviation is 5. Then the sum of 51. squares of all observations is

(A) 255000

(B) 50000

(C) 252500

(D) 250000

 $f: R \to R$ and $g: [0, \infty) \to R$ are defined by $f(x) = x^2$ and $g(x) = \sqrt{x}$. Which one of the 52. following is not true?

(A) (gof)(-2) = 2 (B) (gof)(4) = 4 (C) (fog)(-4) = 4 (D) (fog)(2) = 2

Let $f: R \to R$ be defined by $f(x) = 3x^2 - 5$ and $g: R \to R$ by $g(x) = \frac{x}{x^2 + 1}$ then gof is

(A) $\frac{3x^2}{9x^4 + 30x^2 - 2}$ (B) $\frac{3x^2 - 5}{9x^4 - 30x^2 + 26}$ (C) $\frac{3x^2 - 5}{9x^4 - 6x^2 + 26}$ (D) $\frac{3x^2}{x^4 + 2x^2 - 4}$

⁽D) If two lines are not parallel then they do not intersect in the same plane.