Andhra Pradesh State Council of Higher Education

Question Paper Name:	PHYSICAL SCIENCES
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PHYSICAL SCIENCES

Group Number :	1
Group Id :	62321746
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Teaching and Research Aptitude

Section Id :	62321791
Section Number :	1
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	82
Number of Questions to be attempted:	82
Section Marks:	90
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	623217271
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 6232178146 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

If there is unrest in the college, the main reason may be

Options :

1. Management

2. System of education

3. Teacher

4. Student

Question Number : 2 Question Id : 6232178147 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Students like the teacher most because he

Options :

1. Gives more marks

2. Maintains student discipline

3. Shows concern about students

4. Avoids meeting the students

Question Number : 3 Question Id : 6232178148 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

A teacher can prevent the fluctuations of attention of the students in the classroom by

Options :

1. Reprimanding them

2. Using proper stimulus

3. Implementing rules strictly

4. Repeating the important points

Question Number : 4 Question Id : 6232178149 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Teacher should correct the work done by the students by following one of the techniques

Options :

1. Ill treatment

2. Pass and fail

3. Good relationship

4. Bad Affect

Question Number : 5 Question Id : 6232178150 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Over – motivation by teacher in the class room leads to

Options :

1. Ill treatment

2. Good environment

3. Good relationship

4. Bad Affect

'Achievement Motivation' can be influenced mostly by

Options :

1. Reinforcement by teacher

2. Environment

3. Teaching – learning material

4. Self – Evaluation by student

A teacher can identify a disabled with the help of

Options :

1. Who is affected by the environment

2. Who may not be affected by the environment

3. Who is well with the other people

4. Who is equally competent with others

The full form of 'ITEP' is

Options :

1. Integrated Teacher Education Programme

2. Intensive Teacher Education Programme

3. Inclusive Teacher Education Programme

4. In-service Teacher Education Programme

Question Number : 9 Question Id : 6232178154 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

If a teacher wish to improve his classroom teaching well, he should better involve?

Options :

1. Personal Activity

2. School programmes

3. Governmental Activities

4. Action Research

Question Number : 10 Question Id : 6232178155 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The following is not a measure of dispersion

Options :

1. Standard deviation

2. Variance

3. Quartile deviation

4. Mean

An appropriate source to find out descriptive information is

Options :

1. Directory

2. Bibliography

3. Encyclopaedia

4. Dictionary

The term " Control Group" is used in

Options :

1. Historical research

2. Experimental research

3. Survey research

4. Descriptive research

Question Number : 13 Question Id : 6232178158 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The following is not related to plagiarism

Options :

1. Academic dishonesty

2. Branch of Journalistic ethics

3. Stealing and publication of another author

4. Self-citations

Question Number : 14 Question Id : 6232178159 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

As sample size increases the following is true

Options :

1. Sampling error increases

2. Sampling error decreases

3. Non sampling error decreases

4. Level of significance increases

Question Number : 15 Question Id : 6232178160 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The full form of APA in citation is

Options :

1. American psychological Association

2. American Philosophical Association

3. All people Alphabets

4. American Pedagogical Association

Question Number : 16 Question Id : 6232178161 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Scaling method is used to measure

Options :

1. Quantitative variables

2. Attributes

3. Associations

4. Relations

Question Number : 17 Question Id : 6232178162 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The data collected from records is called

Options :

1. Census data

Primary data

2.

Secondary data

3.

Field data

4.

Question Number : 18 Question Id : 6232178163 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The Null hypothesis contains

Options :

Population parameter

1.

Sample statistic

2.

Sampling distribution

3.

Estimator

4.

