# Andhra Pradesh State Council of Higher Education

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| **Question Paper Name:** | MATHEMATICS |
| **Subject Name:** | MATHEMATICS |
| **Creation Date:** | 2019-11-10 15:11:49 |
| **Duration:** | 180 |
| **Total Marks:** | 180 |
| **Display Marks:** | Yes |
| **Share Answer Key With Delivery Engine:** | Yes |

MATHEMATICS

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|---|---|
| **Group Number :** | 1 |
| **Group Id :** | 62321755 |
| **Group Maximum Duration :** | 0 |
| **Group Minimum Duration :** | 180 |
| **Revisit allowed for view? :** | No |
| **Revisit allowed for edit? :** | No |
| **Break time:** | 0 |
| **Group Marks:** | 180 |
| **Revisit allowed for group Instructions? :** | Yes |
| **Maximum Instruction Time:** | 0 |
| **Minimum Instruction Time:** | 0 |

Teaching and Research Aptitude

| | |
|---|---|
| **Section Id :** | 623217109 |
| **Section Number :** | 1 |
| **Section type :** | Online |
| **Mandatory or Optional:** | Mandatory |
| **Number of Questions:** | 82 |
| **Number of Questions to be attempted:** | 82 |
| **Section Marks:** | 90 |
| **Display Number Panel:** | Yes |
| **Group All Questions:** | No |

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|---|---|
| **Sub-Section Number:** | 1 |
| **Sub-Section Id:** | 623217325 |
| **Question Shuffling Allowed :** | Yes |

**Question Number : 1 Question Id : 6232179775 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The Teacher has been glorified by the phase “Friend, Philosopher and guide” because

**Options :**

1. He is a great reformer of the society

2. He has to play all vital roles in the context of society.

3. He transmits the high value of humanity to students.

4. He is a great patriot

**Question Number : 2 Question Id : 6232179776 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

What are the characteristics of continuous and comprehensive evaluation?

a. It increases the workload on students by taking multiple tests.

b. It replaces marks with grades.

c. It evaluates every aspect of the student

d. It helps in reducing examination phobia

**Options :**

1. (a), (b), (c) and (d)

2. (b) and (c)

3. (a), (b) and (c)

4. (b), (c) and (d)

**Question Number : 3 Question Id : 6232179777 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Before teaching a teacher should

**Options :**

1. Know the existing knowledge of his students and their background knowledge

2. be aware of the environmental variables acting on the mind of the pupils

3. be competent enough to arouse the curiosity of his pupils

4. All of the other options

**Question Number : 4 Question Id : 6232179778 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The major responsibility with which the school personnel have been entrusted is that

**Options :**

1. It harmonizes the needs of the child and demands of the society for the mutual benefit

2. It makes the child employable

3. It prepares the school programme according to the need of the child.

4. All of the other options

**Question Number : 5 Question Id : 6232179779 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Moral values can be effectively inculcated among the students when the teacher.

**Options :**

1. Frequently talks about the values.

2. Himself practices them

3. Tells stories of great persons

4. Talks of gods and goddesses

**Question Number : 6 Question Id : 6232179780 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Which of the following is not an example of learner centred method.

**Options :**

1. Closed ended method

2. Discussion method

3. Discovery based

4. survey method

**Question Number : 7 Question Id : 6232179781 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The highest level of cognitive domain as per revised blooms taxonomy

**Options :**

1. Applying

2. Analysing

3. Creating

4. Evaluating

**Question Number : 8 Question Id : 6232179782 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

As per the UGC recommendations which of the following grade point is correct for B+ grade?

**Options :**

1. 9

2. 7

3. 8

4. 6

**Question Number : 9 Question Id : 6232179783 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The teacher's role at the higher educational level is to:

**Options :**

1. Provide information to students

2. Encourage healthy competition among students.

3. Help students to solve their personal problems.

4. Promote self – learning in students.

**Question Number : 10 Question Id : 6232179784 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

In the process of conducting research "Formulation of Hypothesis" is followed by

**Options :**

1. Statement of objectives

2. Selection of research tools

3. Need for the study

4. Problem statement

**Question Number : 11 Question Id : 6232179785 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Which of the following variable cannot be expressed in quantitative terms?

**Options :**

1. Marital status

2. Income

3. Age

4. Experience

**Question Number : 12 Question Id : 6232179786 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The form that is filled by investigation to collect information from the respondent is called as

**Options :**

1. Schedule

2. Report

3. Response sheet

4. Field report

**Question Number : 13 Question Id : 6232179787 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Studying an element and inferences made for the whole universe is called

**Options :**

1. Inductive logic

2. Deductive logic

3. Predictive logic

4. No logic

**Question Number : 14 Question Id : 6232179788 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The following is not a probabilistic sampling scheme.

**Options :**

1. Stratified random sample

2. Cluster sample

3. Systematic sample

4. Judgement sample

**Question Number : 15 Question Id : 6232179789 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The population census carried out by the Government of India is an example of

**Options :**

1. Exploratory Research

2. Action Research

3. Descriptive Research

4. Analytical Research

**Question Number : 16 Question Id : 6232179790 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The following is not a part of Research ethics.

**Options :**

1. Respect for self interest

2. Respect for Intellectual property

3. Respect for confidentiality

4. Respect to fact presentation

**Question Number : 17 Question Id : 6232179791 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Giving credit to individuals for their creative and intellectual works that has been utilised in the research study is called

**Options :**

1. Bibliography

2. Reference

3. Citation

4. End note

**Question Number : 18 Question Id : 6232179792 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Accepting null hypothesis when it is false is called

**Options :**

1. Type-I error

2. Type-II error

3. Sampling error

4. Parallax error

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| **Sub-Section Number:** | 2 |
| **Sub-Section Id:** | 623217326 |
| **Question Shuffling Allowed :** | Yes |

**Question Id : 6232179793 Question Type : COMPREHENSION Sub Question Shuffling Allowed : Yes Group Comprehension Questions : No**

**Question Numbers : (19 to 27)**

Question Label : Comprehension

**Read the following passage and answer the question**

We look down upon the insects as almost the lowest of living things, and yet these tiny things have learnt the art of co-operation and of sacrifice for the common good far better than man. Ever since I read of the White Ant and of its sacrifice for its comrades, I have developed a soft corner in my heart for it. If mutual co-operation and sacrifice for the good of society are the tests of civilization, we may say that the White Ant and the Ant are in this respect superior to man.

In one of our old Sanskrit books there is a verse which can be translated as follows: "for the family sacrifice the individual, for the community the family, for the country the community and for the soul the whole world". What the soul is few of us can know or tell and each one of us can interpret it in a different way. But the lesson this Sanskrit verse teaches us is the same lesson of co-operation and sacrifice for the larger good. We in India had forgotten this sovereign path to real greatness for many a day, and so we had fallen. But again we seem to have glimpses of it, and all the country is astir. How wonderful it is to see men and women, and boys and girls, smilingly going ahead in India's cause and not caring about any pain or suffering! Well may they smile and be glad, for the joy of serving in a great cause is theirs; and to those who are fortunate comes the joy of sacrifice also. Today we are trying to free India. This is a great thing. But even greater is the cause of humanity itself. And because we feel that our struggle is a part of the great human struggle to end suffering and misery, we can rejoice that we are doing our little bit to help the progress of the world.

**Sub questions**

**Question Number : 19 Question Id : 6232179794 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

In which respect are the insects better than man?

**Options :**

1. More in number

2. Sacrifice for the common good

3. Less complex biological constitution

4. Smaller in size

**Question Number : 20 Question Id : 6232179795 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

What are the tests of civilization?

**Options :**

1. Living together and sharing food

2. Devoid of wars

3. Social etiquette

4. Mutual co-operation and sacrifice

**Question Number : 21 Question Id : 6232179796 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

According to the Sanskrit verse, what should be sacrificed for the sake of the country?

**Options :**

1. The world

2. The community

3. The family

4. The individual

**Question Number : 22 Question Id : 6232179797 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Which concept of human existence can be interpreted in different ways?

**Options :**

1. The soul

2. The mind

3. The god

4. The life

**Question Number : 23 Question Id : 6232179798 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Why had the people of India fallen?

**Options :**

1. Imitation of western culture

2. Hundreds of years slavery

3. Forgotten the sovereign path

4. Lack of confidence in their culture

**Question Number : 24 Question Id : 6232179799 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

How did the people of the country stand for India's cause?

**Options :**

1. Following the National leaders

2. Studying law abroad

3. Being religious

4. Taking pain and suffering in their stride

**Question Number : 25 Question Id : 6232179800 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Who were considered fortunate by the author?

**Options :**

1. The British

2. Freedom fighters

3. Non-Resident Indians

4. The rich of India

**Question Number : 26 Question Id : 6232179801 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

What is greater than freeing India from the foreign rule?

**Options :**

1. Working for the cause of humanity

2. Preserving wild life

3. Balancing ecology

4. Protecting the water bodies

**Question Number : 27 Question Id : 6232179802 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

What does taking up the cause of humanity lead to?

**Options :**

1. End of suffering and misery

2. End of greed and desire

3. Progress of the world

4. End of poverty

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|---|---|
| **Sub-Section Number:** | 3 |
| **Sub-Section Id:** | 623217327 |
| **Question Shuffling Allowed :** | Yes |

**Question Number : 28 Question Id : 6232179803 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

An author communicating with a reader through a book is an example of _____.

**Options :**

1. No communication

2. Interpersonal communication

3. Group communication

4. Mass communication

**Question Number : 29 Question Id : 6232179804 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Differentiation between acceptance and non-acceptance of certain stimuli in classroom communication is the basis of

**Options :**

1. Selective attention

2. Selective morality

3. Selective expectation of performance

4. Selective application to peer group.

**Question Number : 30 Question Id : 6232179805 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Which of the following is NOT one of the primary functions of mass communication.

