

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 :	Material Science and Nanotechnology 19th Oct 2022 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 :	549470397
Section Number :	1
Mandatory or Optional :	Mandatory
Number of Questions :	59
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 : 54947028250 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the independent variable in the process of teaching learning?

Options :

Student

1. ✘

Parents

2. ✘

Teacher

3. ✔

Education Institution

4. ✘

Question Number : 2 Question Id : 54947028251 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 the pioneer in the concept of micro-teaching?

Options :

Oxford University

1. ✘

Stanford University

2. ✔

Delhi University

3. ✘

Madras University

4. ✘

Question Number : 3 Question Id : 54947028252 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When a student asks a question for which the teacher has no direct, correct answer, he should

Options :

Ask the student to find out the answer himself from the library

1. ✘

Tell the student not to put irrelevant questions

2. ✘

Provide some vague answer to satisfy the student

3. ✘

Tell the student that he would tell correct answer later

4. ✔

Question Number : 4 Question Id : 54947028253 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 appropriate in the context of teacher- student relationship?

Options :

Informal and intimate

1. ✘

Cordial and peaceful

2. ✔

Indifferent

3. ✘

Restricted to classroom dynamic

4. ✘

Question Number : 5 Question Id : 54947028254 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Assertion (A): Formative learning tends to accelerate the process of learning.

Reason (R): As against summative evaluation formative evaluation is highly reliable.

Choose the correct answer from the following code:

Options :

Both (A) and (R) are true, and (R) is not the correct explanation of (A).

1. ✘

Both (A) and (R) are true, and (R) is the correct explanation of (A).

2. ✘

(A) is true, but (R) is false.

3. ✔

(A) is false, but (R) is true.

4. ✘

Question Number : 6 Question Id : 54947028255 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

During which year, Educational T V was introduced in India?

Options :

1. ✘ 1971

2. ✘ 1961

3. ✔ 1968

4. ✘ 1978

Question Number : 7 Question Id : 54947028256 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The primary objective of N C T E – is _____

Options :

1. ✔ To maintain standards in education colleges.

2. ✘ To open education colleges.

3. ✘ To provide grant aid to education colleges.

4. ✘ To promote research in education.

Question Number : 8 Question Id : 54947028257 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The quality of research is primarily adjudicated on the basis of

Options :

1. ✔ The rigour with which it was carried out .

2. ✘ The place of publication

3. ✘ The manner in which the action is taken on recommendations.

Quantitative aspects.

4. ✖

Question Number : 9 Question Id : 54947028258 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A research which has explored ideas based on the new facts through the study of the past is called.

Options :

Historical research

1. ✔

Mythological research

2. ✖

Content analysis

3. ✖

Philosophical research

4. ✖

Question Number : 10 Question Id : 54947028259 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 a research method?

Options :

Historical

1. ✘

Survey

2. ✘

Philosophical

3. ✘

Observation

4. ✔

Question Number : 11 Question Id : 54947028260 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

_____ is not required in experimental researches.

Options :

Manipulation

1. ✘

Controlling

2. ✘

Content analysis

3. ✔

Observation

4. ✘

**Question Number : 12 Question Id : 54947028261 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, a satisfactory statistical quantitative method should not possess?

Options :

Measurability

1. ✘

Flexibility

2. ✔

Appropriateness

3. ✘

Comparability

4. ✖

Question Number : 13 Question Id : 54947028262 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 specifically related to a research design?

- A. Designing Hypothesis
- B. Choice of field inquiry
- C. Sample selection
- D. Formulation of plan
- E. Deciding the tools to be employed in data collection

Options :

B, C, and D

1. ✖

A, B, and C

2. ✖

3. ✓ C, D, and E

4. ✘ B, D and E

Question Number : 14 Question Id : 54947028263 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The acronym SPSS stands for:

Options :

1. ✘ Software Package for Social Sciences

2. ✓ Statistical Package for Social Sciences

3. ✘ Statistical Package for Studies in sociology

4. ✘ Statistical Package for social studies

Is Section Default? :

null

Question Id : 54947028264 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 : (15 to 21)

Read the following passage carefully and answer the questions from 15 to 21:

For the mobility-impaired, highly trained canines called ‘service dogs’ can pick up dropped keys, open and close drawers, retrieve prepared meals, help a person in and out of bathtub, dial 911, push and pull wheelchairs, help operate a car or van and pull off gloves, shoes, socks and jackets. Other dogs provide specific assistance to those who suffer seizures (sudden attacks of illness) and require special medication. And, of course, the helping dogs provide companionship, play and give unconditional love to the people they assist. It is thirty odd years now since the placement of the first assistance dog. But only in recent years, with the rising independent movement among disabled people has the idea begun to sored widely. While most service-dogs are trained to work with people who rely on wheelchairs, other categories of helping dogs include hearing –dogs who alert their owners to sounds, such as doorbells, phones, cooking times, alarm clocks, smoke alarms and seizure dogs which carry medication in their packs and are trained to dial 911 on large keypad phones.

Sub questions

Question Number : 15 Question Id : 54947028265 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which kind of dogs, alerts their owners to sounds, such as doorbells and phones?