Sub-Section Number:	2
Sub-Section Id:	623217272
Question Shuffling Allowed :	Yes

Question Id : 6232178164 Question Type : COMPREHENSION Sub Question Shuffling Allowed : Yes Group Comprehension Questions : No

Question Numbers : (19 to 27)

Question Label : Comprehension

Read the following passage and answer the questions given:

From the 1920s onwards, we also find an increasingly active engagement of women in the freedom struggle. Much has been said – and with justice – about the co-option of women's struggle for subjectivity into the nationalist agenda. Yet our analysis would remain simplistic if we do not admit that the increasing active participation of women in these nation – wide movements was changing the parameters of man-woman relationship both within the movement and in society in general in subtle and indirect ways. It was also making dents in the ideological boundaries within which the consciousness of the middle class woman traditionally operated. The experience of participating in the Non-cooperation Movement and courting arrest involved a perception of oneself that did not tally with traditionally – constructed self – images. Then again when women, in their contact with armed revolutionaries, graduated from the role of giving shelter and hiding arms to that of participating in or even leading armed action, they had to breach very stiff barriers of conventional behaviour. There is no doubt that the strategies of the armed revolutionaries imposed severe control over women's sexually and that the ultimate leadership in armed struggle remained with the men. Yet it cannot be denied that this participation demanded that women should create new roles for themselves and in doing so should transgress norms of gender and class relationship. This process became more pronounced when women joined mass-movements organized by the Leftist forces.

Sub questions

What was the turning point in our Freedom Movement from 1920s?
Options :

1. Withdrawal of women from the Movement

2. Passive role of women in the Movement

3. Increasingly active engagement of women

Conflict between men and women

4.

What was the option of women in those times?

Options :

Subjectivity into the national agenda

1.

Mere observation of the movement

2.

Supporting men from home'

3.

Non – interfering attitude

4.

Why were the parameters of man – woman relationship changed

Options :

Imposition of British culture on Indian society

1.

Women's opposition to male domination

2.

Increase in the rate of women's education

3.

Active participation of women in the Movement

4.

The ideological boundaries of the middle class women of 1920s were

Options :

1. Steadfast

2. Modified

3. Dangerous

4. Strengthened

What were the reasons for transformation of traditionally constructed self-image of women?

Options :

1. Women's active participation in the freedom struggle

2. Women taking part in Non-cooperation Movement'

3. Women courting arrest and going to jail

4. All of the other options

Why did women breach stiff barriers of convention?

Options :

1. To lead armed action

2. To discourage the male activists and revolutionaries

3. To disconnect themselves from the Movement

To control their sexuality

4.

How did the men revolutionaries keep the ultimate leadership in armed struggle with them?

Options :

By restricting women to household chores

1.

By sending women to educational institutes

2.

By encouraging them to learn handicrafts

3.

By imposing severe control over women's sexuality

4.

What did women do in order to create new roles for themselves?

Options :

Trained their children to be patriotic

1.

Abided by the norms of society

2.

Transgressed gender and class

3.

Honed their skills

4.

To further their role in armed revolution, women joined mass movements organized by

Options :

1. Mahatma Gandhi

2. Leftists

3. Arya Samaj

4. Azad Hind Fauj

Sub-Section Number:	3
Sub-Section Id:	623217273
Question Shuffling Allowed :	Yes

Question Number : 28 Question Id : 6232178174 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

One of the following is not related to the areas of Johari Window's interpersonal communication.

Options :

1. Hidden Area

2. Known Area

3. Blind Area

4. Unknown Area

Question Number : 29 Question Id : 6232178175 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The questioning device of communication "who says what in which channel to whom with what effect?". Suggested by

Options :

1. Herald Laswell

2. Herald Lasky

3. George Gerbene

4. Herbert spencer

Question Number : 30 Question Id : 6232178176 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The purpose of the freedom in communication results in

Options :

1. Authority

2. Reduction

3. Control

4. Demotivation

Question Number : 31 Question Id : 6232178177 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Computer Assisted Instruction (CAI) is based on one of the following principle.