**Options :**

1. Correlation

2. Cultural transmission

3. Entertainment

4. Immunization

**Question Number : 31 Question Id : 6232179806 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The influence of a group on the attitude of an individual is generally treated in terms of the concept of

**Options :**

1. Psychological group

2. Physical group

3. Corporative group

4. Reference group

**Question Number : 32 Question Id : 6232179807 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Which of the following theories stress that mass media in a society is controlled by the state power?

**Options :**

1. Normative

2. Authoritarian

3. Libertarian

4. Social responsibility

**Question Number : 33 Question Id : 6232179808 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Positive classroom communication leads to

**Options :**

1. coercion

2. submission

3. confrontation

4. persuasion

**Question Number : 34 Question Id : 6232179809 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Deductive communication is

**Options :**

1. Individual

2. Inter – personal

3. Organizational

4. Relational

**Question Number : 35 Question Id : 6232179810 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Which is the essential component of communication?

**Options :**

1. Understanding

2. Medium

3. Thoughts

4. Intention

**Question Number : 36 Question Id : 6232179811 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Match the following

| | | |
|---|---|---|
| A) Pictures | – | 1) High order skills |
| B) high skills | – | 2) Visual communication |
| C) Hums | – | 3) Speech art |
| D) Long Distances | – | 4) Public telephone networks |

**Options :**

1. A-2 B-3 C-1 D-4

2. A-3 B-2 C-1 D-4

3. A-4 B-2 C-1 D-3

4. A-2 B-1 C-3 D-4

**Question Number : 37 Question Id : 6232179812 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The missing number in the sequence of numbers is

4, 5, 9, 18, 34, _____, 95

**Options :**

1. 43

2. 59

3. 67

4. 54

**Question Number : 38 Question Id : 6232179813 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The missing term in the following sequence is

ABC, BDF, _____, DHL

**Options :**

1. DJO

2. CFI

3. DKL

4. DKN

**Question Number : 39 Question Id : 6232179814 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If the numerator of a fraction is increased by 140% and the denominator is increased by 200%, the resultant fraction is $\frac{1}{2}$, then the original fraction is

**Options :**

1. $\frac{5}{19}$

2. $\frac{5}{9}$

3. $\frac{5}{8}$

4. $\frac{3}{4}$

**Question Number : 40 Question Id : 6232179815 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

A person lost 20% by selling an article for 700 rupees. What percent shall he gain by selling it for 1200 rupees?

**Options :**

1. 25

2. 37

3. $37\frac{1}{7}$

4. 40

**Question Number : 41 Question Id : 6232179816 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

A business man allows a discount of 10% on the marked price of an article. Then how much percentage, above the cost price, the article be marked to make a profit of 35%?

**Options :**

1. 40

2. 48

3. 55

4. 50

**Question Number : 42 Question Id : 6232179817 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

A man travels from the city A to the city B by a car with an average speed of 96 kmph and returns from B to A by the same car with an average speed of 32 kmph. Then the average speed of the car for the entire journey is _____ kmph.

**Options :**

1. 16

2. 48

3. 64

4. 84

**Question Number : 43 Question Id : 6232179818 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

In a certain language TABLE is code as UACME, then the code word for CHAIR is

**Options :**

1. DIATS

2. BIAIQ

3. DHAIS

4. DIBJS

**Question Number : 44 Question Id : 6232179819 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $x:y:z = 2:3:5$, then $\frac{x}{y} : \frac{y}{z} : \frac{z}{x} =$

**Options :**

1. 20:18:75

2. 6:15:13

3. 10:13:15

4. 6:15:10

**Question Number : 45 Question Id : 6232179820 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If an amount X invested with a compond intrest rate of 10% per annum become Rs 1,665/- is in 3years. Then the invested amount X is .....

**Options :**

1. 3,500

2. 5,555

3. 5,000

4. 6,500

| | |
|---|---|
| **Sub-Section Number:** | 4 |
| **Sub-Section Id:** | 623217328 |
| **Question Shuffling Allowed :** | No |

**Question Number : 46 Question Id : 6232179821 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Raju is two seats to Ramu's left. Ranga is three seats to Raju's right. Rao is two seats to Raju's left. Krishna is six seats to Sita's right. Sarma is six seats to Krishna's right. Rao is not sitting next to Raju. Who sits one seat to Sarma's left?

**Options :**

1. Rao

2. Krishna

3. Raju

4. Sita

**Question Number : 47 Question Id : 6232179822 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Two statements are given with two conclusions I and II. Which logical conclusion can be drawn out as per the statements?

Statements: All windows are needles

Some trees are windows

Conclusion: I. Some trees are needles

II. Some trees are not needles

**Options :**

1. Only conclusion I follows

2. Only conclusion II follows

3. Both conclusions I and II followed

4. Both conclusions I and II are not followed

**Question Number : 48 Question Id : 6232179823 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The following series follows a pattern. Identify the pattern and fill the blank.

6, 14, 36, 98, _____.

**Options :**

1. 276

2. 275

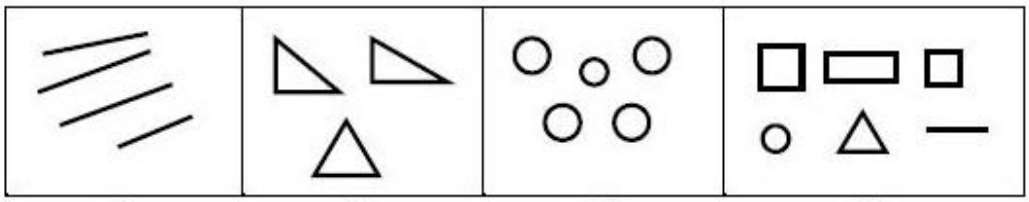
3. 220

4. 274

**Question Number : 49 Question Id : 6232179824 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Choose the figure which is different from other.




**Options :**

1. C

2. B

3. D

4. A

**Question Number : 50 Question Id : 6232179825 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

A is B's sister. C is B's mother. E is D's mother. Then how A is related to D?

**Options :**

1. Sister

2. Grand Mother

3. Daughter

4. Grand Daughter

**Question Number : 51 Question Id : 6232179826 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Arrange the given words in a meaningful sequence and choose at alternative.

i) Site

ii) Plan

iii) Rent

iv) Money

v) Building

vi) Construction

**Options :**

1. i, ii, iii, vi, v, iv

2. ii, iii, vi, v, i, iv

3. iii, iv, ii, vi, v, i

4. iv, i, ii, vi, v, iii

**Question Number : 52 Question Id : 6232179827 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Consider the statements “The hill is fiery. Because the hill is smoky. Whatever has fire has smoke”. In this statement, “The hill has smoke which is invariably associated with fire” is

**Options :**

1. Pratijna

2. Hetu

3. Udaharna

4. Upanaya

**Question Number : 53 Question Id : 6232179828 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Anumāna or inference is defined as

**Options :**

1. Instrument of judgment

2. Instrument of perception

3. Instrument of fact

4. Instrument of cause

**Question Number : 54 Question Id : 6232179829 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The science and study of pramanas is called

**Options :**

1. Nyaya

2. Advaita

3. Mimamsa

4. Vedanta

**Question Number : 55 Question Id : 6232179830 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Study the following tabular statement and answer the question below.

The proportion of male students and the proportion of girl students in a school are given in the following tabular statement. The school has a total of 1600 students and 80% of them are in secondary section and the rest are equally divided between the classes 11 and 12.

| Class | Male | Girl |
|---|---|---|
| 11 | 0.50 | 0.50 |
| 12 | 0.60 | 0.40 |
| Secondary section | 0.45 | 0.55 |

The number of girl students in the class 12 is

**Options :**

1. 32

2. 160

3. 64

4. 80

**Question Number : 56 Question Id : 6232179831 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Study the following tabular statement and answer the question below.

The proportion of male students and the proportion of girl students in a school are given in the following tabular statement. The school has a total of 1600 students and 80% of them are in secondary section and the rest are equally divided between the classes 11 and 12.

| Class | Male | Girl |
|---|---|---|
| 11 | 0.50 | 0.50 |
| 12 | 0.60 | 0.40 |
| Secondary section | 0.45 | 0.55 |

The total number of male students in the school is

**Options :**

1. 700

2. 650

3. 848

4. 752

**Question Number : 57 Question Id : 6232179832 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Study the following tabular statement and answer the question below.

The proportion of male students and the proportion of girl students in a school are given in the following tabular statement. The school has a total of 1600 students and 80% of them are in secondary section and the rest are equally divided between the classes 11 and 12.

| Class | Male | Girl |
|---|---|---|
| 11 | 0.50 | 0.50 |
| 12 | 0.60 | 0.40 |
| Secondary section | 0.45 | 0.55 |

The percentage of male students in the secondary section

**Options :**

1. 36

2. 42

3. 45

4. 48

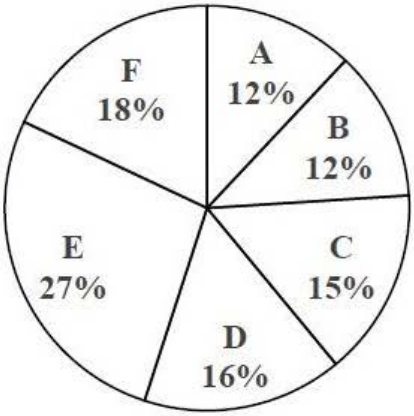
**Question Number : 58 Question Id : 6232179833 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

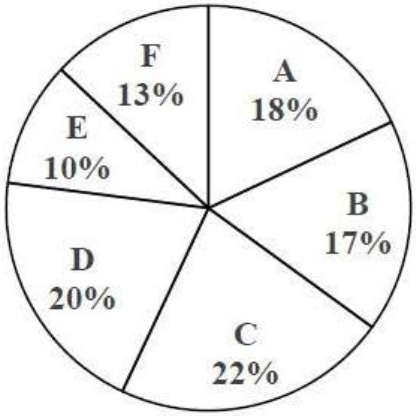
**Wrong Marks : 0**

The following pie chart shows the distribution of men and women in 6 different towns.

