

National Testing Agency

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PGQP27

Group Number : 1
Group Id : 19088930
Group Maximum Duration : 0
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Show Attended Group? : No
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Break time : 0
Group Marks : 400
Is this Group for Examiner? : No

PART A - General

Section Id : 19088979
Section Number : 1
Section type : Online
Mandatory or Optional : Mandatory

Number of Questions : 25
Number of Questions to be attempted : 25
Section Marks : 100
Enable Mark as Answered Mark for Review and Clear Response : Yes
Sub-Section Number : 1
Sub-Section Id : 190889115
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 1908893399 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Select the correct word that can best complete the given sentence:

By training children at a young age we can bring out the _____ talents in them.

- | | |
|-----------------|--------------|
| (1) artificial | (2) budding |
| (3) superficial | (4) inherent |

Options :

19088913501. 1

19088913502. 2

19088913503. 3

19088913504. 4

Question Number : 2 Question Id : 1908893400 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

From the choices given below, select the pair which exhibits the same relationship as the one in capitalized pair of words:

SOUP : APPETIZER

- | | |
|------------------------|-----------------------|
| (1) coffee : bean | (2) pudding : dessert |
| (3) breakfast : cereal | (4) tea : drink |

Options :

19088913505. 1

19088913506. 2

19088913507. 3

19088913508. 4

Question Number : 3 Question Id : 1908893401 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Select the most suitable synonym :

MUDDLE

- | | |
|--------------|---------------|
| (1) whisper | (2) horde |
| (3) disorder | (4) speculate |

Options :

19088913509. 1

19088913510. 2

19088913511. 3

19088913512. 4

Question Number : 4 Question Id : 1908893402 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Identify the part of the body with which the disease is associated:

Leukemia

- | | |
|-----------|----------------------|
| (1) heart | (2) skin |
| (3) lungs | (4) lymphatic system |

Options :

19088913513. 1

19088913514. 2

19088913515. 3

19088913516. 4

Question Number : 5 Question Id : 1908893403 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Identify the meaning of the expression below from the options given:

Per se

- | | |
|----------------------|-----------------|
| (1) by word of mouth | (2) gossip |
| (3) by itself | (4) spontaneous |

Options :

19088913517. 1

19088913518. 2

19088913519. 3

19088913520. 4

Question Number : 6 Question Id : 1908893404 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Identify the meaning of the underlined word:

Home appliances manufacturer 'B' electrical Limited is looking for acquisitions in the domestic market.

- | | |
|----------------|----------------|
| (1) obtainment | (2) apprentice |
| (3) attrition | (4) attention |

Options :

19088913521. 1

19088913522. 2

19088913523. 3

19088913524. 4

Question Number : 7 Question Id : 1908893405 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Identify the meaning of the phrase below from the options given:

Leave to a person by a will

- | | |
|-------------|--------------|
| (1) beseech | (2) billow |
| (3) blanch | (4) bequeath |

Options :

19088913525. 1

19088913526. 2

19088913527. 3

19088913528. 4

Question Number : 8 Question Id : 1908893406 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Select the most suitable antonym:

SKIMPY

- (1) glaring
- (3) affluent

- (2) modest
- (4) generous

Options :

19088913529. 1

19088913530. 2

19088913531. 3

19088913532. 4

Question Number : 9 Question Id : 1908893407 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Identify the meaning of the idiom from the options given:

A man of the world

- (1) headstrong and arrogant
- (2) highly trustworthy
- (3) very popular because of success
- (4) highly experienced in many fields

Options :

19088913533. 1

19088913534. 2

19088913535. 3

19088913536. 4

Question Number : 10 Question Id : 1908893408 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Select the correct word from the answer:

Now a days, it is difficult to _____ good books in English.

- | | |
|-----------|------------|
| (1) track | (2) verify |
| (3) find | (4) know |

Options :

19088913537. 1

19088913538. 2

19088913539. 3

19088913540. 4

Question Number : 11 Question Id : 1908893409 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If Neena says "Anita's father Raman is the only son of my father-in-law Mahipal", then how is Bindu, who is the sister of Anita, related to Mahipal?

- | | |
|-----------|-------------------|
| (1) Neice | (2) Daughter |
| (3) Wife | (4) None of these |

Options :

19088913541. 1

19088913542. 2

19088913543. 3

19088913544. 4

Question Number : 12 Question Id : 1908893410 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Choose the missing term out of the given alternatives.

Y, W, U, S, Q, __, __

(1) N, J

(2) M, L

(3) J, R

(4) O, M

Options :

19088913545. 1

19088913546. 2

19088913547. 3

19088913548. 4

Question Number : 13 Question Id : 1908893411 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Arrange the given words in alphabetical order and tick the one that comes last.

(1) Abandon

(2) Actuate

(3) Accumulate

(4) Acquit

Options :

19088913549. 1

19088913550. 2

19088913551. 3

19088913552. 4

Question Number : 14 Question Id : 1908893412 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Raman ranks sixteenth from the top and forty nine from the bottom in a class. How many students are there in the class?

(1) 64

(2) 65

(3) 66

(4) None of these

Options :

19088913553. 1

19088913554. 2

19088913555. 3

19088913556. 4

Question Number : 15 Question Id : 1908893413 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $\times$ means $\div$, $-$ means $\times$, $\div$ means $+$ and $+$ means $-$, then

$$(3 - 15 \div 19) \times 8 + 6 = ?$$

(1) 8

(2) 4

(3) 2

(4) -1

Options :

19088913557. 1

19088913558. 2

19088913559. 3

19088913560. 4

Question Number : 16 Question Id : 1908893414 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Choose the correct alternative based on relationship :

Botany : Plants :: Entomology : ?

