

Question Paper Preview

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 :

MATHEMATICAL SCIENCES 23rd Dec 2025
Shift 2

Subject Name :

MATHEMATICAL SCIENCES

Creation Date :

2025-12-23 20:55:59

Duration :

180

Total Marks :

300

Display Marks:

Yes

Change Font Color :

No

Change Background Color :

No

Change Theme :

No

Help Button :

No

Show Reports :

No

Show Progress Bar :

No

Group 1

Group Number :

1

Group Id :

898741175

Group Maximum Duration :

0

Group Minimum Duration :

180

Show Attended Group? :

No

Edit Attended Group? :

No

Break time :

0

Group Marks :

300

Paper I

Section Id :

898741349

Section Number :

1

Section type :

Online

Mandatory or Optional :

Mandatory

Number of Questions :

42

Number of Questions to be attempted :

42

Section Marks :	100
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	8987411080
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 89874126484 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following is a characteristic of an adolescent learner?
ఈ దిగువ వానిలో ఏది కౌమార అభ్యాసకుని లక్షణము?

Options :

They are highly dependent on family for all decisions.
అన్ని నిర్ణయాలకు వారు ఎక్కువగా కుటుంబంపై ఆధారపడతారు

898741104401. ✖

They are mainly motivated by their teacher's approval.
వారు వారి ఉపాధ్యాయుల సమ్మతితో ప్రేరేపింపబడతారు

898741104402. ✖

They are often influenced by their peers and social circles.
తరచుగా వారు సహచరులు, సామాజిక వర్గాలచే ప్రభావింపబడతారు

898741104403. ✔

They show a strong preference for rote memorization.
వారు కంఠంఘటం చేయడానికి ఎక్కువ ప్రాధాన్యత ఇస్తారు.

898741104404. ✖

Question Number : 2 Question Id : 89874126485 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The primary purpose of **Evaluation Systems** in teaching is to:

బోధనలో మూల్యాంకన పద్ధతి యొక్క ప్రధాన ఉద్దేశము:

Options :

Punish students for poor performance.

పేలవమైన ఫలితాల కారణంగా విద్యార్థులను శిక్షించడం

898741104405. ✖

Measure the effectiveness of the teaching-learning process.

బోధన - అభ్యాసము ప్రక్రియ సార్థకతను కొలచుట

898741104406. ✔

Create competition among students.

విద్యార్థులలో పోటీ ప్రోత్సహించటం

898741104407. ✖

Provide a final grade without any feedback.

అభివృద్ధికి సూచనలు ఇవ్వకుండానే తుది మూల్యాంకనం చేయడం

898741104408. ✖

Question Number : 3 Question Id : 89874126486 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

A teacher uses a lecture-based approach where the teacher talks and students listen.
This is an example of which type of teaching method?

ఒక ఉపాధ్యాయుడు, “ఉపాధ్యాయుడు మాట్లాడుట - విద్యార్థి వినుట”ను అనుసరించి ఉపన్యాస
ఆధారిత దృక్పథాన్ని ఎంచుకుంటాడు. ఇది ఏ బోధనా పద్ధతికి ఉదాహరణ.

Options :

Learner-centred
అభ్యాసక కేంద్రిత

898741104409. ✖

ICT-based
ఐసిటి ఆధారిత

898741104410. ✖

Teacher-centred
ఉపాధ్యాయ కేంద్రిత

898741104411. ✔

On-line method
ఆన్‌లైన్ పద్ధతి

898741104412. ✖

Question Number : 4 Question Id : 89874126487 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

A teacher wants to use a traditional teaching aid. Which of the following is the best example of a traditional teaching aid?

ఒక ఉపాధ్యాయుడు సాంప్రదాయక బోధనా సహాయాన్ని ఉపయోగించదలచాడు. సాంప్రదాయక బోధనా సహాయానికి ఈ దిగువ వానిలో ఏది తగిన ఉదాహరణ?

Options :

A smart board.

స్మార్ట్ బోర్డు

898741104413. ✖

An overhead projector.

ఓవర్ హెడ్ ప్రొజెక్టర్

898741104414. ✖

A whiteboard with markers.

మార్కర్లతో తెల్ల బోర్డు

898741104415. ✔

A video conferencing tool.

వీడియో కాన్ఫరెన్సింగ్ సాధనం

898741104416. ✖

Question Number : 5 Question Id : 89874126488 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

What is the main advantage of using a Computer Based Test (CBT)?
కంప్యూటరు ఆధారిత పరీక్షను ఉపయోగించుటలో ముఖ్య ప్రయోజనమేమి?

Options :

It requires less time to prepare questions.
ప్రశ్నలను తయారు చేయుటకు తక్కువ సమయం పడుతుంది.

898741104417. ✖

It allows for immediate scoring and feedback.
తక్షణ స్కోరింగుకు, అభిప్రాయ సేకరణకు వీలుంటుంది.

898741104418. ✔

It is a cheaper method of evaluation.
మూల్యాంకనకు ఖర్చు తక్కువ పద్ధతి

898741104419. ✖

It eliminates the need for any human invigilators.
మానవ పర్యవేక్షకుల అవసరాన్ని తొలగిస్తుంది

898741104420. ✖

Question Number : 6 Question Id : 89874126489 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following is a key characteristic of the **Positivism** approach to research?
పరిశోధనా సానుకూల వాద విధానమునకు ఈక్రింది వానిలో ఏది కీలక లక్షణము?

Options :

It focuses on subjective experiences and individual interpretations.
అది పక్షపాత అనుభవాలపైన, వ్యక్తిగత విశ్లేషణలపైన దృష్టి సారిస్తుంది.

898741104421. ✖

It emphasizes that reality can be objectively measured and understood through empirical observation.
అనుభావిక పరిశీలన ద్వారా వాస్తవాలను నిష్పాక్షికంగా కొలవవచ్చును, అర్థం చేసుకొనవచ్చును అని అది నొక్కి చెబుతుంది.

898741104422. ✔

It believes that truth is relative and socially constructed.
అది నిజం, సాపేక్షంగా మరియు సామాజికంగా నిర్మించబడినది అని నమ్ముతుంది.

898741104423. ✖

It relies heavily on qualitative data like interviews and observations.
మౌఖిక పరీక్షలపైనా, పరిశీలనల ద్వారా గుణాత్మక దత్తాంశంపై ఎక్కువ ఆధారపడుతుంది.

898741104424. ✖

Question Number : 7 Question Id : 89874126490 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

What is the correct sequence of steps in the research process?
పరిశోధనా ప్రక్రియలో సరియైన దశల క్రమం ఏది?

Options :

898741104425. ✖ Data collection, problem formulation, literature review, data analysis.
దత్తాంశ సేకరణ, సమస్య సూత్రీకరణ, సాహిత్య సమీక్ష, దత్తాంశ విశ్లేషణ

898741104426. ✔ Problem formulation, literature review, data collection, data analysis.
సమస్య సూత్రీకరణ, సాహిత్య సమీక్ష, దత్తాంశ సేకరణ, దత్తాంశ విశ్లేషణ

898741104427. ✖ Data analysis, data collection, literature review, problem formulation.
దత్తాంశ విశ్లేషణ, దత్తాంశ సేకరణ, సాహిత్య సమీక్ష, సమస్య సూత్రీకరణ

898741104428. ✖ Literature review, data analysis, problem formulation, data collection.
సాహిత్య సమీక్ష, దత్తాంశ విశ్లేషణ, సమస్య సూత్రీకరణ, దత్తాంశ సేకరణ

Question Number : 8 Question Id : 89874126491 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

In the context of Thesis and Article writing, what is the purpose of citing sources?
థీసిస్ మరియు వ్యాస రచన నేపథ్యంలో మూలాల్ని సూచించడానికి ఉన్న ఉద్దేశ్యం ఏమిటి?

Options :

898741104429. ✖ To make the research paper longer.
పరిశోధనా పత్రము నిడివి పెంచుటకు

898741104430. ✖ To show off a researcher's knowledge.
పరిశోధకుని విజ్ఞానాన్ని ప్రదర్శించటం కోసం

898741104431. ✔ To acknowledge the original authors and avoid plagiarism.
అసలు రచయితలను గుర్తించి గ్రంథ చౌర్యమును నివారించుటకు

898741104432. ✖ To fill up space in the bibliography.
గ్రంథ పట్టికలో జాగాను పూరించుటకు

Question Number : 9 Question Id : 89874126492 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following is a key feature of **Qualitative** research methods?
గుణాత్మక పరిశోధనా పద్ధతి ముఖ్య లక్షణము, ఈ దిగువనీయబడిన వానిలో ఏది.

Options :

They are used to measure the effect of one variable on another.
ఒక చలాంకం మరొక చలాంకంపై చూపించే ప్రభావాన్ని కొలవడానికి

898741104433. ✖

They rely on numerical data and statistical analysis.
సంఖ్యా దత్తాంశము, గణాంక విశ్లేషణపై ఆధారపడి ఉంటుంది.

898741104434. ✖

They explore a phenomenon in depth, focusing on non-numerical data.
సంఖ్యేతర దత్తాంశముపై దృష్టి సారిస్తూ దృగ్విషయ లోతును అన్వేషించుట

898741104435. ✔

They are used to test a hypothesis using controlled experiments.
నియంత్రిత కలిగిన ప్రయోగములను ఉపయోగిస్తూ పరికల్పనను పరీక్షించుట

898741104436. ✖

Question Number : 10 Question Id : 89874126493 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

In research, the term **Research Ethics** primarily deals with:
పరిశోధనలో 'పరిశోధనా నైతికాలు' ప్రాథమికంగా ఏవనగా:

Options :

The cost of the research project.
పరిశోధనా ప్రాజెక్టు వ్యయము

898741104437. ✖

The moral principles and guidelines that govern the conduct of research.
పరిశోధన చేయుటకు నైతిక సూత్రాలు, సూచనలు

898741104438. ✔

The speed at which research is conducted.
పరిశోధన చేసిన వేగము

898741104439. ✖

The popularity of the research topic.
పరిశోధనా అంశపు ప్రజాదరణ

898741104440. ✖

Sub-Section Number :

2

Sub-Section Id :

8987411081

Question Shuffling Allowed :

No

Question Id : 89874126494 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (11 to 15)

Question Label : Comprehension

Read the following passage and answer the question that follow:

ఈ దిగువ పాసేజీ చదివి తరువాత వచ్చు ప్రశ్నలకు సమాధానము వ్రాయుము.

Nowhere else does the greater light so rule the day, so measure, so divide, so reign, make so imperial laws, so visibly kindle, so immediately quicken, so suddenly efface, so banish, so restore, as in a plain like this of Suffolk with its enormous sky. The curious have an insufficient motive for going to the mountains if they do it to see the sunrise. The sun that leaps from a mountain peak is a sun past the dew of his birth; he has walked some way towards the common fires of noon. But on the flat country the uprising is early and fresh, the arc is wide, the career is long. The most distant clouds, converging in the beautiful and little-studied order of cloud-perspective (for most painters treat clouds as though they formed perpendicular and not horizontal scenery), are those that gather at the central point of sunrise. On the plain, and there only, can the construction but that is too little vital a word; I should rather say the organism--the unity, the design, of a sky be understood. The light wind that has been moving all night is seen to have not worked at random. It has shepherded some small flocks of cloud afield and folded others. There's husbandry in Heaven. And the order has, or seems to have, the sun for its midst. Not a line, not a curve, but confesses its membership in a design declared from horizon to horizon.

సఫోక్ మైదానాలలో వలె ప్రపంచంలో మరెక్కడా ఒక మహత్తర కాంతి దినాన్ని శాసించదు. సమయాన్ని కొలుస్తు, విభజిస్తూ, నియమాలను అదేశిస్తూ, ఇంతలో వెలుతురూ, అంతలో ఆరిపోతూ, మసకబారిపోతూ, ప్రకాశాన్ని తిరిగి ప్రజ్వలించజేస్తూ అనంత ఆకాశంకింద వెలిగే ఈ కాంతిసఫోక్ మైదానాలో మాత్రమే దృశ్యమానము. కొండలపైని సూర్యోదయాన్ని చూడడం పట్ల అసక్తిగల కొందరు వెళ్తుంటారు కాని అటువంటి అసక్తికి ఏమంత ప్రేరణ ఉండదు. ఎందుకంటే, ఆ కొండచరియల వెనుకనుండి ఎగిసే సూర్యుడు ఉదయపు తడి నుండి మధ్యాహ్నపు వేడి వైపు పయనించేవాడే కాని సమతల మైదానాలలో సూర్యోదయం గమనం సువిశాలం, ప్రయాణం సుదీర్ఘం. దూరంగా కమ్మేమేఘాలు సూర్యోదయాన్ని తొందరగా, స్వచ్ఛంగా మొదలవుతుంది. అట్టి సూర్యోదయాన్ని అనుకరించి ఒక అద్భుతమైన పద్ధతిలో సమన్వయమౌతాయి. (చాలమంది చిత్రకారులు మేఘాలను లంబంగా చిత్రిస్తారు, కాని అవి సమతలంగా వ్యాపించినట్లు కనిపిస్తాయి) ఇలాంటి దృశ్యాన్ని ఆకాశపు నిర్మాణం అనో, ఆకారం అంటే ఆ పదాలు చాలవు. అది ఒక జీవచిత్రం, ఒక ఆలోచనాత్మక రూపకల్పన. రాత్రంతా వీచిన మెల్లనిగాలి యాదృచ్ఛికంగా సాగదు. కొన్ని మేఘాలను నెమ్మదిగా కదిలిస్తూ, మరికొన్నింటిని సమూహాలుగా చేరుస్తూ ఒక క్రమపద్ధతిలో సాగే చక్కనివ్యవస్థ. ఈ వ్యవస్థకి, క్రమానికి కేంద్రం సూర్యుడే. ప్రతి ఒక్క రేఖ, వక్రత ఆ విశ్వరచనలో తన భాగస్వామ్యాన్ని వెల్లడిస్తుంది.