Options :

1. ✘ Service dogs

2. ✘ Canines

3. ✘ Seizure dogs

4. ✔ Hearing dogs

Question Number : 16 Question Id : 54947028266 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The service-dogs are

Options :

1. ✘ Paid highly

2. ✘ Less in number

3. ✔ Multiple taskers

Employees

4. ✘

Question Number : 17 Question Id : 54947028267 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The idea of assistance dogs became popular due to

Options :

1. ✔ Independent movement among the disabled

2. ✘ awareness in hospitals

3. ✘ Independence of the country

4. ✘ Both independent movement among the disabled and awareness in hospitals

Question Number : 18 Question Id : 54947028268 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The categorie of helping –dogs is

Options :

domestic, service and seizure dogs

1. ✘

service, hearing and seizure dogs

2. ✔

hunting and domestic dogs

3. ✘

hearing and domestic dogs

4. ✘

Question Number : 19 Question Id : 54947028269 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The passage makes a distinct difference between

Options :

service and helping dogs

1. ✔

service dogs and canines

2. ✘

canines and ordinary dogs

3. ✘

Both service dogs and canines and canines and ordinary dogs

4. ✘

Question Number : 20 Question Id : 54947028270 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

State the noun form of ‘ trained’

Options :

train

1. ✘

trainer

2. ✘

training

3. ✔

trainee

4. ✖

Question Number : 21 Question Id : 54947028271 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which dogs are trained to work with people who rely on wheelchairs?

Options :

Hearing dogs

1. ✖

Siezure dogs

2. ✖

Service dogs

3. ✔

Street dogs

4. ✖

Is Section Default? : null

Question Number : 22 Question Id : 54947028272 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 Berol's Linear Model of communication?

Options :

1. ✘ S-M-R-C
2. ✘ S-R-M-C
3. ✔ S-M-C-R
4. ✘ S-R-C-M

Question Number : 23 Question Id : 54947028273 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Communication which has no beginning or end is known as _____

Options :

1. ✔ Process
2. ✘ Meditation

Interaction

3. ✘

Transaction

4. ✘

**Question Number : 24 Question Id : 54947028274 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 does not contribute to effective communication?

Options :

Adequate medium

1. ✘

Clarity in language

2. ✘

Listen poorly

3. ✔

Home communication skill

4. ✘

Question Number : 25 Question Id : 54947028275 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

_____An example of channel communication.

Options :

Face – to – face conversation

1. ✓

Noise

2. ✘

Feedback

3. ✘

Context

4. ✘

Question Number : 26 Question Id : 54947028276 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Among the following, which indicates the problem arising from expression?

Options :

Wrong assumption

1. ✘

Cultural barriers

2. ✘

Selecting perception

3. ✘

Semantic problems

4. ✔

Question Number : 27 Question Id : 54947028277 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In India, _____ is not the concern for mass media.

Options :

Privacy

1. ✘

Manipulation

2. ✘

Integration of society

3. ✔

Security

4. ✘

Question Number : 28 Question Id : 54947028278 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

2, 9, 28, 65, 126, 217, 344, _____

Options :

361

1. ✘

362

2. ✘

369

3. ✘

513

4. ✔

Question Number : 29 Question Id : 54947028279 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

B, D, G, I, L, N _____

Options :

1. ✘ N
2. ✘ O
3. ✔ Q
4. ✘ P

Question Number : 30 Question Id : 54947028280 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When "PAT" is coded as "QRBCUV", then how will you code "GRACE"?

Options :

1. ✘ HISTBCDEGF
2. ✔ HISTBCDEFG
3. ✘ HISBTCDEFG

HISTBCEDFG

4. ✘

Question Number : 31 Question Id : 54947028281 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

E is the son of A; D is the son of B; E is married to C; C is the daughter of B. How is D related to E?

Options :

Brother

1. ✘

Uncle

2. ✘

Brother-in-law

3. ✔

Father-in-law

4. ✘

Question Number : 32 Question Id : 54947028282 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\frac{1}{5}$ th of Eiffel tower is painted with bronze, $\frac{1}{4}$ th maroon and the rest, golden. If the height of golden-colored part is 450m, what is the height of Eiffel tower?

Options :

2,250m

1. ✘

750m

2. ✔

1000m

3. ✘

1,250m

4. ✘

Question Number : 33 Question Id : 54947028283 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Pankaj from the home with a speed of 30km/h, reaches the school late by 20 minutes. Next day by increasing the speed by 15km/h, reached the school late by 8 minutes. How far is the school from home?

Options :

35 km

1. ✘

2. ✓ 18 km

3. ✘ 20km

4. ✘ 27km

Question Number : 34 Question Id : 54947028284 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If 30 men carry out a piece of work in 27 days, how many days is required for 18 men to perform another piece of work, which is 3 times bigger

Options :

1. ✓ 135 days

2. ✘ 120 days

3. ✘ 150 days

180 days

4. ✘

Question Number : 35 Question Id : 54947028285 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If two liters of water is evaporated by boiling 8 liters of sugar solution with 5% sugar, findout the percentage of sugar in the remaining solution?

Options :

1. ✘ 8%

2. ✔ $6\frac{2}{3}\%$

3. ✘ 9%

4. ✘ 10%

Question Number : 36 Question Id : 54947028286 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A reasoning started with a particular statement and concluded with a universal statement is known as _____

Options :

Deductive reasoning

1. ✘

Transcendental reasoning

2. ✘

Inductive reasoning

3. ✔

Abnormal reasoning

4. ✘

Question Number : 37 Question Id : 54947028287 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 an argument?

Options :

Devadutt does not eat during day, so he must be eating at night.

1. ✘

Devadutt eats in the night, so he does not eat during the day

2. ✘

If Devadutt is growing fat and if he does not eat during the day, he will be eating at night.

3. ✔

Since Devadutt does not eat in the day, he must be eating in the night.

4. ✘

Question Number : 38 Question Id : 54947028288 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Two propositions with the same subject and predicate terms, but different in quality are termed as:

Options :

Contrary

1. ✘

Subaltern

2. ✘

Subalternation

3. ✘

Contradictory

4. ✓

Question Number : 39 Question Id : 54947028289 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Inductive reasoning presupposes _____

Options :

God created the world

1. ✘

Uniformity of nature

2. ✘

Law of the nature

3. ✘

Unity of nature.