(1) Snakes

(2) Insects

(3) Birds

(4) Germs

Options :

19088913561. 1

19088913562. 2

19088913563. 3

19088913564. 4

Question Number : 17 Question Id : 1908893415 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Choose the correct answer:

$$9572 - 4018 - 2164 = ?$$

(1) 3300

(2) 3390

(3) 3570

(4) 7718

Options :

19088913565. 1

19088913566. 2

19088913567. 3

19088913568. 4

Question Number : 18 Question Id : 1908893416 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The H.C.F. (Highest Common Factor) of 2923 and 3239 is :

(1) 37

(2) 47

(3) 73

(4) 79

Options :

19088913569. 1

19088913570. 2

19088913571. 3

19088913572. 4

Question Number : 19 Question Id : 1908893417 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

One fifth of a number exceeds one seventh of the same by 10. The number is :

- | | |
|---------|---------|
| (1) 125 | (2) 150 |
| (3) 175 | (4) 200 |

Options :

19088913573. 1

19088913574. 2

19088913575. 3

19088913576. 4

Question Number : 20 Question Id : 1908893418 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If a number, divided by 4, is reduced by 21, the number is :

- | | |
|--------|--------|
| (1) 18 | (2) 20 |
| (3) 28 | (4) 38 |

Options :

19088913577. 1

19088913578. 2

19088913579. 3

19088913580. 4

Question Number : 21 Question Id : 1908893419 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The newly launched 100 rupees notes have the motif of ————— on the reverse side.

- | | |
|------------------------|------------------|
| (1) Mangalyaan | (2) Sanchi stupa |
| (3) Hampi with chariot | (4) Rani ki vav |

Options :

19088913581. 1

19088913582. 2

19088913583. 3

19088913584. 4

Question Number : 22 Question Id : 1908893420 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The 'Mission Purvodaya' initiative is related to the development of which of the following?

- | | |
|------------------------|------------------|
| (1) Agriculture sector | (2) Space sector |
| (3) Dairy sector | (4) Steel sector |

Options :

19088913585. 1

19088913586. 2

19088913587. 3

19088913588. 4

Question Number : 23 Question Id : 1908893421 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Generally wooden doors are difficult to open or close during rainy season because of

- | | |
|---------------|--------------------|
| (1) Diffusion | (2) Imbibition |
| (3) Osmosis | (4) Photosynthesis |

Options :

19088913589. 1

19088913590. 2

19088913591. 3

19088913592. 4

Question Number : 24 Question Id : 1908893422 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Mahabhasya, an outstanding work in the fields of Sanskrit grammar, is attributed to

- | | |
|---------------|-------------|
| (1) Ghosha | (2) Ashwins |
| (3) Patanjali | (4) Kalidas |

Options :

19088913593. 1

19088913594. 2

19088913595. 3

19088913596. 4

Question Number : 25 Question Id : 1908893423 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Who among the following passed the Bengal Sati Regulation Act, 1829, which declared the practice of 'Sati' a punishable offence?

- | | |
|---------------------------|---------------------|
| (1) Lord William Bentinck | (2) Lord Dalhousie |
| (3) Lord Wellesley | (4) Warren Hastings |

Options :

19088913597. 1

19088913598. 2

19088913599. 3

19088913600. 4

PART B - MATHEMATICS

Section Id :

19088980

Section Number :

2

Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	75
Number of Questions to be attempted :	75
Section Marks :	300
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	190889116
Question Shuffling Allowed :	Yes

Question Number : 26 Question Id : 1908893424 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let G be a group of order 121, then

- | | |
|---------------------------------|-------------------|
| (1) G is non-abelian | (2) G is cyclic |
| (3) Center of G has order 121 | (4) None of these |

Options :

19088913601. 1

19088913602. 2

19088913603. 3

19088913604. 4

Question Number : 27 Question Id : 1908893425 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The number of subgroups of $\mathbb{Z}_{48}$ is

- | | |
|--------|---------|
| (1) 10 | (2) 48 |
| (3) 2 | (4) 100 |

Options :

19088913605. 1

19088913606. 2

19088913607. 3

19088913608. 4

Question Number : 28 Question Id : 1908893426 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

How many normal subgroups does a non-abelian group G of order 21 have other than the identity subgroup $\{e\}$ and G ?

(1) 0

(2) 7

(3) 3

(4) 1

Options :

19088913609. 1

19088913610. 2

19088913611. 3

19088913612. 4

Question Number : 29 Question Id : 1908893427 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let G be a finite abelian group of order n . Which one of the following is correct?

(1) If d divides n , there exists an element of order d in G

(2) If d divides n , there exists a subgroup of G of order d

(3) If every proper subgroup of G is cyclic then G is cyclic

(4) None of the above

Options :

19088913613. 1

19088913614. 2

19088913615. 3

19088913616. 4

Question Number : 30 Question Id : 1908893428 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Total number of group homomorphisms from $\mathbb{Z}_5$ to $\mathbb{Z}_7$ is

- | | |
|--------|-------|
| (1) 35 | (2) 7 |
| (3) 5 | (4) 1 |

Options :

19088913617. 1

19088913618. 2

19088913619. 3

19088913620. 4

Question Number : 31 Question Id : 1908893429 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The Ring M of 3×3 matrices with elements from the set of real numbers. The two operations in the ring M are usual addition and multiplication of matrices. Then M is a

- (1) Commutative ring with zero divisors, without unity
- (2) Non-commutative ring with zero divisors, with unity
- (3) Commutative ring with unity
- (4) Field

Options :

19088913621. 1

19088913622. 2

19088913623. 3

19088913624. 4

Question Number : 32 Question Id : 1908893430 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The cardinality of a finite integral domain cannot be

- | | |
|--------|-------|
| (1) 21 | (2) 7 |
| (3) 5 | (4) 3 |

Options :

19088913625. 1

19088913626. 2

19088913627. 3

19088913628. 4

Question Number : 33 Question Id : 1908893431 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is not prime ideal of the ring $\mathbb{Z}$ of integers ?

