Entrance Exam

2024



QUESTION PAPER

aglasem.com

Andhra Pradesh State Council of Higher Education

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	MATHEMATICS 4th May 2024 Shift 1
Duration :	120
Total Marks :	140
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No

Show Progress Bar :	No
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

Research Methodology

Section Id :	971036517
Section Number :	1
Mandatory or Optional :	Mandatory
Number of Questions :	66
Section Marks :	70
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 1 Question Id : 97103636379 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a characteristic of reflective teaching?

Options :

1. ✖ Memorization of facts

2. ✖ Understanding complex concepts

3. ✔ Critical analysis of teaching methods

4. ✖ Repetition of instructional materials

Question Number : 2 Question Id : 97103636380 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the key objective of teaching?

Options :

1. ✖ Fostering confusion

2. ✖ Encouraging passive learning

3. ✔ Promoting critical thinking

4. ✖ Discouraging creativity

Question Number : 3 Question Id : 97103636381 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a challenge associated with MOOCs?

Options :

1. ✖ Lack of course variety

2. ✔ Low completion rate

3. ✖ Limited scalability

4.

✖ High cost for learners

Question Number : 4 Question Id : 97103636382 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is a basic requirement for effective teaching?

Options :

1. ✖ Rigid adherence to lesson plans

2. ✖ Lack of flexibility

3. ✔ Adequate preparation

4. ✖ Limited student engagement

Question Number : 5 Question Id : 97103636383 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a characteristic of adolescents?

Options :

1. ✖ Highly stable emotional states

2. ✖ Well-developed cognitive abilities

3. ✖ Strong sense of identity

4. ✔ Rapid physical growth and change

Question Number : 6 Question Id : 97103636384 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of these statements best describes the enrolment process for MOOCs?

Options :

1. ✖ Strict eligibility criteria apply

2. ✖ Limited enrolment slots available

3. ✔ Open to anyone with internet access

4. ✖ Requires payment before enrolment

Question Number : 7 Question Id : 97103636385 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which method of teaching places more emphasis on the active involvement of learners?

Options :

1. ✖ Teacher-centered

2. ✖ Lecture-based

3. ✔ Learner-centered

4. ✖ Rote memorization

Question Number : 8 Question Id : 97103636386 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is a characteristic of qualitative research?

Options :

1. ✖ Focuses on numerical data

2. ✖ Emphasizes statistical analysis

3. ✔ Seeks to understand phenomena in depth

4. ✖ Utilizes controlled experiments

Question Number : 9 Question Id : 97103636387 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which approach to research emphasizes the importance of observable facts and data?

Options :

1. ✖ Post-positivistic

2. ✖ Constructivist

3. ✖ Phenomenological

4. ✔ Positivist

Question Number : 10 Question Id : 97103636388 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which type of research focuses on examining cause-and-effect relationships?

Options :

1. ✔ Experimental

2. ✖ Descriptive

3. ✖ Historical

4. ✖ Qualitative

Question Number : 11 Question Id : 97103636389 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What are the basic steps of research in sequential order?

Options :

1. ✖ Analysis, Conclusion, Data Collection, Hypothesis

2. ✖ Data Collection, Hypothesis, Analysis, Conclusion

3. ✔ Hypothesis, Data Collection, Analysis, Conclusion

4. ✖ Conclusion, Data Collection, Hypothesis, Analysis

Question Number : 12 Question Id : 97103636390 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Where are the references typically included in a thesis?

Options :

1. ✖ In-text citations only

2. ✖ Footnotes exclusively

3. ✖ Endnotes solely

4. ✔ Bibliography

Question Number : 13 Question Id : 97103636391 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How does ICT contribute to governance?

Options :

1. ✖ By reducing transparency

2. ✖ Decreasing efficiency in data analysis

3. ✔ By improving efficiency and transparency

4. ✖ By limiting access to information

Question Number : 14 Question Id : 97103636392 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which aspect is addressed by research ethics?

Options :

1. ✖ Maximizing researcher's benefits

2. ✔ Ensuring confidentiality of participants

3. ✖ Minimizing data validity

4. ✖ Ignoring informed consent

Question Number : 15 Question Id : 97103636393 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How does mass media influence society?

Options :

1. ✖ Limits access to information

2. ✖ Reduces cultural diversity

3. ✔ Shapes public opinion

4. ✖ Decreases social interaction

Question Number : 16 Question Id : 97103636394 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which method of research aims to provide a detailed description of a phenomenon or situation?

Options :

1. ✖ Experimental

2. ✔ Descriptive

3. ✖ Historical

4. ✖ Qualitative

Question Number : 17 Question Id : 97103636395 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What type of communication involves the exchange of information through spoken or written words?

Options :

1. ✖ Non-verbal communication

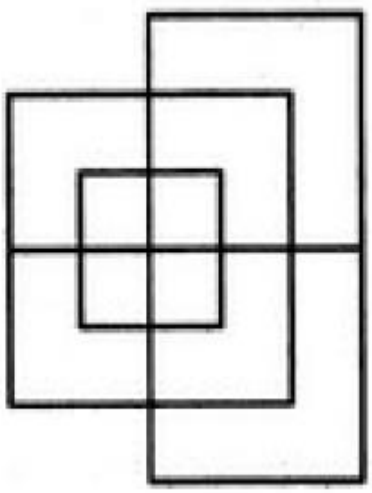
2. ✖ Inter-cultural communication

3. ✖ Group communication

4. ✔ Verbal communication

Question Number : 18 Question Id : 97103636396 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruct Time : 0

Find the minimum number of straight lines required to make the given figure.



Options :

1. ✔ 13

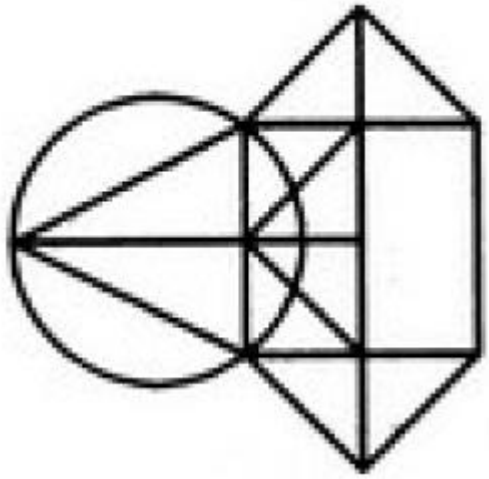
2. ✖ 15

3. ✖ 17

4. ✖ 19

Question Number : 19 Question Id : 97103636397 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Find the number of triangles in the given figure.