Sub questions

Question Number : 11 Question Id : 89874126495 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

What makes the author feel that the sunlight in Suffolk is unique?

సఫోక్లోని సూర్యకిరణాలు ప్రత్యేకమని రచయితకు ఎందుకు అనిపిస్తుంది ?

Options :

It commands and shapes the landscape
అది భూదృశ్యంను ఆదేశించి ఆకృతీకరిస్తుంది

898741104441. ✓

It is ineffective and unpredictable
అది ప్రభావహీనమైనది మరియు అస్థిరమైనది

898741104442. ✗

It is scorching and unbearable
అది భరించలేనంత వేడిగా ఉంటుంది

898741104443. ✗

It hinders and delays seasons
ఇది ఋతువులను నిరోధిస్తుంది మరియు అలస్యం చేస్తుంది

898741104444. ✗

Question Number : 12 Question Id : 89874126496 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The phrase, "the arc is wide, the career is long" in the above passage means _____
"దాని గమనం విశాలం, దాని ప్రయాణం దీర్ఘం." ఈ వాక్యానికి అర్థం _____

Options :

Watching the sun rise from the clouds is an intense experience
మేఘముల నుండి వెలువడే సూర్యోదయాన్ని వీక్షించడం ఒక గాఢమైన అనుభూతి

898741104445. ✗

Watching the sun rise from the plains is incomplete
మైదానాల నుండి సూర్యోదయాన్ని వీక్షించడం ఒక అసంపూర్ణమైన అనుభవం

898741104446. ✗

Watching the sun rise from behind the mountains is boring
పర్వతాల వెనుక నుండి వెలువడే సూర్యోదయాన్ని వీక్షించడం విసుగుగా ఉంటుంది

898741104447. ✗

898741104448. ✓

Watching the sun from the flat lands gives a complete and fuller journey

సమతుల మైదానాల నుండి వెలువడే సూర్యోదయాన్ని చూడడం ఒక సంపూర్ణమైన అనుభవం

Question Number : 13 Question Id : 89874126497 Question Type : MCQ Option Shuffling : No

Correct Marks : 2 Wrong Marks : 0

“it has shepherded some small flocks of cloud afield and folded others” , who is ‘it’ referring to ?

“అది కొన్ని మేఘాలను నెమ్మదిగా కదిలిస్తూ, మరికొన్నింటిని పమూహాలుగా చేర్చుతుంది.”
ఎవరిని ఉద్దేశించి చెప్పబడింది.

Options :

The sun
సూర్యుడు

898741104449. ✖

The wind
గాలి

898741104450. ✔

The plains
మైదానాలు

898741104451. ✖

The painter
చిత్రకారుడు

898741104452. ✖

Question Number : 14 Question Id : 89874126498 Question Type : MCQ Option Shuffling : No

Correct Marks : 2 Wrong Marks : 0

Which phrase in the above passage suggest that there is order in the skies?

పై భాగంలోని ఏ పదబంధం ఆకాశంలో పద్ధతిని సూచిస్తుంది

Options :

The sun leaps from a mountain peak is a sun past the dew of his birth

కొండచరియల వెనుక నుండి ఎగిసే సూర్యుడు, తన జన్మపు తేమను దాటి, ఇప్పటికే
మధ్యాహ్నపు వేడిమి వైపు నడక ప్రారంభించినవాడే.

898741104453. ✖

Gather at the central point of sunrise

సూర్యోదయానికి అనుగుణంగా, ఒక అద్భుత క్రమంలో సమన్వయమవుతాయి

898741104454. ✖

There's husbandry is Heaven

అకాశంలో కూడా ఒక వ్యవస్థ ఉంది. ఒక క్రమశిక్షణ ఉంది

898741104455. ✔

Not a line, not a curve, but confesses its membership in a design declared from horizon to horizon

ప్రతి రేఖ, ప్రతి వక్రత ఆ విశ్వ రూపకల్పనలో తన భాగస్వామ్యాన్ని వెల్లడిస్తుంది.

898741104456. ✖

Question Number : 15 Question Id : 89874126499 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

What is the overall impression of the author?

రచయిత యొక్క సమగ్ర అభిప్రాయం ఏమిటి ?

Options :

Nature's behaviour is hostile

ప్రకృతి ప్రవర్తన ప్రతికూలమైనది

898741104457. ✖

Life in the mountains is unsafe

పర్వతాలలో జీవితం సురక్షితం కాదు

898741104458. ✖

Movement of clouds is unpredictable

మేఘాల కదలిక అస్థిరమైంది

898741104459. ✖

Nature displays harmony and purpose

ప్రకృతి సమన్వయం మరియు లక్షణాన్ని ప్రదర్శిస్తుంది

898741104460. ✔

Sub-Section Number :

3

Sub-Section Id :

8987411082

Question Shuffling Allowed :

Yes

Question Number : 16 Question Id : 89874126500 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

_____ is the idea, information, data, feeling etc., sent by the sender to the receiver.

_____ అనేది పంపిన వ్యక్తి నుండి స్వీకరించే వ్యక్తికు పంపబడే ఆలోచన, సమాచారం, డేటా, భావం మొదలైనవి.

Options :

898741104461. ✖ Code
సంకేతం

898741104462. ✖ Feedback
ప్రతిస్పందన

898741104463. ✔ Message
సందేశం

898741104464. ✖ Media
మాధ్యమం

Question Number : 17 Question Id : 89874126501 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

In a conversation, if a person has hunched his shoulders, he is showing his _____.

ఒక సంభాషణలో వ్యక్తి తన భుజాలను వంచి చూపిస్తే, అతను తన _____ను వ్యక్తపరుస్తున్నాడు.

Options :

Interest

ఆసక్తి

898741104465. ✖

Anxiety

అందోళన

898741104466. ✔

Happiness

సంతోషం

898741104467. ✖

Excitement

ఉత్సాహం

898741104468. ✖

Question Number : 18 Question Id : 89874126502 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

In an inter-cultural communication, if a person is _____, he is likely to commit more mistakes.

అంతర్ సాంస్కృతిక పరమైన(inter- cultural) కమ్యూనికేషన్లో ఒక వ్యక్తి _____గా ఉంటే, అతను ఎక్కువ తప్పులు చేసే అవకాశం ఉంటుంది.

Options :

Prejudiced
ముందస్తు అభిప్రాయం ఉన్నవాడు

898741104469. ✓

Open- minded
విస్తృత దృక్పథం కలిగినవాడు

898741104470. ✗

Willing
నేర్చుకోవడానికి సిద్ధంగా ఉన్నవాడు

898741104471. ✗

Friendly
స్నేహపూర్వకంగా

898741104472. ✗

Question Number : 19 Question Id : 89874126503 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Loud noise that disrupts the flow of communication is considered as a _____ barrier.

కమ్యూనికేషన్ ప్రవాహాన్ని భంగం కలిగించే పెద్ద శబ్దం ఒక _____ అడ్డంకిగా
పరిగణించబడుతుంది

Options :

898741104473. ✖ Emotional
భావోద్వేగ

898741104474. ✖ Psychological
మానసిక

898741104475. ✖ Linguistic
భాషాపద

898741104476. ✔ Physical
భౌతిక

Question Number : 20 Question Id : 89874126504 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Facebook is an example of _____media
ఫేస్బుక్ _____ మాధ్యమానికి ఒక ఉదాహరణ

Options :

Digital
సంకేతాత్మక

898741104477. ✖

Social
సామాజిక

898741104478. ✔

Electric
విద్యుత్ ఆధారిత

898741104479. ✖

Traditional
సాంప్రదాయ

898741104480. ✖

A college runs in two shifts. The morning shift starts at 10AM and lasts till 1.48PM running five periods of equal duration with an interval of 7 minutes after every period. Then the duration of each period (in minutes) is

ఒక కళాశాల రెండు షిఫ్టులలో నడుస్తుంది. ఉదయం షిఫ్టు ఉ.10 గంటలకు ప్రారంభమై ప్రతి పీరియడ్ తరువాత 7 నిమిషాల విరామంతో ఒకే నిడివి గల 5 పీరియడ్లు కొనసాగిన 1.48 గంటలకు ముగుస్తుంది. అప్పుడు ప్రతి పీరియడ్ వ్యవధి (నిమిషాలలో)

Options :

35

898741104481. ✖

40

898741104482. ✔

42

898741104483. ✖

45

898741104484. ✖

Question Number : 22 Question Id : 89874126506 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Two persons A and B together can complete a job in 20 days. Working individually B takes 30 days more than A to complete the same job. In how many days A alone can complete the job?

ఇద్దరు వ్యక్తులు A, Bలు కలిసి ఒక పనిని 20 రోజులలో పూర్తి చేయగలరు. విడివిడిగా పనిచేస్తే A పనిని పూర్తి చేసే రోజుల కన్న B అదే పనిని పూర్తి చేయుటకు 30 రోజులు ఎక్కువ తీసుకుంటాడు. అప్పుడు A ఒక్కడే ఆ పనిని ఎన్ని రోజులలో పూర్తి చేయగలడు?

Options :

898741104485. ✖ 35

898741104486. ✔ 30

898741104487. ✖ 25

898741104488. ✖ 20

With the following notations given answer the question that follows:

$A+B$ means A is the brother of B,

$A \times B$ means A is the father of B,

$A-B$ means A is the sister of B and

$A \div B$ means A is the mother of B

Given $P \times Q \times R \div S$, how is Q related to S?

క్రింది సంకేతాల దృష్ట్యా, దాని క్రిందనీయబడిన ప్రశ్నకు జవాబునీయండి:

$A+B$ అంటే B యొక్క సోదరుడు A అని,

$A \times B$ అంటే B యొక్క తండ్రి A అని,

$A-B$ అంటే B యొక్క సోదరి A అని, మరియు

$A \div B$ అంటే B యొక్క తల్లి A అనీ అర్థం

$P \times Q \times R \div S$ అని ఇస్తే S తో Q కు గల బంధుత్వం ఏది?

Options :

Q is the grand father of S

S యొక్క తాత Q

898741104489. ✓

Q is the father of S

S యొక్క తండ్రి Q

898741104490. ✖

S is the daughter of Q

Q యొక్క కూతురు S

898741104491. ✖

S is the son of Q

Q యొక్క కుమారుడు S

898741104492. ✖

Question Number : 24 Question Id : 89874126508 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

A shop keeper sells an article for Rs.400 and gets some profit. Had he sold same article for Rs.360 he would have got same amount of loss as profit amount. Then the cost price (in rupees) of the article is

ఒక దుకాణదారుడు ఒక వస్తువును రూ.400లకు అమ్మి కొంత లాభం పొందుతాడు. అదే వస్తువును గనక రూ.360కు అమ్మి ఉంటే, లాభం పొందినంత మొత్తం నష్టం పొంది ఉండేవాడు. అప్పుడు ఆ వస్తువుయొక్క కొన్న ధర (రూపాయలలో)

Options :

320

898741104493. ✖

360

898741104494. ✖

380

898741104495. ✔

390

898741104496. ✖

Question Number : 25 Question Id : 89874126509 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

With the following notations find the value of the given expression.

$$a @ b \text{ means } \frac{a}{b}$$

$$a \$ b \text{ means } a \times b$$

$$\text{and } a \# b \text{ means } a - b. \text{ Then } 250 \# 75 @ 20 \$ 24 =$$

$$\text{క్రింది సంకేతాలతో } 250 \# 75 @ 20 \$ 24 =$$

$$a @ b \text{ అంటే } \frac{a}{b}$$

$$a \$ b \text{ అంటే } a \times b$$

$$\text{మరియు } a \# b \text{ అంటే } a - b \text{ అని అర్థం.}$$

Options :

160

898741104497. ✓

120

898741104498. ✗

140

898741104499. ✗

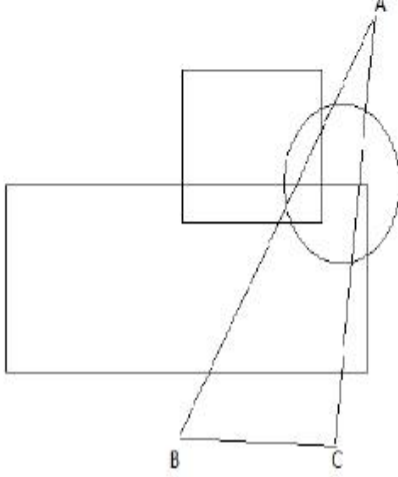
155

898741104500. ✗

Question Number : 26 Question Id : 89874126510 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

In the following diagram rectangle, square, triangle ABC and circle represent respectively the illiterate, employed, farmers and poor.