- | | |
|-------------------|-------------------|
| (1) $2\mathbb{Z}$ | (2) $4\mathbb{Z}$ |
| (3) $3\mathbb{Z}$ | (4) $5\mathbb{Z}$ |

Options :

19088913629. 1

19088913630. 2

19088913631. 3

19088913632. 4

Question Number : 34 Question Id : 1908893432 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following sets of vectors $\alpha = (a_1, a_2, \dots, a_n)$ in $\mathbb{R}^n$ is a subspace of $\mathbb{R}^n$ ($n \geq 3$)?

- | | |
|--|---|
| (1) all α such that $a_1 \geq 0$ | (2) all α such that $a_1 + 3a_2 = a_3$ |
| (3) all α such that $a_2 = a_1^2$ | (4) all α such that $a_1 a_2 = 0$ |

Options :

19088913633. 1

19088913634. 2

19088913635. 3

19088913636. 4

Question Number : 35 Question Id : 1908893433 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The dimension of the vector space of all symmetric matrices of order $n \times n$ with real entries and trace equal to zero is

(1) $\frac{n(n+1)}{2} - 1$

(2) $\frac{n(n-1)}{2} + 1$

(3) $\frac{n(n+1)}{2} + 1$

(4) $\frac{n(n-1)}{2} - 1$

Options :

19088913637. 1

19088913638. 2

19088913639. 3

19088913640. 4

Question Number : 36 Question Id : 1908893434 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Suppose V is a finite dimensional non-zero vector space over the complex field $\mathbb{C}$ and $T : V \rightarrow V$ is a linear transformation such that $\text{range}(T) = \text{null space}(T)$. Then which one of the following is correct ?

(1) The dimension of V may be 7

(2) The dimension of V may be 9

(3) The dimension of V may be 11

(4) The dimension of V may be 6

Options :

19088913641. 1

19088913642. 2

19088913643. 3

19088913644. 4

Question Number : 37 Question Id : 1908893435 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $T: \mathbb{R}^2 \rightarrow \mathbb{R}^2$ be a linear operator defined by $T(x, y) = (x, 0)$. Then the matrix of T relative to the ordered basis $B = \{(0, 1), (1, 0)\}$ is

(1) $\begin{pmatrix} 1 & 0 \\ 1 & 0 \end{pmatrix}$

(2) $\begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix}$

(3) $\begin{pmatrix} 0 & 1 \\ 0 & 0 \end{pmatrix}$

(4) $\begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$

Options :

19088913645. 1

19088913646. 2

19088913647. 3

19088913648. 4

Question Number : 38 Question Id : 1908893436 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let A and B be 2×2 matrices over the real field. Let $\det A$ and $\det B$ denote the determinants of the matrices A and B respectively. Then which one of the following is true ?

(1) $\det(A + B) + \det(A - B) = 2\det A + 2\det B$

(2) $\det(A + B) - \det(A - B) = 2\det A - 2\det B$

(3) $\det(A + B) + \det(A - B) = 2\det A - 2\det B$

(4) $\det(A + B) - \det(A - B) = 2\det A + 2\det B$

Options :

19088913649. 1

19088913650. 2

19088913651. 3

19088913652. 4

Question Number : 39 Question Id : 1908893437 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $A = \begin{pmatrix} 2 & 0 & 5 \\ 1 & 2 & 3 \\ -1 & 5 & 1 \end{pmatrix}$. Let $X, Y \in \mathbb{R}^3$. The system of linear equations $AX = Y$ has a solution

- (1) only for $Y = \begin{pmatrix} x \\ 0 \\ 0 \end{pmatrix}, x \in \mathbb{R}$ (2) for all $Y \in \mathbb{R}^3$
- (3) only for $Y = \begin{pmatrix} 0 \\ y \\ z \end{pmatrix}, y, z \in \mathbb{R}$ (4) only for $Y = \begin{pmatrix} 0 \\ y \\ 0 \end{pmatrix}, y \in \mathbb{R}$

Options :

19088913653. 1

19088913654. 2

19088913655. 3

19088913656. 4

Question Number : 40 Question Id : 1908893438 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is correct ?

- (1) $S = \{(1, 0, 0), (0, -1, 0), (1, 1, 0)\}$ is a linearly independent set of vectors in $\mathbb{R}^3$
- (2) $S = \{(1, 0, 0), (0, 2, 0), (1, 1, 0)\}$ is a linearly independent set of vectors in $\mathbb{R}^3$
- (3) A subset of a linearly dependent set of vectors is linearly independent
- (4) A subset of a linearly independent set of vectors is linearly independent

Options :

19088913657. 1

19088913658. 2

19088913659. 3

19088913660. 4

Question Number : 41 Question Id : 1908893439 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let W be a subspace of $\mathbb{R}^4$ given by $W = \{(x, y, z, w) : y + z + w = 0\}$. Then the dimension of W is

- | | |
|-------|-------|
| (1) 3 | (2) 2 |
| (3) 1 | (4) 4 |

Options :

19088913661. 1

19088913662. 2

19088913663. 3

19088913664. 4

Question Number : 42 Question Id : 1908893440 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The eigenvalues of a skew-symmetric matrix are

- | | |
|------------------------------|--------------|
| (1) of absolute value 1 | (2) real |
| (3) purely imaginary or zero | (4) negative |

Options :

19088913665. 1

19088913666. 2

19088913667. 3

19088913668. 4

Question Number : 43 Question Id : 1908893441 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