Options :

1. ✖ 10

2. ✖ 12

3. ✔ 14

4. ✖ 16

Question Number : 20 Question Id : 97103636398 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Suppose NOIDA is written as OPJEB then what will be the code for DELHI

Options :

1. ✔ EMMIJ

2. ✖ EFMAK

3. ✖ EFAMK

4. ✖ EFMIK

Is Section Default? : null

Question Id : 97103636399 Sub Question Shuffling Allowed : Yes Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (21 to 25)

Read the Passage and answer the following questions:

The primary concern with the longevity of digital documents is the "viewing problem". Unlike analog or physical information, which tends to exist independent of human involvement, digital information needs constant intervention to survive. History has shown that digital documents are problematic by default. Whereas we can actually look at the Sistine Chapel ceiling, painted 500 years ago, it is difficult if not impossible to simply view documents on 8-in. Floppy disks created in the last 20 years have even if there has been an immediate, proactive role in preserving them. Without concerted effort on the part of archivists and preservationists, digital objects quickly become obsolete or inaccessible due to unforeseen, although anticipated, advances in information technology. The variable media art community currently utilizes four digital preservation strategies, all focused on the end product. The first three methods have technical origins and are based on general digital preservation practices. Related to "the viewing problem", they are: refreshing, the upgrade of storage mechanisms; migration, the premeditated upgrade of file formats; and emulation, which focuses on development of operating systems able to run obsolete media. The fourth option, developed by and for the new media art community, is reinterpretation (Depocas et al., 2003), where the curators attempt to recreate a work given comprehensive documentation of the original artefact. Migration and emulation are the two primary methods in managing the problem of obsolete file formats (Waters & Garrett, 1996). Migration focuses on the files themselves, periodically updating files in new software formats. The second method of preservation is emulation, which can be either at the system or the software level. System emulation focuses on developing systems that mimic the hardware used to create or run the original artefact.

Sub questions

Question Number : 21 Question Id : 97103636400 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the primary concern with the longevity of digital documents according to the passage?

Options :

1. ✖ Lack of archivist involvement

2. ✔ Unforeseen advances in technology

3. ✖ Dependence on human intervention

4. ✖ Rapid deterioration of physical form

Question Number : 22 Question Id : 97103636401 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following methods is NOT mentioned as a digital preservation strategy in the passage?

Options :

1. ✖ Refreshing

2. ✔ Reinterpretation

3. ✖ Migration

4. ✖ Emulation

Question Number : 23 Question Id : 97103636402 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What does the term "migration" refer to in the context of digital preservation?

Options :

1. ✖ Recreating original artefacts

2. ✔ Upgrading storage mechanisms

3. ✖ Developing new software formats

4. ✖ Mimicking hardware systems

Question Number : 24 Question Id : 97103636403 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the focus of the fourth preservation option mentioned in the passage, "reinterpretation"?

Options :

1. ✖ Refreshing digital documents

2. ✖ Upgrading file formats

3. ✖ Emulating obsolete media

4. ✔ Recreating original works with comprehensive documentation

Question Number : 25 Question Id : 97103636404 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

According to the passage, what are the two primary methods in managing the problem of obsolete file formats?

Options :

1. ✖ Refreshing and migration

2. ✖ Migration and emulation

3. ✖ Emulation and reinterpretation

4. ✔ Reinterpretation and refreshing

Is Section Default? : null

Question Number : 26 Question Id : 97103636405 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which aspect of communication deals with the exchange of messages between people from different cultural backgrounds?

Options :

1. ✖ Classroom communication

2. ✖ Interpersonal communication

3. ✖ Group communication

4. ✔ Inter-cultural communication

Question Number : 27 Question Id : 97103636406 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

What is a common barrier to effective communication?

Options :

1. ✖ Clear message delivery

2. ✖ Active listening

3. ✔ Language barriers

4. ✖ Mutual understanding

Question Number : 28 Question Id : 97103636407 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruct

Time : 0

How does mass media influence society?

Options :

1. ✖ By reducing communication channels

2. ✖ By encouraging isolation

3. ✔ By shaping public opinion and behavior

4. ✖ By promoting individualism

Question Number : 29 Question Id : 97103636408 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which type of communication is characterized by gestures, facial expressions, and body language?

Options :

1. ✖ Verbal communication

2. ✖ Written communication

3. ✔ Non-verbal communication

4. ✖ Inter-cultural communication

Question Number : 30 Question Id : 97103636409 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The apex body responsible for formulating policies and coordinating higher education in India is:

Options :

1. ✔ Ministry of Education (MoE)

2. ✖ All India Council for Technical Education (AICTE)

3. ✖ National Assessment and Accreditation Council (NAAC)

4. ✖ University Grants Commission (UGC)

Question Number : 31 Question Id : 97103636410 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is key feature of technical education programs in India?

Options :

1. ✖ Emphasis on theoretical knowledge

2. ✖ Short duration of courses

3. ✔ Focus on practical skills and industry relevance

4. ✖ Limited job prospects

Question Number : 32 Question Id : 97103636411 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If a car travels at a constant speed of 60 miles per hour, how far will it travel in 3 hours?

Options :

1. ✖ 120 miles

2. ✖ 160 miles

3. ✔ 180 miles

4. ✖ 200 miles

Question Number : 33 Question Id : 97103636412 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is a key concept in profit and loss calculations?

Options :

1. ✖ Maintaining interest rates

2. ✖ Analyzing letter sequences

3. ✔ Calculating percentage changes

4. ✖ Identifying patterns in codes

Question Number : 34 Question Id : 97103636413 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the original price of an item is Rs.50 and it is sold for Rs.40, what is the loss percentage?

Options :

1. ✔ 20%

2. ✖ 25%

3. ✖ 30%

4. ✖ 35%

Question Number : 35 Question Id : 97103636414 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What mathematical concept involves determining the amount of money earned or paid on an investment or loan?

Options :

1. ✖ Time & Distance

2. ✖ Ratio

3. ✔ Interest

4. ✖ Averages

Question Number : 36 Question Id : 97103636415 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the simple interest on a principal amount of Rs.1000 for one year at 5% per annum is Rs.50, what is the interest rate for two years?

Options :

1. ✖ 5%

2. ✔ 10%

3. ✖ 15%

4. ✖ 20%

Question Number : 37 Question Id : 97103636416 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The famous ancient Indian university, Nalanda, was primarily known for its focus on:

Options :

1. ✖ Science and technology

2. ✖ Literature and arts

3. ✖ Medicine and healthcare

4. ✔ Buddhist studies and philosophy

Question Number : 38 Question Id : 97103636417 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Montreal Protocol is related to the protection of the:

Options :

1. ✔ Ozone layer

2. ✖ Rainforests

3. ✖ Coral reefs

4. ✖ Polar ice caps

Question Number : 39 Question Id : 97103636418 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the purpose of using Venn diagrams in logic?