క్రింది పటంలో దీర్ఘచతురస్రం, చతురస్రం, త్రిభుజం మరియు వృత్తంలు వరుసగా నిరక్ష రాస్యలు, ఉద్యోగులు, వ్యవసాయదారులు మరియు బీదవారిని సూచిస్తాయి.



Consider the statements:

S_1 : Some farmers who are employed are either poor or illiterate or both

S_2 : All unemployed farmers are poor and illiterate.

S_3 : Some poor farmers who are employed are not illiterate.

Which of the following statement(s) is (are) correct?

క్రింది ప్రవచనాలను గైకొనుము.

S_1 : ఉద్యోగస్తులైన కొందరు వ్యవసాయదారులు అయితే బీదవారు లేదా నిరక్షరాస్యులు లేదా ఈ రెండూ అయి ఉంటారు.

S_2 : ఉద్యోగస్తులు కాని వ్యవసాయదారులందరూ బీదవారు మరియు నిరక్షరాస్యులు.

S_3 : ఉద్యోగస్తులైన కొందరు బీద వ్యవసాయదారులు నిరక్షరాస్యులు కారు.

క్రింది ప్రవచనాలలో ఏది (వి) సరైనవి?

Options :

All S_1, S_2 and S_3

S_1, S_2 మరియు S_3 లన్నీ

898741104501. ✖

only S_3

S_3 మాత్రమే

898741104502. ✖

898741104503. ✖

S₁ and S₂ only
S₁ మరియు S₂లు మాత్రమే

S₂ and S₃ only
S₂ మరియు S₃లు మాత్రమే

898741104504. ✓

Question Number : 27 Question Id : 89874126511 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Select the suitable entry from the given options that fills the blank space in the analogy Light : Candle :: ----:-----

ఇచ్చిన ఐచ్ఛికాల నుండి సరైన దానితో క్రింది సామ్యతలోని ఖాళీ స్థలాన్ని పూరించండి.
కాంతి : కొవ్వొత్తి :: ---- : ----

Options :

Exercise : strength
వ్యాయామం : బలం

898741104505. ✖

Energy : Coil
శక్తి : కాయిల్

898741104506. ✖

Power : Battery
పవర్ : బ్యాటరీ

898741104507. ✓

Automobile : Engine
ఆటోమొబైల్ : ఇంజను

898741104508. ✖

Question Number : 28 Question Id : 89874126512 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following is an example of an informal fallacy?

క్రింది వాటిలో ఏది హెత్యుభాసానికి ఒక ఉదాహరణ అవుతుంది?

Options :

898741104509. ✖
Affirming the consequent
అనుగామి సంఘటనను ధృవీకరించడం

898741104510. ✖
Denying the antecedent
పూర్వాంగాన్ని నిరాకరించడం

898741104511. ✔
Ad hominem
ఆడ్ హోమినెమ్

898741104512. ✖
Modus ponens
మోడస్ పోనెన్స్

Question Number : 29 Question Id : 89874126513 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following is considered direct and immediate knowledge in Indian theory of knowledge?

భారతీయ జ్ఞానంలో క్రింది వాటిలో దేనిని ప్రత్యక్ష జ్ఞానంగా పరిగణిస్తారు?

Options :

Anumana
అనుమాన

898741104513. ✖

Pratyaksha
ప్రత్యక్ష

898741104514. ✔

Upamana
ఉపమాన

898741104515. ✖

Arthapatti
అర్థపట్టి

898741104516. ✖

Question Number : 30 Question Id : 89874126514 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which logical distinction best explains why arthapatti (postulation) is considered a separate means of knowledge and not merely inference (anuma na)?

ఒక 'అనుమాన'నే కాకుండా అర్థపట్టిని జ్ఞానానికి ఒక ప్రత్యేకమైన వేరొక మార్గంగా ఎందుకు గైకొంటారు' అనే దానిని క్రింది వాటిలో ఏ తర్కబద్ధమైన విభేదం బాగా వివరిస్తుంది?

Options :

Arthāpatti involves perception preceding inference

898741104517. ✖

అర్థపట్టిలో అనుమతికి ముందు అవగాహనను కలిగి ఉంటుంది.

Arthāpatti bridges a logical gap not covered by direct perception or testimony

ప్రత్యేక అవగాహన లేదా వాంగ్మూలం ద్వారా పూర్తిగా తీరని తార్కిక లోపాన్ని అర్థపట్టి పూరిస్తుంది.

898741104518. ✔

Arthāpatti includes direct cognition of the unseen

898741104519. ✖

కనలేని ప్రత్యక్ష జ్ఞానాన్ని అర్థపట్టిలో చూడవచ్చు.

Arthāpatti operates only in scriptural interpretation

898741104520. ✖

కేవలం లేఖన వ్యాఖ్యానంలోనే అర్థపట్టి పనిచేస్తుంది.

Sub-Section Number :

4

Sub-Section Id :

8987411083

Question Shuffling Allowed :

No

Question Id : 89874126515 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Question Numbers : (31 to 35)

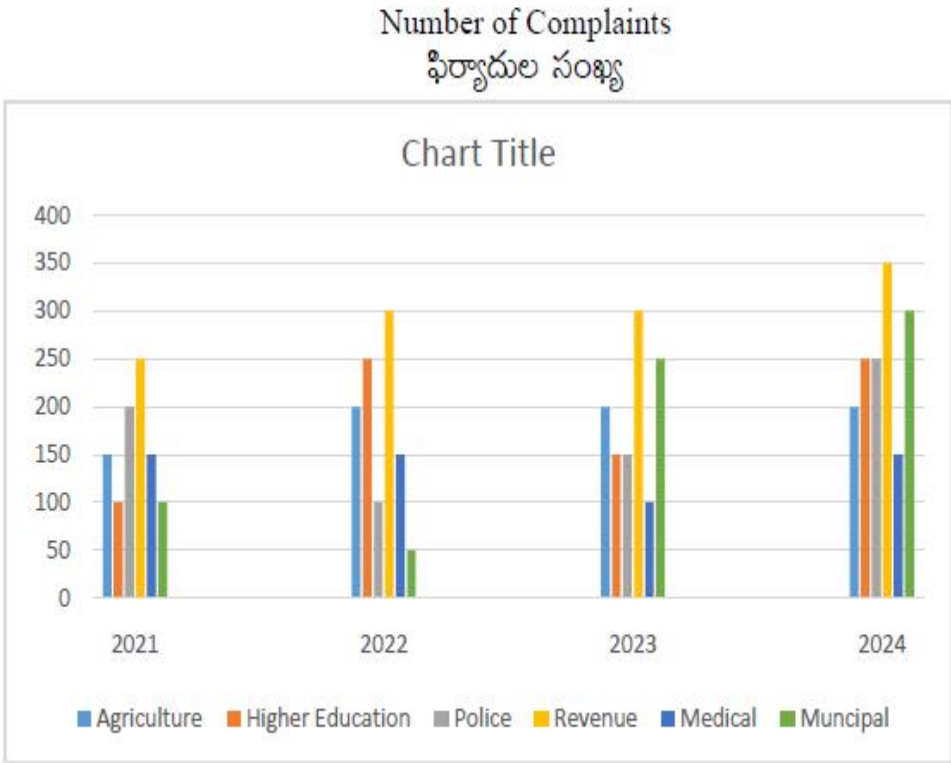
Question Label : Comprehension

Answer the questions from 31 to 35 based on the data provided in the chart.

క్రింది పటం ఆధారంగా 31 నుండి 35 వరకు గల ప్రశ్నలకు జవాబులనివ్వండి.

The bar chart below shows the number of complaints received across six departments – Agriculture, Higher Education, Police, Revenue, Medical and Municipal- for the years 2021 to 2024.

ఆరు విభాగాలకు సంబంధించి స్వీకరించిన ఫిర్యాదుల సంఖ్యను క్రింది కమ్మీ చిత్రం చూపుతుంది: వ్యవసాయం, ఉన్నత విద్య, పోలీసు, రెవెన్యూ, మెడికల్ మరియు పురపాలక విభాగాలలో 2021 నుండి 2024 సంవత్సరాలకు సంబంధించిన ఫిర్యాదులు.



Sub questions

Question Number : 31 Question Id : 89874126516 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

From 2021 to 2024, the department that has received least number of total complaints is

2021 నుండి 2024 సంవత్సరాలలో మొత్తంగా అతి తక్కువ ఫిర్యాదులను పొందిన విభాగం

Options :

898741104521. ✖

Police

పోలీసు

Medical

మెడికల్

898741104522. ✓

Agriculture

వ్యవసాయం

898741104523. ✖

Revenue

రెవెన్యూ

898741104524. ✖

Question Number : 32 Question Id : 89874126517 Question Type : MCQ Option Shuffling : No

Correct Marks : 2 Wrong Marks : 0

The average of number of complaints received by Municipal department from 2021 to 2024 is

2021 నుండి 2024 సంవత్సరాలలో పురపాలక విభాగం అందుకున్న ఫిర్యాదుల సంఖ్యల సగటు

Options :

187

898741104525. ✖

137

898741104526. ✖

300

898741104527. ✖

175

898741104528. ✓

Question Number : 33 Question Id : 89874126518 Question Type : MCQ Option Shuffling : No

Correct Marks : 2 Wrong Marks : 0

From 2021 to 2024, which department experienced the highest percentage increase in the number of complaints?

2021 నుండి 2024 వరకు ఏ విభాగం ఫిర్యాదుల సంఖ్యలో అత్యధిక పెరుగుదల శాతం చవి చూసింది?

Options :

Revenue
రెవెన్యూ

898741104529. ✖

Medical
మెడికల్

898741104530. ✖

Municipal
పురపాలక

898741104531. ✔

Agriculture
వ్యవసాయం

898741104532. ✖

Question Number : 34 Question Id : 89874126519 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

In which year was the difference between the number of complaints in the Revenue and Municipal departments the greatest?

ఏ సంవత్సరంలో రెవెన్యూ మరియు పురపాలక విభాగాల్లో ఫిర్యాదుల సంఖ్యలలో భేదం గరిష్టంగా ఉంది?

Options :

898741104533. ✔ 2021

898741104534. ✖ 2022

898741104535. ✖ 2023

898741104536. ✖

Question Number : 35 Question Id : 89874126520 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

If the average number of complaints across the six departments in 2023 is calculated, which department's complaints are closest to this average?

2023లో అన్ని ఆరు విభాగాల ఫిర్యాదుల సగటుని గణిస్తే, ఏ విభాగంలో ఫిర్యాదుల సంఖ్య ఈ సగటుకు అత్యంత సమీపంగా ఉంది?

Options :

898741104537. ✖ Agriculture
వ్యవసాయం

898741104538. ✖ Higher Education
ఉన్నత విద్య

898741104539. ✔ Police
పోలీసు

898741104540. ✖ Medical
మెడికల్

Sub-Section Number :

5

Sub-Section Id :

8987411084

Question Shuffling Allowed :

Yes

Question Number : 36 Question Id : 89874126521 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

What is the full form of HTTP?

HTTP యొక్క పూర్తి రూపం ఏమిటి?

Options :

Hyper Text Transfer Protocol
హైపర్ టెక్స్ట్ ట్రాన్స్ఫర్ ప్రోటోకాల్

898741104541. ✓

High Technology Transfer Process
హై టెక్నాలజీ ట్రాన్స్ఫర్ ప్రొసెస్

898741104542. ✗

Hyper Text Transmission Protocol
హైపర్ టెక్స్ట్ ట్రాన్స్మిషన్ ప్రోటోకాల్

898741104543. ✗

High-level Text Transfer Protocol
హై-లెవల్ టెక్స్ట్ ట్రాన్స్ఫర్ ప్రోటోకాల్

898741104544. ✗

Question Number : 37 Question Id : 89874126522 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Putting files to the server from the computer is?
కంప్యూటర్ నుండి సర్వర్కు ఫైల్లను ఉంచడం అంటే ఏమిటి?