4. ✓

Question Number : 40 Question Id : 54947028290 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Venn diagram is a kind of diagram to

Options :

1. ✘ Represent but not assess the validity of elementary inferences of syllogistic form.
2. ✔ Represent and assess the validity of elementary inferences of syllogistic form.
3. ✘ Represent and assess the truth of elementary inferences of syllogistic form.
4. ✘ Assess but not represent the truth of elementary inferences of syllogistic form.

Question Number : 41 Question Id : 54947028291 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Indian school of logic uses _____pramana to prove the existence of God.

Options :

1. ✘ Arthapatti
2. ✔ Anumana

Upamana

3. ✖

Pratyaksha

4. ✖

Question Number : 42 Question Id : 54947028292 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

_____ Concept of Indian logic system denotes circumstantial implication.

Options :

Upamana

1. ✖

Anupalabdi

2. ✖

Pratyaksa

3. ✖

Arthapatti

4. ✔

Is Section Default? :

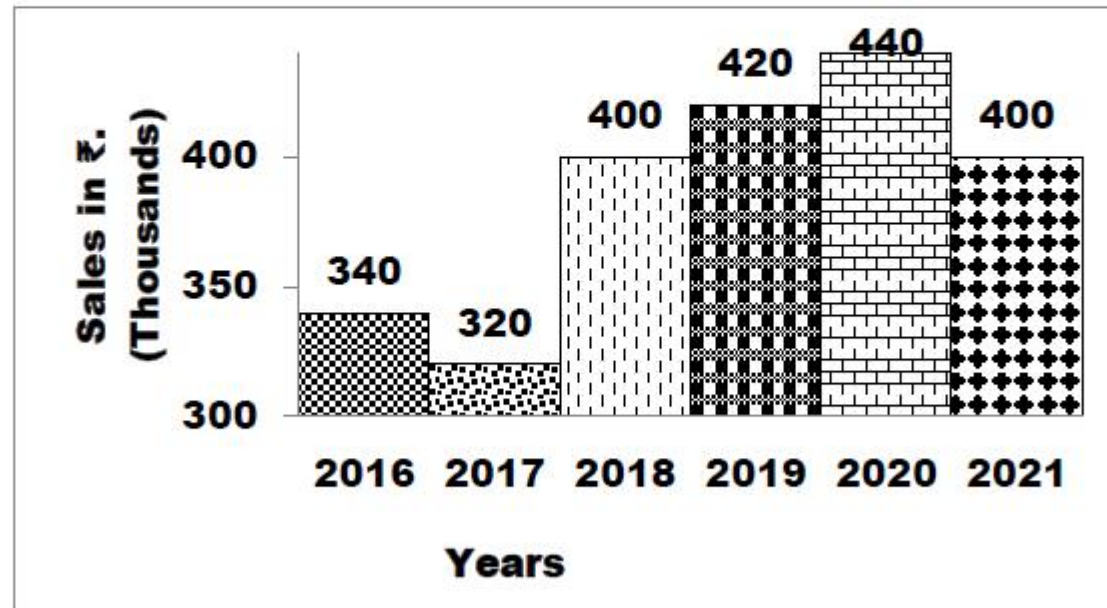
null

Question Id : 54947028293 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 : (43 to 45)

Note:

Study the following bar chart carefully and answer the questions 43 to 45. It gives sales (in thousands) of a product over years 2016 - 2021.



Sub questions

Question Number : 43 Question Id : 54947028294 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 average sales for the period 2018 to 2021?

Options :

1. ✘ 425

2. ✘ 430

3. ✘ 420

4. ✔ 415

Question Number : 44 Question Id : 54947028295 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The sales of 2017 are _____ times of sales 2018.

Options :

1. ✘ 1.25

2. ✔ 0.8

3. ✘ 8.25

8

4. ✖

Question Number : 45 Question Id : 54947028296 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which year, the percentage of increase over the previous year is the least?

Options :

1. ✖ 2016

2. ✔ 2020

3. ✖ 2018

4. ✖ 2019

Is Section Default? : null

Question Id : 54947028297 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 : (46 to 49)

Note:

Study the following table carefully and answer the questions from 46 to 49. It consists of data on marks obtained by various candidates in different subjects

Students	Subjects (Max Marks)					
	Maths (150)	Chemistry (130)	Physics (120)	Geography (100)	History (100)	Comp Science (100)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

Sub questions

Question Number : 46 Question Id : 54947028298 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Who among the following has obtained the highest aggregate marks?

Options :

1. ✘ Ayush

2. ✘ Aman

3. ✘ Sajal

4. ✔ Muskan

Question Number : 47 Question Id : 54947028299 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 average of marks obtained by all candidates in Physics?

Options :

1. ✘ 62.85

2. ✔ 74.28

3. ✘ 78.52

4. ✘ No answer

Question Number : 48 Question Id : 54947028300 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 average of marks obtained by Aman for all subjects?

Options :

1. ✘ 72

2. ✔ 75

3. ✘ 80

4. ✘ 85

Question Number : 49 Question Id : 54947028301 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 approximate percentage of marks obtained by Ayush?

Options :

1. ✘ 72

2. ✔ 73

3. ✘ 75

4. ✘ 78

Is Section Default? : null

Question Number : 50 Question Id : 54947028302 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 employs asynchronous communication?

- A) Video conferencing
- B) Email
- C) Forums
- D) Instant messaging

Choose the correct option.