Options :

1. ✔ To establish validity of arguments

2. ✖ To identify formal fallacies

3. ✖ To understand linguistic nuances

4. ✖ To evaluate deductive reasoning

Question Number : 40 Question Id : 97103636419 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which Indian logic concept refers to verbal testimony as a means of knowledge?

Options :

1. ✖ Pratyaksha

2. ✖ Anumana

3. ✔ Shabda

4. ✖ Arthapatti

Question Number : 41 Question Id : 97103636420 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What does Anumana primarily involve in Indian logic?

Options :

1. ✖ Perception

2. ✔ Inference

3. ✖ Comparison

4. ✖ Non-apprehension

Question Number : 42 Question Id : 97103636421 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the term used for the invariable relation between a property and a subject in Indian logic?

Options :

1. ✖ Pratyaksha

2. ✖ Upamana

3. ✔ Vyapti

4. ✖ Anupalabddhi

Question Number : 43 Question Id : 97103636422 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which type of reasoning primarily relies on specific examples to draw conclusions?

Options :

1. ✖ Deductive reasoning

2. ✔ Inductive reasoning

3. ✖ Analogies

4. ✖ *Pramanas*

Question Number : 44 Question Id : 97103636423 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the primary purpose of evaluating deductive reasoning?

Options :

1. ✖ To establish linguistic connotations

2. ✖ To identify fallacies in arguments

3. ✔ To establish validity of conclusions

4. ✖ To determine invariable relations

Question Number : 45 Question Id : 97103636424 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Indian logic, which means of knowledge refers to perception?

Options :

1. ✔ Pratyaksha

2. ✖ Anumana

3. ✖ Upamana

4. ✖ Shabda

Question Number : 46 Question Id : 97103636425 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The International Kabbadi League (IKL) was formed last month to give a boost to the game at international standards. It had a tournament, where 2 teams played some matches. Each team comprised of 7 players each. The listings of the 2 teams X and Y were lost, but certain details regarding the players were available. A, B, C, D, E, F, G, H, I, J, K, L, M and N are the players.

I. D and E were in Team X, K and G were in team Y.

II. H and B were in the same team, but not in the team in which F was.

III. The sum of the scores of members of Team Y was not greater than 115.

The table containing the details of the players and their scores is below

A	B	C	D	E	F	G	H	I	J	K	L	M	N
28	12	29	10	9	11	13	14	22	28	16	20	18	15

Which of these players was definitely in Team Y?

Options :

1. ✖ L

2. ✔ M

3. ✖ N

4. ✖ K

Question Number : 47 Question Id : 97103636426 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The International Kabbadi League (IKL) was formed last month to give a boost to the game at international standards. It had a tournament, where 2 teams played some matches. Each team comprised of 7 players each. The listings of the 2 teams X and Y were lost, but certain details regarding the players were available. A, B, C, D, E, F, G, H, I, J, K, L, M and N are the players.

I. D and E were in Team X, K and G were in team Y.

II. H and B were in the same team, but not in the team in which F was.

III. The sum of the scores of members of Team Y was not greater than 115.

The table containing the details of the players and their scores is below

A	B	C	D	E	F	G	H	I	J	K	L	M	N
28	12	29	10	9	11	13	14	22	28	16	20	18	15

If the score for team Y was less than 110, what could be the score of team X?

Options :

1. ✖ 135

2. ✖ 137

3. ✖ 139

4. ✔ Cannot be determined

Question Number : 48 Question Id : 97103636427 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The International Kabbadi League (IKL) was formed last month to give a boost to the game at international standards. It had a tournament, where 2 teams played some matches. Each team comprised of 7 players each. The listings of the 2 teams X and Y were lost, but certain details regarding the players were available. A, B, C, D, E, F, G, H, I, J, K, L, M and N are the players.

I. D and E were in Team X, K and G were in team Y.

II. H and B were in the same team, but not in the team in which F was.

III. The sum of the scores of members of Team Y was not greater than 115.

The table containing the details of the players and their scores is below

A	B	C	D	E	F	G	H	I	J	K	L	M	N
28	12	29	10	9	11	13	14	22	28	16	20	18	15

Which of these players could not be in team Y, if the score of Y was 115?

Options :

1. ✖ A

2. ✔ L

3. ✖ M

4. ✖ N

Question Number : 49 Question Id : 97103636428 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The International Kabbadi League (IKL) was formed last month to give a boost to the game at international standards. It had a tournament, where 2 teams played some matches. Each team comprised of 7 players each. The listings of the 2 teams X and Y were lost, but certain details regarding the players were available. A, B, C, D, E, F, G, H, I, J, K, L, M and N are the players.

I. D and E were in Team X, K and G were in team Y.

II. H and B were in the same team, but not in the team in which F was.

III. The sum of the scores of members of Team Y was not greater than 115.

The table containing the details of the players and their scores is below

A	B	C	D	E	F	G	H	I	J	K	L	M	N
28	12	29	10	9	11	13	14	22	28	16	20	18	15

Which of these players was definitely in team X, if the score of Y was 112?

Options :

1. ✖ I

2. ✔ L

3. ✖ M

4. ✖ N

Question Number : 50 Question Id : 97103636429 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The International Kabbadi League (IKL) was formed last month to give a boost to the game at international standards. It had a tournament, where 2 teams played some matches. Each team comprised of 7 players each. The listings of the 2 teams X and Y were lost, but certain details regarding the players were available. A, B, C, D, E, F, G, H, I, J, K, L, M and N are the players.

I. D and E were in Team X, K and G were in team Y.

II. H and B were in the same team, but not in the team in which F was.

III. The sum of the scores of members of Team Y was not greater than 115.

The table containing the details of the players and their scores is below

A	B	C	D	E	F	G	H	I	J	K	L	M	N
28	12	29	10	9	11	13	14	22	28	16	20	18	15

Which of these players are definitely in Team X?

Options :

1. ✖ F

2. ✖ H

3. ✖ B

4. ✔ K

Question Number : 51 Question Id : 97103636430 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which term refers to a network of private computers within an organization or institution?

Options :

1. ✖ Internet

2. ✔ Intranet

3. ✖ Extranet

4. ✖ Ethernet

Question Number : 52 Question Id : 97103636431 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the primary purpose of email communication?

Options :

1. ✖ Audio conferencing

2. ✖ Video conferencing

3. ✔ Text-based messaging

4. ✖ File sharing

Question Number : 53 Question Id : 97103636432 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the purpose of a cache in computer system.