Options :

898741104545. ✖ Downloading
డౌన్లోడ్ చేస్తుంది

898741104546. ✔ Uploading
అప్లోడ్ చేస్తుంది

898741104547. ✖ Trashing
ట్రాష్ చేయడం

898741104548. ✖ Transferring
బదిలీ చేయడం

Question Number : 38 Question Id : 89874126523 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following is a key advantage of video conferencing over audio conferencing?

ఆడియో కాన్ఫరెన్సింగ్ కంటే వీడియో కాన్ఫరెన్సింగ్ యొక్క ముఖ్యమైన ప్రయోజనం ఏమిటి?

Options :

Lower bandwidth requirements
తక్కువ బ్యాండ్విడ్త్ అవసరాలు

898741104549. ✖

Enhanced engagement through visual cues
దృశ్య సంకేతాల ద్వారా మెరుగుగా పాల్గొనడం

898741104550. ✔

Simpler technology for participants
పాల్గొనేవారికి సరళమైన సాంకేతికత

898741104551. ✖

Primarily relies on speech for conveying messages
సందేశాలను అందించడానికి ప్రధానంగా మాటలపై ఆధారపడుతుంది

898741104552. ✖

Question Number : 39 Question Id : 89874126524 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following is a digital repository for scientists and researchers in India?

భారతదేశంలోని శాస్త్రవేత్తలు మరియు పరిశోధకులకు ఈ క్రింది వాటిలో ఏది డిజిటల్ రిపోజిటరీ ?

Options :

e- ShodhSindhu

ఇ-శోధ్ సింధు

898741104553. ✖

VIDWAN

విద్వాన్

898741104554. ✔

FOSSE

ఫోస్సే

898741104555. ✖

e-Yantra

ఇ - యంత్ర

898741104556. ✖

Question Number : 40 Question Id : 89874126525 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The purpose of Virtual Labs is to:

వర్చువల్ ల్యాబ్ల ఉద్దేశ్యం

Options :

Conduct physical lab experiments

భౌతిక ప్రయోగశాల ప్రయోగాలను నిర్వహించడం

898741104557. ✖

Perform experiments remotely using simulations

అనుకరణలను ఉపయోగించి రిమోట్గా ప్రయోగాలను నిర్వహించడం

898741104558. ✔

Promote arts education

కళా విద్యను ప్రోత్సహించడం

898741104559. ✖

Build physical laboratories

భౌతిక ప్రయోగశాలలను నిర్మించడం

898741104560. ✖

Question Number : 41 Question Id : 89874126526 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The Sustainable Development Goals are characterized by a broader approach compared to the Millennium Development Goals, with a greater emphasis on:

సస్టైనబుల్ డెవలప్మెంట్ లక్ష్యాలను (SDGs) మిలేనియం డెవలప్మెంట్ లక్ష్యాల కంటే విస్తృత దృష్టికోణంతో ప్రత్యేకత కలిగి ఉండటంలో, ఎక్కువ ప్రాధాన్యత ఏ అంశాలకు ఇవ్వబడింది ?

Options :

Social equity and the planet's well-being
సామాజిక సమానత్వం మరియు ప్రపంచం యొక్క శ్రేయస్సు

898741104561. ✓

Primarily on economic development
ప్రధానంగా ఆర్థిక అభివృద్ధిపై

898741104562. ✗

National averages and the poorest countries
జాతీయ సగటులు మరియు అత్యంత పేద దేశాలు

898741104563. ✗

Environmental protection only
పర్యావరణ పరిరక్షణ మాత్రమే

898741104564. ✗

Question Number : 42 Question Id : 89874126527 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which environmental issue is directly linked to unsustainable agriculture practices?
ఏ పర్యావరణ సమస్య అస్థిరమైన వ్యవసాయ పద్ధతులతో నేరుగా ముడిపడి ఉంది?

Options :

Depletion of the ozone layer
ఓజోన్ పొర క్షీణత

898741104565. ✖

Soil degradation
మట్టి క్షీణత

898741104566. ✔

Acid rain
ఆమ్ల వర్షం

898741104567. ✖

Urban sprawl
పట్టణ విస్తరణ

898741104568. ✖

Question Number : 43 Question Id : 89874126528 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which type of waste is particularly problematic due to its potential to release toxic chemicals and heavy metals when not properly managed?

సరిగ్గా నిర్వహించనప్పుడు విషపూరిత రసాయనాలు మరియు భారీ లోహాలను విడుదల చేసే సామర్థ్యం ఉన్నందున ఏ రకమైన వ్యర్థాలు ముఖ్యంగా సమస్యాత్మకమైనవి?

Options :

Agricultural waste
వ్యవసాయ వ్యర్థాలు

898741104569. ✖

Solid municipal waste
ఘన పురపాలక వ్యర్థాలు

898741104570. ✖

Electronic waste (e-waste)
ఎలక్ట్రానిక్ వ్యర్థాలు (ఇ-వ్యర్థాలు)

898741104571. ✔

Biomedical waste
బయోమెడికల్ వ్యర్థాలు

898741104572. ✖

Question Number : 44 Question Id : 89874126529 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Geothermal energy is derived from:
భూ ఉష్ణశక్తి దీని నుండి ఉద్భవించింది:

Options :

The gravitational pull of the moon
చంద్రుని గురుత్వాకర్షణ

898741104573. ✖

The heat stored within the Earth's core and crust
భూమి యొక్క కేంద్రం మరియు భూభాగంలో నిల్వ ఉన్న ఉష్ణం

898741104574. ✔

The energy from the ocean's tides
సముద్రపు అలల నుండి వచ్చే శక్తి

898741104575. ✖

The light and heat of the sun
సూర్యుని కాంతి మరియు వేడి

898741104576. ✖

Question Number : 45 Question Id : 89874126530 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The International Solar Alliance (ISA) is a collaborative initiative of which two countries?

అంతర్జాతీయ సౌర కూటమి (ISA) ఏ రెండు దేశాల సహకార చొరవ?

Options :

India and China

భారతదేశం మరియు చైనా

898741104577. ✖

India and France

భారతదేశం మరియు ఫ్రాన్స్

898741104578. ✔

India and the USA

భారతదేశం మరియు USA

898741104579. ✖

France and Germany

ఫ్రాన్స్ మరియు జర్మనీ

898741104580. ✖

Question Number : 46 Question Id : 89874126531 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The decline of Nalanda University is largely attributed to the invasion and sacking by:
నలంద విశ్వవిద్యాలయం పతనానికి ప్రధానంగా ఎవరి దండయాత్ర మరియు కొల్లగొట్టడం
కారణమనిచెప్పవచ్చు.

Options :

Alexander the Great
అలెగ్జాండర్ ది గ్రేట్

898741104581. ✖

Aurangzeb
ఔరంగజేబు

898741104582. ✖

BakhtiyarKhilji
భక్తియార్ ఖిల్జీ

898741104583. ✔

Muhammad of Ghazni
ఘజ్నీ మహమ్మద్

898741104584. ✖

Question Number : 47 Question Id : 89874126532 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

In which year was the University Grants Commission (UGC) formally established by an Act of Parliament?

పార్లమెంటు ద్వారా యూనివర్సిటీ గ్రాంట్స్ కమిషన్ (UGC) ఏ సంవత్సరంలో అధికారికంగా స్థాపించబడింది.

Options :

1956

898741104585. ✓

1953

898741104586. ✗

1947

898741104587. ✗

1968

898741104588. ✗

Question Number : 48 Question Id : 89874126533 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which government initiative in India promotes online learning and Massive Open Online Courses (MOOCs)?

ఆన్లైన్ లెర్నింగ్ మరియు మ్యాసివ్ ఓపెన్ ఆన్లైన్ కోర్సులను ప్రోత్సహించే భారత ప్రభుత్వ కార్యక్రమం ఏది?

Options :

898741104589. ✖ ISRO
ఇస్రో

898741104590. ✔ SWAYAM
స్వయం

898741104591. ✖ National Institute of Technology (NIT)
నేషనల్ ఇన్స్టిట్యూట్ ఆఫ్ టెక్నాలజీ (NIT)

898741104592. ✖ The Traditional Knowledge Digital Library (TKDL)
ది ట్రేడిషనల్ నాలెడ్జ్ డిజిటల్ లైబ్రరీ (TKDL)

Question Number : 49 Question Id : 89874126534 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

What is considered as a key element of Value Education for a child's social development?

పిల్లల సామాజిక అభివృద్ధికి విలువల విద్యలో కీలకమైన అంశంగా పరిగణించబడుతుంది ఏమిటి?

Options :

The playground
ఆట స్థలం

898741104593. ✖

Family and neighbourhood
కుటుంబం మరియు పరిసరాలు

898741104594. ✖

School and family
పాఠశాల మరియు కుటుంబం

898741104595. ✔

The school alone
పాఠశాల మాత్రమే

898741104596. ✖

Question Number : 50 Question Id : 89874126535 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The use of digital technology in governance, known as e-Governance, is an instrument for achieving good governance because it can do all of the following except:

పాలనలో డిజిటల్ టేక్నాలజీని ఉపయోగించడం, దీనిని ఇ-గవర్నెన్స్ అని పిలుస్తారు, ఇది మంచి పాలనను సాధించడానికి ఒక సాధనం ఎందుకంటే ఇది ఈ క్రింది వాటిని తప్ప అన్నింటినీ చేయగలదు.

Options :

Improve efficiency and economy
సామర్థ్యం మరియు ఆర్థిక వ్యవస్థను మెరుగుపరచడం

898741104597. ✖

Enhance citizens' interface with the government
ప్రభుత్వంతో పౌరుల పరస్పర సంబంధాన్ని మెరుగుపరచడం

898741104598. ✖

Improve decision-making and transparency
నిర్ణయం తీసుకోవడం మరియు పారదర్శకతను మెరుగుపరచడం

898741104599. ✖

Increase bureaucratic red-tapism
బ్యూరోక్రాటిక్ నిర్వహణ కఠినత పెంచటం

898741104600. ✔

Paper II

Section Id :	898741350
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	100
Number of Questions to be attempted :	100
Section Marks :	200
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	8987411085
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 89874126536 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Consider the following statements.

(A) Let X be any subset of $\mathbb{R}$ and Let Y be a subset of $\mathbb{R}$ such that $X \subseteq Y \subseteq \overline{X}$.

Then $\overline{Y} = \overline{X}$.

(B) If X and Y are any subsets of $\mathbb{R}$, then $\overline{X \cap Y} = \overline{X} \cap \overline{Y}$.

Choose the correct option from the following.

Options :

898741104601. ✓ Only A is true

898741104602. ✗ Only B is true

898741104603. ✗ Both A and B are true

898741104604. ✗ Both A and B are false

Question Number : 52 Question Id : 89874126537 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Let $A = \{n \in \mathbb{N} : \text{Either } n \text{ is a multiple of 5 or a multiple of 7 but not a multiple of 35}\}$. If $S = \sum_{n \in A} \frac{1}{n^2}$, then $S =$

Options :

898741104605. ✖ $\frac{1}{6}$

898741104606. ✔ $\frac{1}{12}$

898741104607. ✖ $\frac{1}{24}$

898741104608. ✖ $\frac{1}{18}$

Question Number : 53 Question Id : 89874126538 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Consider the series $\sum_{n=1}^{\infty} a_n$, where $a_n = \left(\frac{5 + (-1)^n}{2} \right)^{-n}$. Which of the following statements is FALSE ?

Options :

The series is convergent.

898741104609. ✖

$$\liminf_{n \rightarrow \infty} a_n^{1/n} = \frac{1}{3}$$

898741104610. ✖

$$\limsup_{n \rightarrow \infty} a_n^{1/n} = \frac{1}{2}$$

898741104611. ✖

The series is divergent.