Options :

1. ✘ A and C

2. ✘ B and D

3. ✔ B and C

4. ✘ A and D

Question Number : 51 Question Id : 54947028303 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Read the following two statements:

A) ICT is considered a subset of IT.

B) The “right to use” a piece of software is termed as copyright.

Which of the above statements(s) is/are correct?

Options :

1. ✔ Neither (A) nor (B)

2. ✘ Both (A) and (B)

3. ✘ (B) only

4. ✘ (A) only

Question Number : 52 Question Id : 54947028304 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 can be taken the digital library for education?

Options :

1. ✘ Swayam

2. ✘ MOOC

3. ✘ Sakshat

4. ✔ NPTEL

Question Number : 53 Question Id : 54947028305 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 lists computer memory sequentially from highest to lowest speed?

Options :

1. ✘ Secondary storage; Main Memory (RAM); Cache Memory; CPU Registers
2. ✘ CPU Registers; Cache Memory; Secondary storage; Main Memory (RAM)
3. ✘ Cache Memory; CPU Registers; Main Memory (RAM); Secondary Storage
4. ✔ CPU Registers; Cache Memory; Main Memory (RAM); Secondary Storage

Question Number : 54 Question Id : 54947028306 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Each computer connected to the internet should

Options :

1. ✘ Be an IBM PC
2. ✔ Have a unique IP address
3. ✘ Have a modern connection
4. ✘ Be internet compatible

Question Number : 55 Question Id : 54947028307 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 exact format of Email address?

Options :

1. ✔ name@website.info
2. ✘ name@website@info
3. ✘ www.nameofebsite.com

name.website.com

4. ✖

**Question Number : 56 Question Id : 54947028308 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

_____ is the oldest soap opera telecasted in India.

Options :

Kahani Ghar Ghar Ki

1. ✖

Buniyaad

2. ✖

Kyunki Saas Bhi Kabhi Bahu Thee

3. ✖

Hum Log

4. ✔

**Question Number : 57 Question Id : 54947028309 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Indicate the name of the research station established for conducting research at Antarctica by Government of India

Options :

Yamunotri

1. ✘

UttariGangotri

2. ✘

DakshinGangotri

3. ✔

None of these.

4. ✘

Question Number : 58 Question Id : 54947028310 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 are priority areas related to the sustainable development Goals?

- i. No poverty
- ii. Peace, Justice and strong institutions
- iii. Zero hunger
- iv. Reducing urbanization

Choose the correct answer from the options given below.

Options :

(i) , (iii), (iv)

1. ✘

(ii), (iii), (iv)

2. ✘

(i), (ii), (iv)

3. ✘

(i), (ii), (iii)

4. ✔

Question Number : 59 Question Id : 54947028311 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The common feature between NO₂, SO₂, CO and SPM is _____

Options :

Are greenhouse gases

1. ✘

Are classified as secondary pollutants

2. ✘

Are classified as primary pollutants

3. ✔

Have equal role in causing acid rain

4. ✘

Question Number : 60 Question Id : 54947028312 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Given below are an assertion and a reason:

Assertion (A):

Methaemoglobinaemia is a condition wherein blood is unable to carry and deliver enough oxygen to the body.

Reason (R):

Consumption of drinking water with high nitrate level may lead to Methaemoglobinaemia.

Choose the correct answer from the options given below:

Options :

1. ✘ Both (A) and (R) are true but (R) is not the correct explanation of (A).
2. ✔ Both (A) and (R) are true and (R) is the correct explanation of (A).
3. ✘ (A) is true, but (R) is false
4. ✘ (A) is false, but (R) is true.

Which of the following gases has the highest global warming potential?

Options :

Carbon dioxide

1. ✘

Sulphur hexafluoride

2. ✔

Chlorofluorocarbon

3. ✘

Methane

4. ✘

Question Number : 62 Question Id : 54947028314 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 percentage occurrence of earthquakes at plate boundaries?

Options :

90

1. ✔

2. ✘ 50

3. ✘ 80

4. ✘ 75

Question Number : 63 Question Id : 54947028315 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which year, India Government has announced the National Action plan on Climate Change?

Options :

1. ✘ 2005

2. ✘ 2009

3. ✔ 2008

4. ✘ 2012

Question Number : 64 Question Id : 54947028316 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Radhakrishnan Commission, opined that the aim of Higher Education should be

Options :

1. ✘ To inculcate values Peace and harmony.

2. ✘ To develop great personalities who can contribute to politics, administration, industry and commerce

3. ✘ To impart traditional education to students.

4. ✔ To inculcate values Peace and harmony, and also develop great personalities who can contribute to politics, administration, industry and commerce

Question Number : 65 Question Id : 54947028317 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Value education makes a student.

Options :

Successful businessman

1. ✘

Good teacher

2. ✘

Able manager

3. ✘

Good citizen.

4. ✔

Question Number : 66 Question Id : 54947028318 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Among the appointees of the Governor, _____ can be removed by the President of India only?

Options :

Vice-Chancellor of a State University

1. ✘

Advocate-General

2. ✘

A member of the State Public Service Commission

3. ✓

Chief Minister of a State.

4. ✘

**Question Number : 67 Question Id : 54947028319 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Where and when was the Second Buddhist Council held?

Options :

Sri Lanka in the first century BCE

1. ✘

Vaishali in 383 BCE

2. ✓

Pataliputra in 250 BCE

3. ✘

Mandalay in 1871 CE

4. ✘

Question Number : 68 Question Id : 54947028320 Display Question Number : Yes Is Question Mandatory : No Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which of the following year, the Universities in the presidency towns were established in India?