Options :

1. ✖ To connect to wireless networks

2. ✖ To store long – term data back ups

3. ✔ To store temporary data for faster access

4. ✖ To process mathematical calculations

Question Number : 54 Question Id : 97103636433 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is a digital initiative in higher education that provides access to educational resources over the internet?

Options :

1. ✖ Digital literacy programs

2. ✔ Massive Open Online Courses (MOOCs)

3. ✖ Audio conferencing

4. ✖ Video conferencing

Question Number : 55 Question Id : 97103636434 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the term for the process of holding meetings over the internet where participants can see and hear each other in real-time?

Options :

1. ✔ Video conferencing

2. ✖ Audio conferencing

3. ✖ Emailing

4. ✖ Telecommuting

Question Number : 56 Question Id : 97103636435 Display Question Number : Yes Is Questi

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which term refers to the basic unit of data in computing and telecommunications?

Options :

1. ✔ Byte

2. ✖ Kilobyte

3. ✖ Megabyte

4. ✖ Gigabyte

Question Number : 57 Question Id : 97103636436 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the context of ICT and governance, what does ICT primarily facilitate?

Options :

1. ✖ Increases bureaucracy

2. ✖ Decreases transparency

3. ✔ Improves communication and efficiency

4. ✖ Enhances corruption

Question Number : 58 Question Id : 97103636437 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What does the term "Internet" refer to?

Options :

1. ✖ A network of private computers within an organization

2. ✔ A global network connecting millions of computers

3. ✖ An internal network for file sharing within an organization

4. ✖ A platform for video conferencing

Question Number : 59 Question Id : 97103636438 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which technology allows users to interact with computers using voice commands?

Options :

1. ✖ Artificial Intelligence

2. ✖ Augmented reality

3. ✖ Virtual reality

4. ✔ Speech recognition

Question Number : 60 Question Id : 97103636439 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which international agreement aims to address climate change by reducing greenhouse gas emissions?

Options :

1. ✖ Montreal Protocol

2. ✖ Rio Summit

3. ✖ Convention on Biodiversity

4. ✔ Paris Agreement

Question Number : 61 Question Id : 97103636440 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the primary focus of the National Action Plan on Climate Change?

Options :

1. ✖ Mitigating air pollution

2. ✖ Addressing water pollution

3. ✔ Reducing greenhouse gas emissions

4. ✖ Promoting renewable energy

Question Number : 62 Question Id : 97103636441 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which type of pollution is primarily caused by industrial emissions and vehicle exhaust?

Options :

1. ✔ Air pollution

2. ✖ Water pollution

3. ✖ Soil pollution

4. ✖ Noise pollution

Question Number : 63 Question Id : 97103636442 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which renewable energy resource harnesses energy from the Earth's internal heat?

Options :

1. ✖ Solar

2. ✖ Wind

3. ✔ Geothermal

4. ✖ Biomass

Question Number : 64 Question Id : 97103636443 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which international agreement aims to protect the ozone layer by phasing out the production and use of ozone-depleting substances?

Options :

1. ✔ Montreal Protocol

2. ✖ Rio Summit

3. ✖ Kyoto Protocol

4. ✖ Paris Agreement

Question Number : 65 Question Id : 97103636444 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which organization aims to promote solar energy usage globally through international cooperation and partnerships?

Options :

1. ✖ Montreal Protocol

2. ✖ Convention on Biodiversity

3. ✔ International Solar Alliance

4. ✖ Kyoto Protocol

Question Number : 66 Question Id : 97103636445 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is an anthropogenic activity?

Options :

1. ✖ Volcanic eruption

2. ✖ Earthquake

3. ✔ Deforestation

4. ✖ Tsunami

Question Number : 67 Question Id : 97103636446 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What type of education in India focuses on imparting practical skills and hands-on training?

Options :

1. ✔ Technical education

2. ✖ Value education

3. ✖ Environmental education

4. ✖ Conventional education

Question Number : 68 Question Id : 97103636447 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the emphasis of value education in India?

Options :

1. ✖ Acquiring technical skills

2. ✔ Developing moral and ethical values

3. ✖ Learning traditional subjects

4. ✖ Enhancing environmental awareness

Question Number : 69 Question Id : 97103636448 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which type of learning program in India includes fields like engineering, medicine, and management?

Options :

1. ✖ Oriental learning

2. ✖ Conventional learning

3. ✖ Non-conventional learning

4. ✔ Professional education

Question Number : 70 Question Id : 97103636449 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What aspect of education in India does environmental education primarily address?

Options :

1. ✖ Technical skills

2. ✖ Ethical values

3. ✔ Environmental awareness and conservation

4. ✖ Professional development

MATHEMATICS

Section Id :	971036518
Section Number :	2
Mandatory or Optional :	Mandatory
Number of Questions :	70
Section Marks :	70
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 71 Question Id : 97103636450 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following sets is countable?

Options :

1. ✖ The set of all functions from $\mathbb{Q}$ to $\mathbb{Q}$

2. ✖ The set of all functions from $\mathbb{Q}$ to $\{0,1\}$

3. ✔ The set of all functions from $\mathbb{Q}$ to $\{0,1\}$ which vanish outside a finite set

4. ✖ The set of all subsets of $\mathbb{N}$

Question Number : 72 Question Id : 97103636451 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let X and Y be normed linear spaces, and let $T: X \to Y$ be any bijective linear map with closed graph. Then which one of the following statements is TRUE?

Options :

1. ✖ The graph of T is equal to $X \times Y$

2. ✖ T^{-1} is continuous

3. ✔ The graph of T^{-1} is closed

4. ✖ T is continuous

Question Number : 73 Question Id : 97103636452 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $f:\mathbb{R}^2 \to \mathbb{R}$ be differentiable. Let $D_u f(0,0)$ and $D_v f(0,0)$ be the directional derivatives of f at $(0,0)$ in the directions of the unit vectors $u = \left(\frac{1}{\sqrt{5}}, \frac{2}{\sqrt{5}}\right)$ and $v = \left(\frac{1}{\sqrt{2}}, \frac{-1}{\sqrt{2}}\right)$, respectively. If $D_u f(0,0) = \sqrt{5}$ and $D_v f(0,0) = \sqrt{2}$, then $\frac{\partial f}{\partial x}(0,0) + \frac{\partial f}{\partial y}(0,0) =$

Options :

1. ✖ 0

2. ✔ 4

3. ✖ 1

4. ✖ Does not exist

Question Number : 74 Question Id : 97103636453 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\lim_{n\to\infty} \frac{1}{\sqrt{n}}\left(\frac{1}{\sqrt{2}+\sqrt{4}} + \frac{1}{\sqrt{4}+\sqrt{6}} + \cdots + \frac{1}{\sqrt{2n}+\sqrt{2n+2}}\right)$ is

Options :

1. ✖ $\sqrt{2}$

2. ✔ $\frac{1}{\sqrt{2}}$

3. ✖ $\sqrt{2}+1$

4. ✖ $\frac{1}{\sqrt{2}+1}$

Question Number : 75 Question Id : 97103636454 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let X and Y be metric spaces and let $f: X \to Y$ be a continuous map. For any subset S of X, which one of the following statements is true?