898741104612. ✔

Match the entries in List-A with the entries in List-B

List-A

List-B

(a) $\lim_{n \rightarrow \infty} \int_0^1 \frac{n^3 \sqrt{n}}{1+n^4 x^2} dx =$

(A) 4

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

(B) 3

(c) $\lim_{x \rightarrow 0} \frac{1}{e^x} \int_0^x (1 + \sin t)^{\frac{1}{t}} dt =$

(C) 2

(d) $\sum_{n=1}^{\infty} 3^{n-1} \sin\left(\frac{x}{3^n}\right) = \frac{1}{2k}(x - \sin x),, \text{ where } k =$

(D) 1

(E) 0

Options :

898741104613. ✖ (a,C), (b,D), (c,E), (d,A)

898741104614. ✖ (a,B), (b,C), (c,D), (d,E)

898741104615. ✖ (a,A), (b,B), (c,D), (d,E)

898741104616. ✔ (a,E), (b,B), (c,D), (d,C)

Question Number : 55 Question Id : 89874126540 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Let $f: \mathbb{R}^2 \rightarrow \mathbb{R}^2$ be the function defined by $f(x, y) = (x^2, y^2)$. If $x_0 = (1, 2)$ and $v = (3, 4)$, then the directional derivative $D_v f(x_0) =$

Options :

898741104617. ✖ $(8, 6)$

898741104618. ✖ $(6, 8)$

898741104619. ✔ $(6, 16)$

898741104620. ✖ $(16, 6)$

Question Number : 56 Question Id : 89874126541 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

$$\int_0^{\pi} \frac{1}{\sqrt{3 - \cos x}} dx = k \int_0^1 \frac{dx}{\sqrt{1 - x^4}}, \text{ where } k =$$

Options :

898741104621. ✖ $2\sqrt{2}$

898741104622. ✖ $\frac{1}{\sqrt{2}}$

898741104623. ✔ $\sqrt{2}$

898741104624. ✖ $4\sqrt{2}$

Question Number : 57 Question Id : 89874126542 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Let f be a continuous even function on $[-3, 3]$. Then $\int_{-3}^3 \frac{f(x)}{1+e^x} dx =$

Options :

898741104625. ✖ $2 \int_0^3 f(x) dx$

898741104626. ✖ $3 \int_0^1 f(x) dx$

898741104627. ✖ $6 \int_0^1 f(x) dx$

898741104628. ✔ $\int_0^3 f(x) dx$

Question Number : 58 Question Id : 89874126543 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Consider the following statements.

(A) $e^x < (1+x)^{1+x}$ for $x > 0$.

(B) $x(2 + \cos x) > 3 \sin x$ for $x > 0$.

Choose the correct option from the following.

Options :

898741104629. ✖ Only A is true

898741104630. ✖ Only B is true

898741104631. ✔ Both A and B are true

898741104632. ✖ Both A and B are false

Question Number : 59 Question Id : 89874126544 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following series converges uniformly?

Options :

$$f_n(x) = n \log \left(\frac{1+nx}{nx} \right) \text{ on } (0, \infty)$$

898741104633. ✖

$$f_n(x) = \tan^{-1} \left(\frac{2x}{x^2 + n^3} \right) \text{ on } \mathbb{R}$$

898741104634. ✔

$$f_n(x) = \begin{cases} x/n, & n \text{ is even} \\ 1/n, & n \text{ is odd} \end{cases} \text{ on } \mathbb{R}$$

898741104635. ✖

$$f_n(x) = \frac{x^{2n}}{1+x^{2n}} \text{ on } \mathbb{R}.$$

898741104636. ✖

Question Number : 60 Question Id : 89874126545 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following statements is TRUE?

Options :

898741104637. ✖ If $f: \mathbb{R} \rightarrow \mathbb{R}$ is a mapping such that $f^{-1}(a, \infty)$ and $f^{-1}(-\infty, b)$ are open sets in $\mathbb{R}$ for any $a, b \in \mathbb{R}$, then f need not be continuous.

898741104638. ✔ Let $X = C[0, 1]$, the space of all continuous functions with the metric $d_{\infty}(f, g) = \sup\{|f(x) - g(x)| : x \in [0, 1]\}$. Then the mapping $\phi: X \rightarrow \mathbb{R}$ defined by $\phi(f) = f(0)$ is continuous.

898741104639. ✖ Let $X = C[0, 1]$, the space of all continuous functions with the metric $d_{\infty}(f, g) = \sup\{|f(x) - g(x)| : x \in [0, 1]\}$ and Y be the subspace of all differentiable functions. Then the mapping defined by $D(f) = f'$, (where f' the derivative of f) is continuous.

898741104640. ✖ $P[a, b]$, the set of all polynomials over $[a, b]$ is not dense in $C[a, b]$.

Question Number : 61 Question Id : 89874126546 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following statements is False?

Options :

898741104641. ✖ If E_1, E_2 are any two Lebesgue measurable subsets of $\mathbb{R}$, then so is $E_1 \Delta E_2$.

898741104642. ✖ Any decreasing function defined on $[9, 10]$ is of bounded variation.

898741104643. ✖ A metric space (X, d) is compact if it is totally bounded and complete.

898741104644. ✔ The space l_{∞} of all bounded sequences of real numbers is separable.

Question Number : 62 Question Id : 89874126547 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The Lagrangian of a motion of a particle of unit mass moving in a central force field under a force that varies inversely as the square of distance from the centre O is

Options :

898741104645. ✖ $r^2\theta = \text{constant.}$

898741104646. ✖ $r^4\theta = \text{constant.}$

898741104647. ✔ $r^2\dot{\theta} = \text{constant.}$

898741104648. ✖ $r^3\dot{\theta} = \text{constant.}$

Question Number : 63 Question Id : 89874126548 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following statements is FALSE?

Options :

898741104649. ✖ $S_4 = \langle (1\ 2\ 3\ 4), (1\ 2\ 4\ 3) \rangle.$

898741104650. ✖ A_4 is the only subgroup of S_4 .

898741104651. ✖ $S_n = \langle (1\ 2), (1\ 3), \dots, (1\ n) \rangle.$

898741104652. ✔ If α is a cycle of length r in S_n , and $\beta \in S_n$, then $\beta\alpha\beta^{-1}$ is a cycle of length $3r$.

Question Number : 64 Question Id : 89874126549 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The number of 4 cycles in S_6 is

Options :

898741104653. ✖ 80

898741104654. ✔ 90

898741104655. ✖ 120

898741104656. ✖ 180

Question Number : 65 Question Id : 89874126550 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Consider the quotient ring $\frac{\mathbb{Z}_2[x]}{\langle x^3 + 1 \rangle}$. Match the entries in List-1 with entries in

List-2

List-1

List-2

- | | |
|------------------------------|-------------------|
| (a) $(x^2 + 1)(x^2 + x) =$ | (A) 0 |
| (b) $(x + 1)(x^2 + x + 1) =$ | (B) $x^2 + x + 1$ |
| (c) $x^2(x^2 + x) =$ | (C) $(x^2 + 1)$ |
| (d) $(x^2 + x + 1)x^2 =$ | (D) $(x + 1)$ |
| | (E) $(x^2 + x)$ |

Options :

898741104657. ✖ a-A b-B c-C d-E

898741104658. ✖ a-D b-A c-C d-B

898741104659. ✖ a-A b-C c-B d-D

898741104660. ✔ a-C b-A c-D d-B

Question Number : 66 Question Id : 89874126551 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following statements is FALSE?

Options :

898741104661. ✖ A finite p- group is nil potent.

898741104662. ✖ A finite group is solvable if every composition factor is of prime order.

898741104663. ✖ Let G be a group and σ be a non -trivial automorphism of G such that $\sigma(x) = x$ or x^{-1} . Then G is solvable.

898741104664. ✔ If p, q are any two primes, then every group of order p^2q is not solvable.

Question Number : 67 Question Id : 89874126552 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following rings is not a field?

Options :

898741104665. ✖ $\frac{Z_2[x]}{\langle x^3 + x + 1 \rangle}$

898741104666. ✖ $\frac{Z_2[x]}{\langle x^3 + x^2 + 1 \rangle}$

898741104667. ✔ $\frac{Z_2[x]}{\langle x^2 + 1 \rangle}$

898741104668. ✖ $\frac{Z_2[x]}{\langle x^4 + x^3 + 1 \rangle}$

Question Number : 68 Question Id : 89874126553 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Consider the following statements in the polynomial ring $\mathbb{Z}[x]$.

(A) (x) is a maximal ideal.

(B) the zero ideal $\{0\}$ is a prime ideal.

Choose the correct option from the following.

Options :

898741104669. ✓ A is false.

898741104670. ✗ B is false .

898741104671. ✗ Both A,B are true.

898741104672. ✗ Both A,B are false.

Question Number : 69 Question Id : 89874126554 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Let $p(x) = x^3 - 3x - 1 \in \mathbb{Q}[x]$. If α is any root of $p(x)$, then the degree of $[\mathbb{Q}(\alpha) : \mathbb{Q}] =$

Options :

898741104673. ✓ 3

898741104674. ✗ 6

898741104675. ✗ 9

898741104676. ✗ 2

Question Number : 70 Question Id : 89874126555 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The number of ways that the 11 identical boxes in a bag can be painted so that three are brown, three are white and five are black is

Options :

898741104677. ✖ $\frac{11(11!)}{5!3!3!}$

898741104678. ✖ $11!5!3!3!$

898741104679. ✔ $\frac{1}{11} \left(\frac{11!}{5!3!3!} \right)$

898741104680. ✖ $\frac{1}{121} \left(\frac{11!}{5!3!3!} \right)$

Question Number : 71 Question Id : 89874126556 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The last digit in the decimal value of $1997^{1998^{1999}}$ is

Options :

898741104681. ✖ 3

898741104682. ✖ 5

898741104683. ✖ 2

898741104684. ✔ 1

Question Number : 72 Question Id : 89874126557 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Let V be the vector space $\mathbb{R}$ over the field $\mathbb{Q}$ of rational numbers .Then which of the following statements is **FALSE**?

Options :

898741104685. ✖ $\{1, \sqrt{2}\}$ is linearly independent.

898741104686. ✖ $\{\sqrt{2}, \sqrt{3}\}$ is linearly independent.

898741104687. ✔ $\{\sqrt{2}, \sqrt{3}, \sqrt{12}\}$ is linearly independent.

898741104688. ✖ $\{\sqrt{5}, \sqrt{3}\}$ is linearly independent.

Question Number : 73 Question Id : 89874126558 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following statements is **FALSE** in a vector space $V(F)$?

Options :

898741104689. ✔ If W_1, W_2, W_3 are subspaces of V , then $W_1 \cap (W_2 + W_3) = (W_1 \cap W_2) + (W_1 \cap W_3)$.

898741104690. ✖ If W_1, W_2 are subspaces of V , then $W_1 + W_2$ is the subspace generated by $W_1 \cup W_2$.

898741104691. ✖ Two subspaces W_1, W_2 of V are independent if $W_1 \cap W_2 = \{0\}$.

898741104692. ✖ If A is a subset of V , then $\text{Span}(\text{Span}A) = \text{Span}(A)$.

Question Number : 74 Question Id : 89874126559 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Let $a_n = \frac{[\sqrt{2}] + [2\sqrt{2}] + [3\sqrt{2}] + \dots + [n\sqrt{2}]}{n^2}$, where $[x]$ denotes the greatest integer not exceeding x . Then $\lim_{n \rightarrow \infty} a_n =$

Options :

898741104693. ✖ 0

898741104694. ✖ $\sqrt{2}$

898741104695. ✔ $\frac{1}{\sqrt{2}}$

898741104696. ✖ 2

Question Number : 75 Question Id : 89874126560 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

If $\lambda_1, \lambda_2, \lambda_3$ are the characteristic values of a 3×3 matrix A which are in arithmetic progression with $\text{tr}(A) = 15$ and $\det(A) = 80$, then $\lambda_1^2 + \lambda_2^2 + \lambda_3^2 =$

Options :

898741104697. ✖ 50

898741104698. ✔ 93

898741104699. ✖ 65

898741104700. ✖ 83

Question Number : 76 Question Id : 89874126561 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following statements is **TRUE**?

Options :

898741104701. ✖ Any $n \times n$ matrix A is similar to $A+I$.

898741104702. ✖ Every diagonalizable matrix is invertible.

898741104703. ✔ Any $n \times n$ matrix A is triangulable if its minimal polynomial is the product of linear polynomials.

898741104704. ✖ For any square matrix A , $\det e^A \neq e^{\det A}$

Question Number : 77 Question Id : 89874126562 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following matrices is not similar to $A = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 6 \end{pmatrix}$?