Options :

1858

1. ✘

1857

2. ✔

1900

3. ✘

1909

4. ✘

Question Number : 69 Question Id : 54947028321 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

According to National Educational Policy, 2020, the Gross Enrolment Ratio in higher education would increased to _____ percent by 2035.

Options :

40

1. ✘

2. ✓ 50

3. ✘ 60

4. ✘ 70

Question Number : 70 Question Id : 54947028322 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which of the following states, 50th Central University was established?

Options :

1. ✘ Tamil Nadu

2. ✓ Telangana

3. ✘ Tripura

4. ✘ Andhra Pradesh.

Material Science and Nanotechnology

Section Id :	549470398
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 : 54947028323 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The elastic scattering of a photon is called

Options :

1. ✘ Atmospheric scattering
2. ✘ Conserved scattering
3. ✔ Rayleigh scattering
4. ✘ Raman scattering

Question Number : 72 Question Id : 54947028324 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Number of nodal planes for d-orbital are

Options :

1. ✘ 2
2. ✔ 3
3. ✘ 0
4. ✘ 1

Question Number : 73 Question Id : 54947028325 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Pauli's Exclusion Principle states that

Options :

1. ✘ Two fermions can have the same quantum number
2. ✔ Two fermions cannot have the same quantum number
3. ✘ Four fermions can have the same quantum number
4. ✘ Four fermions cannot have the same quantum number

Question Number : 74 Question Id : 54947028326 Display Question Number : Yes Is Question Mandatory : No Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A Carnot engine operates between two thermal reservoirs which are at 300 K and 500 K. If the heat absorbed by this engine is 100 kJ, the work done is equal to

Options :

1. ✘ 100 kJ
2. ✘ 60 kJ
3. ✔ 40 kJ
4. ✘ 250 kJ

Question Number : 75 Question Id : 54947028327 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The quantum mechanics mainly states that: The wave function or state function of a system evolves in time according to the time-dependent Schrodinger equation $\hat{H}\psi(r,t)$
=

Options :

1. ✘ $-\text{i}\hbar \frac{\partial \psi}{\partial t}$
2. ✔ $+\text{i}\hbar \frac{\partial \psi}{\partial t}$

3. ✘ $-\hbar \frac{\partial^2 \psi}{\partial t^2}$

4. ✘ $+\hbar \frac{\partial^2 \psi}{\partial t^2}$

Question Number : 76 Question Id : 54947028328 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The fundamental observables associated with the motion of a single quantum mechanical particle are

Options :

- 1. ✘ E and P operators
- 2. ✔ x and P operators
- 3. ✘ L and P operators
- 4. ✘ E and x operators

Question Number : 77 Question Id : 54947028329 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The property introduced by zeroeth law of thermodynamics is

Options :

1. ✓ Temperature
2. ✗ Enthalpy
3. ✗ Entropy
4. ✗ Work

Question Number : 78 Question Id : 54947028330 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Five moles of a substance has an internal energy of 30 kJ and a total volume of 8 cubic meters and is at a pressure of 50 kPa. Its molar enthalpy is given by _____ kJ

Options :

1. ✗ 80
2. ✓ 86
3. ✗ 88
4. ✗ 430

Question Number : 79 Question Id : 54947028331 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fugacity of an ideal gas is equal to

Options :

1. ✓ its pressure
2. ✗ the pressure calculated from van der Waals equation
3. ✗ half of its pressure
4. ✗ 80 percent of its pressure

Question Number : 80 Question Id : 54947028332 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

There is no exchange of heat and work between the system and surroundings. Such a system is called as

Options :

1. ✗ Open system
2. ✗ Closed system
3. ✓ Isolated system

4. ✘ Flow process

Question Number : 81 Question Id : 54947028333 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fajan's Rules are generally based on the

Options :

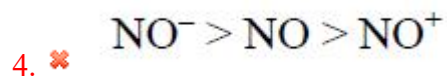
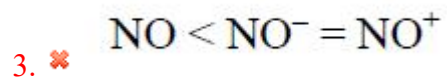
1. ✔ Size of the ion, charge of the cation, electronic configuration
2. ✘ solubility of the molecules
3. ✘ Acidity of the solution
4. ✘ Bond energy of the molecules

Question Number : 82 Question Id : 54947028334 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Select the correct arrangement of bond order from the following

Options :

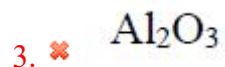
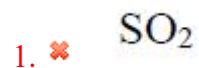
1. ✘ $\text{NO} > \text{NO}^- > \text{NO}^+$
2. ✔ $\text{NO}^- < \text{NO} < \text{NO}^+$



Question Number : 83 Question Id : 54947028335 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the odd electron molecule from the following molecules?

Options :



Question Number : 84 Question Id : 54947028336 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the correct statement, among the following:

Options :

1. ✘ The energy of bonding molecular orbital is higher than that of atomic orbitals from which it is formed
2. ✘ Anti-bonding takes place when lobes of atomic orbital have same signs
3. ✘ The energy of anti-bonding molecular orbital is lower than that of atomic orbital from which is formed
4. ✔ The energy of anti-bonding molecular orbital is higher than that of atomic orbitals from which it is formed

Question Number : 85 Question Id : 54947028337 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A centre of symmetry means

Options :

1. ✔ Similar faces occur in parallel pairs on opposite sides of a crystal
2. ✘ Similar faces are not occurred from the opposite sides of a crystal
3. ✘ Opposite edges are inclined to each other
4. ✘ Opposite faces are inclined to each other

Question Number : 86 Question Id : 54947028338 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The defect which occurs due to the missing of a pair of positive and negative ions is called

Options :