Based on this information answer the question given below.

Total number of men = 54600




Total number of women = 49400

Total number of men and women in the town C is

**Options :**

1. 19000

2. 19058

3. 20463

4. 21252

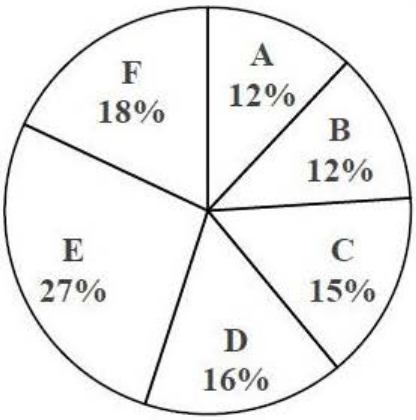
**Question Number : 59 Question Id : 6232179834 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

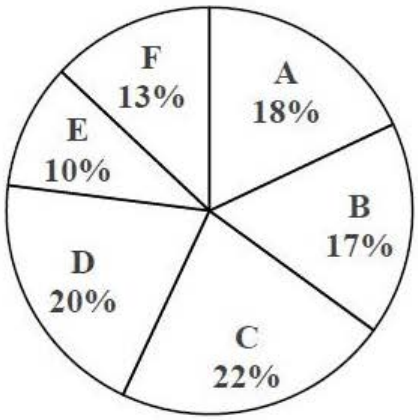
**Wrong Marks : 0**

The following pie chart show the distribution of men and women in 6 different towns.

Based on this information answer the question given below.

Total number of men = 54600




Total number of women = 49400

The ratio between the number of men and women in the town D is

**Options :**

1. 1092:1235

2. 348:177

3. 2:3

4. 12:13

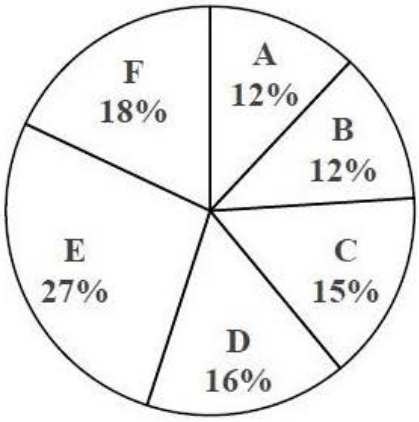
**Question Number : 60 Question Id : 6232179835 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

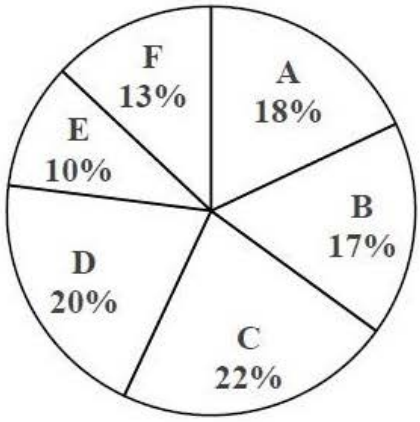
**Wrong Marks : 0**

The following pie chart show the distribution of men and women in 6 different towns.

Based on this information answer the question given below.

Total number of men = 54600




Total number of women = 49400

The total number of women in the towns B, D and F is

**Options :**

1. 24000

2. 24363

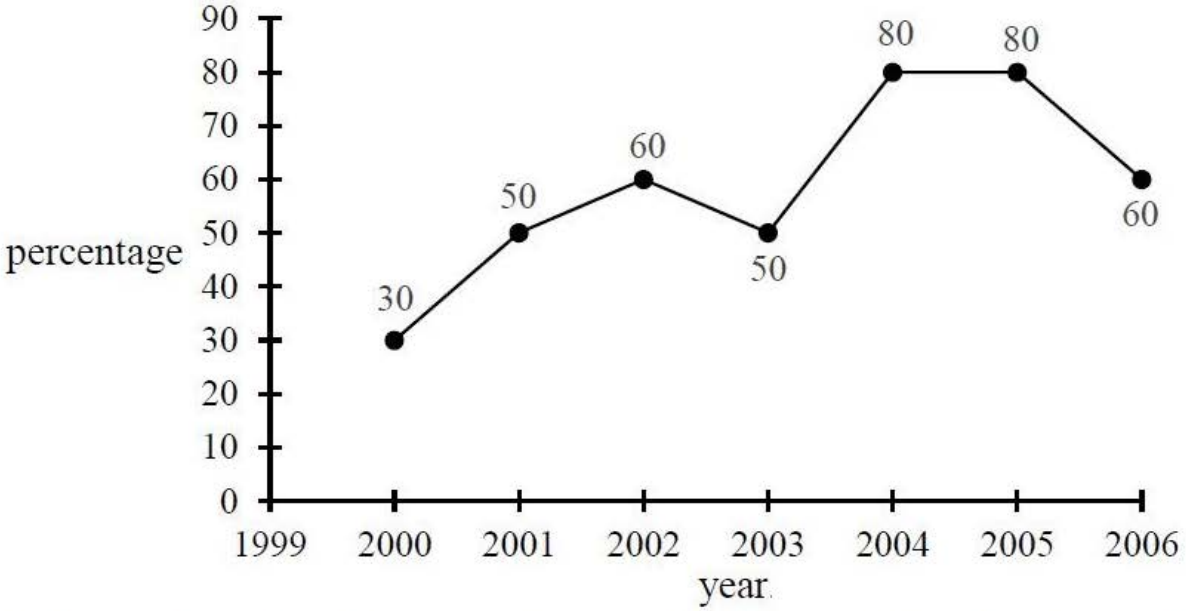
3. 24700

4. 29560

**Question Number : 61 Question Id : 6232179836 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The following line graph represents the percentage of the number of qualified candidates in an examination out of the total number of candidates appeared in that examination for the corresponding year. Based on the information for the years 2000 to 2006, answer the question below.




If the number of qualified candidates in 2004 was 42400, then the number of candidates appeared for the examination in 2004 was

**Options :**

1. 50000

2. 53250

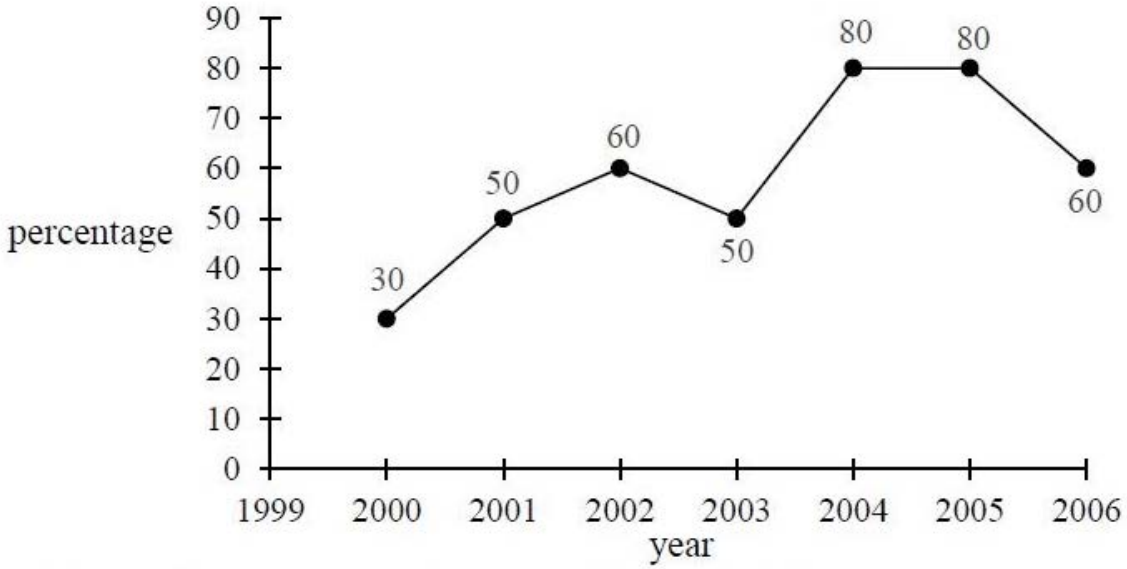
3. 53000

4. 48250

**Question Number : 62 Question Id : 6232179837 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The following line graph represents the percentage of the number of qualified candidates in an examination out of the total number of candidates appeared in that examination for the corresponding year. Based on the information for the years 2000 to 2006, answer the question below.