Options :

$$B = \begin{pmatrix} 1 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \end{pmatrix}$$

898741104705. ✖

$$C = \begin{pmatrix} 1 & 2 & 0 \\ 3 & 4 & 5 \\ 0 & 7 & 6 \end{pmatrix}$$

898741104706. ✔

$$E = \begin{pmatrix} 4 & 7 & 0 \\ 0 & 1 & 0 \\ 8 & 9 & 6 \end{pmatrix}$$

898741104707. ✖

$$A = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 5 & 1 \\ 3 & 1 & 5 \end{pmatrix}$$

898741104708. ✖

Question Number : 78 Question Id : 89874126563 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Let q be the quadratic form associated with the symmetric bilinear form f on the vector space $\mathbb{R}^2(\mathbb{R})$. Also let $\alpha = (x_1, x_2), \beta = (y_1, y_2)$ be any two vectors in $\mathbb{R}^2(\mathbb{R})$. If $q(x_1, x_2) = x_1^2 + 16x_2^2$, then $f((x_1, x_2), (y_1, y_2)) =$

Options :

898741104709. ✖ $x_1y_1 + 4x_2y_2$

898741104710. ✖ $x_1y_1 + 8x_2y_2$

898741104711. ✔ $x_1y_1 + 16x_2y_2$

898741104712. ✖ $8x_1y_1 + x_2y_2$

Question Number : 79 Question Id : 89874126564 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The rational canonical form of the matrix $A = \begin{pmatrix} 5 & -6 & -6 \\ -1 & 4 & 2 \\ 3 & -6 & -4 \end{pmatrix}$ is

Options :

898741104713. ✖ $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{pmatrix}$

898741104714. ✖ $\begin{pmatrix} 0 & -3 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

898741104715. ✔ $E = \begin{pmatrix} 0 & -2 & 0 \\ 1 & 3 & 0 \\ 0 & 0 & 2 \end{pmatrix}$

898741104716. ✖ $\begin{pmatrix} 0 & 1 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{pmatrix}$

Question Number : 80 Question Id : 89874126565 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Consider the following statements .

(A) Any 2×2 matrix with complex entries is either similar to $\begin{pmatrix} c_1 & 0 \\ 0 & c_2 \end{pmatrix}$ possibly with

$$c_1 = c_2 \text{ or } \begin{pmatrix} c & 0 \\ 1 & c \end{pmatrix}.$$

(B) If $T: V \rightarrow V$ is a linear operator and $\alpha \in V, f(x) \in F[x]$, then

$$fZ(\alpha; T) = Z(f\alpha; T).$$

(C) Let $T: V \rightarrow V$ be a linear operator. Then T has a cyclic vector if the characteristic polynomial and the minimal polynomial for T are same.

(D) Any real symmetric matrix need not be diagonalizable.

Choose the correct option from the following.

Options :

898741104717. ✖ A, B, D are true.

898741104718. ✔ A,B,C are true.

898741104719. ✖ Only B,D are true.

898741104720. ✖ Only D is true.

Question Number : 81 Question Id : 89874126566 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The variational problem of extremizing the functional $J[y(x)] = \int_1^2 \frac{1}{x} \left[1 + \left(\frac{dy}{dx} \right)^2 \right] dx$,
 $y(1) = 0, y(2) = 2$ has

Options :

898741104721. ✖ No solution

898741104722. ✔ A unique solution

898741104723. ✖ Two solutions

898741104724. ✖ Infinitely many solutions

Question Number : 82 Question Id : 89874126567 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The extremal of the functional $J[y(x)] = \int_1^4 \left(\frac{dy}{dx} \right)^2 dx$, $y(1) = 3, y(4) = 24$ subject to
the condition $\int_1^4 y dx = 36$ is

Options :

898741104725. ✖ A hyperbola

898741104726. ✔ A parabola

898741104727. ✖ An ellipse

898741104728. ✖ A circle

Question Number : 83 Question Id : 89874126568 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The extremals of the functional $J[y(x)] = \int_a^b \left[2y + \left(\frac{dy}{dx} \right)^2 + \left(\frac{dz}{dx} \right)^2 \right] dx$ are

Options :

898741104729. ✖ $y = (c_1x + c_2) \cos x + (c_3x + c_4) \sin x, z = (c_1x + c_2) \cos x + (c_3x + c_4) \sin x - 2c_2 \sin x + 2c_4 \cos x$

898741104730. ✖ $y = a_1x + a_2, z = b_1x + b_2$

898741104731. ✖ $y = (c_1x + c_2) \cos x + (c_3x + c_4) \sin x, z = (c_1x + c_2x^2) \cos x + (c_3x + c_4x^2) \sin x + 2c_2 - 4c_4 \cos x$

898741104732. ✔ $y = \frac{x^2}{2} + a_1x + a_2, z = b_1x + b_2$

Question Number : 84 Question Id : 89874126569 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

If $y(x)$ is the solution of the integral equation $\int_0^x (x^2 + t^2 - 2xt) y(t) dt = x^3$, then

$y(24) =$

Options :

898741104733. ✖ 16

898741104734. ✔ 3

898741104735. ✖ 9

898741104736. ✖ 24

Question Number : 85 Question Id : 89874126570 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The boundary value problem $\frac{d^2 y}{dx^2} + y = 0, y(0) = 1, y'(1) = 0$ is equivalent to the integral equation

Options :

$$y(x) = x + \int_0^x t y(t) dt + \int_x^1 y(t) dt$$

898741104737. ✖

$$y(x) = x + \int_0^t t y(t) dt + x \int_t^1 y(t) dt$$

898741104738. ✖

$$y(x) = 1 + \int_0^t t y(t) dt + x \int_t^1 y(t) dt$$

898741104739. ✖

$$y(x) = 1 + \int_0^x t y(t) dt + x \int_x^1 y(t) dt$$

898741104740. ✔

Question Number : 86 Question Id : 89874126571 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The resolvent kernel $R(x, t; 1)$ of the integral equation $y(x) = \frac{1}{1+x^2} + \int_0^x \sin(x-t)y(t) dt$ is

Options :

$$x-t$$

898741104741. ✔

$$e^{x-t}(x-t)$$

898741104742. ✖

$$e^{x-t} \sin(x-t)$$

898741104743. ✖

$$\sin(x-t)$$

898741104744. ✖

Question Number : 87 Question Id : 89874126572 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The homogeneous Fredholm integral equation $y(x) - \lambda \int_0^{2\pi} \sin x \cos t y(t) dt = 0$ has

Options :

One characteristic number

898741104745. ✖

Two characteristic numbers

898741104746. ✖

No characteristic number

898741104747. ✔

Infinitely many characteristic numbers

898741104748. ✖

Question Number : 88 Question Id : 89874126573 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The solution of the integral equation $y(x) - \lambda \int_0^1 \cos(\log t) y(t) dt = 1$ is $y(t)$ which is equal to

Options :

898741104749. ✖ $\frac{\lambda^2}{2-\lambda}, \lambda \neq 2$

898741104750. ✖ $\frac{2\lambda}{4-\lambda}, \lambda \neq 4$

898741104751. ✖ $\frac{1}{4-\lambda}, \lambda \neq 4$

898741104752. ✔ $\frac{2}{2-\lambda}, \lambda \neq 2$

Question Number : 89 Question Id : 89874126574 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following functions satisfies Lipschitz condition in the region indicated ?

Options :

$$f(x, y) = \frac{\sin y}{x}, f(0, y) = 0, R: |x| \leq 1, |y| < \infty$$

898741104753. ✖

$$f(x, y) = \frac{e^x}{y^2}, f(x, 0) = 0, R: |x| \leq 2, |y| \leq \frac{1}{2}$$

898741104754. ✖

$$f(x, y) = \frac{3y^3 e^x}{1+y^2} + 2x^2 \cos y, R: |x| \leq 1, |y| < \infty$$

898741104755. ✔

$$f(x, y) = y e^{\frac{1}{x^2}}, f(0, y) = 0, R: |x| \leq 1, |y| < \infty$$

898741104756. ✖

Question Number : 90 Question Id : 89874126575 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The fundamental matrix of the system of equations $\begin{pmatrix} y_1' \\ y_2' \end{pmatrix} = \begin{pmatrix} 2 & 2 \\ 1 & 3 \end{pmatrix} \begin{pmatrix} y_1 \\ y_2 \end{pmatrix}$ is

Options :

898741104757. ✖ $\begin{pmatrix} 3e^{4t} + 2e^t & -2e^t + 2e^{4t} \\ -e^t + 3e^{4t} & e^t + 2e^{4t} \end{pmatrix}$

898741104758. ✔ $\begin{pmatrix} e^{4t} & -2e^t \\ e^{4t} & e^t \end{pmatrix}$

898741104759. ✖ $\begin{pmatrix} e^{4t} & -2e^t \\ 2e^{4t} & e^t \end{pmatrix}$

898741104760. ✖ $\begin{pmatrix} e^{4t} + 2e^t & -e^t + e^{4t} \\ -2e^t + e^{4t} & 2e^t + e^{4t} \end{pmatrix}$

Question Number : 91 Question Id : 89874126576 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The number of solutions of the differential equation $x^2y'' - xy' + 2y = 6, y(1) = 1, y'(1) = 2$ is

Options :

898741104761. ✖ 0

898741104762. ✔ 1

898741104763. ✖ 2

898741104764. ✖ ∞

Question Number : 92 Question Id : 89874126577 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The Green's function of the boundary value problem

$$y'' = 0, y(0) = 0, y'(1) = 0 \text{ is}$$

Options :

898741104765. ✖

$$G(x, t) = \begin{cases} t, & 0 \leq x \leq t \\ x, & t \leq x \leq 1 \end{cases}$$

898741104766. ✖

$$G(x, t) = \begin{cases} x + 2t, & 0 \leq x \leq t \\ t + 2x, & t \leq x \leq 1 \end{cases}$$

898741104767. ✔

$$G(x, t) = \begin{cases} x, & 0 \leq x \leq t \\ t, & t \leq x \leq 1 \end{cases}$$

898741104768. ✖

$$G(x, t) = \begin{cases} t + 2x, & 0 \leq x \leq t \\ x + 2t, & t \leq x \leq 1 \end{cases}$$

Question Number : 93 Question Id : 89874126578 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The values of λ for which the boundary value problem $x^2 y'' + xy' + \lambda y = 0$,
 $y(1) = y(e) = 0$, $1 \leq x \leq e$, has non-trivial solutions are

Options :

898741104769. ✖ $4n^2\pi^2, n=1,2,3,\dots$

898741104770. ✖ $\left(n + \frac{1}{2}\right)^2 \pi^2, n = 1, 2, 3, \dots$

898741104771. ✖ $\left(n + \frac{1}{2}\right) \pi, n = 1, 2, 3, \dots$

898741104772. ✔ $n^2\pi^2, n = 1, 2, 3, \dots$

Question Number : 94 Question Id : 89874126579 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The largest interval of existence of the solution of the initial value problem

$$y' = e^x (1+y)^{-1}, y(0) = 0, R: |y| \leq \frac{3}{4}, |x| \leq 1 \text{ by Picard's theorem is}$$

Options :

$$\left[-\frac{1}{2e}, \frac{1}{2e} \right]$$

898741104773. ✖

$$\left[-\frac{3}{16e}, \frac{3}{16e} \right]$$

898741104774. ✔

$$\left[-\frac{21}{16e}, \frac{21}{16e} \right]$$

898741104775. ✖

$$\left[-\frac{1}{e}, \frac{1}{e} \right]$$

898741104776. ✖

Question Number : 95 Question Id : 89874126580 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The function $\sin\left(\frac{x^2 + y^2 + z^2}{x}\right) + \left(\frac{y}{x}\right)^3 = 4$ is a solution of the partial differential equation

Options :

898741104777. ✖ $2xz p + 2yz q = y^2 - x^2 - z^2$

898741104778. ✖ $x p + y q = z^2 - x^2 - y^2$

898741104779. ✔ $2xz p + 2yz q = z^2 - x^2 - y^2$

898741104780. ✖ $xz p + yz q = x^2 + y^2 - z^2$

Question Number : 96 Question Id : 89874126581 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

If $z(x, y) = -2(x \cos y + 2 \sin y)$ is a particular integral of the partial differential equation $\frac{\partial^2 z}{\partial x^2} + k \frac{\partial^2 z}{\partial x \partial y} + \frac{\partial^2 z}{\partial y^2} = 2x \cos y$, then $k =$

Options :

898741104781. ✖ 2

898741104782. ✖ -4

898741104783. ✖ 1

898741104784. ✔ -2

Question Number : 97 Question Id : 89874126582 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Let $z(x, t)$ be the solution of the initial boundary value problem $\frac{\partial^2 z}{\partial t^2} - \frac{\partial^2 z}{\partial x^2} = 0$,

$z(0, t) = z(1, t) = 0, z(x, 0) = \sin(2\pi x)$ and $\frac{\partial z}{\partial t}(x, 0) = 0, 0 < x < 1, t > 0$. Then $z\left(\frac{1}{4}, \frac{1}{4}\right) =$

Options :

898741104785. ✖ π

$-\pi$

898741104786. ✖

898741104787. ✖ 1

898741104788. ✔ 0

Question Number : 98 Question Id : 89874126583 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The value of $p + q + r$ so that the order of the iterative method $x_{n+1} = px_n + \frac{qa}{x_n^2} + \frac{ra^2}{x_n^5}$
for $a^{1/3}$ becomes as high as possible is

