

CUET UG - 2022
(CANDIDATE RESPONSE SHEET)

Paper/Subject MATHEMATICS/APPLIED MATHEMATICS
Exam Date 17 Aug 2022
Exam Slot 1

Question ID:481291

Section Name:COMPULSORY

Question:

If $x = 2at, y = at^2$, then $\frac{d^2y}{dx^2}$ is :

- A 1
- B $\frac{1}{2a}$
- C t
- D 0

Answer Given By Candidate:**B**

Question ID:481292

Section Name:COMPULSORY

Question:

A die is thrown once. If E is the event that 'the number appearing is a multiple of 3' and F be the event 'the number appearing is even', then the incorrect option is

- A $\overline{P(E)} = \frac{1}{3}$
- B $P(F) = \frac{1}{2}$
- C $P(E \cap F) = \frac{1}{6}$
- D E and F are dependent events.

Answer Given By Candidate:**D**

Question ID:481293

Section Name:COMPULSORY

Question:

Ten eggs are drawn successively with replacement from a lot containing 10% defective eggs. The probability that there is at least one defective egg is:

- A $\frac{10^{10} - 9^{10}}{10^{10}}$

B $\frac{9^{10}-10^{10}}{10^{10}}$

C $\frac{10^9-9^{10}}{10^{10}}$

D $\frac{10^{10}+9^{10}}{10^{10}}$

Answer Given By Candidate: **Not Attempted**

Question ID:481294

Section Name:COMPULSORY

Question:

If m is the degree and n is the order of the given differential equation

$$\frac{x^3 \left(\frac{d^3 y}{dx^3} \right)^2 + 2x^2 \left(\frac{d^2 y}{dx^2} \right)^3}{(x+1)^5} = \left(3x - \frac{d^2 y}{dx^2} \right)^4$$

A $m-n=2$

B $m+n=5$

C $m=4, n=3$

D Order (n) is 3 but degree (m) is not defined

Answer Given By Candidate: **B**

Question ID:481295

Section Name:COMPULSORY

Question:

The differential equation representing the family of curves $y = m(x - d)$ where m and d are arbitrary constants, is :

A $\frac{dy}{dx} = 0$

B $\frac{d^2 y}{dx^2} = 0$

C $x \frac{d^2 y}{dx^2} + y = 0$

D $x \frac{d^2 y}{dx^2} - y = 0$

Answer Given By Candidate: **B**

Question ID:481296

Section Name:COMPULSORY

Question:

$$\int_1^2 \frac{dx}{x(x^4+1)} = ?$$

- A $\log\left(\frac{32}{17}\right)$
- B $\log\left(\frac{16}{17}\right)$
- C $\frac{1}{4} \log\left(\frac{16}{17}\right)$
- D $\frac{1}{4} \log\left(\frac{32}{17}\right)$

Answer Given By Candidate: **Not Attempted****Question ID:481297****Section Name:**COMPULSORY**Question:**

If the area of the region in first quadrant, bounded by the curve

 $y^2 = 9x$, $x = 2$, $x = 4$ and the x-axis is $a + b\sqrt{2}$, then the value of $a + b$ is:

- A 16
- B 12
- C 20
- D 8

Answer Given By Candidate: **Not Attempted****Question ID:481298****Section Name:**COMPULSORY**Question:**If $\begin{bmatrix} x+y+z \\ x+z \\ y+z \end{bmatrix} = \begin{bmatrix} 11 \\ 6 \\ 8 \end{bmatrix}$, then the value of $x+2y-3z$ is:

- A 5
- B 4
- C 3
- D 7

Answer Given By Candidate: **B****Question ID:481299****Section Name:**COMPULSORY

Question:

If $x = 3t^2 + 5t + 6$ and $y = -4t^3 - 2t^2 + 5t + 7$, $t \neq \frac{-5}{6}$ then the value of $\frac{dy}{dx}$ is:

- A $-2t + 1$
- B $\frac{-12t^2 - 4t - 5}{6t + 5}$
- C $\frac{-4t^3 - 2t^2 + 5t + 7}{3t^2 + 5t + 6}$
- D $\frac{-4t^3 - 2t^2 + 5t + 7}{6t + 5}$

Answer Given By Candidate: **Not Attempted**

Question ID:4812910

Section Name:COMPULSORY

Question:

The interval in which the function f given by $f(x) = x^2 - 4x + 6$ is strictly increasing is

- A $(-\infty, 2)$
- B $(-\infty, -2)$
- C $(2, \infty)$
- D $(-2, \infty)$

Answer Given By Candidate: **A**

Question ID:4812911

Section Name:COMPULSORY

Question:

If $y = \log_e \left(\frac{2x}{1-x} \right)$, then $\frac{d^2y}{dx^2}$ at $x = \frac{1}{2}$ is:

- A $\frac{1}{2}$
- B $\frac{1}{4}$
- C 0
- D $\frac{3}{5}$

Answer Given By Candidate: **Not Attempted**

Question ID:4812912

Section Name:COMPULSORY

Question:

If a, b, c are mutually unequal real numbers, then the value of $\frac{\begin{vmatrix} 1 & a & a^3 \\ 1 & b & b^3 \\ 1 & c & c^3 \end{vmatrix}}{\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix}} =$

- A $-(a + b + c)$
- B $a + b + c$
- C $a^2 + b^2 + c^2$
- D $a^3 + b^3 + c^3$

Answer Given By Candidate: **Not Attempted**

Question ID:4812913

Section Name:COMPULSORY

Question:

If $A = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ and $n \in \mathbb{N}$ (where \mathbb{N} is the set of natural numbers), then A^n is equal to:

- A nA
- B $2nA$
- C $2^{n-1}A$
- D 2^nA

Answer Given By Candidate: **A**

Question ID:4812914

Section Name:COMPULSORY

Question:

If $y = \frac{1}{\sqrt{1+x^2-x}}$, then the value of $(1+x^2)^{\frac{3}{2}} \cdot \frac{d^2y}{dx^2}$ is:

- A x
- B $x^2 - 1$
- C $\sqrt{1+x^2} - 1$
- D 1

Answer Given By Candidate: **Not Attempted**

Question ID:4812915

Section Name:COMPULSORY

Question:

The equation of the tangent to the curve $y = x^2 - 2x + 7$, which is parallel to the line $2x - y + 9 = 0$, is :

- A $2x - y + 3 = 0$

B $2x - y + 6 = 0$

C $2x - y + 1 = 0$

D $2x - y + 4 = 0$

Answer Given By Candidate: **A**

Question ID:4812951

Section Name:MATHEMATICS CORE

Question:

Consider the non-empty set consisting of children in a family and a relation R defined as aRb if a is brother of b. Then R is:

A Symmetric but not transitive

B Transitive but not symmetric

C Neither symmetric nor transitive

D Both symmetric and transitive

Answer Given By Candidate: **D**

Question ID:4812952

Section Name:MATHEMATICS CORE

Question:

The relation R in the set $\{1, 2, 3\}$ given by $R = \{(1, 1), (2, 2), (3, 3), (1, 2), (2, 3)\}$ is :

A Reflexive only

B Reflexive and symmetry relation

C Transitive only

D Equivalence relation

Answer Given By Candidate: **A**

Question ID:4812953

Section Name:MATHEMATICS CORE

Question:

If $f: \mathbb{R} - \{-1\} \rightarrow \mathbb{R} - \{1\}$ be a function defined by $f(x) = \frac{x-1}{x+1}$, then:

A. f is one-one but not onto.

B. f is onto but not one-one.

C. f is one-one and onto.

D. $f^{-1}(x) = \frac{x+1}{x-1}$

E. $(f \circ f)(x) = -\frac{1}{x}; x \neq 0, -1$

Choose the correct answer from the options given below:

A A, D, E only

B C, D only

C B, E only

D C, E only

Answer Given By Candidate: **D**

Question ID:4812954

Section Name:MATHEMATICS CORE

Question:

The domain of the function $\cos^{-1}(2x - 1)$ is:

A $[0, 1]$

B $[-1, 1]$

C $(-1, 1)$

D $[0, \pi]$

Answer Given By Candidate: **A**

Question ID:4812955

Section Name:MATHEMATICS CORE

Question:

$$\tan^{-1}\left(\frac{x}{y}\right) - \tan^{-1}\left(\frac{x-y}{x+y}\right) =$$

A $\frac{\pi}{6}$

B $\frac{\pi}{3}$

C $\frac{\pi}{4}$

D $\frac{\pi}{2}$

Answer Given By Candidate: **C**

Question ID: **4812956**

Section Name: MATHEMATICS CORE

Question:

If the matrix $A = \begin{bmatrix} 3 & 2a & -5 \\ -4 & 0 & b \\ -5 & 3 & 7 \end{bmatrix}$ is symmetric then the value of $(a + b)$ is:

A 1

B 5

C 3

D 4

Answer Given By Candidate: **A**

Question ID: **4812957**

Section Name: MATHEMATICS CORE

Question:

If A is square matrix of size 4 and $|A| = 6$. If $|\text{Adj. (Adj. (3A))}| = 2^a \cdot 3^b$, then value of $a + b$ is:

A 24

B 54

C 72

D 216

Answer Given By Candidate: **Not Attempted**

Question ID: **4812958**

Section Name: MATHEMATICS CORE

Question:

The value of x for which $\begin{vmatrix} 3 & x \\ x & 1 \end{vmatrix} = \begin{vmatrix} 3 & 2 \\ 4 & 1 \end{vmatrix}$, is :

A 2

B $\pm 2\sqrt{2}$

C 4

D $\pm 2\sqrt{3}$

Answer Given By Candidate: **B**

Question ID:4812959**Section Name:**MATHEMATICS CORE**Question:**If $y = \left(\frac{1}{x}\right)^x$, then $\frac{d^2y}{dx^2} =$

- A $x^{-x}(1 + \log x)^2 - x^{-(x+1)}$
- B $x^{-x}(1 + \log x)^2 - x^{-(x-1)}$
- C $x^{-x}(1 + \log x)^{-2} - x^{-(x+1)}$
- D $x^{-x}(1 + \log x)^{-1} + x^{-(x-1)}$

Answer Given By Candidate:**B****Question ID:4812960****Section Name:**MATHEMATICS CORE**Question:**If \vec{a} is a unit vector and $(\vec{x} - \vec{a}) \cdot (\vec{x} + \vec{a}) = 8$ then $|\vec{x}|$ is:

- A 2
- B 3
- C ± 3
- D 5

Answer Given By Candidate:**B****Question ID:4812961****Section Name:**MATHEMATICS CORE**Question:**

$$\begin{vmatrix} 0 & \sin 2\alpha & -\cos^2 \alpha \\ -\sin^2 \alpha & 0 & \sin \alpha \sin \beta \\ -\cos \alpha \sin \beta & 2\sin^2 \beta & 0 \end{vmatrix} =$$

- A 0
- B -1
- C Independent of α
- D Independent of β

Answer Given By Candidate:**A****Question ID:4812962****Section Name:**MATHEMATICS CORE**Question:**