If the total number of qualified candidates in 2005 and 2006 together was 33500 and the number of candidates appeared in 2005 was 26500, then the number of candidates appeared for the examination in 2006 was

**Options :**

1. 20500

2. 20000

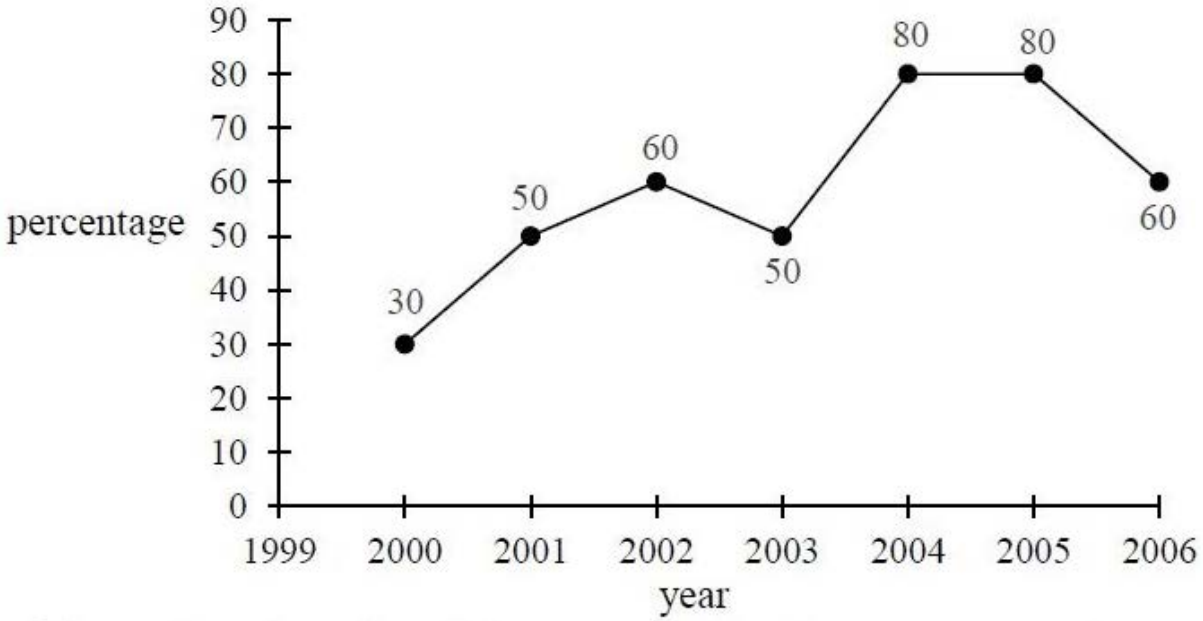
3. 22500

4. 24050

**Question Number : 63 Question Id : 6232179838 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The following line graph represents the percentage of the number of qualified candidates in an examination out of the total number of candidates appeared in that examination for the corresponding year. Based on the information for the years 2000 to 2006, answer the question below.




If the total number of candidates appeared for the years 2001 and 2003 put together was 20000 and the number of qualified candidates in 2001 was 7550, then the number of qualified candidates in 2003 was

**Options :**

1. 2400

2. 2450

3. 4900

4. 7550

| | |
|---|---|
| **Sub-Section Number:** | 5 |
| **Sub-Section Id:** | 623217329 |
| **Question Shuffling Allowed :** | Yes |

**Question Number : 64 Question Id : 6232179839 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The full form of USB

**Options :**

1. University Security Block

2. United Serial Bus

3. Universal Serial Bus

4. Ultra Security Block

**Question Number : 65 Question Id : 6232179840 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

An unsolicited e-mail message sent to many recipients at once is a

**Options :**

1. Worm

2. Virus

3. Threat

4. Spam

**Question Number : 66 Question Id : 6232179841 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The full form of MOOC is

**Options :**

1. Massive Open Online Course

2. Massive Online Open Course

3. Massive Original Online Course

4. Massive Oriented Online Course

**Question Number : 67 Question Id : 6232179842 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

TCP/IP is necessary if one is to connect to the

**Options :**

1. Phone lines

2. LAN

3. Internet

4. Server

**Question Number : 68 Question Id : 6232179843 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

"SWAYAM" platform is developed by

**Options :**

1. MHRD with the help of Microsoft

2. AICTE with the help of Microsoft

3. MHRD and AICTE with the help of Microsoft

4. UGC with the help of Microsoft

**Question Number : 69 Question Id : 6232179844 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The digital repository of Indian Electronic Theses and Dissertations "Shodhganga" set up by

**Options :**

1. INFLIBNET Centre

2. NPTEL

3. UGC

4. AICTE

**Question Number : 70 Question Id : 6232179845 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The following is not the benefit of ICT Governance.

**Options :**

1. Increase transparency

2. Higher availability of public domain information

3. Increase efficiency due to connectivity

4. Reduce security of information

**Question Number : 71 Question Id : 6232179846 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Which of the following enable one to send the same letter to different persons in MSWORD

**Options :**

1. Mail join

2. Mail copy

3. Mail insert

4. Mail merge

**Question Number : 72 Question Id : 6232179847 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Which of the following is not a/an image/graphic format?

**Options :**

1. PNG

2. GIF

3. BMP

4. GUI

**Question Number : 73 Question Id : 6232179848 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Which of the following statements is related to sustainability

**Options :**

1. It refers to a process or state that can be maintained indefinitely.

2. Natural resources must be used in ways that create ecological debts.

3. Consumption of the total natural capital stock.

4. None of the other options

**Question Number : 74 Question Id : 6232179849 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Contaminated substances which leak into ground and carried by filtration into ground water is known as

**Options :**

1. Air pollution

2. Water pollution

3. Noise pollution

4. Land contamination

**Question Number : 75 Question Id : 6232179850 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

When was the problem of ozone depletion first identified?

**Options :**

1. 1970

2. 1971

3. 1972

4. 1973

**Question Number : 76 Question Id : 6232179851 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Why is the runoff from fertilized agricultural fields, even if free of pesticides, often harmful to the ecosystems of temperate lakes?

**Options :**

1. The fertilizer promotes the growth of fish to the point where they cannot find enough food to eat.

2. The runoff causes a surface algal bloom, which reduces the penetration of light into the water reducing photosynthesis and thereby which reducing the amount of oxygen in the water.

3. Fertilizer runoff promotes antibiotic resistance

4. The runoff raises the levels of inorganic nutrients in the surface waters to levels that are toxic for algae and other lake organisms.

**Question Number : 77 Question Id : 6232179852 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Sulphur - rich fossil fuels _____.

**Options :**

1. Cause less harm to the environment than other fossil fuels

2. Contribute to global cooling

3. Deplete the ozone layer

4. Contribute to acid rain

**Question Number : 78 Question Id : 6232179853 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The most nuclear fuel used in the world is _____.

**Options :**

1. Thorium-232

2. Uranium-238

3. Uranium-235

4. Plutonium-239

**Question Number : 79 Question Id : 6232179854 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Boiling water reactor and pressurised water reactors are

**Options :**

1. Solar reactor

2. OTEC

3. Biogas reactor

4. Nuclear reactor

**Question Number : 80 Question Id : 6232179855 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Which is known as seismic wave?

**Options :**

1. Tsunami

2. Hurricane

3. Typhoon

4. El Nino

**Question Number : 81 Question Id : 6232179856 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

With minor exception, which of the following has been phased out completely globally?

**Options :**

1. Carbon dioxide

2. Carbon monoxide

3. Chlorofluorocarbons

4. Nitrogen dioxide

**Question Number : 82 Question Id : 6232179857 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

In which medium were instructions given in the Buddhist system of education.

**Options :**

1. Sanskrit

2. Hindi

3. Pali

4. None of the other options

**Question Number : 83 Question Id : 6232179858 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Prime Minister Research Fellowship is for students pursuing Ph.D programme in _____ organization.

**Options :**

1. State and Central universities

2. Central Universities, IISc, IITs, NITs

3. IISc, IIIts, NITs, IISERS, IITs, State and Central Universities

4. IITs and IISC

**Question Number : 84 Question Id : 6232179859 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The University Grants Commission was established with which of the following aims?

a) Promotion of research and development in higher education

b) Identifying and sustaining institutions of potential learning

c) Capacity building of teachers

d) Providing autonomy to each and every higher educational institutions in India

**Options :**

1. (a), (b), (c) and (d)

2. (a), (b), (c)

3. (b), (c), (d)

4. (a), (b), (d)

**Question Number : 85 Question Id : 6232179860 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The first Open University in India was set up in the state of

**Options :**

1. Andhra Pradesh

2. Delhi

3. Tamil Nadu

4. Kerala

**Question Number : 86 Question Id : 6232179861 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The study of interaction between living and non-living organisms and environment is called

**Options :**

1. Ecosystem

2. Ecology

3. Phytogeography

4. Phytosociology

**Question Number : 87 Question Id : 6232179862 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Kothari Commission report was submitted to the Government in the year

**Options :**

1. 1960

2. 1966

3. 1968

4. 1970

**Question Number : 88 Question Id : 6232179863 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Common Wealth of learning focussed on promoting

**Options :**

1. economic development by providing education and teaching skills.

2. knowledge

3. personality development

communication skills.

4.

**Question Number : 89 Question Id : 6232179864 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Under CBCS, which of the following is not regarded as a "programme"?

**Options :**

1. Certificate

2. Diploma

3. Degree

4. None of the other options

**Question Number : 90 Question Id : 6232179865 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Extension of inference is called

**Options :**

1. Observation

2. Conclusions

3. Analysis

4. Hypothesis

| | |
|---|---|
| **Section Number :** | 2 |
| **Section type :** | Online |
| **Mandatory or Optional:** | Mandatory |
| **Number of Questions:** | 90 |
| **Number of Questions to be attempted:** | 90 |
| **Section Marks:** | 90 |
| **Display Number Panel:** | Yes |
| **Group All Questions:** | No |

| | |
|---|---|
| **Sub-Section Number:** | 1 |
| **Sub-Section Id:** | 623217330 |
| **Question Shuffling Allowed :** | Yes |

**Question Number : 91 Question Id : 6232179866 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

For $n \in \mathbb{Z}^+$, let $a_n = \left(1+\frac{1}{n}\right)^n$. Then

**Options :**

1. $a_{n+1} < a_n$

2. $\frac{a_n}{a_{n+1}} = \frac{n+1}{n}$

3. $a_n < a_{n+1}$

4. $\frac{a_n}{a_{n+1}} = \frac{n}{n+1}$

**Question Number : 92 Question Id : 6232179867 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let B be a non empty set of real numbers which is bounded above and $\alpha$ = Sup B.