Options :

1. Classical conditioning

2. Sender conditioning

3. Operant conditioning

4. Respondent conditioning

Question Number : 32 Question Id : 6232178178 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Berlo's model of communication has the following four elements

Options :

1. Source, message, noise, barrier

2. Source, message, channel, receiver

3. Source, channel, receiver, feedback

4. Source, receiver, message, medium

Question Number : 33 Question Id : 6232178179 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Community radio comes under

Options :

1. Instructional Media

2. Social Media

3. Mass Media

4. Digital Media

Question Number : 34 Question Id : 6232178180 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

'Diorama' is an extension of the following

Options :

1. Four Dimension

2. Uni – Dimension

3. Two – Dimension

4. Three – Dimension

Question Number : 35 Question Id : 6232178181 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

In a 'Dyad' communication, the number of persons involved are

Options :

1. 3

2. 4

3. 2

4. 5

Question Number : 36 Question Id : 6232178182 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

'Hermeneutics' is a branch of knowledge, whose main role of the teacher is to

Options :

1. Teach the philosophy of behaviour

2. Interprets the meanings of codes

Question Number : 37 Question Id : 6232178183 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The number that comes next in the sequence 4, 60, 212 is _____.

Options :

1. 339

2. 345

3. 508

4. 612

Question Number : 38 Question Id : 6232178184 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Identify the missing number in the sequence $33\frac{1}{3}$, $37\frac{1}{2}$, $42\frac{6}{7}$, _____, 60.

Options :

1. 50

2. 45

3. $46\frac{3}{5}$

4. 55

Question Number : 39 Question Id : 6232178185 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Which term comes next in the sequence YEB, VHG, SKL, PNQ, _____?

Options :

1. MQV

2. MOR

3. ROS

4. SQT

Question Number : 40 Question Id : 6232178186 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

A man purchased 20 watches for a cost of ₹200 and sold them for ₹300. What is the percentage of profit he got?

Options :

1. 50

2. 40

3. 60

4. 100

Question Number : 41 Question Id : 6232178187 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

If $x : y = 3 : 4,$ then $(5x + 3y) : (4x + 7y) =$

Options :

1. $11 : 8$

2. 8 : 11

3. 27 : 40

4. 40 : 27

Question Number : 42 Question Id : 6232178188 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The average marks of 23 students is 45 and the average marks of another 27 students

is 55. Then the average marks of all the students put together is

Options :

1. 50

2. 50.4

3. 48

4. 48.5

Question Number : 43 Question Id : 6232178189 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The difference between the compound interest and the simple interest on a certain sum

for two years at the same interest rate 8% per annum is 64. Then the sum is in rupees

Options :

1. 15,000

2. 12,000

3. 10,000

4. $8,000$

In a certain code 4523 is written as 5476 and 2871 is written as 7128. Then the code

for 2018 is

Options :

1. 7981

2. 9001

3. 7901

4. 5798

A train passes a pole of height 3 meters in 10 seconds and a platform of 130 meters

long in 36 seconds. Then the speed of the train in km/h is

Options :

1. 25

2. 18

3. 50

4. 27

Question Number : 46 Question Id : 6232178192 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Which word does not belong with the other?

Options :

1. Congar

2. Leopard

3. Elephant

4. Lion

Question Number : 47 Question Id : 6232178193 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The word in the bottom row one related in the same way as the words in the top row.

For each item find the word that completes the bottom row of words

Candle, Lamp, Flood light

Hut, Cottage, _____.

Options :

1. Tent

2. City'

3. Dwelling

4. House

Question Number : 48 Question Id : 6232178194 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

In the following a statement is given. The statement is followed by two conclusions. Identify which of the given conclusions logically follows:

Statement: Some actors are singers. All the singers are dancers.

Conclusions : 1. Some actors are dancers

2. No singer is actor

Options :

1. Only (1) conclusion follows

2. Only (2) conclusion follows

3. Both (1) and (2) follows

4. Neither (1) nor (2) follows

Question Number : 49 Question Id : 6232178195 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

In the following series, you will be looking a pattern. Fill the blank in the series.

SCD, TEF, UGH, WKL, _____.

Options :

1. CMN

2. UJI

3. VIJ

4. IJT

Question Number : 50 Question Id : 6232178196 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

In the following series, you will be looking pattern. Fill the blank in the series.

BCB, DED, FGF, HIH _____.