Options :

1. ✖ If S is open, then $f(S)$ is open

2. ✔ If S is connected, then $f(S)$ is connected

3. ✖ If S is closed, then $f(S)$ is closed

4. ✖ If S is bounded, then $f(S)$ is bounded

Question Number : 76 Question Id : 97103636455 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A polynomial of odd degree with real coefficients must have

Options :

1. ✔ At least one real root

2. ✖ No real root

3. ✖ Only real roots

4. ✖ At least one root which is not real

Question Number : 77 Question Id : 97103636456 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following real-valued function on $(0,1)$ is uniformly continuous?

Options :

1. ✖ $f(x) = \frac{1}{x}$

2. ✔ $f(x) = \frac{sinx}{x}$

3. ✖ $f(x) = sin\frac{1}{x}$

4. ✖ $f(x) = \frac{cosx}{x}$

Question Number : 78 Question Id : 97103636457 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $f: \mathbb{R}^2 \to \mathbb{R}$ be given by $f(x,y) = 4xy - 2x^2 - y^4$. Then f has

Options :

1. ✔ A point of local maximum and a saddle point

2. ✖ A point of local minimum and a saddle point

3. ✖ A point of local maximum and a point of local minimum

4. ✖ Two saddle points

Question Number : 79 Question Id : 97103636458 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruct Time : 0

Which one of the following statement is not correct?

Options :

1. ✖ Constant functions are measurable.

2. ✖ Continuous functions are measurable.

3. ✖ Monotone functions are measurable.

4. ✔ If f is a real-valued measurable function, then $-f$ need not be a measurable function.

Question Number : 80 Question Id : 97103636459 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the matrix A of order 3×3 has the eigenvalues 1,3, and -4, then the trace of the matrix $-2A^2$ is

Options :

1. ✖ -62

2. ✔ -52

3. ✖ 62

4. ✖ 0

Question Number : 81 Question Id : 97103636460 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Suppose V is a finite dimensional non-zero vector space over $\mathbb{C}$ and $T: V \to V$ is a linear transformation such that Range (T) = Null space (T). Then which of the following statements is FALSE?

Options :

1. ✖ The dimension of V is even

2. ✖ 0 is the only eigenvalue of T

3.

✔ Both 0 and 1 are eigenvalues of T

4. ✖ $T^2 = 0$

Question Number : 82 Question Id : 97103636461 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let V denote the vector space of real valued continuous functions on the closed interval $[0,1]$. Let W be the subspace of V spanned by $\{sin(x), cos\ (x), tan\ (x)\}$. Then the dimension of W over $\mathbb{R}$ is

Options :

1. ✖ 1

2. ✖ 2

3. ✔ 3

4. ✖ Infinite

Question Number : 83 Question Id : 97103636462 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Suppose V and U are finite dimensional vector spaces with $\dim V = m$ and $\dim U = n$. Then $\dim Hom(V, U) =$

Options :

1. ✖ $m+n$

2. ✔ mn

3. ✖ m^n

4. ✖ n^m

Question Number : 84 Question Id : 97103636463 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let M be a 3×3 real matrix such that $M^2 = 2M + 3I$. If the determinant of M is -9, then the trace of M equals

Options :

1. ✖ 0

2. ✔ 5

3. ✖ -1

4. ✖ -5

Question Number : 85 Question Id : 97103636464 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let N be the vector space of all real polynomials of degree at most 3. Define $S: N \rightarrow N$ by $S(p(x) = p(x+1), p \in N$. Then the matrix of S in the basis $\{1, x, x^2, x^3\}$ considered as column vectors, is given by

Options :

1. ✖ $\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 \\ 0 & 0 & 3 & 0 \\ 0 & 0 & 0 & 4 \end{pmatrix}$

2. ✔ $\begin{pmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 2 & 3 \\ 0 & 0 & 1 & 3 \\ 0 & 0 & 0 & 1 \end{pmatrix}$

3. ✖ $\begin{pmatrix} 1 & 1 & 2 & 3 \\ 1 & 1 & 2 & 3 \\ 2 & 2 & 2 & 3 \\ 3 & 3 & 3 & 3 \end{pmatrix}$

4. ✖ $\begin{pmatrix} 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$

Question Number : 86 Question Id : 97103636465 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let A, B be $n \times n$ real matrices. Which of the following statement is correct?

Options :

1. ✖ $rank\ (A+B) = rank(A) + rank(B)$

2. ✔ $rank\ (A+B) \leq rank(A) + rank(B)$

3. ✖ $rank\ (A+B) = \min\{rank(A),\ rank(B)\}$

4. ✖ $rank\ (A+B) = \max\{rank(A),\ rank(B)\}$

Question Number : 87 Question Id : 97103636466 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following matrices is not diagonalizable over $\mathbb{R}$?

Options :

1. ✖ $\begin{pmatrix} 1 & 1 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

2. ✖ $\begin{pmatrix} 1 & 1 & 0 \\ 0 & 2 & 1 \\ 0 & 0 & 3 \end{pmatrix}$

3. ✔ $\begin{pmatrix} 1 & 1 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 2 \end{pmatrix}$

4. ✖

$$\begin{pmatrix} 1 & 0 & 1 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{pmatrix}$$

Question Number : 88 Question Id : 97103636467 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider $\mathbb{R}^3$ with the standard inner product. Let W be the subspace of $\mathbb{R}^3$ spanned by $(1,0,-1)$. Which of the following is a basis for the orthogonal complement of W?