For the matrix $A = \begin{pmatrix} 0 & 0 & 1 \\ 2 & 1 & 1 \\ 1 & 1 & 1 \end{pmatrix}$, A^{-1} is given by

- | | |
|---------------------|--------------------|
| (1) $A^2 + 2A + 3I$ | (2) $A - 3I$ |
| (3) $A^2 - 2A$ | (4) $A^2 - 2A - I$ |

Options :

19088913669. 1

19088913670. 2

19088913671. 3

19088913672. 4

Question Number : 44 Question Id : 1908893442 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let M^T denotes the transpose of M . Given that $M = \begin{pmatrix} \frac{3}{5} & \frac{3}{5} \\ x & \frac{3}{5} \end{pmatrix}$, where $M^T = M^{-1}$, then the value of x is

- | | |
|--------------------|--------------------|
| (1) $-\frac{4}{5}$ | (2) 1 |
| (3) 0 | (4) $-\frac{3}{5}$ |

Options :

19088913673. 1

19088913674. 2

19088913675. 3

19088913676. 4

Question Number : 45 Question Id : 1908893443 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $\{a_n\}_{n=1}^{\infty}$ be a bounded sequence of real numbers. Then

- (1) There is a subsequence of $\{a_n\}_{n=1}^{\infty}$ which is convergent
- (2) Every subsequence of $\{a_n\}_{n=1}^{\infty}$ is convergent
- (3) There is exactly one subsequence of $\{a_n\}_{n=1}^{\infty}$ which is convergent
- (4) None of these

Options :

19088913677. 1

19088913678. 2

19088913679. 3

19088913680. 4

Question Number : 46 Question Id : 1908893444 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is incorrect ?

- (1) Every subsequence of a convergent sequence of real numbers is convergent
- (2) Every convergent sequence of real numbers is bounded
- (3) Every bounded infinite set of real numbers has at least one limit point
- (4) Every bounded sequence of real numbers is convergent

Options :

19088913681. 1

19088913682. 2

19088913683. 3

19088913684. 4

Question Number : 47 Question Id : 1908893445 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following series is convergent ?

(1) $\sum_{n=1}^{\infty} n^2$

(2) $\sum_{n=1}^{\infty} \frac{1}{n(n+1)}$

(3) $\sum_{n=1}^{\infty} \left(\frac{3}{2}\right)^n$

(4) $\sum_{n=1}^{\infty} n^3$

Options :

19088913685. 1

19088913686. 2

19088913687. 3

19088913688. 4

Question Number : 48 Question Id : 1908893446 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be a continuous function. If $\int_0^x f(2t) dt = \frac{x}{\pi} \sin(\pi x)$ for all $x \in \mathbb{R}$ then $f(2)$ is equal to

(1) 2

(2) 1

(3) 0

(4) -1

Options :

19088913689. 1

19088913690. 2

19088913691. 3

19088913692. 4

Question Number : 49 Question Id : 1908893447 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is incorrect ?

- (1) A function which is uniformly continuous on an interval is continuous on that interval
- (2) If a function is continuous in a closed and bounded interval, then it is bounded therein
- (3) The function defined by $f(x) = \begin{cases} x \sin \frac{1}{x}, & \text{when } x \neq 0 \\ 0, & \text{when } x = 0 \end{cases}$ is not continuous at $x = 0$
- (4) A function which is derivable at a point is necessarily continuous at that point

Options :

19088913693. 1

19088913694. 2

19088913695. 3

19088913696. 4

Question Number : 50 Question Id : 1908893448 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $\mathbb{Q}^c$ denotes the complement of the set of rational numbers $\mathbb{Q}$. The set of all boundary points of $\mathbb{Q}$ in the set of real numbers $\mathbb{R}$ is

- (1) $\mathbb{Q}^c$
- (2) $\mathbb{R}$
- (3) $\emptyset$
- (4) $\mathbb{Q}$

Options :

19088913697. 1

19088913698. 2

19088913699. 3

19088913700. 4

Question Number : 51 Question Id : 1908893449 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The set $U = \{x \in \mathbb{R} \mid \sin x = \frac{1}{2}\}$ is

- | | |
|-----------------------------|--------------------------|
| (1) closed | (2) open |
| (3) neither open nor closed | (4) both open and closed |

Options :

19088913701. 1

19088913702. 2

19088913703. 3

19088913704. 4

Question Number : 52 Question Id : 1908893450 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In the Taylor series expansion of e^x about $x = 2$, the coefficient of $(x - 2)^4$ is

- | | |
|-----------------------|-----------------------|
| (1) $\frac{1}{256}$ | (2) $\frac{2^4}{256}$ |
| (3) $\frac{e^4}{256}$ | (4) $\frac{e^2}{256}$ |

Options :

19088913705. 1

19088913706. 2

19088913707. 3

19088913708. 4

Question Number : 53 Question Id : 1908893451 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $x \in \mathbb{R}$. The set of all x at which the power series $\sum_{n=1}^{\infty} \frac{x^n}{n^n}$ converges is

- | | |
|------------------|---------------|
| (1) $[-1, 1]$ | (2) $(-1, 1)$ |
| (3) $\mathbb{R}$ | (4) $[0, 1]$ |

Options :

19088913709. 1

19088913710. 2

19088913711. 3

19088913712. 4

Question Number : 54 Question Id : 1908893452 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $(x, y) \in \mathbb{R}^2$. Which one of the following is true ?