Options :

1. JKJ

2. HJH

3. IJI

4. JHJ

Question Number : 51 Question Id : 6232178197 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Here are some words translated from an artificial language:

Hepllesh means cloudburst

Srenchoch means pinball

Resbosrench mean minepin

Which word could mean Clonalnine?

Options :

1. Leshsrench

2. Haplresho

3. Haploch

4. Ochhapl.

Question Number : 52 Question Id : 6232178198 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

If the day after the day after tomorrow is four days before Monday. What day is it today?

Options :

1. Tuesday

2. Wednesday

3. Thursday

4. Monday

Question Number : 53 Question Id : 6232178199 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Rama is younger than Rao

Raju was born after Rama

If the above two statements are true, then which the following statement is correct?

Options :

1. Rao is older than Raju

2. Rama is older than Raju

3. Both Rao and Rama are older than Raju

4. None of the other options

Question Number : 54 Question Id : 6232178200 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Knowledge based on memory is known as

Options :

1. Direct perception

2. Indirect perception

3. Inference

4. Analogy

Study the following tabular statement which indicates the performance of department of surgery of a hospital for the period January to July 2019. Based on this information answer the question given below.

Month	Total successful operations		Total unsuccessful operations
	ENT	Eyes	
January	4	6	6
February	6	2	8
March	6	4	4
April	8	4	6
May	4	4	4
June	2	4	6
July	1	3	8

The total number of successful operations performed during the months having 31 days of the given period is

Options :

1. 32

2. 48

3. 26

4. 40

Study the following tabular statement which indicates the performance of department of surgery of a hospital for the period January to July 2019. Based on this information answer the question given below.

Month	Total successful operations		Total unsuccessful operations
	ENT	Eyes	
January	4	6	6
February	6	2	8
March	6	4	4
April	8	4	6
May	4	4	4
June	2	4	6
July	1	3	8

The percentage of successful operations from January to April of the year 2019

Options :

1. 40

2. 60.5

3. 62.5

4. 64

Study the following tabular statement which indicates the performance of department of surgery of a hospital for the period January to July 2019. Based on this information answer the question given below.

Month	Total successful operations		Total unsuccessful operations
	ENT	Eyes	
January	4	6	6
February	6	2	8
March	6	4	4
April	8	4	6
May	4	4	4
June	2	4	6
July	1	3	8

If there are 50 more operations left to be performed, then how many operations must be successful in order to make the overall percentage of successful operations to 60?
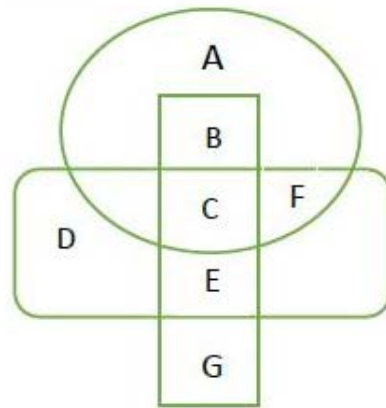
Options :

1. 42

2. 32

3. 38

4. 36

Study the following figure carefully and answer the question given below. In the figure ◯ represents the students studying Mathematics, ☐ represents the students studying Physics and ☐ represents the students studying Chemistry.

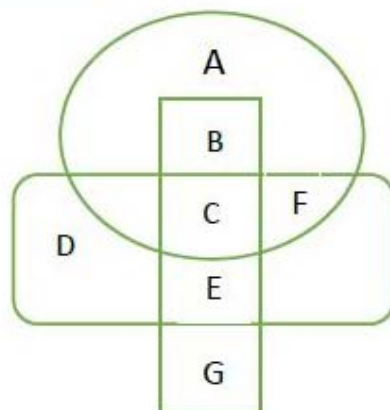Students who study Mathematics and Physics only are represented by

Options :

1. C

2. E

3. A

4. B

Question Number : 59 Question Id : 6232178205 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Study the following figure carefully and answer the question given below. In the figure ◯ represents the students studying Mathematics, ☐ represents the students studying Physics and ☐ represents the students studying Chemistry.