Suppose $A = \{-x + 1 \mid x \in B\}$ and $\beta$ = Inf A. Then

**Options :**

1. $\alpha = -\beta$

2. $\alpha + \beta = 1$

3. $\alpha = \beta$

4. $\alpha - \beta = 1$

**Question Number : 93 Question Id : 6232179868 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

For $n \in \mathbb{Z}^+$, if $x_n = \left(\frac{n^2+3n+2}{n^2+3}\right)^{3n+2}$, Then the limit of the sequence $\{x_n\}$ is

**Options :**

1. $e^9$

2. $e^3$

3. $e^6$

4. does not exist

**Question Number : 94 Question Id : 6232179869 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

For $n \in \mathbb{Z}^+$, define $a_n = \begin{cases} \frac{1}{2^{\frac{n+1}{2}}} & \text{if } n \text{ is odd} \\ \frac{1}{3^{n/2}} & \text{if } n \text{ is even} \end{cases}$, then $\lim\limits_{n\to\infty} \sup \sqrt[n]{a_n} =$

**Options :**

1. $\frac{1}{2}$

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

3. $\frac{1}{\sqrt{3}}$

4. $\frac{1}{\sqrt{2}}$

**Question Number : 95 Question Id : 6232179870 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The set of all limit points of the set $\mathbb{Z}$ of all integers in $\mathbb{R}$ is

**Options :**

1. $\mathbb{Z}$, the set of all integers

2. $\mathbb{Z} - \{0\}$, the set of all non zero integers

3. $\mathbb{Q}$, the set of all rational numbers

4. $\phi$, the empty set

**Question Number : 96 Question Id : 6232179871 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Define $f : \mathbb{R} \to \mathbb{R}$ by $f(x) = \begin{cases} x & \text{if } x \text{ is rational} \\ 1-x & \text{if } x \text{ is irrational} \end{cases}$, then the set of all points at which f is discontinuous is

**Options :**

1. $\{0\}$

2. $\mathbb{R} - \left\{\frac{1}{2}\right\}$

3. $\mathbb{R} - \{0\}$

4. $\left\{\frac{1}{2}\right\}$

**Question Number : 97 Question Id : 6232179872 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Suppose a, b are real numbers, $b > 0$ and f is defined on $[-1, 1]$ by $f(x) = \begin{cases} x^a \sin(x^{-b}), & \text{if } x \neq 0 \\ 0, & \text{if } x = 0 \end{cases}$. Then the necessary and sufficient condition for the derivative $f'$ of f to be continuous is

**Options :**

1. $a > 1 + b$

2. $a > 1$

3. $a > 2 + b$

4. $a > 2 + 2b$

**Question Number : 98 Question Id : 6232179873 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

For any non-negative integer n, define $f_n : \mathbb{R} \to \mathbb{R}$ by $f_n(x) = \frac{x^2}{(1+x^2)^n}$ for all $x \in \mathbb{R}$ and write $f(x) = \sum_{n=0}^{\infty} f_n(x)$ for all $x \in \mathbb{R}$. Then $f(2) + f(3) =$

**Options :**

1. $15$

2. $10$

3. $5$

4. $0$

**Question Number : 99 Question Id : 6232179874 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

For $n \in \mathbb{Z}^+$, define $f_n(x) = nx(1 - x^2)^n$ for all $x \in [0, 1]$. Then $\lim_{n\to\infty} \int_0^1 f_n(x)\,dx =$

**Options :**

1. $0$

2. $\frac{1}{2}$

3. $1$

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

**Question Number : 100 Question Id : 6232179875 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let $f : [0, 1] \to \mathbb{R}$ be defined by $f(x) = x^3$ for all $x \in [0, 1]$ and $P = \left\{0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1\right\}$ be a partition of $[0, 1]$. Then the lower Riemann sum $L(p, f) =$

**Options :**

1. $\frac{25}{64}$

2. $\frac{16}{64}$

3. $\frac{9}{64}$

4. $\frac{4}{64}$

**Question Number : 101 Question Id : 6232179876 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $f(x) = x - [x]$ for $0 \le x \le 3$, where $[x]$ denotes the largest integer not exceeding x, then the total variation of f over [0, 3] is

**Options :**

1. $0$

2. $4$

3. $2$

4. $6$

**Question Number : 102 Question Id : 6232179877 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

$$\int_0^{\frac{\pi}{4}} \log_e(1+\tan x)\,dx =$$

**Options :**

1. $\frac{\pi}{4}\log_e 2$

2. $\frac{\pi}{8}\log_e 2$

3. $\frac{-\pi}{4}\log_e 2$

4. $\frac{-\pi}{8}\log_e 2$

**Question Number : 103 Question Id : 6232179878 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $f : \mathbb{R}^3 \to \mathbb{R}$ is defined by $f(x, y, z) = x^3 + y^3 + z^3 - 3xyz$ for all $(x, y, z) \in \mathbb{R}^3$, then

$$x\frac{\partial f}{\partial x} + y\frac{\partial f}{\partial y} + z\frac{\partial f}{\partial z} =$$

**Options :**

1. $0$

2. $f$

3. $2f$

4. $3f$

**Question Number : 104 Question Id : 6232179879 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let $\mathbb{R}$ be the metric space of all real numbers with Euclidean metric d. Then a subset of $\mathbb{R}$ which is connected but not compact among the following is

**Options :**

1. $[1, 5) \cup (3, 10]$

2. $(1, 5] \cup [3, 10)$

3. $(1, 3) \cup (5, 10)$

4. $[1, 3] \cup [5, 10]$

**Question Number : 105 Question Id : 6232179880 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let (X, d) be a metric space. Then for any subset A of X, boundary of A is (Here $\overline{A}$ = closure for A, and $A^\circ$ = interior of A)

**Options :**

1. $\overline{A} \cap \overline{(A^\circ)}$

2. $\overline{A} \cap A'$

3. $\overline{A} \cap \overline{A'}$

4. $\overline{A} - A$

**Question Number : 106 Question Id : 6232179881 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

For $n \in \mathbb{Z}^+$ and $\overline{x} = (x_1, x_2, \ldots, x_n) \in \mathbb{R}^n$, define $\| x \| = \left( \sum_{i=1}^{n} x_i^2 \right)^{\frac{1}{2}}$. Then for $\overline{x} = (3, 4, 5)$ and $\overline{y} = (4, 4, 0)$ in $\mathbb{R}^3$, $\| \overline{x} \| \cdot \| \overline{y} \| =$

**Options :**

1. $29\sqrt{2}$

2. $200$

3. $100\sqrt{2}$

4. $40$

**Question Number : 107 Question Id : 6232179882 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

A subspace of the vector space $\mathbb{R}^3$ over the field $\mathbb{R}$ among the following is

**Options :**

1. $\{(a, b, c) \in \mathbb{R}^3 \mid a + 2b + 3c = 6\}$

2. $\{(x, y, z) \in \mathbb{R}^3 \mid 3x = 7y\}$

3. $\{(a, b, c) \in \mathbb{R}^3 \mid a^2 + b^2 = c^2\}$

4. $\{(x, y, z) \in \mathbb{R}^3 \mid x + y + z = xyz\}$

**Question Number : 108 Question Id : 6232179883 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $W_1$, $W_2$ are subspaces of a finite dimensional vector space V such that $\dim W_1 = 8$, $\dim(W_1 + W_2) = 13$ and $\dim(W_1 \cap W_2) = 4$, then $\dim W_2 =$

**Options :**

1. $7$

2. $8$

3. $9$

4. $10$

**Question Number : 109 Question Id : 6232179884 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $\varphi$ is the linear transformation defined from the vector space $\mathbb{R}^3$ into $\mathbb{R}^3$ by $\varphi(x_1, x_2, x_3) = (x_1 + 2x_2, x_2 + x_3, x_2)$ for all $(x_1, x_2, x_3) \in \mathbb{R}^3$, then dimension of Kernel of $\varphi$ is

**Options :**

1. $0$

2. $1$

3. $2$

4. $3$

**Question Number : 110 Question Id : 6232179885 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let T be a linear transformation from the vector space $\mathbb{R}^3$ into itself defined by $T(x, y, z) = (x + 2y, x - 2y, z)$ for all $(x, y, z) \in \mathbb{R}^3$. If $B = \{(1, 0, 0), (1, 1, 0), (1, 1, 1)\}$, then the matrix $[T]_B$ =

**Options :**

1. $\begin{bmatrix} 0 & 4 & 4 \\ 1 & 1 & 2 \\ 0 & 0 & 1 \end{bmatrix}$

2. $\begin{bmatrix} 0 & 4 & 4 \\ 1 & -1 & -2 \\ 0 & 0 & 1 \end{bmatrix}$

3. $\begin{bmatrix} 0 & 1 & 0 \\ 4 & 1 & 0 \\ 0 & -2 & 1 \end{bmatrix}$

4. $\begin{bmatrix} 0 & 1 & 0 \\ 4 & -1 & 0 \\ 4 & -2 & 1 \end{bmatrix}$

**Question Number : 111 Question Id : 6232179886 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

A basis for the vector space $\mathbb{R}^3$ over the field $\mathbb{R}$ among the following is

**Options :**

1. $\{(2, -1, 4), (-1, 3, 2), (1, 7, 14)\}$

2. $\{(0, 1, -5), (-1, 3, 4), (-2, 8, -2)\}$

3. $\{(4, 1, 3), (-2, 3, -1), (-2, 10, 0)\}$

4. $\{(2, 4, -1), (3, -1, 5), (5, 3, -6)\}$

**Question Number : 112 Question Id : 6232179887 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let A be a $3 \times 3$ matrix with $\det A = 5$, then determinant of the adjoint of the matrix A is

**Options :**

1. 10

2. 40

3. 1600

4. 25

**Question Number : 113 Question Id : 6232179888 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The rank of the matrix $A = \begin{bmatrix} 3 & 4 & 1 & 5 \\ 1 & 2 & 1 & 4 \\ 2 & 0 & -2 & -6 \\ 7 & 8 & 1 & 7 \\ 5 & 4 & -1 & -1 \end{bmatrix}$ is

**Options :**

1. 5

2. 4

3. 3

4. 2

**Question Number : 114 Question Id : 6232179889 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $A = \begin{bmatrix} 3 & 4 & 8 \\ 6 & 5 & 3 \\ 2 & 9 & 1 \end{bmatrix}$ and if A = B + C where B is a symmetric matrix and C is a skew-symmetric matrix, then C =