1. ✘ Vacancy defect
2. ✘ Void defect
3. ✘ Frankel defect
4. ✔ Schottky defect

Question Number : 87 Question Id : 54947028339 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Find out the angle between two directions in the crystal $[h_1k_1l_1]$ and $[h_2k_2l_2]$

Options :

1. ✔
$$\frac{(h_1h_2 + k_1k_2 + l_1l_2)}{\sqrt{(h_1^2 + k_1^2 + l_1^2)} \sqrt{(h_2^2 + k_2^2 + l_2^2)}}$$

2. ✖
$$\frac{(h_1 h_2 + k_1 k_2 + l_1 l_2)}{\sqrt{(h_1^2 + k_1^2 + l_1^2)} + \sqrt{(h_2^2 + k_2^2 + l_2^2)}}$$

3. ✖
$$\frac{(h_1 h_2 + k_1 k_2 + l_1 l_2)}{\sqrt{(h_1^2 + k_1^2 + l_1^2)} - \sqrt{(h_2^2 + k_2^2 + l_2^2)}}$$

4. ✖
$$\frac{(h_1 k_2 + h_2 k_2 + h_2 l_2)}{\sqrt{(h_1^2 + k_1^2 + l_1^2)} \sqrt{(h_2^2 + k_2^2 + l_2^2)}}$$

Question Number : 88 Question Id : 54947028340 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The atomic radius of a metallic element which crystallizes in face centered cubic system is 1.28Å. Find the number of metal elements per square meter on the plane (110) _____

Options :

1. ✖ 100 atoms/m²

2. ✔ 10.79×10^{18} atoms/m²

3. ✖ 13.15×10^{18} atoms/m²

4. ✘ 14.25×10^{18} atoms/m²

Question Number : 89 Question Id : 54947028341 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The inter-axial angles (α, β, γ) of triclinic system are related as

Options :

1. ✘ $\alpha \perp \beta \perp \gamma$

2. ✔ $\alpha \neq \beta \neq \gamma \neq 90$

3. ✘ $\alpha \neq \beta = \gamma$

4. ✘ $\alpha \neq \beta \neq \gamma$

Question Number : 90 Question Id : 54947028342 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

F-centers in the crystals, are responsible for

Options :

1. ✔ Colour of the compound

2. ✘ Gaining charge on the surface

3. ✘ Keep the crystal at zero charge
4. ✘ Keep the crystal surface rough

Question Number : 91 Question Id : 54947028343 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum magnetic susceptibility at Neel temperature can be found in

Options :

1. ✔ Anti-ferromagnetic materials
2. ✘ Diamagnetic materials
3. ✘ Ferrimagnetic materials
4. ✘ Ferromagnetic materials

Question Number : 92 Question Id : 54947028344 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Heisenberg principle states that it is

Options :

1. ✔ Impossible to determine simultaneously the exact position and exact momentum of an electron

2. ✘ Possible to determine simultaneously the exact position and exact momentum of an electron
3. ✘ Impossible to determine magnetic susceptibility and magnetic permeability
4. ✘ Possible to calculate simultaneously residual flux density and coercive force

Question Number : 93 Question Id : 54947028345 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Air is the

Options :

1. ✘ Diamagnetic
2. ✔ Paramagnetic
3. ✘ Ferromagnetic
4. ✘ Anti-ferromagnetic

Question Number : 94 Question Id : 54947028346 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the reason for the failure of Curie-Weiss Law and Curie Law at absolute zero

Options :

1. ✘ Molecular motion ceases
2. ✘ Molecular motion ceases and magnetic susceptibility only applicable when state is disordered
3. ✘ Magnetic moment per unit volume becomes zero
4. ✔ Magnetic susceptibility only applicable when state is disordered

Question Number : 95 Question Id : 54947028347 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the Magnetic material which is used in the construction of circulators, gyrators and isolators?

Options :

1. ✘ Ferromagnetic material
2. ✔ Ferrimagnetic material

3. ✘ Antiferromagnetic material

4. ✘ Diamagnetic material

Question Number : 96 Question Id : 54947028348 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is an example for natural nanomaterial?

Options :

1. ✘ Sand

2. ✘ TiO₂ nanoparticles

3. ✔ Clay

4. ✘ Quartz

Question Number : 97 Question Id : 54947028349 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the material where the magnetic moments align themselves parallel to each other?

Options :

1. ✔ Ferromagnetic materials

2. ✘ Paramagnetic material
3. ✘ Ferrimagnetic material
4. ✘ Diamagnetic material

Question Number : 98 Question Id : 54947028350 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Size of the nanomaterials ranges from

Options :

1. ✔ 1-100 nanometer
2. ✘ 1-10 μm
3. ✘ 200-500 nanometer
4. ✘ 100-200 nanometer

Question Number : 99 Question Id : 54947028351 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Hydrothermal process is generally used for the preparation of

Options :

1. ✘ TiBr₂ nanoparticles
2. ✔ TiO₂ nanoparticles
3. ✘ TiB₂ nanoparticles
4. ✘ TiH₂ nanoparticles

Question Number : 100 Question Id : 54947028352 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fullerenes refer to

Options :

1. ✔ A molecule with 60 carbon atoms
2. ✘ A molecule with 60 hydrogen atoms
3. ✘ A molecule with 70 titanium atoms
4. ✘ A molecule with 60 helium atoms

Question Number : 101 Question Id : 54947028353 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is an example for bottom-up approach?