Students who study Chemistry only are represented by

Options :

1. B,G D and F

2. D and F

3. C,D,E and F

4. D,E and F

Question Number : 60 Question Id : 6232178206 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Study the following figure carefully and answer the question given below. In the figure ◯ represents the students studying Mathematics, ▯ represents the students studying Physics and ▭ represents the students studying Chemistry.
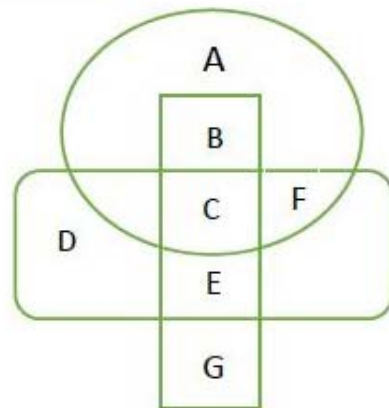

Students who study all the three subjects, i.e., Mathematics, Physics and Chemistry
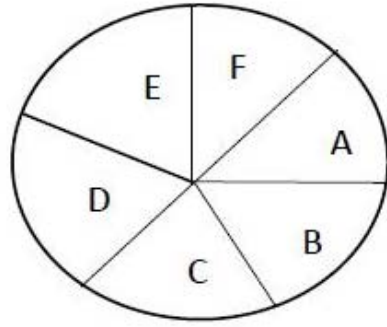
Options :

1. C, D and F

2. B and C

3. C and F

4. C

Question Number : 61 Question Id : 6232178207 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The following Pie chart represents the percentage distribution of the expenditure incurred in publishing a book. Study the chart carefully and answer the question given below.

A – Printing cost 20%, B – Paper cost 25% C – Binding cost 20%, D – Royalty 15%

E – Promotion cost 10%, F – Transportation cost.

If for a certain type of books, the publisher has to pay 24000 rupees towards Royalty, then the amount to be paid towards the transportation is in rupees.

Options :

1. 16000

2. 12000

3. 10500

4. 16800

Question Number : 62 Question Id : 6232178208 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The following Pie chart represents the percentage distribution of the expenditure incurred in publishing a book. Study the chart carefully and answer the question given below.

A – Printing cost 20%, B – Paper cost 25% C – Binding cost 20%, D – Royalty 15%

E – Promotion cost 10%, F – Transportation cost.

The angle of the sector corresponding to the expenditure incurred on the binding cost, is in degrees.

Options :

1. 36

2. 48

3. 72

4. 54

The following Pie chart represents the percentage distribution of the expenditure incurred in publishing a book. Study the chart carefully and answer the question given below.

A – Printing cost 20%, B – Paper cost 25% C – Binding cost 20%, D – Royalty 15%
E – promotion cost 10%, F – Transportation cost.

If for a certain edition of a book, the paper cost in rupees 55000, then the expenditure involved for the printing and the transportation together is in rupees
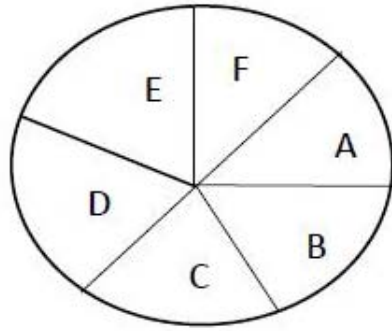
Options :

1. 50000

2. 66000

3. 45000

4. 38750

Question Number : 64 Question Id : 6232178210 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The following pollutants (s) can cause cancer in humans.

Options :

1. Mercury

2. Lead

3. Ozone

4. Pesticides

Which year Biosphere reserve project was initiated in India?

Options :

1. 1986

2. 1984

3. 1989

4. 1985

Phytoplanktons are the members of

Options :

1. Grass land ecosystem

2. Forest ecosystem

3. Aquatic ecosystem

4. Desert ecosystem

Photosphere is described as the

Options :

1. Lower layer of atmosphere

2. Wave length of solar spectrum
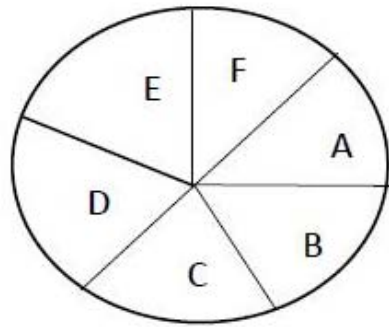
3. Visible surface of the sun from which radiation emanates

4. Global warming

Question Number : 68 Question Id : 6232178214 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The earthquake waves which have transverse movements are known as

Options :

1. Secondary waves

2. Tidal waves

3. Primary waves

4. Surface waves

Question Number : 69 Question Id : 6232178215 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

A lunar eclipse occurs when.