**Options :**

1. $\begin{bmatrix} 0 & -1 & 3 \\ 1 & 0 & -3 \\ -3 & 3 & 0 \end{bmatrix}$

2. $\begin{bmatrix} 0 & -2 & 6 \\ 2 & 0 & -6 \\ -6 & 6 & 0 \end{bmatrix}$

3. $\begin{bmatrix} 0 & 1 & -3 \\ -1 & 0 & 3 \\ 3 & -3 & 0 \end{bmatrix}$

4. $\begin{bmatrix} 0 & 2 & -6 \\ -2 & 0 & 6 \\ 6 & -6 & 0 \end{bmatrix}$

**Question Number : 115 Question Id : 6232179890 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

For the system of equations

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

$$x + 3y + 2z = 4$$

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

to have no solution, a possible solution for $(\alpha, \beta) =$

**Options :**

1. $(-6, 2)$

2. $(-6, 4)$

3. $(-3, 2)$

4. $(-3, 4)$

**Question Number : 116 Question Id : 6232179891 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $\alpha, \beta, \gamma$ are the Eigen values of the matrix $\begin{bmatrix} 7 & 3 & -1 \\ 4 & -1 & 2 \\ 0 & 3 & -6 \end{bmatrix}$, then $\alpha\beta + \beta\gamma + \gamma\alpha =$

**Options :**

1. $-60$

2. $60$

3. $-61$

4. $61$

**Question Number : 117 Question Id : 6232179892 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

For the matrix $A = \begin{bmatrix} 1 & 4 & -7 \\ 2 & 3 & 5 \\ -6 & 1 & 8 \end{bmatrix}$, if $A^{-1} = \alpha A^2 + \beta A + \gamma I$, then $7\alpha - \beta + 4\gamma =$

**Options :**

1. $5$

2. $1$

3. $\frac{1}{5}$

4. $-1$

**Question Number : 118 Question Id : 6232179893 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If T is the linear operator on $\mathbb{R}^3$ defined by $T(x,y,z) = (x + 2y, 2x + 3y - z, y - z)$ for all $(x,y,z) \in \mathbb{R}^3$, and if $2T^3 - 6T^2 - 8T = \lambda I$, then $\lambda =$

**Options :**

1. $1$

2. 2

3. 3

4. 4

**Question Number : 119 Question Id : 6232179894 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let T be the linear operator defined on $\mathbb{R}^2$ by $T(x_1, x_2) = (x_1, 0)$ for all $(x_1, x_2) \in \mathbb{R}^2$. Suppose $B = \{(1, 0), (0, 1)\}$ and $B' = \{(1, 1), (2, 1)\}$ be ordered bases for $\mathbb{R}^2$. If P is a non-singular matrix such that $[T]_{B'} = P^{-1}[T]_B P$, then P =

**Options :**

1. $\begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix}$

2. $\begin{bmatrix} 1 & 2 \\ 1 & 1 \end{bmatrix}$

3. $\begin{bmatrix} -1 & 2 \\ 1 & -1 \end{bmatrix}$

4. $\begin{bmatrix} -1 & 1 \\ 2 & -1 \end{bmatrix}$

**Question Number : 120 Question Id : 6232179895 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let q be the quadratic form on the vector space $\mathbb{R}^2$ over the field $\mathbb{R}$ defined by

$$q(x, y) = 5x^2 + 4xy + 7y^2 \text{ for all } (x, y) \in \mathbb{R}^2.$$

If f is the symmetric bilinear transformation associated with q, then $f((1, -2), (2, -1)) =$

**Options :**

1. $14$

2. $21$

3. $28$

4. $56$

**Question Number : 121 Question Id : 6232179896 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If z is a complex number and $z_k = \cos\frac{\pi}{2^k} + i\sin\frac{\pi}{2^k}$, $k = 1, 2, 3, ....$, then $z_1 . z_2 . .... \infty$

**Options :**

1. $-1$

2. $0$

3. $1$

4. $\infty$

**Question Number : 122 Question Id : 6232179897 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $\beta$ is real, the values of z such that $\sqrt{2}\sin z = \cosh\beta + i\sinh\beta$ are

**Options :**

1. $z = \frac{n\pi}{2} + (-1)^n\left(\frac{3\pi}{4} + i\beta\right),\ n = 0, \pm1, \pm2, ....$

2. $z = n\pi + (-1)^n\left(\frac{\pi}{2} - i\beta\right),\ n = 0, \pm1, \pm2, ....$

3. $z = n\pi + (-1)^n \left( \frac{\pi}{4} + i\beta \right),\ n = 0, \pm 1, \pm 2, \ldots.$

4. $z = \frac{n\pi}{2} + (-1)^n \left( \frac{\pi}{4} - i\beta \right),\ n = 0, \pm 1, \pm 2, \ldots.$

**Question Number : 123 Question Id : 6232179898 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The values of z satisfying the equation $e^z = -2$ are

**Options :**

1. $z = \ell n\, 2 \pm 2\, n\, \pi\, i, \qquad n = 0, 1, 2, \ldots..$

2. $z = \ell n\, 2 \pm (2n + 1)\, \pi\, i, \qquad n = 0, 1, 2, \ldots..$

3. $z = \ell n\, 2 - (2n - 1)\, \pi\, i, \qquad n = 0, 1, 2, \ldots..$

4. $z = \ell n\, 2 + (2n - 1)\, \pi\, i, \qquad n = 0, 1, 2, \ldots..$

**Question Number : 124 Question Id : 6232179899 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $f(z) = u + i\upsilon$ is an analytic function of $z = x + iy$ and $u + \upsilon = (x + y)(2 - 4xy + x^2 + y^2)$ then $u(x, y) =$ (c is an arbitrary constant).

**Options :**

1. $2x^3 - 3x^2y + y + c$

2. $2x - 3x^2y + y^3 + c$

3. $2x^2 - 3xy^2 + y^3 + c$

4. $2x^2 - 3xy + y^3 + c$

**Question Number : 125 Question Id : 6232179900 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $f(z) = u + i\upsilon$ is an analytic function of $z = x + iy$ and $u + \upsilon = (x + y)(2 - 4xy + x^2 + y^2)$ then $\upsilon(x, y) =$ (c is an arbitrary constant).

**Options :**

1. $x^2 - 3xy + y^2 + c$

2. $x^3 - 3x^2y + 3y + c$

3. $x^3 - 3xy^2 + 2y + c$

4. $x^3 + 3x^2y + y^2 + c$

**Question Number : 126 Question Id : 6232179901 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If C is the arc of the circle $|z| = 2$ from $\theta = 0$ to $\theta = \frac{\pi}{3}$, then $\int_C z^2 dz =$

**Options :**

1. $\frac{-16}{3}$

2. $\frac{-8}{3}$

3. $6\pi i$

4. $0$

**Question Number : 127 Question Id : 6232179902 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The value of the integral $\oint_C \frac{z^2+1}{z(2z-1)}dz, C : |z| = 1$ is equal to

**Options :**

1. $\frac{5\pi i}{2}$

2. $\frac{9\pi i}{2}$

3. $\frac{\pi i}{2}$

4. $2\pi i$

**Question Number : 128 Question Id : 6232179903 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $\phi(\xi) = \int_C \frac{4z^2+z+5}{(z-\xi)}dz$ and C is the ellipse $\left(\frac{x}{2}\right)^2 + \left(\frac{y}{3}\right)^2 = 1$, then $\phi'(-1) =$

**Options :**

1. $2\pi i$

2. $-7\pi i$

3. $-14\pi i$

4. $8\pi i$

**Question Number : 129 Question Id : 6232179904 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The radius of convergence of the power series $\sum \frac{(n!)^2 z^n}{(2n)!}$ is

**Options :**

1. $\frac{1}{4}$

2. $1$

3. $4$

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

**Question Number : 130 Question Id : 6232179905 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The Laurent series expansion of $f(z) = \frac{7z-2}{(z+1)z(z-2)}$ in the region $1 < z+1 < 3$, is

**Options :**

1. $f(z) = \frac{1}{z+1} - \frac{2}{(z+1)^2} - \frac{3}{(z+1)^3} + \ldots$

2. $f(z) = \frac{2}{z+1} - \frac{1}{(z+1)^2} + \frac{3}{(z+1)^3} + \ldots$

3. $f(z) = \frac{-2}{z+1} + \frac{1}{(z+1)^2} + \frac{1}{(z+1)^3} + \ldots$

4. $f(z) = \frac{-1}{z+1} + \frac{2}{(z+1)^2} + \frac{1}{(z+1)^3} + \ldots$

**Question Number : 131 Question Id : 6232179906 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The sum of the residues corresponding to the poles of the function $f(z) = \frac{z^2}{(z-1)^2(z+2)}$ inside the circle $|z| = 2.5$, is

**Options :**

1. $-1$

2. $1$

3. $\frac{4}{9}$

4. $2$

**Question Number : 132 Question Id : 6232179907 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The residue of the function $f(z) = \frac{1}{z(e^z - 1)}$ at the origin is

**Options :**

1. $1$

2. $\frac{1}{2}$

3. $-\frac{1}{2}$

4. $2$

**Question Number : 133 Question Id : 6232179908 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The angle of rotation of the transformation $\omega = z^2$ at the point $z = 1 + i$ is

**Options :**

1. $\frac{\pi}{6}$

2. $\frac{\pi}{4}$

3. $\frac{\pi}{3}$

4. $\frac{\pi}{2}$

**Question Number : 134 Question Id : 6232179909 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The bilinear transformation $\omega = \frac{az + b}{cz + d}$, $ad - bc \neq 0$ is conformal at z =

**Options :**

1. $0$

2. $1$

3. $i$

4. $\infty$

**Question Number : 135 Question Id : 6232179910 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The Mobius transformation that sends the points $z = 0, -i, 2i$ into the points $\omega = 5i, \infty, \frac{-i}{3}$ respectively, is w =