$$\int \frac{2}{x^4 - 1} dx =$$

- A

$$\log \left| \frac{x^2 - 1}{x^2 + 1} \right| + C$$

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

C $\frac{1}{2} \log \left| \frac{x-1}{x+1} \right| - \tan^{-1}x + C$

D $\tan^{-1}x + \frac{1}{2} \log \left| \frac{x+1}{x-1} \right| + C$

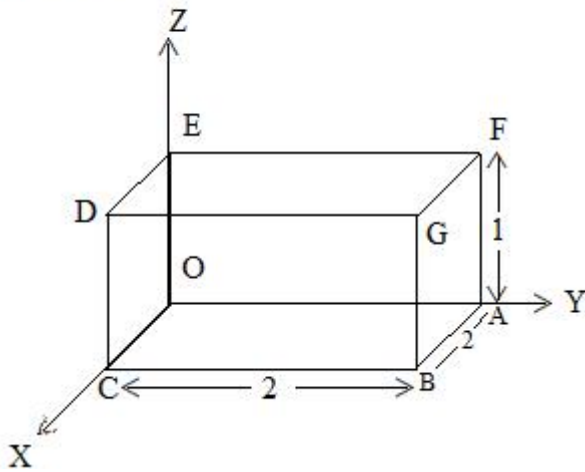
Answer Given By Candidate: **D**

Question ID:4812963

Section Name:MATHEMATICS CORE

Question:

The acute angle between the diagonals OG and AD of the cuboid (shown in the figure) is:



A $\cos^{-1}\left(\frac{1}{3}\right)$

B $\cos^{-1}\left(-\frac{1}{3}\right)$

C $\cos^{-1}\left(\frac{7}{9}\right)$

D $\cos^{-1}\left(\frac{1}{9}\right)$

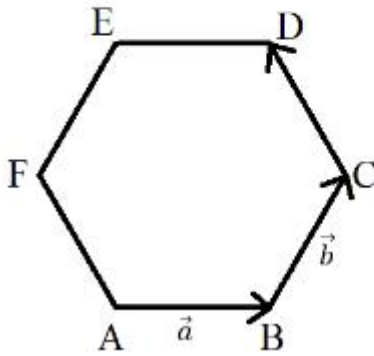
Answer Given By Candidate: **Not Attempted**

Question ID:4812964

Section Name:MATHEMATICS CORE

Question:

In the following figure ABCDEF is a regular hexagon. If $\overrightarrow{AB} = \vec{a}$ and $\overrightarrow{BC} = \vec{b}$ then \overrightarrow{CD} in terms of \vec{a} and \vec{b} is:



- A $\vec{a} + \vec{b}$
- B $\vec{a} - \vec{b}$
- C $\vec{b} - \vec{a}$
- D $3\vec{b} - \vec{a}$

Answer Given By Candidate: **Not Attempted**

Question ID:4812965

Section Name: MATHEMATICS CORE

Question:

The integrating factor of the differential equation

$$x \frac{dy}{dx} + y - x + xy \cot x = 0, (x \neq 0) \text{ is:}$$

- A $x \sin x$
- B $x \cos x$
- C x
- D $\sin x$

Answer Given By Candidate: **A**

Question ID:4812966

Section Name: MATHEMATICS CORE

Question:

$$\int_{\frac{1}{4}}^1 \frac{dx}{\sqrt{-x^2 - 2x + 3}} =$$

- A $\sin^{-1}\left(\frac{1}{4}\right)$
- B $\sin^{-1}\left(\frac{3}{4}\right)$
- C

$$\sin^{-1}\left(\frac{5}{8}\right)$$

D $\cos^{-1}\left(\frac{5}{8}\right)$

Answer Given By Candidate: **C**

Question ID:4812967

Section Name:MATHEMATICS CORE

Question:

A random variable X has the following probability distribution:

x	0	1	2	3	4	5	6	7
P(X = x)	0	k	2k	2k	3k	k ²	2k ²	7k ² + k

The value of P(0 < X < 5) is:

A $\frac{1}{5}$

B $\frac{2}{5}$

C $\frac{4}{5}$

D $\frac{3}{5}$

Answer Given By Candidate: **C**

Question ID:4812968

Section Name:MATHEMATICS CORE

Question:

Two independent events A and B are such that $P(A) = \frac{1}{2}$ and $P(B) = \frac{1}{3}$, the $P(A|B)$ =

A $\frac{1}{3}$

B $\frac{1}{2}$

C $\frac{2}{3}$

D 1

Answer Given By Candidate: **B**

Question ID:4812969

Section Name:MATHEMATICS CORE

Question:

Probability that A speaks truth is $\frac{4}{5}$. He tosses a coin and reports that a head appears. The probability that actually there was a head, is:

- A $\frac{4}{5}$
- B $\frac{1}{2}$
- C $\frac{1}{5}$
- D $\frac{2}{5}$

Answer Given By Candidate: **A**

Question ID:4812970

Section Name: MATHEMATICS CORE

Question:

The expectation of a number obtained when throwing a die having 1 written on three faces, 2 on two faces and 5 on one face is given by:

- A 2
- B $\frac{3}{2}$
- C $\frac{71}{30}$
- D 6

Answer Given By Candidate: **Not Attempted**

Question ID:4812971

Section Name: MATHEMATICS CORE

Question:

If $\int \frac{dx}{\sqrt{x+2}-\sqrt{x+1}} = \frac{2}{3} \left[(\lambda+1)^{\frac{3}{2}} - \lambda^{\frac{3}{2}} \right] + C$, then the value of λ is:

- A $x-1$
- B x
- C $x+1$
- D $\frac{1}{x}$

Answer Given By Candidate: **C**

Question ID:4812972

Section Name: MATHEMATICS CORE

Question:

$$\int_0^{\pi} \sin^3 x \cdot \cos^2 x \cdot dx =$$

- A $-\frac{4}{15}$
- B $\frac{2}{15}$
- C 0
- D $\frac{4}{15}$

Answer Given By Candidate: **A****Question ID:4812973****Section Name:**MATHEMATICS CORE**Question:**The distance of the point (3, -2, 1) from the plane $2x - y + 2z + 3 = 0$ is:

- A $\frac{3}{13}$
- B $\frac{13}{3}$
- C $\frac{14}{3}$
- D $\frac{3}{14}$

Answer Given By Candidate: **B****Question ID:4812974****Section Name:**MATHEMATICS CORE**Question:**The maximum value of the function $z = 3x + 3y$, subject to the constraints $x + 2y \leq 30$, $2x + y \leq 50$, $x \geq 0$, $y \geq 0$ is :

- A 75
- B 90
- C 80
- D 45

Answer Given By Candidate: **Not Attempted****Question ID:4812975****Section Name:**MATHEMATICS CORE

Question:

Let R be the relation in the set $A = \{a, b, c, d\}$ given by
 $R = \{(a, a), (b, b), (c, c), (a, b), (b, a), (c, d), (d, d), (d, c)\}$

- A R is reflexive and symmetric but not transitive
- B R is reflexive and transitive but not symmetric
- C R is symmetric and transitive but not reflexive
- D R is an equivalence relation

Answer Given By Candidate: **D**

Passage:

Three pizza outlets A, B and C sell three types of pizza namely cheese pizza, veg pizza and paneer pizza. In a day, A can sell 40 cheese pizza, 30 veg pizza and 20 paneer pizza; B can sell 20 cheese pizza, 40 veg pizza and 60 paneer pizza; C can sell 60 cheese pizza, 20 veg pizza and 30 paneer pizza. If the revenue generated in a day by A is ₹6000, by B is ₹9000 and by C is ₹7000. If x denotes selling price of cheese pizza, y is selling price of veg pizza and z be the selling price of Paneer pizza then based on this information, answer the following question:

Question ID:4812976

Section Name:MATHEMATICS CORE

Question:

The revenue generated by three outlets A, B and C are :

- A 6000
- B 22000
- C 16000
- D 15000

Answer Given By Candidate: **B**

Question ID:4812977

Section Name:MATHEMATICS CORE

Question:

The matrix representation of the above problem is :

- A $\begin{bmatrix} 4 & 2 & 6 \\ 3 & 4 & 2 \\ 2 & 6 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 600 \\ 900 \\ 700 \end{bmatrix}$
- B $\begin{bmatrix} 4 & 3 & 2 \\ 2 & 4 & 6 \\ 6 & 2 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 600 \\ 900 \\ 700 \end{bmatrix}$