Options :

1. ✓ Sol-Gel method
2. ✗ Ball milling method
3. ✗ Oxidation method
4. ✗ Reduction method

Question Number : 102 Question Id : 54947028354 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Quantum dots are generally used in

Options :

1. ✗ Mechanics
2. ✗ Quantum physics
3. ✓ Optoelectronics
4. ✗ Crystallography

Question Number : 103 Question Id : 54947028355 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Chemical Vapour Deposition (CVD) is used in the semiconductor industry_____.

Options :

1. ✓ To produce high performance thin films
2. ✗ To produce high performance powders
3. ✗ To produce high performance fibers
4. ✗ To produce high performance bulk materials

Question Number : 104 Question Id : 54947028356 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

X-rays are used for the determination of crystal structures because

Options :

1. ✗ Wavelength of X-rays is much smaller than inter-atomic distances
2. ✓ Wavelength of X-rays is comparable to the inter-atomic distances
3. ✗ Very high energy of X-rays

4. ✘ Very low energy of X-rays

Question Number : 105 Question Id : 54947028357 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 shapes are formed by the diffracted radiation in the powder method?

Options :

1. ✘ Spherical

2. ✘ Circular

3. ✔ Conical

4. ✘ Cubical

Question Number : 106 Question Id : 54947028358 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Beer's law states that

Options :

1. ✔ Absorption of light is directly proportional to concentration

2. ✘ Absorption of light is directly proportional to the distance
3. ✘ Absorption of light is directly proportional to the volume solution
4. ✘ Absorption of light is directly proportional to composition of the solution

Question Number : 107 Question Id : 54947028359 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Miller indices h , k , and l of parallel planes in a BCC lattice should satisfy which of the following X-ray diffraction reflection rules?

Options :

1. ✔ $h + k + l$ should be even
2. ✘ h , k and l should form Pythagoras triplet
3. ✘ h , k and l should all be either even or odd
4. ✘ All planes allow reflections.

Question Number : 108 Question Id : 54947028360 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 has same units?

Options :

1. ✘ Pressure, Temperature, Universal gas constant
2. ✔ Universal gas constant, molar heat capacity, molar entropy
3. ✘ Molar volume, molar enthalpy, molar entropy
4. ✘ Molar volume, specific volume, specific entropy

Question Number : 109 Question Id : 54947028361 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Rotational energy of a diatomic molecule can be expressed in terms of wave number

Options :

1. ✔
$$E_J = \frac{h}{8\pi^2 IC} J(J + 1)$$

2. ✘
$$E_J = \frac{h^2}{8\pi^2 I} J(J + 1)$$

3. ✘
$$E_J = \frac{h^2}{8\pi^2 IC} J(J + 1)$$

4. ✘
$$E_J = \frac{h}{8\pi^2 I C} J(J + 2)$$

Question Number : 110 Question Id : 54947028362 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 region of IR spectra appears between (1400-600) cm^{-1} ?

Options :

1. ✔ Fingerprint region
2. ✘ Low frequency region
3. ✘ Functional group region
4. ✘ High-frequency region

Question Number : 111 Question Id : 54947028363 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 wavelength range for UV spectrum of light?

Options :

1. ✘ 700 to 1 nm

2. ✘ 0.01 to 10 nm
3. ✘ 400 to 700 nm
4. ✔ 100 to 400 nm

Question Number : 112 Question Id : 54947028364 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the wrong statement from the following:

Options :

1. ✘ NMR spectrometers use radiofrequency electromagnetic radiation
2. ✘ UV absorption is attributable to electronic transitions
3. ✘ UV spectra provide information about valence electrons
4. ✔ IR absorption is attributable to transitions between rotational energy levels of whole molecules

Question Number : 113 Question Id : 54947028365 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Vibrational stretching frequency of diatomic molecule is very much controlled by

Options :

1. ✘ Kinetic energy only
2. ✘ Force constant only
3. ✘ Mass of the two atoms only
4. ✔ Mass of the two atoms and force constant

Question Number : 114 Question Id : 54947028366 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The linear harmonic oscillator is described by the

Options :

1. ✔ Schrodinger equation
2. ✘ Feynman equations
3. ✘ Bohr equation
4. ✘ Einstein equation

Question Number : 115 Question Id : 54947028367 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 a Auxochromes?

Options :

1. ✘ OH
2. ✘ NH₂
3. ✘ SH
4. ✔ C = C

Question Number : 116 Question Id : 54947028368 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the compound in which bathochromic shift in polar solvent can be seen?

Options :

1. ✘ Water
2. ✘ Ethanol
3. ✔ Ethylene
4. ✘ Chloroform

Question Number : 117 Question Id : 54947028369 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the molecule that will not be displayed in an infrared spectrum.

Options :

1. ✓ CO₂

2. ✗ N₂

3. ✗ Benzene

4. ✗ HCCH

Question Number : 118 Question Id : 54947028370 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If there is no significant change in the dipole character of the molecule, how many bands will be appeared in the IR spectrum?

Options :

1. ✓ No bands

2. ✗ One band

3. ✗ Three bands

4. ✘ Two bands

Question Number : 119 Question Id : 54947028371 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The most commonly used laser for Raman spectroscopy is _____

Options :

1. ✘ Nd:YAG
2. ✘ Ruby laser
3. ✔ He-Ne laser
4. ✘ Semiconductor laser

Question Number : 120 Question Id : 54947028372 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the following techniques which is used to know the size and crystallinity of Nano materials.

Options :

1. ✔ TEM
2. ✘ EDAX

3. ✖ HR-MS

4. ✖ AFM and STM

Question Number : 121 Question Id : 54947028373 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the molecule which is having the highest bond order?