Options :

898741104789. ✖ 2

898741104790. ✖ 4

898741104791. ✔ 1

898741104792. ✖ -1

Question Number : 99 Question Id : 89874126584 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The trace of the Gauss-Seidel iterative matrix for the system of equations
 $4x - y - 2z = -2, 4x - 8y + z = -21, -2x + y + 5z = 15$ is

Options :

898741104793. ✖ 40

898741104794. ✔ $\frac{1}{4}$

898741104795. ✖ $\frac{1}{8}$

898741104796. ✖ -3

Question Number : 100 Question Id : 89874126585 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The values of a and b such that the function $f(x) = \begin{cases} x^2 - ax + 1, & 1 \leq x \leq 2 \\ 3x - b, & 2 \leq x \leq 3 \end{cases}$ is a
quadratic spline are respectively

Options :

898741104797. ✔ 1, 3

898741104798. ✖ 1, 2

898741104799. ✖ 2, 3

898741104800. ✖ 1, 9

Question Number : 101 Question Id : 89874126586 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The minimum number of intervals required to evaluate $\int_0^1 \ln(1+x) dx$ using Simpson's $\frac{1}{3}$ rule with accuracy of 10^{-6} is

Options :

898741104801. ✖ 10

898741104802. ✖ 16

898741104803. ✖ 12

898741104804. ✔ 14

Question Number : 102 Question Id : 89874126587 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Consider the initial problem $\frac{dy}{dx} = \frac{x^2}{y^2+1}, y(0) = 0$. The approximate value of the solution $y(x)$ at $x = 0.5$ correct to three decimal places using Picard's method is

Options :

898741104805. ✖ 0.034

898741104806. ✔ 0.042

898741104807. ✖ 0.124

898741104808. ✖ 0.143

Question Number : 103 Question Id : 89874126588 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The values of z such that $\frac{\sqrt{2} \sin z}{\cosh \alpha} = 1 + i \tanh \alpha$, α is real, are

Options :

898741104809. ✖ $n\pi, n \in \mathbb{Z}$

898741104810. ✖ $n\pi + \left(\frac{\pi}{4} + i\alpha\right), n \in \mathbb{Z}$

898741104811. ✔ $n\pi + (-1)^n \left(\frac{\pi}{4} + i\alpha\right), n \in \mathbb{Z}$

898741104812. ✖ $n\pi + (-1)^n \left(\frac{\pi}{4}\right), n \in \mathbb{Z}$

Question Number : 104 Question Id : 89874126589 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Match the items of List A with the items of the List B

List-A

(a) For $\frac{z-\sin z}{z^2}$, $z = 0$ is

(b) For $f(z) = (z+1)\sin\frac{1}{z-2}$, $z = 2$ is

(c) For $w = \frac{1}{\sin z - \cos z}$, $z = \frac{\pi}{4}$ is

(d) For $f(z) = \frac{e^{\frac{1}{z}}}{z^2}$, $z = 0$ is

List-B

(i) a removable singularity

(ii) an essential singularity

(iii) a pole

(iv) a pole having residue zero

(v) a zero of order 4

The correct matching is

Options :

898741104813. ✓ a-v b-iii c-i d-iv

898741104814. ✗ a-iii b-iv c-v d-i

898741104815. ✗ a-ii b-iv c-i d-v

898741104816. ✗ a-i b-ii c-iii d-iv

Question Number : 105 Question Id : 89874126590 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The radius of convergence of the power series $\sum \left(\frac{3^n}{4^n + 5^n} + 1 + n + n^n \right) z^n$ is

Options :

898741104817. ✖ $\frac{5}{3}$

898741104818. ✖ $\frac{4}{3}$

898741104819. ✔ 0

898741104820. ✖ ∞

Question Number : 106 Question Id : 89874126591 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The number of zeros of $f(z) = z^5 - 3z^2 - 1$ in the annulus $\frac{3}{4} \leq |z| < 2^{\frac{2}{3}}$ is

Options :

898741104821. ✖ 5

898741104822. ✔ 3

898741104823. ✖ 4

898741104824. ✖ 2

Question Number : 107 Question Id : 89874126592 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The value of the integral $\int_{\left|z+\frac{1}{2}\right|=1} \frac{e^{1/(z-1)^2} \sin z}{z^2(z^2-1)} dz$ is

Options :

898741104825. ✖ 0

898741104826. ✖ $i\pi(e^{1/4} \sin 1)$

898741104827. ✖ $i\pi(e^{1/4} \sin 1 - e)$

898741104828. ✔ $i\pi(e^{1/4} \sin 1 - 2e)$

Question Number : 108 Question Id : 89874126593 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following pairs of spaces are not homeomorphic ?

Options :

898741104829. ✖ $\mathbb{R}$ and $(0,1)$

898741104830. ✖ $\mathbb{R}^2$ and $\mathbb{C}$

898741104831. ✔ The unit circle and $[0,1]$

898741104832. ✖ The open unit disk in $\mathbb{R}^2$ and $\mathbb{R}^2$

Question Number : 109 Question Id : 89874126594 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following sets is compact in $\mathbb{R}^2$?

Options :

898741104833. ✖ $\{(x, y) \in \mathbb{R}^2 \mid x^2 + y^2 \leq 1, y \neq 0\}$

898741104834. ✔ $\{(x, y) \in \mathbb{R}^2 \mid 1 \leq x^2 + y^2 \leq 9\}$

898741104835. ✖ $\{(x, y) \in \mathbb{R}^2 \mid 0 < x \leq 1, 0 \leq y \leq \frac{1}{x}\}$

898741104836. ✖ $\{(x, y) \in \mathbb{R}^2 \mid x^2 + y^2 < 1\}$

Question Number : 110 Question Id : 89874126595 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The number of distinct Hausdorff topologies on the set $X = \{1, 2, 3, \dots, 2025\}$ is

Options :

898741104837. ✖ 0

898741104838. ✔ 1

898741104839. ✖ 2

898741104840. ✖ 2025

Question Number : 111 Question Id : 89874126596 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

A number ' n ' is chosen from $S = \{1, 2, 3, \dots, 50\}$. Let $A = \{n \in S : n + \frac{50}{n} > 27\}$,
 $B = \{n \in S : n \text{ is a prime}\}$ and $C = \{n \in S : n \text{ is a square}\}$. The correct order of their probabilities is
:

Options :

898741104841. ✖ $P(A) > P(C) > P(B)$

898741104842. ✔ $P(A) > P(B) > P(C)$

898741104843. ✖ $P(B) < P(A) < P(C)$

898741104844. ✖ $P(A) < P(B) < P(C)$

Question Number : 112 Question Id : 89874126597 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

Let A, B, C be pairwise independent events with $P(C) > 0$ and $P(A \cup B \cup C) = 0$.

Then $P(A^c \cap B^c | C)$ is equals to

Options :

898741104845. ✖ $P(A) - P(B^c)$

898741104846. ✖ $P(A^c) + P(B^c)$

898741104847. ✔ $P(A^c) - P(B)$

898741104848. ✖ $P(A^c) - P(B^c)$

Question Number : 113 Question Id : 89874126598 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

Consider a sequence of i.i.d. random variables $X_1, X_2, \dots, X_n$ where $E(X_i) = \mu$ and $Var(X_i) = \sigma^2$. Which of the following statements is correct about the convergence of $\bar{X}_n$ as $n \rightarrow \infty$?

Options :

898741104849. ✖ $\bar{X}_n$ converges to a constant
898741104850. ✖ $\bar{X}_n$ converges in distribution to $N(\mu, \sigma^2)$
898741104851. ✖ $\bar{X}_n$ converges to σ^2 almost surely
898741104852. ✔ $\bar{X}_n$ converges to μ almost surely

Question Number : 114 Question Id : 89874126599 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

The Weak Law of Large Numbers (WLLN) ensures that for a sequence of i.i.d. random variables with mean μ , the probability that the sample mean $\bar{X}_n$ deviates from μ by more than $\epsilon > 0$ approaches which value as $n \rightarrow \infty$?

Options :

898741104853. ✔ 0
898741104854. ✖ 1
898741104855. ✖ ϵ
898741104856. ✖ $\frac{1}{n}$

Question Number : 115 Question Id : 89874126600 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

Using Bayes' theorem, if $P(B|A) = 0.8$, $P(B|A^c) = 0.4$, $P(A) = 0.4$, and $P(A^c) = 0.6$, what is $P(A|B)$?

Options :

898741104857. ✖ $\frac{2}{3}$

898741104858. ✔ $\frac{4}{7}$

898741104859. ✖ $\frac{3}{5}$

898741104860. ✖ $\frac{4}{5}$

Question Number : 116 Question Id : 89874126601 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

Let X be a non-negative random variable representing the number of hours a machine operates before it needs maintenance. The expected value of X is $E[X] = 10$ hours. Using Markov's Inequality find an upper bound on the probability that the machine operates for more than 20 hours before needing maintenance

Options :

898741104861. ✖ 0.8

898741104862. ✖ 0.4

898741104863. ✔ 0.5

898741104864. ✖ 0.3

Question Number : 117 Question Id : 89874126602 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

In a Poisson frequency distribution, frequency corresponding to 3 successes is $\frac{2}{3}$ times frequency corresponding to 4 successes. The standard deviation of the distribution is :

Options :

898741104865. ✖ 4

898741104866. ✖ $\sqrt{5}$

898741104867. ✖ 2.5

898741104868. ✔ $\sqrt{6}$

Question Number : 118 Question Id : 89874126603 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

A river's high-water mark Y has the distribution function $F(y) = P(Y \leq y) = 1 - \frac{1}{y^2}$, $1 \leq y < \infty$. If the low-water mark is reset to 0 and scaled by $\frac{1}{10}$ th, the high-water mark becomes $Z = 10(Y - 1)$. The cumulative distribution function $F_Z(z)$ is :

Options :

898741104869. ✖ $\left(1 + \frac{z}{10}\right)^2$

898741104870. ✖ $\left(1 + \frac{z}{10}\right)^{-2}$

898741104871. ✔ $1 - \left(1 + \frac{z}{10}\right)^{-2}$

898741104872. ✖ $1 + \left(1 + \frac{z}{10}\right)^2$

Question Number : 119 Question Id : 89874126604 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

In a distribution exactly normal, 10.03% of the items are under 25 kgs weight and 89.97% of the items are under 70 kgs weight. What will be the standard deviation of the distribution?

{Given: $P(0 < Z < 1.28) = 0.3997$ }

Options :

898741104873. ✓ 18

898741104874. ✗ 20

898741104875. ✗ 25

898741104876. ✗ insufficient information

Question Number : 120 Question Id : 89874126605 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

The moment generating function of a distribution is given by $M_X(t) = 0.2e^{-t} + 0.1e^0 + 0.4e^t + 0.3e^{2t}$, then the 1st raw moment about the value 1 will be :

Options :

898741104877. ✗ 0.0

898741104878. ✓ -0.2

898741104879. ✗ 0.8

898741104880. ✗ 1.2

Question Number : 121 Question Id : 89874126606 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

Let $X \sim N_p(\mu, \Sigma)$ and A be a $p \times p$ matrix. What is the distribution of the linear transformation AX .

Options :

898741104881. ✖ $N_p(\mu, \Sigma)$

898741104882. ✖ $N_p(A\mu, \Sigma A^T)$

898741104883. ✖ $N_p(\mu, A\Sigma A^T)$

898741104884. ✔ $N_p(A\mu, A\Sigma A^T)$

Question Number : 122 Question Id : 89874126607 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

If $S_1 \sim W_p(\Sigma, n_1)$ and $S_2 \sim W_p(\Sigma, n_2)$ are independent Wishart-distributed random matrices, what will be the distribution of $S_1 + S_2$?

Options :

898741104885. ✖ $W_p(\Sigma, \sqrt{n_1^2 + n_2^2})$

898741104886. ✔ $W_p(\Sigma, n_1 + n_2)$

898741104887. ✖ $W_p(\Sigma, \sqrt{n_1 n_2})$

898741104888. ✖ $W_p(\Sigma, n_1 n_2)$

Question Number : 123 Question Id : 89874126608 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

For a dataset with two variables, the covariance matrix is given by $\Sigma = \begin{pmatrix} 4 & 2 \\ 2 & 3 \end{pmatrix}$. Then the proportion of the total variance explained by the first principal component is :

Options :

898741104889. ✖ 0.710

898741104890. ✔ 0.794

898741104891. ✖ 0.641

898741104892. ✖ 0.450

Question Number : 124 Question Id : 89874126609 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

Given the covariance matrices $\Sigma_{XX} = \begin{pmatrix} 1.0 & 0.5 \\ 0.5 & 1.0 \end{pmatrix}$, $\Sigma_{YY} = \begin{pmatrix} 1.0 & 0.2 \\ 0.2 & 1.0 \end{pmatrix}$, and $\Sigma_{XY} = \begin{pmatrix} 0.3 & 0.4 \\ 0.5 & 0.6 \end{pmatrix}$, the first canonical correlation is :

Options :

898741104893. ✖ 0.3

898741104894. ✖ 0.6

898741104895. ✔ 0.7

898741104896. ✖ 0.9

Question Number : 125 Question Id : 89874126610 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Consider a random vector $X \sim N_p(\mu, \Sigma)$ and a quadratic form $X^T A X$ where A is a symmetric matrix.

