

CUET UG - 2022
(CANDIDATE RESPONSE SHEET)

Paper/Subject MATHEMATICS/APPLIED MATHEMATICS
Exam Date 06 Aug 2022
Exam Slot 2

Question ID:481211

Section Name:COMPULSORY

Question:

If A is a matrix of order $m \times n$ and B is another matrix such that $A'B$ and BA' are both defined, then the order of matrix B is

- A $m \times n$
- B $n \times m$
- C $m \times m$
- D $n \times n$

Answer Given By Candidate:**B**

Question ID:481212

Section Name:COMPULSORY

Question:

If $A = \begin{bmatrix} 2x & 0 \\ x & x \end{bmatrix}$ and $A^{-1} = \begin{bmatrix} 1 & 0 \\ -1 & 2 \end{bmatrix}$, then the value of x is

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

Answer Given By Candidate:**C**

Question ID:481213

Section Name:COMPULSORY

Question:

If the matrix $\begin{bmatrix} 0 & -1 & 3x \\ 1 & y & -5 \\ -6 & 5 & 0 \end{bmatrix}$ is skew-symmetric, then

- A $x = -2, y = 0$
- B $x = 2, y = 0$
- C $x = -2, y = 1$
- D $x = 2, y = -1$

Answer Given By Candidate: **D**

Question ID: **481214**

Section Name: COMPULSORY

Question:

The function $f(x) = 6(2x^4 - x^2)$ is strictly increasing in

- A $(-\infty, -\frac{1}{2}) \cup (\frac{1}{2}, \infty)$
- B $(-\frac{1}{2}, 0) \cup (\frac{1}{2}, \infty)$
- C $(-\frac{1}{2}, \frac{1}{2})$
- D $(-\infty, -\frac{1}{2}) \cup (0, \frac{1}{2})$

Answer Given By Candidate: **A**

Question ID: **481215**

Section Name: COMPULSORY

Question:

If $\sqrt{y+x} + \sqrt{y-x} = a, a > 1$, $\frac{d^2y}{dx^2}$ is equal to ;

- A $-\frac{2}{a}$
- B $-\frac{a^2}{2}$
- C $\frac{2}{a^2}$
- D $\frac{2}{a}$

Answer Given By Candidate: **B**

Question ID: **481216**

Section Name: COMPULSORY

Question:

The maximum slope of the tangents to the curve $y(x) = -x^3 + 3x^2 + 9x - 30$ is

- A 0
- B 12
- C 16
- D 18

Answer Given By Candidate: **D**

Question ID:481217**Section Name:COMPULSORY****Question:**

The value of $\int_0^1 e^x (x + 1) dx$ is equal to

- A $e + 1$
- B $3e$
- C e
- D $3e - 2$

Answer Given By Candidate:A

Question ID:481218**Section Name:COMPULSORY****Question:**

If $f'(x) = 4x^5 - 6x$ and $f(0) = 3$, then $f(3)$ is equal to

- A 462
- B 219
- C 138
- D 957

Answer Given By Candidate:A

Question ID:481219**Section Name:COMPULSORY****Question:**

The value of $\int_{-4}^4 \log_e \left(\frac{1-x}{1+x} \right) dx$ is equal to

- A 2
- B 1
- C 0
- D $8 \log_e(2)$

Answer Given By Candidate:D

Question ID:4812110**Section Name:COMPULSORY****Question:**

If the order and the degree of the differential equation $\left(\frac{dy}{dx}\right)^{\frac{1}{2}} = \left(\frac{d^2y}{dx^2}\right)^{\frac{1}{5}}$ are O and S respectively, then $S - O$ is equal to

- A 3
- B 2
- C 1
- D 0

Answer Given By Candidate: **C**

Question ID: **4812111**

Section Name: COMPULSORY

Question:

If the system of linear equations

$$x + 2y - 3z = 1$$

$$(2p + 1)y + z = 2$$

$$3x + 3z = 5$$

has a unique solution, then p can not be equal to

A $\frac{3}{2}$

B $-\frac{3}{4}$

C $-\frac{4}{3}$

D $\frac{2}{3}$

Answer Given By Candidate: **B**

Question ID: **4812112**

Section Name: COMPULSORY

Question:

Match List I with List II

List I	List II
A. The number of arbitrary constants in the particular solution of differential equation of order 2	I. 1
B. The number of arbitrary constants in the general solution of differential equation of order 2	II. 0
C. The integrating factor of differential equation $\frac{dy}{dx} + \frac{1}{x}y = 3, x > 0$, is	III. 2
D. For differential equation, $x^2 \frac{dy}{dx} + x = xy, x > 0, \lim_{x \rightarrow 0^+} y(x)$ is equal to	IV. x