- | | |
|---|---|
| (1) $\lim_{(x,y) \rightarrow (0,0)} \frac{2xy^2}{x^2 + y^4}$ exists | (2) $\lim_{(x,y) \rightarrow (0,0)} \frac{2xy^2}{x^2 + y^4}$ does not exist |
| (3) $f(x, y) = \frac{2xy^2}{x^2 + y^4}$ is continuous at $(0, 0)$ | (4) None of these |

Options :

19088913713. 1

19088913714. 2

19088913715. 3

19088913716. 4

Question Number : 55 Question Id : 1908893453 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $(x, y) \in \mathbb{R}^2$. Consider the function $f: \mathbb{R}^2 \rightarrow \mathbb{R}$ such that $f(x, y) = x^2 + 2xy + y^2$. Then

- (1) The function f is a non-homogeneous function
- (2) The function f is a homogeneous function of degree 1
- (3) The function f is a homogeneous function of degree 2
- (4) The function f is a homogeneous function of degree 0

Options :

19088913717. 1

19088913718. 2

19088913719. 3

19088913720. 4

Question Number : 56 Question Id : 1908893454 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $f: \mathbb{C} \rightarrow \mathbb{C}$ such that $f(z) = u + iv$ with $z = x + iy$. Then which one of the following is true for the function f to be analytic

- (1) $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial x}$
- (2) $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}$ and $\frac{\partial u}{\partial y} = -\frac{\partial v}{\partial x}$
- (3) $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial x}$ and $\frac{\partial u}{\partial x} = -\frac{\partial v}{\partial x}$
- (4) $\frac{\partial^2 u}{\partial x \partial y} = \frac{\partial^2 v}{\partial x \partial y}$

Options :

19088913721. 1

19088913722. 2

19088913723. 3

19088913724. 4

Question Number : 57 Question Id : 1908893455 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is an analytic function ?

- | | |
|----------------------|---------------------------|
| (1) z | (2) $\bar{z}$ |
| (3) Real part of z | (4) Imaginary part of z |

Options :

19088913725. 1

19088913726. 2

19088913727. 3

19088913728. 4

Question Number : 58 Question Id : 1908893456 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The radius of convergence of the power series $\sum_{n=1}^{\infty} n^n z^n$ is

- | | |
|-------|-------------------|
| (1) 1 | (2) ∞ |
| (3) 0 | (4) None of these |

Options :

19088913729. 1

19088913730. 2

19088913731. 3

19088913732. 4

Question Number : 59 Question Id : 1908893457 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The maximum modulus of e^{z^2} on the set $S = \{z \in \mathbb{C} : 0 \leq \operatorname{Re}(z) \leq 1, 0 \leq \operatorname{Im}(z) \leq 1\}$ is

- | | |
|-------------------|--------------|
| (1) e | (2) 1 |
| (3) $\frac{1}{e}$ | (4) ∞ |

Options :

19088913733. 1

19088913734. 2

19088913735. 3

19088913736. 4

Question Number : 60 Question Id : 1908893458 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is incorrect ?

- (1) Every bounded entire function must be constant
- (2) Every non-constant single-variable polynomial with complex coefficients has at least one complex root
- (3) If $f(z)$ is analytic everywhere within a simply connected region D , then $\oint_C f(z) dz = 0$ for every simple closed path C lying in the region D
- (4) None of these

Options :

19088913737. 1

19088913738. 2

19088913739. 3

19088913740. 4

Question Number : 61 Question Id : 1908893459 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of integral $\oint_{|z-i|=2} \frac{1}{z^2 + 4} dz$ is

- | | |
|---------------------|--------------|
| (1) 0 | (2) π |
| (3) $\frac{\pi}{2}$ | (4) ∞ |

Options :

19088913741. 1

19088913742. 2

19088913743. 3

19088913744. 4

Question Number : 62 Question Id : 1908893460 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $f: \mathbb{C} \rightarrow \mathbb{C}$ be an entire function. If real part of f is bounded then

- | | |
|---------------------------------------|-----------------------------|
| (1) $f \equiv 0$ | (2) f is nonzero constant |
| (3) Imaginary part of f is constant | (4) f is constant |

Options :

19088913745. 1

19088913746. 2

19088913747. 3

19088913748. 4

Question Number : 63 Question Id : 1908893461 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is correct ?

- (1) $S_1 = \{z \in \mathbb{C} : 1 < |z| < 2\}$ is connected
- (2) $S_2 = \{z \in \mathbb{C} : |z| < 1 \text{ and } |z - 2| < 1\}$ is connected
- (3) $S_3 = \{z \in \mathbb{C} : \text{Im}(z) > 1\}$ is not connected
- (4) $S_4 = \{z \in \mathbb{C} : \text{Im}(z) = 1\}$ is not connected

Options :

19088913749. 1

19088913750. 2

19088913751. 3

19088913752. 4

Question Number : 64 Question Id : 1908893462 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

About the definite integrals, which one of the following is incorrect ?

(1) $\int_a^b f(x) dx = - \int_a^b f(t) dt$

(2) $\int_a^b f(x) dt = - \int_b^a f(x) dx$

(3) If $a < c < b$, then $\int_a^b f(x) dx = \int_a^c f(x) dx + \int_c^b f(x) dx$

(4) $\int_{-a}^a f(x) dx = \begin{cases} 2 \int_0^a f(x) dx, & \text{when } f(x) \text{ is even} \\ 0 & , \text{when } f(x) \text{ is odd} \end{cases}$

Options :

19088913753. 1

19088913754. 2

19088913755. 3

19088913756. 4

Question Number : 65 Question Id : 1908893463 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of integral $\int_{-\pi/2}^{\pi/2} x \cos x dx$ is

(1) $\pi - 2$

(2) $\pi + 2$

(3) 0

(4) $\frac{\pi}{2}$

Options :

19088913757. 1

19088913758. 2

19088913759. 3

19088913760. 4

Question Number : 66 Question Id : 1908893464 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is incorrect?