Options :

1. ✔ $\{(1,0,1),(0,1,0)\}$

2. ✖ $\{(1,2,1),(0,1,1)\}$

3. ✖ $\{(2,1,2),(4,2,4)\}$

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

Question Number : 89 Question Id : 97103636468 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The matrix $\begin{pmatrix} 3 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 3 \end{pmatrix}$ is

Options :

1. ✔ Positive definite

2. ✖ Non-negative definite but not positive definite

3. ✖ Negative definite

4. ✖ Neither negative definite nor positive definite

Question Number : 90 Question Id : 97103636469 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The principal value of $(-1)^{(-2i/\pi)}$ is

Options :

1. ✔ e^2

2. ✖ e^{2i}

3. ✖ e^{-2i}

4. ✖ e^{-2}

Question Number : 91 Question Id : 97103636470 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The function $f: \mathbb{C} \to \mathbb{C}$ defined by $f(z) = e^z + e^{-z}$ has

Options :

1. ✖ Finitely many zeros

2. ✖ No zeros

3. ✖ Only real zeros

4. ✔ Infinitely many zeros

Question Number : 92 Question Id : 97103636471 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let f be a real valued harmonic function on $\mathbb{C}$, that is, f satisfies the equation $\frac{\partial^2 f}{\partial x^2}+\frac{\partial^2 f}{\partial y^2}=0$. Define the functions $g=\frac{\partial f}{\partial x}-i\frac{\partial f}{\partial y}$, $h=\frac{\partial f}{\partial x}+i\frac{\partial f}{\partial y}$. Then

Options :

1. ✖ g and h are both holomorphic functions

2. ✔ g is holomorphic, but h need not be holomorphic

3. ✖ h is holomorphic, but g need not be holomorphic

4. ✖ Both g and h are identically equal to the zero function

Question Number : 93 Question Id : 97103636472 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $u(x,y)$ is harmonic in a bounded domain D and is continuous in $\overline{D} = D \cup \delta D$ (where δD is the boundary of D), u attains its maximum on

Options :

1. ✖ Interior of D

2. ✖ Exterior of D

3. ✔ The boundary δD of D

4. ✖ On an open subset of D

Question Number : 94 Question Id : 97103636473 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\int_{|z+1|=2} \frac{z^2}{4-z^2} dz =$$

Options :

1. ✖ 0

2. ✖ $-2\pi i$

3. ✔ $2\pi i$

4. ✖ 1

Question Number : 95 Question Id : 97103636474 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The radius of convergence of the series $\sum_{n=1}^{\infty} z^{n^2}$ is

Options :

1. ✖ 0

2. ✖ ∞

3. ✔ 1

4. ✖ 2

Question Number : 96 Question Id : 97103636475 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $M = \{a_1, a_2, a_3 : a_i \in \{1,2,3,4\}, a_1 + a_2 + a_3 = 6\}$. Then the number of elements in M is

Options :

1. ✖ 8

2. ✖ 9

3. ✔ 10

4. ✖ 12

Question Number : 97 Question Id : 97103636476 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The unit digit of 2^{100} is

Options :

1. ✖ 2

2. ✖ 4

3. ✔ 6

4. ✖ 8

Question Number : 98 Question Id : 97103636477 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of 5-Sylow subgroups in the symmetric group S_5 of degree 5 is

Options :

1. ✖ 1

2. ✔ 6

3. ✖ 0

4. ✖ 5

Question Number : 99 Question Id : 97103636478 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let G be a group with $o(G) = p^2$ where p is a prime number. Then choose the statement which is not possible?

Options :

1. ✖ $Z(G) \neq \{e\}$

2. ✖ G is abelian

3. ✔ $o(Z(G)) = p$

4. ✖ $Z(G) = G$

Question Number : 100 Question Id : 97103636479 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the permutation group S_6, the number of elements of order 8 is

Options :

1. ✔ 0

2. ✖ 1

3. ✖ 2

4. ✖ 4

Question Number : 101 Question Id : 97103636480 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How many generators does a cyclic group of order 36 have?

Options :

1. ✖ 6

2. ✔ 12

3. ✖ 18

4. ✖ 24

Question Number : 102 Question Id : 97103636481 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of group homomorphisms from $\mathbb{Z}_{10}$ to $\mathbb{Z}_{20}$ is

Options :

1. ✖ Zero

2. ✖ One

3. ✖ Five

4. ✔ Ten

Question Number : 103 Question Id : 97103636482 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of subfields of a field of cardinality 2^{100} is

Options :

1. ✖ 2

2. ✖ 4

3. ✔ 9

4. ✖ 100

Question Number : 104 Question Id : 97103636483 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Choose the polynomial which is not irreducible over the field of rational numbers

Options :

1. ✖ $x^4 - 2$

2. ✖ $x^3 - 3$

3. ✖ $1 + x + x^2$

4. ✔ $1 + x + x^2 + x^3$

Question Number : 105 Question Id : 97103636484 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following rings is a PID (Principal Ideal Domain)?

Options :

1. ✔ $\frac{\mathbb{Q}[X,Y]}{<X>}$

2. ✖ $\mathbb{Z} \oplus \mathbb{Z}$

3. ✖ $\mathbb{Z}[X]$

4. ✖ $M_2[\mathbb{Z}]$, the ring of 2×2 matrices with entries in $\mathbb{Z}$

Question Number : 106 Question Id : 97103636485 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The degree of the extension $\mathbb{Q}(\sqrt{2} + \sqrt[3]{2})$ over the field $\mathbb{Q}(\sqrt{2})$ is

Options :

1. ✖ 1

2. ✖ 2

3. ✔ 3

4. ✖ 6

Question Number : 107 Question Id : 97103636486 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the discrete topology on the set X, one of the following holds

Options :

1. ✔ Every set is both open and closed

2. ✖ Every set is neither open nor closed

3. ✖ Every set is open but not closed

4. ✖ Every set is closed but not open

Question Number : 108 Question Id : 97103636487 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not true?

Options :

1. ✔ If X is a Hausdorff space with countable basis, then X is metrizable.

2. ✖ Every metrizable space is normal.

3. ✖ A subspace of a Hausdorff space is Hausdorff.

4. ✖ Every locally compact Hausdorff space is regular.

Question Number : 109 Question Id : 97103636488 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is called the Tychonoff Theorem?

Options :

1. ✖ Finite product of connected spaces is connected.

2. ✔ An arbitrary product of compact spaces is compact in the product topology.

3. ✖ Finite product of compact spaces is compact.

4. ✖ An arbitrary product of connected spaces is connected in the product topology.