Choose the correct answer from the options given below:

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

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

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

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

Answer Given By Candidate: **D**

Question ID:4812113

Section Name:COMPULSORY

Question:

If the mean and variance of a binomially distributed random variable X are 4 and 2 respectively, then $P(X=2)$ is equal to

A $\frac{7}{32}$

B $\frac{1}{32}$

C $\frac{7}{64}$

D $\frac{1}{8}$

Answer Given By Candidate: **B**

Question ID:4812114

Section Name:COMPULSORY

Question:

Which is the most suitable definition for random variable among the options given below:

A It is a relation between the events of a sample space and the numbers in $[0,1]$.

B It is a function defined from the sample space of a random experiment to the set of real numbers.

C It is a table containing probability values

D It is a function from the set of natural numbers to the numbers in $[0,1]$

Answer Given By Candidate: **B**

Question ID:4812115

Section Name:COMPULSORY

Question:

The optimal solution of the Linear Programming problem

Maximize $Z = 3x_1 + 5x_2$,

s. t. $3x_1 + 2x_2 \leq 18$

$$x_1 \leq 4$$

$$x_2 \leq 6$$

$$x_1 \geq 0, x_2 \geq 0 \text{ is}$$

- A (4, 5)
- B (2, 6)
- C (4, 3)
- D (3, 6)

Answer Given By Candidate: **D**

Question ID:4812151

Section Name:MATHEMATICS CORE

Question:

If a relation R is defined on the set $X = \{1,2,3,4\}$ as $R = \{(1,1),(2,2),(3,4),(4,3)\}$, then R is

- A reflexive and not transitive.
- B symmetric and not reflexive.
- C transitive and not symmetric
- D neither reflexive nor symmetric and nor transitive

Answer Given By Candidate: **Not Attempted**

Question ID:4812152

Section Name:MATHEMATICS CORE

Question:

Match List I with List II

List I	List II
A. Range of $ x $	I. $(-5, \infty)$
B. Range of $9x^2 + 6x - 5$ for all $x \geq 0$	II. $[0, \infty)$
C. Domain of $\frac{1}{\sqrt{x+5}}$	III. $\{(1,1), (2,2), (3,3)\}$
D. Smallest equivalence relation on Set $\{1,2,3\}$	IV. $[-5, \infty)$

Choose the correct answer from the options given below:

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

Answer Given By Candidate: **Not Attempted**

Question ID:4812153

Section Name:MATHEMATICS CORE

Question:

If A is a square matrix of order 3 and $|\text{adj } A| = 49$, then $|7A^{-1}|^2$

- A 7^2
 B 7^4
 C 1
 D $\frac{1}{7^2}$

Answer Given By Candidate: **Not Attempted**

Question ID:4812154

Section Name: MATHEMATICS CORE

Question:

The set of all values of α for which the system of linear equations

$$x + y + z = 1$$

$$x + 2y + 4z = \alpha$$

$$x + 4y + 10z = \alpha^2$$

is consistent; is

- A $\{1, 2\}$
 B $\{-1, 2\}$
 C $\{-1, -2\}$
 D $\{1, -2\}$

Answer Given By Candidate: **Not Attempted**

Question ID:4812155

Section Name: MATHEMATICS CORE

Question:

If $3A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ x & 2 & y \end{bmatrix}$ and $AA^T = I$, then $x + y$ is equal to

- A 1
 B -1
 C 3
 D -3

Answer Given By Candidate: **C**

Question ID:4812156

Section Name: MATHEMATICS CORE

Question:

If $x = \int_0^y \frac{dt}{\sqrt{1+9t^2}}$ and $\frac{d^2y}{dx^2} = \lambda y$, then, λ is equal to

- A 3
- B 6
- C 9
- D 12

Answer Given By Candidate: **Not Attempted**

Question ID:4812157

Section Name: MATHEMATICS CORE

Question:

If $A = \begin{bmatrix} 0 & 2 & -3 \\ y & 0 & -1 \\ z & x & 0 \end{bmatrix}$ is skew symmetric matrix, then $x^3 + y^3 + z^3 - 3xyz$ is equal to :

- A -2
- B -1
- C 38
- D 13

Answer Given By Candidate: **C**

Question ID:4812158

Section Name: MATHEMATICS CORE

Question:

The value of $\cos^{-1} \left(\sin \left(\cos^{-1} \frac{1}{2} \right) \right) + \tan^{-1}(1)$

- A $\frac{\pi}{6}$
- B $\frac{\pi}{3}$
- C $\frac{\pi}{2}$
- D $\frac{5\pi}{12}$

Answer Given By Candidate: **C**

Question ID:4812159

Section Name: MATHEMATICS CORE

Question:

The Principal value of $\cos^{-1} \left(-\frac{1}{2} \right)$ is:

- A $\frac{\pi}{3}$

B $\frac{2\pi}{3}$

C $\frac{5\pi}{6}$

D $\frac{3\pi}{4}$

Answer Given By Candidate:**B**

Question ID:4812160

Section Name:MATHEMATICS CORE

Question:

The value of k, for which the function $f(x) = \begin{cases} \frac{\sin kx}{x} + 3 \cos x, & x \neq 0 \\ 7, & x = 0 \end{cases}$ is continuous at $x = 0$, is

A 3

B 5

C 1

D 4

Answer Given By Candidate:**C**

Question ID:4812161

Section Name:MATHEMATICS CORE

Question:

If f is a function defined by $f(x) = \begin{cases} 5x^2 - x + 3, & x < 1 \\ 3x + 4, & x \geq 1 \end{cases}$, then, at $x = 1$, f is

A continuous and differentiable

B continuous but not differentiable

C $\lim_{x \rightarrow 1^-} f'(x) = 10$

D $f''(1) = 10$

Answer Given By Candidate:**B**

Question ID:4812162

Section Name:MATHEMATICS CORE

Question:

The line $ax + by = 7$ is a tangent to the curve $y = \frac{x-7}{(x-2)(x-3)}$ at the point where it cuts the x-axis

- A. The y-intercept of the line is -0.7
- B. $b = -7$
- C. $a = 1$
- D. the line passes through the point $(-13, -1)$
- E. $b = -20$

Choose the correct answer from the options given below:

- A A, B, D Only
- B C, D, E Only
- C A, D, E Only
- D B, C, D Only

Answer Given By Candidate: **Not Attempted**

Question ID:4812163

Section Name: MATHEMATICS CORE

Question:

The slope of normal to the curve $y = 3x^2 + 3 \sin 3x$, at $x = 0$ is:

- A 9
- B $\frac{1}{9}$
- C $-\frac{1}{9}$
- D -9

Answer Given By Candidate: **Not Attempted**

Question ID:4812164

Section Name: MATHEMATICS CORE

Question:

The curve passing through the point $(-1, 1)$, given that the slope of the tangent to the curve at any point (x, y) is $\frac{2x}{y^2}$ also passes through the point $(k, -\frac{1}{2})$, then

- A $4k^2 - 5 = 0$
- B $8k^2 - 5 = 0$
- C $8k^2 - 17 = 0$
- D $5k^2 - 8 = 0$

Answer Given By Candidate: **Not Attempted**

Question ID:4812165

Section Name: MATHEMATICS CORE

Question:

If the solution curve of the differentiable equation $\frac{dy}{dx} + 2y = e^{3x}$, passes through the point $(0, \frac{6}{5})$, then the value of $y(\log_e 2)$ is:

A $\frac{37}{20}$

B $\frac{1}{5}$

C $\frac{11}{5}$

D 1

Answer Given By Candidate: **Not Attempted**

Question ID:4812166

Section Name: MATHEMATICS CORE

Question:

If two lines $\frac{x-3}{2} = \frac{y-4}{5} = \frac{z}{4}$ and $\frac{x-4}{3} = \frac{y-5}{6} = \frac{1-z}{k}$, are coplanar, then k is equal to

A 5

B -5

C 9

D -3

Answer Given By Candidate: **Not Attempted**

Question ID:4812167

Section Name: MATHEMATICS CORE

Question:

The foot of perpendicular from the point P (1, 2, -3) to the line

$$\frac{x+1}{2} = \frac{y-3}{-2} = \frac{z}{-1} \text{ is}$$

A (1, 1, 1)

B (1, -1, 1)

C (1, 1, -1)

D (-1, 1, 1)

Answer Given By Candidate: **Not Attempted**

Question ID:4812168

Section Name: MATHEMATICS CORE

Question:

The equation of plane passing through the point of (3, 2, 0) and containing the line

$$\frac{x-2}{2} = \frac{y+3}{4} = \frac{z-1}{1} \text{ is}$$

- A $3x - y - 2z = 7$
- B $3x - y + 2z = 7$
- C $x + y - 2z = 5$
- D $x - y + 2z = 1$