Under what conditions will $X^T A X$ have a chi-square distribution:

Options :

898741104897. ✖ when A is a positive definite matrix

898741104898. ✔ when A is idempotent and Σ is the identity matrix

898741104899. ✖ when $A = \Sigma^{-1}$

898741104900. ✖ when A is an identity matrix

Which of the following statements are correct:

- (i). If $X \sim N(\mu, \sigma^2)$ then the sample mean square variance is a MLE for the parameter σ^2 .
- (ii). If $X \sim U(0, \theta)$ then the maximum ordered statistic is a sufficient Estimator for θ .
- (iii). If a discrete random variable X with probability mass function

$f(x, \theta) = \theta(1 - \theta)^x; 0 < \theta < 1, x = 1, 2, \dots$; then $\frac{1}{n} \sum_{i=1}^n x_i + 1$ is an unbiased estimator for $\frac{1}{\theta}$.

Options :

(i) & (ii)

898741104901. ✖

(i) & (iii)

898741104902. ✖

(ii) & (iii)

898741104903. ✔

(i), (ii) & (iii)

898741104904. ✖

Question Number : 127 Question Id : 89874126612 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

The data on study variable (Y) and auxiliary variable (X) are given below, are for a hypothetical population of 8 units

Y	6	6	8	10	14	12	18	22
X	4	7	9	11	13	12	16	20

For a simple random sample without replacement of size 2, $(y, x): \{(10, 11), (12, 12)\}$. The population mean $\bar{Y}$ under ratio estimator is :

Options :

898741104905. ✖ 12.5

898741104906. ✖ 12.0

898741104907. ✖ 11.5

898741104908. ✔ 11.0

Question Number : 128 Question Id : 89874126613 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

Under PPSWR sampling scheme, which of the following is an unbiased estimator for population mean :

Options :

898741104909. ✓
$$\bar{y}_{pps} = \frac{1}{nN} \sum_{i=1}^n \frac{y_i}{p_i}$$

898741104910. ✗
$$\bar{y}_{pps} = \frac{1}{N} \sum_{i=1}^n \frac{y_i}{p_i}$$

898741104911. ✗
$$\bar{y}_{pps} = \frac{n}{N} \sum_{i=1}^n \frac{y_i}{p_i}$$

898741104912. ✗
$$\bar{y}_{pps} = \frac{N}{n} \sum_{i=1}^n \frac{y_i}{p_i}$$

Question Number : 129 Question Id : 89874126614 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

If the correlation coefficient between the auxiliary variable x and study variable y is 0.9, and the regression coefficient $b = 1.5$, what would be the best strategy to reduce variance in the regression estimator?

Options :

898741104913. ✗ Decrease the correlation between x and y

898741104914. ✗ Use a different auxiliary variable with lower correlation

898741104915. ✗ Ignore auxiliary information and use simple random sampling

898741104916. ✓ Increase the sample size

Question Number : 130 Question Id : 89874126615 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

In a Latin Square Design, if there are 4 treatments, how many rows and columns will the design have?

Options :

898741104917. ✖ 2 rows and 2 columns

898741104918. ✔ 4 rows and 4 columns

898741104919. ✖ 8 rows and 8 columns

898741104920. ✖ 16 rows and 16 columns

Question Number : 131 Question Id : 89874126616 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

In a randomized block design with 3 blocks and 6 treatments, if each treatment is replicated 2 times in each block, how many experimental units are there in total?

Options :

898741104921. ✖ 12

898741104922. ✖ 18

898741104923. ✔ 36

898741104924. ✖ 72

Question Number : 132 Question Id : 89874126617 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

In a 2^2 factorial experiment with factors A and B, the following data is obtained:

- Factor A at low level, Factor B at low level: 20
- Factor A at low level, Factor B at high level: 30
- Factor A at high level, Factor B at low level: 40
- Factor A at high level, Factor B at high level: 50

Then, the main effect of factor A is

Options :

898741104925. ✖ 10

898741104926. ✔ 20

898741104927. ✖ 30

898741104928. ✖ 40

Question Number : 133 Question Id : 89874126618 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

In a BIBD, what does it mean if a design is said to be "incomplete"?

Options :

898741104929. ✔ Not all treatments are included in each block.

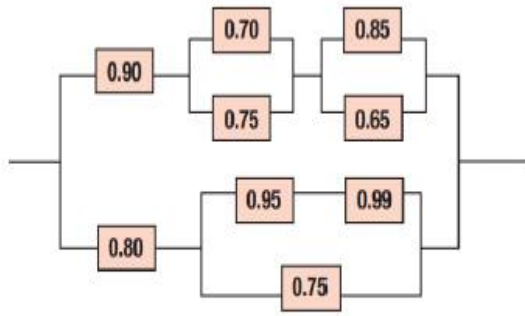
898741104930. ✖ Some blocks do not contain any treatments.

898741104931. ✖ Each treatment appears in some blocks but not in all blocks.

898741104932. ✖ The design does not include every possible pair of treatments.

Question Number : 134 Question Id : 89874126619 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

The reliability block diagram of a system is given below



The number in each box is the reliability of the component. This system has nine components. Find the reliability of the system.

Options :

898741104933. ✖ 0.78879

898741104934. ✖ 0.78810

898741104935. ✔ 0.95525

898741104936. ✖ 0.91123

Question Number : 135 Question Id : 89874126620 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

An electronic device has a failure rate of 0.0025 failures per hour. The MTTF for this device in days is

Options :

898741104937. ✖ 10.15 days

898741104938. ✔ 16.67 days

898741104939. ✖ 20.43 days

898741104940. ✖ 37.00 days

Question Number : 136 Question Id : 89874126621 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

Consider the following statements:

In a single-server queuing model

State 1. The service times follow a memory less process

State 2. The arrivals is described as a Poisson distribution

State 3. Uncertainty concerning the demand for service exists

Which of the above statements are correct?

Options :

898741104941. ✓ 1, 2 and 3

898741104942. ✗ 1 and 2 only

898741104943. ✗ 1 and 3 only

898741104944. ✗ 2 and 3 only

Question Number : 137 Question Id : 89874126622 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

For a simple queue (M/M/1), $\rho = \frac{\lambda}{\mu}$ is known as

Options :

898741104945. ✗ Poisson busy period

898741104946. ✗ Random factor

898741104947. ✓ Traffic intensity

898741104948. ✗ Exponential service factor

Question Number : 138 Question Id : 89874126623 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Which of the following is not a corner point in the formulation of the given LPP, maximize

$$z = 5x_1 + 7x_2 \text{ subject to constraints: } x_1 + x_2 \leq 4, 3x_1 + 8x_2 \leq 24, 10x_1 + 7x_2 \leq 35, x_1, x_2 \geq 0,$$

Options :

898741104949. ✓ (0.0, 3.5)

898741104950. ✗ (1.6, 2.4)

898741104951. ✗ (1.6, 2.3)

898741104952. ✗ (0.0, 0.0)

Question Number : 139 Question Id : 89874126624 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Customers arrive at a bank at an average interval rate of 15 minutes, the cashier takes an average of 6 minutes for one customer. The average queue length is

Options :

898741104953. ✗ 0.41

898741104954. ✗ 0.32

898741104955. ✗ 0.40

898741104956. ✓ 0.27

Question Number : 140 Question Id : 89874126625 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

The common assumptions based on Gauss-Markov model are cataloged here. Which of them is correct.

Options :

898741104957. ✓ In Gauss Markov models, the random error variable consists of a mean zero.
898741104958. ✗ In Gauss Markov models, the random error variables are also homoscedastic. So, all the variables contain finite unequal variance.
898741104959. ✗ In Gauss Markov models, all the unique and different error terms are related.
898741104960. ✗ There is no linearity in ordinary least square assumption.

Question Number : 141 Question Id : 89874126626 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

Under the Gauss-Markov assumption of $y = Xb + e$, if $\lambda^T b$ is estimable function, then what is the nature of $\lambda^T b$.

Options :

898741104961. ✗ Linear unbiased estimator
898741104962. ✗ Minimum variance unbiased estimator (MVUE)
898741104963. ✗ Biased estimator
898741104964. ✓ Best linear unbiased estimator (BLUE)

Question Number : 142 Question Id : 89874126627 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

Which of the following is a disadvantage of the fixed effects approach in estimating a panel model?

Options :

The model is likely to be technical to estimate.

898741104965. ✖

The approach may not be valid if the composite error term is correlated with one or more of the explanatory variables.

898741104966. ✖

The number of parameters to estimate may be large, resulting in a loss of degrees of freedom.

898741104967. ✔

The fixed effects approach can only capture cross-sectional heterogeneity but not temporal variation in the dependent variable.

898741104968. ✖

Question Number : 143 Question Id : 89874126628 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

What is Multicollinearity?

Options :

Low correlation between independent variables

898741104969. ✖

Correlation between features

898741104970. ✖

Correlation between outliers

898741104971. ✖

High correlation between independent variables

898741104972. ✔

Question Number : 144 Question Id : 89874126629 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The student's t-test is typically used

Options :

- 898741104973. ✖ in comparing multiple groups to see if their means differ
- 898741104974. ✖ in testing the stationarity of a time series
- 898741104975. ✔ in comparing two groups to see if their means differ
- 898741104976. ✖ in testing the goodness of fit of a model

Question Number : 145 Question Id : 89874126630 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The sign test is

Options :

- 898741104977. ✔ Less powerful than that of the Wilcoxon signed-rank test
- 898741104978. ✖ More powerful than the paired sample t-test
- 898741104979. ✖ More powerful than the Wilcoxon signed-rank test
- 898741104980. ✖ Equivalent to the Mann-Whitney test

Question Number : 146 Question Id : 89874126631 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

Three brands of coffee are rated for taste on a scale of 1 to 10. Six persons are asked to rate each brand so that there is a total of 18 observations. The appropriate test to determine if three brands taste equally good is

Options :

- 898741104981. ✖ One way ANOVA
- 898741104982. ✖ Wilcoxon rank-sum test
- 898741104983. ✖ Spearman rank difference
- 898741104984. ✔ Friedman Test

Question Number : 147 Question Id : 89874126632 Question Type : MCQ Option Shuffling : No Correct Marks : 2 Wrong Marks : 0

If Chi-square goodness of fit test has 6 categories and $N=30$, then the correct number of degrees of freedom is

Options :

- 898741104985. ✔ 5
- 898741104986. ✖ 6
- 898741104987. ✖ 28
- 898741104988. ✖ 29

Question Number : 148 Question Id : 89874126633 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

The TPM for a three state Markov Chain is given below

$$P = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$$

Options :

898741104989. ✖ All states are aperiodic

898741104990. ✖ State 0 is aperiodic

898741104991. ✖ State 0 has period 2 but other states aperiodic

898741104992. ✔ All states have period 3

Question Number : 149 Question Id : 89874126634 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

Suppose $N_1(t)$, $N_2(t)$, $N_3(t)$ be three independent Poisson processes with rate λ_1 , λ_2 , λ_3 and

$N(t) = N_1(t) + N_2(t) + N_3(t)$ follows which of the following distribution

Options :

898741104993. ✖ $N(\lambda, 1) ; \lambda = \lambda_1 + \lambda_2 + \lambda_3$

898741104994. ✔ $P(\lambda) ; \lambda = \lambda_1 + \lambda_2 + \lambda_3$

898741104995. ✖ $Exp(\lambda) ; \lambda = \lambda_1 + \lambda_2 + \lambda_3$

898741104996. ✖ $N(\lambda, \lambda) ; \lambda = \lambda_1 + \lambda_2 + \lambda_3$

Question Number : 150 Question Id : 89874126635 Question Type : MCQ Option Shuffling : No
Correct Marks : 2 Wrong Marks : 0

If $X_1, X_2, \dots, X_n \sim U(0, 1)$, the expected value of the smallest order statistics $X_{(1)}$ is

Options :

898741104997. ✓ $\frac{1}{n+1}$

898741104998. ✗ $\frac{n}{n+1}$

898741104999. ✗ $\frac{1}{n}$

898741105000. ✗ $\frac{1}{2}$