Question Number : 110 Question Id : 97103636489 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Let E be a connected subset of $\mathbb{R}$ with atleast two elements. Then the number of elements in E is

Options :

1. ✖ Exactly two

2. ✖ More than two but finite

3. ✖ Countably infinite

4. ✔ Uncountable

Question Number : 111 Question Id : 97103636490 Display Question Number : Yes Is Quest Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The integrating factor of $\frac{dy}{dx} + y \cot x = \cos x$ is

Options :

1. ✖ $sec\ x$

2. ✖ $cos\ x$

3. ✖ $cosec\ x$

4. ✔ $sin\ x$

Question Number : 112 Question Id : 97103636491 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The particular integral of $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = e^{-2x} + sin\ x$ is

Options :

1. ✖ $xe^{-2x} + \frac{1}{10}(\sin x + 3\cos x)$

2. ✔ $-xe^{-2x} + \frac{1}{10}(\sin x - 3\cos x)$

3. ✖ $-xe^{-2x} + \frac{1}{10}(\cos x - 3\sin x)$

4. ✖ $-xe^{-2x} + \frac{1}{10}(\sin x + 3\cos x)$

Question Number : 113 Question Id : 97103636492 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Resultant of the two equal forces of magnitude P acting at an angle $\frac{\pi}{2}$ is

Options :

1. ✖ $P/\sqrt{2}$

2. ✔ $\sqrt{2}\ P$

3. ✖ $2P$

4. ✖ 0

Question Number : 114 Question Id : 97103636493 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The singular integral of the ordinary differential equation is $(xy' - y)^2 = x\text{^}2(x^2 - y^2)$ is

Options :

1. ✖ $y = x \sin x$

2. ✖ $y = x \sin\left(x + \frac{\pi}{4}\right)$

3. ✔ $y = x$

4. ✖ $y = x + \frac{\pi}{4}$

Question Number : 115 Question Id : 97103636494 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The differential equation $\frac{dy}{dx} = 60(y^2)^{\frac{1}{5}}; x > 0, y(0) = 0$ has

Options :

1. ✖ A unique solution

2. ✖ Two solutions

3. ✖ No solution

4. ✔ Infinite number of solutions

Question Number : 116 Question Id : 97103636495 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the initial value problem in $\mathbb{R}^2, Y'(t) = AY + BY; Y(0) = Y_0$, where $A = \begin{bmatrix} 1 & 0 \\ -1 & 1 \end{bmatrix}, B = \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$. Then $Y(t)$ is given by

Options :

1. ✖ $e^{tA}e^{tB}Y_0$

2. ✖ $e^{tB}e^{tA}Y_0$

3. ✔ $e^{t(A+B)}Y_0$

4. ✖ $e^{-t(A+B)}Y_0$

Question Number : 117 Question Id : 97103636496 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The set of real numbers λ for which the boundary value problem $\frac{d^2y}{dx^2} + \lambda y = 0, y(0) = 0, y(\pi) = 0$ has non-trivial solution is

Options :

1. ✖ $(-\infty, 0)$

2. ✖ $\{\sqrt{n} | n \text{ is a positive integer}\}$

3. ✔ $\{n^2 | n \text{ is a positive integer}\}$

4. ✖ $\mathbb{R}$

Question Number : 118 Question Id : 97103636497 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the eigen value problem $\left((1+x^4)y'\right)' + \lambda y = 0, x \in (0,1),\ y(0) = 0, y(1) + 2y'(1) = 0$. Then which of the following statements are true?

Options :

1. ✖ All the eigen values are negative

2. ✔ All the eigen values are positive

3. ✖ There exist some negative eigen values and some positive eigen values

4. ✖ There are no eigen values.

Question Number : 119 Question Id : 97103636498 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $G(x,y)$ be the Green's function of the boundary value problem $[(1+x)u']' + (\sin x)u = 0, x \in [0,1], u(0) = u(1) = 0$. Then the function g defined by $g(x) = G(x, 1/2), x \in [0,1]$

Options :

1. ✔ Is continuous

2. ✖ Is discontinuous at $x = \frac{1}{2}$

3. ✖ Is differentiable

4. ✖ Does not have the left derivative at $x = ½$

Question Number : 120 Question Id : 97103636499 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Charpit's equation for the PDE $up^2 + q^2 + x + y = 0, p = \frac{\partial u}{\partial x}, q = \frac{\partial u}{\partial y}$ are given by

Options :

1. ✖ $\frac{dx}{-1-p^3} = \frac{dy}{-1-qp^2} = \frac{du}{2p^2u+2q^2} = \frac{dp}{2p} = \frac{dq}{2q}$

2. ✔ $\frac{dx}{2pu} = \frac{dy}{2q} = \frac{du}{2p^2u+2q^2} = \frac{dp}{-1-p^3} = \frac{dq}{-1-qp^2}$

3. ✖ $\frac{dx}{up^2} = \frac{dy}{q^2} = \frac{du}{0} = \frac{dp}{x} = \frac{dq}{y}$

4. ✖ $\frac{dx}{2q} = \frac{dy}{2pu} = \frac{du}{x+y} = \frac{dp}{p^2} = \frac{dq}{qp^2}$

Question Number : 121 Question Id : 97103636500 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of characteristic curves of the PDE $(x^2 + 2y)u_{xx} + (y^3 - y + x)u_{yy} +$

$x^2(y-1)u_{xy} + 3u_x + u = 0$ passing through the point $x = 1, y = 1$ is

Options :

1. ✔ 0

2. ✖ 1

3. ✖ 2

4. ✖ 3

Question Number : 122 Question Id : 97103636501 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The second order PDE $u_{yy} - yu_{xx} + x^3u = 0$ is

Options :

1. ✖ Elliptic for all $x \in \mathbb{R}, y \in \mathbb{R}$

2. ✖ Parabolic for all $x \in \mathbb{R}, y \in \mathbb{R}$

3. ✔ Elliptic for all $x \in \mathbb{R}, y < 0$

4. ✖ Hyperbolic for all $x \in \mathbb{R}, y < 0$

Question Number : 123 Question Id : 97103636502 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $u(x,t)$ be the solution of the initial value problem $u_{tt} - u_{xx} = 0, u(x,0) = x^3, u_t(x,0) = \sin x$. Then $u(\pi,\pi)$ is

Options :

1. ✔ $4\pi^3$

2. ✖ π^3

3. ✖ 0

4. ✖ 4

Question Number : 124 Question Id : 97103636503 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Consider the wave equation $\frac{\partial^2 u}{\partial t^2} = 4\frac{\partial^2 u}{\partial x^2}, 0 < x < \pi, t > 0$, with $u(0,t) = u(\pi,t) = 0$,

$u(x,0) = \sin x$ and $\frac{\partial u}{\partial t} = 0$ at $t = 0$. Then $u(\frac{\pi}{2},\frac{\pi}{2})$ is

Options :

1. ✖ 2

2. ✖ 1

3. ✖ 0

4. ✔ -1

Question Number : 125 Question Id : 97103636504 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The variational problem of extremizing the functional $I(y(x)) = \int_0^{2\pi}\left[\left(\frac{dy}{dx}\right)^2 - y^2\right]dx;$

$y(0) = 1,\ y(2\pi) = 1$ has

Options :