C

$$\begin{bmatrix} 4 & 3 & 2 \\ 1 & 2 & 3 \\ 6 & 2 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 600 \\ 450 \\ 700 \end{bmatrix}$$

D $\begin{bmatrix} 4 & 2 & 6 \\ 3 & 4 & 2 \\ 2 & 6 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 6000 \\ 9000 \\ 7000 \end{bmatrix}$

Answer Given By Candidate: **B**

Question ID:4812978

Section Name:MATHEMATICS CORE

Question:

The price of a cheese pizza is:

- A ₹50
- B ₹80
- C ₹500
- D ₹800

Answer Given By Candidate: **A**

Question ID:4812979

Section Name:MATHEMATICS CORE

Question:

The price of a paneer pizza is:

- A ₹50
- B ₹60
- C ₹65
- D ₹80

Answer Given By Candidate: **D**

Question ID:4812980

Section Name:MATHEMATICS CORE

Question:

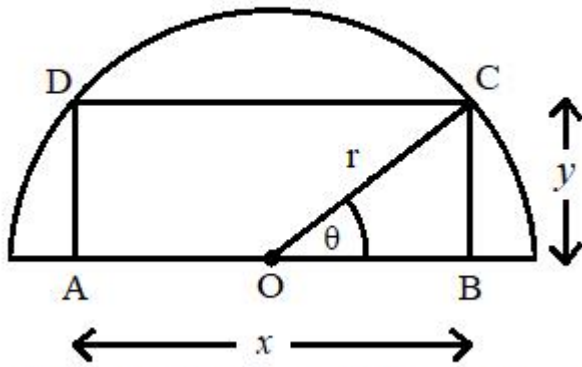
If the cost price of a cheese pizza is ₹30, a veg pizza is ₹50 and a paneer pizza is ₹50, what is the profit of outlet A in a day?

- A ₹6300
- B ₹3300
- C ₹2300
- D ₹18300

Answer Given By Candidate: **C**

Passage:

A rectangle of length 'x' and breadth 'y' is inscribed in a semi circle of fixed radius 'r' as shown in the figure given below.



Based on the above information answer the following question :

Question ID:4812981

Section Name:MATHEMATICS CORE

Question:

Area $A(\theta)$, $0 < \theta < \frac{\pi}{2}$ of the rectangle ABCD, is :

- A $r^2 \sin \theta$
- B $r^2 \sin 2\theta$
- C $r^2 \cos 2\theta$
- D $r^2 \cos \theta$

Answer Given By Candidate:**Not Attempted**

Question ID:4812982

Section Name:MATHEMATICS CORE

Question:

The value of θ , for which $A'(\theta) = 0$ is :

- A π
- B $\frac{\pi}{2}$
- C $\frac{\pi}{4}$
- D $\frac{\pi}{3}$

Answer Given By Candidate:**Not Attempted**

Question ID:4812983

Section Name: MATHEMATICS CORE

Question:

Dimensions x, y of the rectangle ABCD, when area is maximum are :

- A $r\frac{\sqrt{3}}{2}, \frac{2r}{\sqrt{3}}$
- B $r\sqrt{2}, \frac{r}{\sqrt{2}}$
- C $\frac{r}{\sqrt{2}}, \sqrt{2}r$
- D $r, \frac{r}{\sqrt{2}}$

Answer Given By Candidate: **Not Attempted**

Question ID: **4812984**

Section Name: MATHEMATICS CORE

Question:

Maximum area of the Rectangle is:

- A $2r^2$
- B $3r^2$
- C r^2
- D $4r^2$

Answer Given By Candidate: **Not Attempted**

Question ID: **4812985**

Section Name: MATHEMATICS CORE

Question:

Perimeter of rectangle when its area is maximum is:

- A $\frac{8\sqrt{3}r}{3}$
- B $4r$
- C $\frac{7\sqrt{3}r}{3}$
- D $3\sqrt{2}r$

Answer Given By Candidate: **Not Attempted**