Answer Given By Candidate: **A**

Question ID:4812169

Section Name: MATHEMATICS CORE

Question:

The sum of all the values of λ for which the distance of the point P (2, 3, λ) from the plane $x + 2y - 2z = 9$ is 3 units, is

- A -9
- B -1
- C 1
- D 9

Answer Given By Candidate: **Not Attempted**

Question ID:4812170

Section Name: MATHEMATICS CORE

Question:

The value of $\hat{i} \cdot (\hat{k} \times \hat{j}) + \hat{j} \cdot (\hat{i} \times \hat{k}) + \hat{k} \cdot (\hat{j} \times \hat{i})$ is

- A 0
- B 3
- C -1
- D -3

Answer Given By Candidate: **Not Attempted**

Question ID:4812171

Section Name: MATHEMATICS CORE

Question:

In a triangle, ΔABC , the sides AB and AC are represented by vectors $\hat{i} + \hat{j} + \hat{k}$ and $2\hat{i} - \hat{k}$ respectively. The length of median drawn from vertex A to BC is:

- A $\sqrt{10}$
- B $\sqrt{6}$
- C $\sqrt{5}$

D $\sqrt{\frac{5}{2}}$

Answer Given By Candidate: **Not Attempted**

Question ID:4812172

Section Name:MATHEMATICS CORE

Question:

Let $\vec{OA} = 2\hat{i} - \hat{j} + \hat{k}$ and $\vec{OB} = \hat{i} + \hat{j} - \hat{k}$. Then

- A. The magnitude of vector \vec{OA} is 6
- B. The magnitude of vector \vec{OB} is $\sqrt{3}$
- C. The vector \vec{AB} is $(-\hat{i} + 2\hat{j} - 2\hat{k})$
- D. $\vec{OA} \cdot \vec{OB} = 0$
- E. $\vec{OA} \parallel \vec{OB}$

Choose the correct answer from the options given below:

- A A, B, C, D Only
- B A, B, E Only
- C C, D, E Only
- D B, C, D Only

Answer Given By Candidate: **Not Attempted**

Question ID:4812173

Section Name:MATHEMATICS CORE

Question:

The optimal value of linear programming problem maximum $Z = 3x + 4y$, subject to,

$$x + 3y \leq 12$$

$$x + y \geq 8$$

$$x, y \geq 0 \text{ is}$$

- A 26
- B 32
- C 36
- D 38

Answer Given By Candidate: **A**

Question ID:4812174**Section Name:**MATHEMATICS CORE**Question:**

There are three identical boxes I, II and III, each containing two balls. In box I, both balls are red, In box II, both balls are blue and box III contains one blue ball and one red ball. A boy randomly chooses a box and takes out a ball at random from it. If the ball is red, then the probability that the other ball in the box is also red colour is:

A $\frac{1}{2}$

B $\frac{2}{3}$

C 0

D 1

Answer Given By Candidate:A

Question ID:4812175**Section Name:**MATHEMATICS CORE**Question:**

If A and B are two independent events such that $P(A) = 0.4$, and $P(B) = 0.5$, then $P(\text{neither A nor B})$ is