- (1) If a real valued function f is monotonic on $[a, b]$, then it is integrable on $[a, b]$
- (2) A real valued bounded function f , having a finite number of points of discontinuity on $[a, b]$, is not integrable on $[a, b]$
- (3) If a real valued function f is integrable on $[a, b]$, then f^2 is also integrable on $[a, b]$
- (4) Every real valued continuous function f on $[a, b]$ is integrable on $[a, b]$

Options :

19088913761. 1

19088913762. 2

19088913763. 3

19088913764. 4

Question Number : 67 Question Id : 1908893465 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of integral $\int_0^{\pi} x \sin x \, dx$ is

- (1) 2π
- (2) 0
- (3) $\frac{\pi}{2}$
- (4) π

Options :

19088913765. 1

19088913766. 2

19088913767. 3

19088913768. 4

Question Number : 68 Question Id : 1908893466 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is the statement of fundamental theorem of calculus?

- (1) Every continuous function is integrable
- (2) Functions possessing primitives are necessarily continuous
- (3) If a real valued function is bounded and integrable on $[a, b]$, and there exists a function F such that $\frac{d}{dx}F(x) = f$ on $[a, b]$, then $\int_a^b f(x) dx = F(b) - F(a)$
- (4) Every monotonically increasing function is integrable

Options :

19088913769. 1

19088913770. 2

19088913771. 3

19088913772. 4

Question Number : 69 Question Id : 1908893467 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

After the change of order of integral, the double integral $\int_0^8 \int_{\frac{1}{x^3}}^2 dy dx$ becomes

- (1) $\int_{\frac{1}{x^3}}^2 \int_0^8 dx dy$
- (2) $\int_0^2 \int_0^{y^3} dx dy$
- (3) $\int_8^0 \int_2^{\frac{1}{x^3}} dx dy$
- (4) $\int_0^2 \int_{y^3}^0 dx dy$

Options :

19088913773. 1

19088913774. 2

19088913775. 3

19088913776. 4

Question Number : 70 Question Id : 1908893468 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The area of the region bounded by the curves $x = y^2$ and $y = x^2$ is

(1) 1

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

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

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

Options :

19088913777. 1

19088913778. 2

19088913779. 3

19088913780. 4

Question Number : 71 Question Id : 1908893469 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of the tripple integral $\int_{x=0}^1 \int_{y=0}^1 \int_{z=0}^1 (x^2 + y^2 + z^2) dz dy dx$ is

(1) 0

(2) $-\frac{1}{3}$

(3) $-\frac{1}{4}$

(4) 1

Options :

19088913781. 1

19088913782. 2

19088913783. 3

19088913784. 4

Question Number : 72 Question Id : 1908893470 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The degree of the differential equation $\left[1 + \left(\frac{dy}{dx}\right)^2\right]^{\frac{3}{2}} = \frac{d^2y}{dx^2}$ is

(1) 1

(2) 2

(3) 3

(4) Not defined

Options :

19088913785. 1

19088913786. 2

19088913787. 3

19088913788. 4

Question Number : 73 Question Id : 1908893471 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The differential equation $x \frac{dx}{dy} + y = 0$, represents a family of

(1) hyperbolas

(2) exponential curves

(3) parabolas

(4) circles

Options :

19088913789. 1

19088913790. 2

19088913791. 3

19088913792. 4

Question Number : 74 Question Id : 1908893472 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The family of orthogonal trajectories of the family of parabolas $y = cx^2$ is

- (1) $x^2 + 2y^2 = k^2$, where k is an arbitrary constant
- (2) $2x^2 + y^2 = k^2$, where k is an arbitrary constant
- (3) $x^2 + y^2 = k^2$, where k is an arbitrary constant
- (4) $x^2 = ky$ where k is an arbitrary constant

Options :

19088913793. 1

19088913794. 2

19088913795. 3

19088913796. 4

Question Number : 75 Question Id : 1908893473 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

For $a, b, c \in \mathbb{R}$, if the differential equation $(ax^2 + bxy + y^2)dx + (2x^2 + cxy + y^2)dy = 0$ is exact,
then

- (1) $b = 2, c = 4$
- (2) $a = b, c = 20$
- (3) $b = 4, c = 2$
- (4) $b = 2, a = 2c$

Options :

19088913797. 1

19088913798. 2

19088913799. 3

19088913800. 4

Question Number : 76 Question Id : 1908893474 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is a linear differential equation?

(1) $\frac{dy}{dx} = \sin y$

(2) $y \frac{dy}{dx} = x$

(3) $\left(\frac{dy}{dx}\right)^2 = 1$

(4) $\frac{dy}{dx} = e^x$

Options :

19088913801. 1

19088913802. 2

19088913803. 3

19088913804. 4

Question Number : 77 Question Id : 1908893475 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is an integrating factor of the differential equation $ydx + 2xdy = 0$?

(1) $\mu(x, y) = x$

(2) $\mu(x, y) = y$

(3) $\mu(x, y) = 1$

(4) $\mu(x, y) = 2$

Options :

19088913805. 1

19088913806. 2

19088913807. 3

19088913808. 4

Question Number : 78 Question Id : 1908893476 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The general solution of the differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} - 2y = 0$ is

- | | |
|------------------------------|--------------------------|
| (1) $c_1e^{-2x} + c_2e^x$ | (2) ce^{-2x} |
| (3) $c_1e^x + c_2x + c_3x^3$ | (4) $c_1e^{2x} + c_2e^x$ |

Options :

19088913809. 1

19088913810. 2

19088913811. 3

19088913812. 4

Question Number : 79 Question Id : 1908893477 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The differential equation $\frac{d^2y}{dx^2} + \sin(x+y) = \sin x$ is

- (1) Linear and non-homogeneous
- (2) Linear and homogeneous
- (3) Nonlinear and homogeneous
- (4) Nonlinear and non-homogeneous