**Options :**

1. $\frac{-3z+5i}{-iz+1}$

2. $\frac{8z+5i}{iz-1}$

3. $\frac{3z+2i}{iz+1}$

4. $\frac{-z+3i}{z-i}$

**Question Number : 136 Question Id : 6232179911 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If A has 8 elements, then the number of bijections f from A to A such that f(x) = x holds exactly for 2 elements of A is

**Options :**

1. 1484

2. 1855

3. 7420

4. 3710

**Question Number : 137 Question Id : 6232179912 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If 9 boys are sitting in a row, then the number of ways of selecting 4 out of them so that no two adjacent boys are selected is

**Options :**

1. 15

2. 12

3. 24

4. 30

**Question Number : 138 Question Id : 6232179913 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $\varphi$ is the Euler's function and if $\varphi(\varphi(2^{15}.3^{17})) = 2^{\alpha}.3^{\beta}$, then $\alpha + \beta =$

**Options :**

1. 32

2. 31

3. 30

4. 29

**Question Number : 139 Question Id : 6232179914 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If k is the largest positive integer such that $6^k$, divides (135)!, then k =

**Options :**

1. 88

2. 66

3. 44

4. 33

**Question Number : 140 Question Id : 6232179915 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

For $x, y \in \mathbb{R}$, define $f_{x,y} : \mathbb{R} \to \mathbb{R}$ by $f_{x,y}(t) = x.t + y$ for all $t \in \mathbb{R}$. If, in the group $G = \{f_{x,y} \mid x, y \in \mathbb{R}\}$, $(f_{3,5})^{-1} = f_{a,b}$, then $(a, b) =$

**Options :**

1. $(5, 3)$

2. $\left(\frac{1}{3}, \frac{-5}{3}\right)$

3. $\left(\frac{1}{5}, \frac{-3}{5}\right)$

4. $(5, -3)$

**Question Number : 141 Question Id : 6232179916 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let G be a finite abelean group and H, K be subgroups of G such that $O(H) = 6$, $O(H \cap K) = 3$ and $O(HK) = 24$, then $O(K) =$

**Options :**

1. 3

2. 6

3. 8

4. 12

**Question Number : 142 Question Id : 6232179917 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let $S_{10}$ be the group of all permutations of 10 elements. Suppose $f = (2\ 5\ 7\ 9\ 10) \circ (1\ 3\ 5\ 6\ 7) \circ (1\ 2\ 4\ 8\ 9)$. Then $(f^{-1} \circ f^{-1})(9) =$

**Options :**

1. 6

2. 5

3. 7

4. 10

**Question Number : 143 Question Id : 6232179918 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let $\mathbb{Z}_8$ be the ring of all residue classes of integers modulo 8. Define a homomorphism $f : \mathbb{Z} \to \mathbb{Z}_8$ by $f(n) = \bar{r}$, where $n = 8K + r$ with $r, K \in \mathbb{Z}$ and $0 \leq r \leq 7$. Then Ker f =

**Options :**

1. $\{0\}$

2. $\mathbb{Z}$

3. $4\mathbb{Z}$

4. $8\mathbb{Z}$

**Question Number : 144 Question Id : 6232179919 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The number of zero divisors other than $\bar{0}$ in the ring $(\mathbb{Z}_{12}, +_{12}, \times_{12})$ of all residue classes of integers modulo 12 is

**Options :**

1. 4

2. 5

3. 6

4. $7$

**Question Number : 145 Question Id : 6232179920 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

In the field $(\mathbb{Z}_{19}, +_{19}, \times_{19})$ of all residue classes of integers modulo 19, $(\overline{12}) \times_{19} (\overline{14})^{-1} =$

**Options :**

1. $\overline{17}$

2. $\overline{7}$

3. $\overline{12}$

4. $\overline{9}$

**Question Number : 146 Question Id : 6232179921 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The G.C.D. of $12 + 11i$ and $7 + i$ in the ring $\mathbb{Z}[i]$ of all Gaussian integers is

**Options :**

1. $1 - 2i$

2. $2 - i$

3. $1 + 2i$

4. $2 + i$

**Question Number : 147 Question Id : 6232179922 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

In the polynomial ring $\mathbb{Z}[x]$, a polynomial which is not irreducible among the following is

**Options :**

1. $x^3 - 9x + 15$

2. $7x^4 - 2x^3 + 6x^2 + 10x + 14$

3. $3x^3 + 5x^2 + 10x + 35$

4. $2x^3 + 7x^2 + 14x + 12$

**Question Number : 148 Question Id : 6232179923 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The order of the Galois group of the polynomial $x^3 - 2 \in \mathbb{Q}[x]$ is

**Options :**

1. 2

2. 4

3. 6

4. 8

**Question Number : 149 Question Id : 6232179924 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let $\mathbb{R}$ be the set of all real numbers with standard topology. Then the number of elements in the boundary of the set $A = (1, 3] \cup [5, 7)$ in $\mathbb{R}$ is

**Options :**

1. 4

2. 3

3. 1

4. 0

**Question Number : 150 Question Id : 6232179925 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Let X be the set of all real numbers and $\tau = \{A \subseteq X \mid A = \phi \text{ or } X - A \text{ is finite}\}$. Then the number of subsets of the topological space $(X, \tau)$ which are not connected subspaces, is

**Options :**

1. $0$

2. $4$

3. $2$

4. Infinite

**Question Number : 151 Question Id : 6232179926 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The particular integral of the equation $16y'' + 8y' + y = 48\, x\, e^{-x/4}$ is

**Options :**

1. $y(x) = \frac{1}{2}x^3 e^{-x/4}$

2. $y(x) = 12x\, e^{-x/4}$

3. $y(x) = -16x^2\, e^{-x/4}$

4. $y(x) = -6x^3\, e^{-x/4}$

**Question Number : 152 Question Id : 6232179927 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The singular solution of the differential equation $p = \ell n\,(px - y)$, $p = \frac{dy}{dx}$ is

**Options :**

1. $y = e^{-x}(\ell n\, x + 1)$

2. $y = \frac{x}{2}(\ell n\, x + 1)$

3. $y = e^{x}(\ell n\, x - 1)$

4. $y = x(\ell n\, x - 1)$

**Question Number : 153 Question Id : 6232179928 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The Eigen values of the Sturm-Liouville problem $y'' + \lambda y = 0$, $\lambda \neq 0$ with $y(0) + y'(0) = 0$ and $y(1) + y'(1) = 0$ are

**Options :**

1. all purely imaginary

2. real for $\lambda < 0$ and complex for $\lambda > 0$

3. real for $\lambda > 0$ and complex for $\lambda < 0$

4. all real

**Question Number : 154 Question Id : 6232179929 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The solution of the differential equation $(5x^3 + 12x^2 + 6y^2)\, dx + 6\, xy\, dy = 0$ is

**Options :**

1. $3xy + 3x^2 + x^4 = c$

2. $3x^2y^2 + 3x^4 + x^5 = c$

3. $3xy^2 - 3x^4 - x^3 = c$

4. $2x^2y - 3x^3 - x^4 = c$

**Question Number : 155 Question Id : 6232179930 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The solution of the system of equations $\frac{dx}{dt} = 2y - 1$, $\frac{dy}{dt} = 1 + 2x$, with $x(0) = \frac{3}{2}$ and $y(0) = \frac{9}{2}$ is

**Options :**

1. $x = 2e^{2t} - 2e^{-2t} + \frac{1}{2}$, $y = 3e^{2t} - e^{-2t} - \frac{1}{2}$

2. $x = 2e^{2t} - 3e^{-2t}$, $y = e^{2t} + 3e^{-2t}$

3. $x = 3e^{2t} - e^{-2t}$, $y = 2e^{2t} - e^{-2t}$

4. $x = 3e^{2t} - e^{-2t} - \frac{1}{2}$, $y = 3e^{2t} + e^{-2t} + \frac{1}{2}$

**Question Number : 156 Question Id : 6232179931 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The Green's function for the boundary value problem $\frac{d^2y}{dx^2} - y = 0$ with $y(0) = y(1) = 0$ is $G(x, t) =$

**Options :**

1. $\frac{\sinh x \sinh(t-1)}{\sinh 1}, x < t \;;\; \frac{\sinh t \sinh(x-1)}{\sinh 1}, x > t$

2. $\frac{\sinh x \cosh(t-1)}{\sinh 1}, x < t \; ; \; \frac{\sinh t \cosh(x-1)}{\sinh 1}, x > t$

3. $\frac{\cosh x \sinh(t-1)}{\sinh 1}, x < t \; ; \; \frac{\cosh t \sinh(x-1)}{\sinh 1}, x > t$

4. $\frac{\cosh x \cosh(t-1)}{\cosh 1}, x < t \; ; \; \frac{\sinh t \sinh(x-1)}{\cosh 1}, x > t$

**Question Number : 157 Question Id : 6232179932 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The particular integral of the differential equation $y'' + y = \text{cosec } x$, is

**Options :**

1. $y_p = x \cos x - \sin x \log \sin x$

2. $y_p = -x \cos x + \sin x \log \sin x$

3. $y_p = -x \sin x + \cos x \log \cos x$

4. $y_p = x \sin x - \cos x \log \cos x$

**Question Number : 158 Question Id : 6232179933 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The complete solution of the partial differential equation $2xz - px^2 - 2qxy + pq = 0$ is

**Options :**

1. $z - ay = b(x^2 - a)$

2. $\log(z - ax) = y - a \log(b + y)$

3. $z - a e^y = b(x^2 + a)$

4. $z - 4ay = b(ax - 2)$

**Question Number : 159 Question Id : 6232179934 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The general solution of the partial differential equation $xzp + yzq = xy$ is