1. ✖ A unique solution

2. ✖ Exactly two solutions

3. ✔ An infinite number of solutions

4. ✖ No solution

Question Number : 126 Question Id : 97103636505 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the functional $J(y) = \int_a^b F(x, y, y')dx$, where $F(x, y, y') = y' + y$ for admissible functions y. Then J has

Options :

1. ✔ No extremals

2. ✖ Several extremals

3. ✖ $y(x) = e^{-x}$ as an extremal

4. ✖ $y(x) =$ constant as an extremal

Question Number : 127 Question Id : 97103636506 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The integral equation $y(x) = x - \int_1^x xy(t)dt; y \in C^1(1, \infty)$ has the solution

Options :

1. ✖ $y = x(1 - \ln x)$

2. ✖ $y = xe^{x-\frac{1}{2}}(x-1)+x$

3. ✔ $y = xe^{\frac{1-x^2}{2}}$

4. ✖ $y = x - x\left(e^{x^2} - e\right)$

Question Number : 128 Question Id : 97103636507 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The initial value problem $\frac{d^2y}{dx^2} + y = 0; x > 0, y(0) = 1, y'(0) = 0,$ is equivalent to the

Volterra integral equation

Options :

1. ✔ $y(x) = 1 + \int_0^x (t-x)y(t)dt$

2. ✖ $y(x) = 1 + \int_0^x (t+x)y(t)dt$

3. ✖ $y(x) = 1 + \int_0^x xt\, y(t)dt$

4. ✖ $y(x) = 1 + \int_0^x (x-t)y(t)dt$

Question Number : 129 Question Id : 97103636508 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Let $\phi(x)$ be the solution of $\int_0^x e^{x-t}\phi(t)dt = x, x > 0$. Then $\phi(1)$ equals

Options :

1. ✖ -1

2. ✔ 0

3. ✖ 1

4. ✖ 2

Question Number : 130 Question Id : 97103636509 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruct

Time : 0

Let $f(x) = \sqrt{x+3}$ for $x \geq -3$. Consider the iteration $x_{n+1} = f(x_n), x_0 = 0; n \geq 0$. The possible limits of the iteration are

Options :

1. ✖ -1

2. ✖ 3

3. ✖ 0

4. ✔ $\sqrt{3+\sqrt{3+\sqrt{3+\cdots}}}$

Question Number : 131 Question Id : 97103636510 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider two weightless, inextensible rods AB and BC, suspended at A and joined by a flexible joint at B. Then the degrees of freedom of the system is

Options :

1. ✖ 3

2. ✔ 4

3. ✖ 5

4. ✖ 6

Question Number : 132 Question Id : 97103636511 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A force $5\hat{i} - 2\hat{j} + 3\hat{k}$ acts on a particle with position vector $2\hat{i} + \hat{j} - 2\hat{k}$. The torque of the force about the origin is

Options :

1. ✖ $\hat{i} + 16\hat{j} + 9\hat{k}$

2. ✔ $-\hat{i} - 16\hat{j} - 9\hat{k}$

3. ✖ $\hat{i} + 16\hat{j} - 9\hat{k}$

4. ✖ $\hat{i} - 16\hat{j} + 9\hat{k}$

Question Number : 133 Question Id : 97103636512 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the Hamiltonian (H) and the Lagrangian (L) for a free particle of mass m and the velocity v. Then

Options :

1. ✖ H and L are independent of each other

2. ✖ H and L are related but have different dependence on v

3. ✔ H and L are equal

4. ✖ H and L are dependent of each other

Question Number : 134 Question Id : 97103636513 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $y'' + y = 0$ with $y(0) = 2$and $y'(0) = -3$, then its solution is

Options :

1. ✖ $y(x) = 5\cos x + 2\sin x$

2. ✔ $y(x) = 2\cos x - 3\sin x$

3. ✖ $y(x) = 3\cos 5x + 2\sin x$

4. ✖ $y(x) = 6\cos 2x + 3\sin 3x$

Question Number : 135 Question Id : 97103636514 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the equations $\frac{dx}{dt} + y = \sin t + 1$, $\frac{dy}{dt} + x = \cos t$, if $y = \sin t + 1 - e^{-t}$, then x is equal to

Options :

1. ✔ $-e^{-t}$

2. ✖ e^{-t}

3. ✖ $\cos t$

4. ✖ $\sin t$

Question Number : 136 Question Id : 97103636515 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

The necessary and sufficient conditions for the differential equation $M\,dx + N\,dy = 0$ to

be exact is

Options :

1. ✖ $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}$

2. ✔ $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$

3. ✖ $\frac{\partial M}{\partial x} = -\frac{\partial N}{\partial y}$

4. ✖ $\frac{\partial M}{\partial y} = -\frac{\partial N}{\partial x}$

Question Number : 137 Question Id : 97103636516 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\frac{1}{D-2}e^{4x}$ (where D is $\frac{d}{dx}$) is

Options :

1. ✖ $\frac{1}{4}e^{4x}$

2. ✖ $-\frac{1}{4}e^{4x}$

3. ✔ $\frac{1}{2}e^{4x}$

4. ✖ $-\frac{1}{2}e^{4x}$

Question Number : 138 Question Id : 97103636517 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the function u which depends on position x and time t. The partial differential equation $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ is known as

Options :

1. ✖ Wave equation

2. ✖ Laplace's equation

3. ✔ Heat equation

4. ✖ Elasticity equation

Question Number : 139 Question Id : 97103636518 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Solutions of Laplace's equation having continuous second-order partial derivatives are called

Options :

1. ✖ Biharmonic functions

2. ✔ Harmonic functions

3. ✖ Conjugate harmonic functions

4. ✖ Error functions

Question Number : 140 Question Id : 97103636519 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The root of the function $f(x) = x^3 + x - 1$ obtained after first iteration on application of Newton-Raphson scheme using an initial guess of $x_0 = 1$ is

Options :

1. ✖ 0.682

2. ✖ 0.686

3. ✔ 0.750

4. ✖ 1.000

Entrance Exams

- Agricultural Entrance Exams
- Architecture Entrance Exam
- Arts and Humanities Entrance Exams
- Commerce Entrance Examinations
- Common Entrance Examinations
- Computer Application Entrance Exams
- Design Entrance Exams
- Education Entrance Exams
- Engineering Entrance Exams
- Hotel Management Entrance Exams
- Law Entrance Exams
- MBA Entrance Exams
- Media & Journalism Entrance Exams
- Medical Entrance Exams
- Nursing Entrance Exams
- Pharmacy Entrance Exams
- Science Entrance Exams
- Diploma & Polytechnic
- Lateral Entry