Options :

19088913813. 1

19088913814. 2

19088913815. 3

19088913816. 4

Question Number : 80 Question Id : 1908893478 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The solution of the differential equation $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 4y = 0$ satisfying the conditions $y(0) = 4$

and $\left.\frac{dy}{dx}\right|_{x=0} = 8$ is

- | | |
|------------------------|----------------|
| (1) e^{2x} | (2) $4e^{-2x}$ |
| (3) $(4 + 16x)e^{-2x}$ | (4) $4e^{2x}$ |

Options :

19088913817. 1

19088913818. 2

19088913819. 3

19088913820. 4

Question Number : 81 Question Id : 1908893479 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $y(x)$ be the solution of the initial value problem $x^2 \frac{d^2y}{dx^2} - 4x \frac{dy}{dx} + 6y = 0$, $x > 0$ $y(2) = 0$,

$\left.\frac{dy}{dx}\right|_{x=2} = 4$. Then value of $y(4)$ is

- | | |
|--------|--------------------|
| (1) 32 | (2) 0 |
| (3) 1 | (4) $\frac{1}{32}$ |

Options :

19088913821. 1

19088913822. 2

19088913823. 3

19088913824. 4

Question Number : 82 Question Id : 1908893480 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$y = Ae^{2x} + Be^{-2x}$, where A and B are arbitrary constants, is a solution of

(1) $B \frac{d^2 y}{dx^2} + Ay = 0$

(2) $A \frac{d^2 y}{dx^2} + 4y = 0$

(3) $\frac{d^2 y}{dx^2} + 2y = 4$

(4) $\frac{d^2 y}{dx^2} - 4y = 0$

Options :

19088913825. 1

19088913826. 2

19088913827. 3

19088913828. 4

Question Number : 83 Question Id : 1908893481 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let P and Q be real constants. Then $y = e^{mx}$ is a solution of differential equation

$\frac{d^2 y}{dx^2} + P \frac{dy}{dx} + Qy = 0$, if

(1) $m^2 + Pm - Q = 0$

(2) $m^2 + Pm + Q = 0$

(3) $m^2 - Pm + Q = 0$

(4) $m^2 - Pm - Q = 0$

Options :

19088913829. 1

19088913830. 2

19088913831. 3

19088913832. 4

Question Number : 84 Question Id : 1908893482 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $y_1(x)$ and $y_2(x)$, defined on $[0,1]$, be twice continuously differentiable functions satisfying $\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = 0$. Let $W(x)$ be Wronskian of y_1 and y_2 which satisfies $W\left(\frac{1}{2}\right) = 0$.

Then

- (1) $W(x) \neq 0$ for all $x \in \left[0, \frac{1}{2}\right) \cup \left(\frac{1}{2}, 1\right]$
- (2) $W(x) > 0$ for all $x \in \left[\frac{1}{2}, 1\right]$
- (3) $W(x) = 0$ for all $x \in [0, 1]$
- (4) $W(x) < 0$ for all $x \in \left[0, \frac{1}{2}\right)$

Options :

19088913833. 1

19088913834. 2

19088913835. 3

19088913836. 4

Question Number : 85 Question Id : 1908893483 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The two linearly independent solutions of the differential equation $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = 0$ are

- (1) e^x and $2e^x$
- (2) x and $5x^2$
- (3) $\sin x$ and $9\sin x$
- (4) e^x and xe^x

Options :

19088913837. 1

19088913838. 2

19088913839. 3

19088913840. 4

Question Number : 86 Question Id : 1908893484 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ and $\nabla = \frac{\partial}{\partial x}\hat{i} + \frac{\partial}{\partial y}\hat{j} + \frac{\partial}{\partial z}\hat{k}$. If $\phi(x, y, z)$ is a solution of the Laplace's equation then the vector field $(\nabla\phi + \vec{r})$ is

- | | |
|-------------------------------------|---|
| (1) solenoidal but not irrotational | (2) neither solenoidal nor irrotational |
| (3) irrotational but not solenoidal | (4) both solenoidal and irrotational |

Options :

19088913841. 1

19088913842. 2

19088913843. 3

19088913844. 4

Question Number : 87 Question Id : 1908893485 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let ϕ and $\vec{f}$ be differentiable scalar and vector functions, respectively and both have continuous second partial derivatives. Then which one of the following is true?

- (1) The curl of the gradient of ϕ is never zero
- (2) The divergence of the curl of $\vec{f}$ is zero
- (3) $\vec{f}$ is irrotational if its divergence is zero
- (4) $\vec{f}$ is called solenoidal if curl of $\vec{f}$ is zero

Options :

19088913845. 1

19088913846. 2

19088913847. 3

19088913848. 4

Question Number : 88 Question Id : 1908893486 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The magnitude of the gradient of function $f: \mathbb{R}^3 \rightarrow \mathbb{R}$ such that $f(x, y, z) = xyz^2$ at the point $(1, 0, 2)$ is

- | | |
|-------|-------|
| (1) 4 | (2) 3 |
| (3) 1 | (4) 0 |

Options :

19088913849. 1

19088913850. 2

19088913851. 3

19088913852. 4

Question Number : 89 Question Id : 1908893487 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Suppose $\vec{r} = x\hat{i} + y\hat{j}$ be a position vector of the point $P(x, y)$. Let $\vec{f} = -3x^2\hat{i} + 5xy\hat{j}$ and let C be the curve $y = 2x^2$ in the xy -plane. Then the value of the line integral $\int_C \vec{f} \cdot d\vec{r}$ from the point $P_1(0, 0)$ to $P_2(1, 2)$ is

- | | |
|-------|-------------------|
| (1) 0 | (2) $\frac{1}{7}$ |
| (3) 1 | (4) 7 |