**Options :**

1. $\phi\left(\frac{y}{x}, xy - z\right) = 0$

2. $\phi\left(\frac{x}{y}, xy - z^2\right) = 0$

3. $\phi\left(\frac{y}{z}, yz - x\right) = 0$

4. $\phi\left(\frac{x}{y}, xz - y^2\right) = 0$

**Question Number : 160 Question Id : 6232179935 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The particular integral of the partial differential equation

$$(D^2 - DD' + D' - 1)z = \cos(x + 2y) + e^y \text{ is}$$

**Options :**

1. $\frac{1}{2}\sin(x + 2y) - xe^y$

2. $\frac{1}{2}\sin(x + 2y) - ye^y$

3. $2\sin(x+2y)+ye^{y}$

4. $-2\sin(x+2y)+xe^{y}$

**Question Number : 161 Question Id : 6232179936 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The partial differential equation $\frac{\partial^2 z}{\partial x^2}+y^2\frac{\partial^2 z}{\partial y^2}=y,\ y\neq 0$ is

**Options :**

1. a linear parabolic equation

2. a linear elliptic equation

3. a linear hyperbolic equation

4. a non-linear hyperbolic equation

**Question Number : 162 Question Id : 6232179937 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The general solution of the differential equation $(D^2+DD'-2D'^2)z=(y+1)e^{x}$ is

**Options :**

1. $z=\phi_1(y-x)+\phi_2(y-2x)-ye^{x}$

2. $z=\phi_1(y+x)+\phi_2(y-2x)+xe^{y}$

3. $z=\phi_1(y-x)+\phi_2(y+2x)+ye^{x}$

4. $z=\phi_1(y+x)+\phi_2(y-2x)+ye^{x}$

**Question Number : 163 Question Id : 6232179938 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The value of f(2) obtained by applying the Lagrange's interpolation formula for the following tabular data is

| x | 0 | 1 | 4 | 6 |
|---|---|---|---|---|
| f(x) | 1 | −1 | 1 | −1 |

**Options :**

1. 2.2114

2. 2.5334

3. 2.4664

4. 2.3334

**Question Number : 164 Question Id : 6232179939 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The value of x + y + z obtained by solving the following linear equations correct to three decimal places using Gauss-Seidal method is

$$10x + 2y + z = 9$$

$$2x + 20y - 2z = -44$$

$$-2x + 3y + 10z = 22$$

**Options :**

1. 2.453

2. 2.276

3. 2.018

4. 1.822

**Question Number : 165 Question Id : 6232179940 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Given the following tabular data, the value of x for which y is minimum, is

| x | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|
| y | 0.205 | 0.240 | 0.259 | 0.262 | 0.250 | 0.224 |

**Options :**

1. 5.7015

2. 5.6875

3. 5.5612

4. 5.4863

**Question Number : 166 Question Id : 6232179941 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The coordinates of points on a curve are given in the following table

| X | 0.00 | 0.25 | 0.50 | 0.75 | 1.0 |
|---|---|---|---|---|---|
| f(x) | 1.0000 | 0.9896 | 0.9589 | 0.9089 | 0.8415 |

The volume of revolution (in cubic units) obtained by Simpson's $\frac{1}{3}$ rule, when the area under the curve bounded by the lines $x = 0$ and $x = 1$ and the X-axis is rotated about the X-axis is

**Options :**

1. 2.7218

2. 2.7643

3. 2.8192

4. 2.9025

**Question Number : 167 Question Id : 6232179942 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The solution of $y' = x - y$ with $y(0) = 1$ at $x = 0\ (0.2)\ 0.6$ using Euler's method is

**Options :**

1. 0.679

2. 0.654

3. 0.641

4. 0.624

**Question Number : 168 Question Id : 6232179943 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

Given the initial value problem $\frac{dy}{dx} = x(y - x)$; $y(2) = 3$, the value of $y(2.2)$ obtained by using fourth order Runge-Kutta method with step size $h = 0.2$, is

**Options :**

1. 3.4725

2. 3.6037

3. 3.6214

4. 3.6359

**Question Number : 169 Question Id : 6232179944 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The value of $f(5.0)$ obtained by fitting a natural cubic spline to the following data, is

| x | 3.0 | 4.5 | 7.0 | 9.0 |
|---|---|---|---|---|
| y = f(x) | 2.5 | 1.0 | 2.5 | 0.5 |

**Options :**

1. 1.1467

2. 1.1635

3. 1.1532

4. 1.1255

**Question Number : 170 Question Id : 6232179945 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The extremal of the functional $\int_0^1 y'^2 dx$ under the constraint $\int_0^1 y\,dx = 2$, given $y(0) = 0$ and $y(1) = 1$ is

**Options :**

1. $y = \frac{x}{2} + 1$

2. $y = -1 + 2x + x^2$

3. $y = 1 - 6x - 6x^2$

4. $y = 3x^2 - x + 1$

**Question Number : 171 Question Id : 6232179946 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The curve connecting the given points A and B which is traversed by a particle sliding from A to B in the shortest time, ignoring friction and resistance of the medium, is a

**Options :**

1. circle

2. catenary

3. circular helix

4. cycloid

**Question Number : 172 Question Id : 6232179947 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The Euler's equation for the extremals of the functional $\int_{x_1}^{x_2} (y^2 - y\,y' + y'^2)\,dx$, is

**Options :**

1. $y'' - y = 0$

2. $y'' + y = x$

3. $y'' - 6x = 0$

4. $y'' - 3y' = 0$

**Question Number : 173 Question Id : 6232179948 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The solution of the integral equation $\phi(x) = \sin x + 2\int_0^x e^{x-\xi}\phi(\xi)\,d\xi$ is

**Options :**

1. $\phi(x) = \frac{2}{5}e^{2x} - \frac{1}{5}\cos x + \frac{3}{5}\sin x$

2. $\phi(x) = \frac{1}{5}e^{2x} - \frac{3}{5}\cos x + \frac{2}{5}\sin x$

3. $\phi(x) = \frac{1}{5}e^{3x} + \frac{2}{5}\cos x - \frac{3}{5}\sin x$

$$\phi(x) = \frac{e^{3x}}{5} - \frac{1}{5}\cos x + \frac{2}{5}\sin x$$

4.

**Question Number : 174 Question Id : 6232179949 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The solution of the integral equation $\phi(x) = e^x + \lambda\int_0^1 2e^x e^{\xi}\phi(\xi)\,d\xi$ obtained by the method of separable Kernels, is

**Options :**

$$\phi(x) = \frac{2}{1+\lambda(e^2-1)}e^x$$

1.

$$\phi(x) = \frac{1}{1+\lambda(e^2+1)}e^x$$

2.

$$\phi(x) = \frac{1}{2-\lambda(e^2-1)}e^x$$

3.

$$\phi(x) = \frac{1}{1-\lambda(e^2-1)}e^x$$

4.

**Question Number : 175 Question Id : 6232179950 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The solution of the integral equation $\phi(x) = \frac{5x}{6} + \frac{1}{2}\int_0^1 x\,\xi\,\phi(\xi)\,d\xi$ obtained by the method of resolvant Kernel, is

**Options :**

$$e^x$$

1.

$$x$$

2.

3. $\frac{5x}{6}+\frac{1}{4}$

4. $\frac{5x}{6}+\frac{x^2}{4}$

**Question Number : 176 Question Id : 6232179951 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

The Eigen values of the homogeneous integral equation $\phi(x)=\lambda\int_0^{\pi}\cos(x+\xi)\,\phi(\xi)\,d\xi$ with separable Kernels, are

**Options :**

1. $-\frac{1}{\pi};\ \frac{1}{\pi}$

2. $-\frac{2}{\pi};\ \frac{2}{\pi}$

3. $-\frac{1}{2};\ \frac{1}{2}$

4. $-\frac{1}{2\pi};\ \frac{1}{2\pi}$

**Question Number : 177 Question Id : 6232179952 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If the transformation $Q=q^{\alpha}\cos(\beta p),\ P=q^{\alpha}\sin(\beta p)$ is canonical, then

**Options :**

1. $\alpha=2,\ \beta=\frac{1}{2}$

2. $\alpha = 2, \beta = 1$

3. $\alpha = \frac{1}{2}, \beta = 2$

4. $\alpha = 0, \beta = 1$

**Question Number : 178 Question Id : 6232179953 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

A particle of unit mass is moving under gravitational field along the curve

$$x = \theta - \sin\theta, \; y = 1 + \cos\theta.$$

Then the Lagrangian L for this motion is

**Options :**

1. $\dot{\theta}^2(1+\cos\theta) - g(1-\cos\theta)$

2. $\dot{\theta}^2(1+\cos\theta) + g(1+\cos\theta)$

3. $\dot{\theta}^2(1-\cos\theta) - g(1+\cos\theta)$

4. $\frac{\dot{\theta}^2}{2}(1+\cos\theta) + g(1+2\cos\theta)$

**Question Number : 179 Question Id : 6232179954 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

For a moving body in space, if the Hamiltonian, with the usual notation is

$$H = \frac{1}{2q^2}[1 + p^2q^6],$$

then its Lagrangian L is equal to

**Options :**

1. $\frac{\dot{q}^2}{2q^4}$

2. $\frac{\dot{q}^2}{2q^4} - \frac{1}{2q^2}$

3. $\frac{q^2}{2\dot{q}^4} + \frac{1}{2q^2}$

4. $\frac{\dot{q}^2}{2q^4} + \frac{1}{2q^2}$

**Question Number : 180 Question Id : 6232179955 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Wrong Marks : 0**

If $I_1$, $I_2$, $I_3$ represent the principal moments of inertia of a rigid body and $\omega = (\omega_1, \omega_2, \omega_3)$ is the angular velocity with components along the three principal axes, then the z-component of the torque acting on the body in general is

**Options :**

1. $I_3\ \omega_3 + (I_2 - I_1)\ \omega_1\omega_2$

2. $I_3\ \omega_3 - (I_2 - I_1)\ \omega_1\omega_2$

3. $I_3\ \dot{\omega}_3 + (I_2 - I_1)\ \dot{\omega}_1\dot{\omega}_2$

4. $I_3\ \dot{\omega}_3 + (I_2 - I_1)\ \omega_1\omega_2$