A 0.24

B 0.30

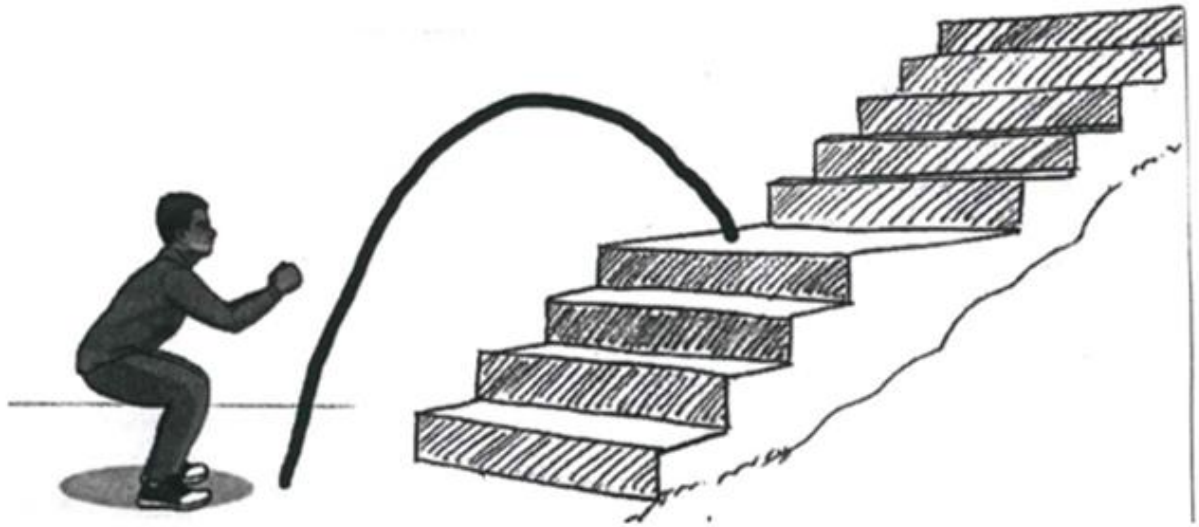
C 0.25

D 0.28

Answer Given By Candidate:Not Attempted

Passage:

A man plans to jump and climb the stairs. The path (as shown in the figure) he moves for the first jump is given by $y = y(x) = x + \sqrt{2x - 3x^2}$ where 'x' (in meters) is the horizontal distance moved and 'y' (in meters) is the corresponding height. Assuming that his initial point is at origin.



Based on the above information answer the Questions

Question ID:4812176

Section Name:MATHEMATICS CORE

Question:

The value of x for which $\frac{dy}{dx} = 0$, is

- A $\frac{1}{2}$
- B $\frac{1}{7}$
- C $\frac{2}{3}$
- D $\frac{1}{3}$

Answer Given By Candidate:**Not Attempted**

Question ID:4812177

Section Name:MATHEMATICS CORE

Question:

$y(x)$ is strictly increasing in the interval

A $(0, \frac{1}{6})$

B $(\frac{1}{6}, \frac{2}{3})$

C $(0, \frac{1}{2})$

D $(\frac{1}{2}, \frac{2}{3})$

Answer Given By Candidate: **Not Attempted**

Question ID:4812178

Section Name: MATHEMATICS CORE

Question:

The maximum height (in meters) achieved in the first jump is

A $\frac{2}{3}$

B 1

C $\frac{1}{2}$

D $\frac{1}{6}$

Answer Given By Candidate: **Not Attempted**

Question ID:4812179

Section Name: MATHEMATICS CORE

Question:

Evaluate $\int_0^{\frac{1}{3}} y dx$

A $\frac{1}{18} + \frac{2\sqrt{3}\pi}{27}$

B $\frac{1}{18} + \sqrt{3}\frac{\pi}{36}$

C $\frac{1}{18} + \frac{\sqrt{6}\pi}{9}$

D $\frac{1}{18} + \frac{\pi}{36}$

Answer Given By Candidate: **Not Attempted**

Question ID:4812180

Section Name: MATHEMATICS CORE

Question:

The value of $\frac{dy}{dx}$ when $x = \frac{1}{6}$, is

- A 2
- B 0
- C 3
- D 1

Answer Given By Candidate: **Not Attempted**

Passage:

A student was doing a project work, involving a school survey, to find the number of hours spent on study by students, on a randomly selected school day. At the end of the survey he prepared the following report related to the data.

Let x denote the number of hours spent on study by students on a randomly selected school day then,

$$P(X = x) = \begin{cases} 0.2 & , \text{if } x = 0 \\ kx & , \text{if } x = 1 \text{ or } x = 2 \\ k(6 - x) & , \text{if } x = 3 \text{ or } x = 4 \\ 0, & \text{otherwise} \end{cases}$$

where k is unknown constant

Based on the above information answer the Questions

Question ID:4812181

Section Name: MATHEMATICS CORE

Question:

The value of k is

- A 0.1
- B 0.2
- C 0.25
- D 0.125

Answer Given By Candidate: **A**

Question ID:4812182

Section Name: MATHEMATICS CORE

Question:

The probability that the study time of students is not more than one hour.

- A 0.4
- B 0.3

C 0.2

D 0.1

Answer Given By Candidate: C

Question ID: 4812183

Section Name: MATHEMATICS CORE

Question:

The probability that the study time of students is at least 3 hours

A 0.5

B 0.2

C 0.8

D 0.7

Answer Given By Candidate: D

Question ID: 4812184

Section Name: MATHEMATICS CORE

Question:

The probability that the study time of students is exactly 2 hours

A 0.4

B 0.5

C 0.7

D 0.2

Answer Given By Candidate: D

Question ID: 4812185

Section Name: MATHEMATICS CORE

Question:

The probability that the study time of students is at least 1 hour

A 0.2

B 0.7

C 0.8

D 0.6

Answer Given By Candidate: C