Options :

19088913853. 1

19088913854. 2

19088913855. 3

19088913856. 4

Question Number : 90 Question Id : 1908893488 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $\vec{F}$ is a conservative vector field, then

- | | |
|-------------------------------|-------------------------------------|
| (1) $\vec{F}$ is solenoidal | (2) curl of $\vec{F}$ is nonzero |
| (3) $\vec{F}$ is irrotational | (4) divergence of $\vec{F}$ is zero |

Options :

19088913857. 1

19088913858. 2

19088913859. 3

19088913860. 4

Question Number : 91 Question Id : 1908893489 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $\vec{F} = 2xz\hat{i} - x\hat{j} + y^2\hat{k}$. The value of $\iiint_V \vec{F} dV$, where V is the region bounded by the surfaces $x = 0, y = 0, y = 6, z = x^2, z = 4$ is

- | | |
|---|---|
| (1) 1 | (2) $8\hat{i} + 4\hat{j} + 4\hat{k}$ |
| (3) $128\hat{i} - 24\hat{j} + 385\hat{k}$ | (4) $128\hat{i} - 24\hat{j} + 384\hat{k}$ |

Options :

19088913861. 1

19088913862. 2

19088913863. 3

19088913864. 4

Question Number : 92 Question Id : 1908893490 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is true?

- (1) Green's theorem in the plane is a special case of Stokes' theorem
- (2) Stokes' theorem is a special case of Green's theorem
- (3) Fundamental theorem of integral calculus is the generalization of Green's theorem in plane
- (4) Green's theorem in plane is the generalization of Gauss' divergence theorem

Options :

19088913865. 1

19088913866. 2

19088913867. 3

19088913868. 4

Question Number : 93 Question Id : 1908893491 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is incorrect?

- (1) The intersection of two convex sets is a convex set
- (2) The intersection of any finite number of convex sets is a convex set
- (3) The set $S = \{(x, y) \in \mathbb{R}^2 : x^2 + y^2 \leq 1\}$ is a convex set
- (4) The union of two convex sets is also a convex set

Options :

19088913869. 1

19088913870. 2

19088913871. 3

19088913872. 4

Question Number : 94 Question Id : 1908893492 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $S = \{(x, y) \in \mathbb{R}^2 : x^2 + y^2 = 1\}$ and $T = \{(x, y) \in \mathbb{R}^2 : y \geq x^2\}$. Then which one of the following is correct

- (1) S is a convex set but T is not a convex set
- (2) T is a convex set but S is not a convex set
- (3) Both S and T are not convex sets
- (4) Both S and T are convex sets

Options :

19088913873. 1

19088913874. 2

19088913875. 3

19088913876. 4

Question Number : 95 Question Id : 1908893493 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is in the convex hull of the points $(0, 1)$, $(1, 0)$ and $(1, 1)$?

- (1) $(0, 0)$
- (2) $\left(0, \frac{3}{2}\right)$
- (3) $\left(\frac{1}{2}, \frac{1}{2}\right)$
- (4) $(-10, 10)$

Options :

19088913877. 1

19088913878. 2

19088913879. 3

19088913880. 4

Question Number : 96 Question Id : 1908893494 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $S = \{(x, y) \in \mathbb{R}^2 : x^2 + y^2 < 1\}$ and $T = \left\{(0, 1), \left(\frac{1}{2}, \frac{1}{2}\right), (1, 0)\right\}$, then the convex hull of $S \cup T$ is

- | | |
|--|----------------|
| (1) $\{(x, y) \in \mathbb{R}^2 : x^2 + y^2 \leq 1\}$ | (2) $S \cup T$ |
| (3) $\{(x, y) \in \mathbb{R}^2 : x^2 + y^2 < 1\}$ | (4) $S \cap T$ |

Options :

19088913881. 1

19088913882. 2

19088913883. 3

19088913884. 4

Question Number : 97 Question Id : 1908893495 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following is true?

- (1) A boundary point of a convex set is the extreme point of the convex set
- (2) An extreme point of a convex set is the boundary point of the convex set
- (3) Convex hull of a set $S \subset \mathbb{R}^n$ is the largest convex set containing S
- (4) A hyperplane in $\mathbb{R}^n$ is not a convex set

Options :

19088913885. 1

19088913886. 2

19088913887. 3

19088913888. 4

Question Number : 98 Question Id : 1908893496 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

One of the vertex of the convex set $\{(x, y) \in \mathbb{R}^2 : x + 2y \geq 2, 2x + 3y \leq 6, x \geq 0, y \geq 0\}$ is

- | | |
|--------------|------------|
| (1) (0, 0) | (2) (1, 1) |
| (3) (2, 0.5) | (4) (3, 0) |

Options :

19088913889. 1

19088913890. 2

19088913891. 3

19088913892. 4

Question Number : 99 Question Id : 1908893497 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of the objective function at an optimal solution of the linear programming problem $\min z = x_1 + x_2$ subject to the conditions $x_1 - x_2 = -5$, $x_1 \geq 0$, $x_2 \geq 0$ will be

(1) 0

(2) 10

(3) 5

(4) -5

Options :

19088913893. 1

19088913894. 2

19088913895. 3

19088913896. 4

Question Number : 100 Question Id : 1908893498 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The linear programming problem $\max z = -x_1 + 2x_2$ subject to conditions $-x_1 + x_2 \leq 1$, $-x_1 + 2x_2 \leq 4$, $0 \leq x_1 \leq 5$, $x_2 \geq 0$ has

(1) multiple optimal solutions

(2) unique optimal solution

(3) no solution

(4) unbounded solution

Options :

19088913897. 1

19088913898. 2

19088913899. 3

19088913900. 4

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