Options :

1. ✔ O_2^+

2. ✖ O_2^{2-}

3. ✖ O_2^-

4. ✖ O_2

Question Number : 122 Question Id : 54947028374 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Among the following, both microwave and rotational Raman active molecule is

Options :

1. ✔ CH_4

2. ✘ N₂O

3. ✘ C₂H₄

4. ✘ CO₂

Question Number : 123 Question Id : 54947028375 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the component from which TEM focuses the beam of electrons on the sample?

Options :

1. ✔ Condenser lens

2. ✘ Ocular lens

3. ✘ Column

4. ✘ Stage

Question Number : 124 Question Id : 54947028376 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which instrument is more useful to read the surface morphology of a specimen?

Options :

1. ✘ Optical microscope
2. ✘ Light microscope
3. ✔ Scanning Electron Microscope
4. ✘ Transition Electron Microscope

Question Number : 125 Question Id : 54947028377 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Signal splitting in NMR arises from

Options :

1. ✘ Shielding effect
2. ✘ Spin-spin decoupling
3. ✘ Deshielding effect
4. ✔ Spin-spin coupling

Question Number : 126 Question Id : 54947028378 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The vibrational stretching frequency of diatomic molecule generally depend on _____

Options :

1. ✘ Atomic population
2. ✔ Force constant
3. ✘ Magnetic field
4. ✘ Temperature

Question Number : 127 Question Id : 54947028379 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Covalent bond is also known as _____ bond

Options :

1. ✘ Heteropolar
2. ✔ Homopolar
3. ✘ Electrovalent
4. ✘ Electrolytic

Question Number : 128 Question Id : 54947028380 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Generally, Quantum mechanics is a theory of operators (observables) acting on an abstract space called

Options :

1. ✘ Lorentz space
2. ✔ Hilbert Space
3. ✘ Reimannian Space
4. ✘ Boson Field

Question Number : 129 Question Id : 54947028381 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Lattice energy is inversely proportional to sum of radii of

Options :

1. ✘ Cation only
2. ✘ Anion only
3. ✔ Anion and cation together

4. ✘ Photons only

Question Number : 130 Question Id : 54947028382 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the correct statement from the following statements:

Options :

1. ✔ Higher the bond order, stronger is the pull between two atoms and smaller is the bond length
2. ✘ Lower the bond order, weaker is the pull between two atoms and smaller is the bond length
3. ✘ Higher the bond order, weaker is the pull between two atoms and longer is the bond length
4. ✘ Higher the bond order, weaker is the pull between two atoms and smaller is the bond length

Question Number : 131 Question Id : 54947028383 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The preparation of nanoscale materials by chemically or physically from the larger size materials is said to be _____ approach in nanotechnology?

Options :

1. ✘ Bottom-up approach
2. ✔ Top-down approach
3. ✘ Top-intermediate approach
4. ✘ Bottom-up and top-down approach

Question Number : 132 Question Id : 54947028384 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The typical precursor used in sol-gel are _____

Options :

1. ✘ Metal dioxides
2. ✘ Metal oxides
3. ✘ Metal fluorides
4. ✔ Metal alkoxides

Question Number : 133 Question Id : 54947028385 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 beams are studied to determine the nature of crystal during examination of crystals using X-rays?

Options :

1. ✘ Transmitted beam
2. ✘ Incident beam
3. ✔ Diffracted beam
4. ✘ Refracted beam

Question Number : 134 Question Id : 54947028386 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum magnification of an electron microscope is up to

Options :

1. ✘ 1000x
2. ✘ 100x
3. ✔ 1,00,000x
4. ✘ 10,000,000x

Question Number : 135 Question Id : 54947028387 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Hypsochromic shifts refers to

Options :

1. ✓ The absorption maximum shift towards shorter wavelength due to change in the polarity of the solvent
2. ✘ The absorption minimum shift towards longer wavelength due to change of the solvent
3. ✘ The absorption shift is not occurred due to no change in the solvent
4. ✘ The absorption shift decreases intensity of radiation

Question Number : 136 Question Id : 54947028388 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Vibrational spectroscopy involves the transitions falling in the spectral range of

Options :

1. ✓ 400-4000 cm^{-1}
2. ✘ 300-3000 cm^{-1}

3. ✘ 500-5000 cm^{-1}

4. ✘ 100-1000 cm^{-1}

Question Number : 137 Question Id : 54947028389 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The elastic scattering of a photon is called

Options :

1. ✘ Atmospheric scattering

2. ✔ Rayleigh scattering

3. ✘ Conserved scattering

4. ✘ Raman scattering

Question Number : 138 Question Id : 54947028390 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The potential energy of an electron moving in one dimension and confined to the right half-space ($x > 0$) is $V(x) = -\frac{e^2}{4x}$ where, 'e' is the charge on the electron. The corresponding 1D Schrodinger equation is

$$-\frac{\hbar^2}{2m} \frac{d^2 \psi}{dx^2} - \frac{e^2}{4x} \psi = E\psi = -|E|\psi$$

Find the solution of the Schrodinger equation at large x?

Options :

1. ✓ $\psi(x \rightarrow \infty) = e^{-ax}$

2. ✗ $\psi(x \rightarrow \infty) = e^{ax}$

3. ✗ $\psi(x \rightarrow \infty) = e^{2ax}$

4. ✗ $\psi(x \rightarrow \infty) = e^{5ax}$

Question Number : 139 Question Id : 54947028391 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 partial molar property?

Options :

1. ✗ Total pressure of the system

2. ✘ Total volume of the system
3. ✘ Overall density of the system
4. ✔ Chemical potential

Question Number : 140 Question Id : 54947028392 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a reversible adiabatic process

Options :

1. ✘ Temperature is constant
2. ✘ Pressure is constant
3. ✘ Volume is constant
4. ✔ Entropy is constant