Options :

1. Sun, Moon and Earth are not in the same line

2. Earth comes between the Sun and the Moon

3. Moon comes between the Sun and the Earth

4. Sun comes between the Earth and the Moon

Question Number : 70 Question Id : 6232178216 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

"Joy water fall" is located in

Options :

1. Karnataka

2. Kerala

3. Andhra Pradesh

4. Maharashtra

Question Number : 71 Question Id : 6232178217 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The central pollution Board was established under the following Act in India.

Options :

1. Water (Prevention and control of pollution) Act, 1974

2. Air (Prevention and control of pollution) Act, 1981

3. Urban area (Prevention and control of pollution) Act, 1976

4. Noise pollution (Regulations and control) Act, 2013

Question Number : 72 Question Id : 6232178218 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

According to Andhra Pradesh government sand mining policy announced on 4th September 2019, the stock yards are operated by.

Options :

1. APMDC

2. APPCB

3. CREDAI

4. AP Green Tribunal

Question Number : 73 Question Id : 6232178219 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical Wrong Marks : 0

The full form of FTP is

Options :

1. File Transaction Protocol

2. File Truncation Protocol

3. File Transfer Protocol

4. File Transfer Processing

Question Number : 74 Question Id : 6232178220 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical Wrong Marks : 0

With regard to computer memory which of the following statement (s) is/are true.

    (i) ROM is volatile memory

    (ii) RAM is volatile memory

    (iii) Secondary memory is volatile

Options :

1. (i) only

2. (ii) only

3. Both (i) and (ii)

4. (i) and (iii) only

Question Number : 75 Question Id : 6232178221 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

If binary equivalent of the decimal number 48 is 110000, then the binary equivalent of decimal numbers 51 is

Options :

1. 110010

2. 110011

3. 110001

4. 110100

Question Number : 76 Question Id : 6232178222 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Which of the following is not open source software?

Options :

1. Internet explorer

2. Open office

3. Fedora Linux

4. Apache HTTP server

Question Number : 77 Question Id : 6232178223 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Fire wall in computers is used for

Options :

1. Security

2. Data transmission

3. Authentication

4. Monitoring

Question Number : 78 Question Id : 6232178224 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

IC chips for computer are made of

Options :

1. Silver

2. Aluminium

3. Silicon

4. Steel

Question Number : 79 Question Id : 6232178225 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The following protect computer system from hackers.

Options :

1. Antivirus

2. Backup

3. Hard disk

4. Firewall

Question Number : 80 Question Id : 6232178226 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

"IT for mass" is a plan scheme.

Options :

1. Department of electronics and information technology

2. University grants commission

3. MHRD

4. AICT

Question Number : 81 Question Id : 6232178227 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The full form of NPTEL is

Options :

1. National Programme on Technology Enhanced Learning

2. National Programme on Technology Enforced Learning

3. National Project for Technology Enhanced Learning

4. National Project for Technology Enforced Learning

Question Number : 82 Question Id : 6232178228 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The first Open University was set up in the State of

Options :

1. New Delhi

2. Arunachal Pradesh

3. Tamil Nadu

4. Andhra Pradesh

Question Number : 83 Question Id : 6232178229 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

During Vedic period the students who studied in Gurukula lived in

Options :

1. Ashram

2. Guru's house

3. Parents' home

4. Forest

Question Number : 84 Question Id : 6232178230 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The concept of 'Smritimana' given by Yagya-Valkya was based on the principle of

Options :

1. Accuracy

2. Purity

3. Yagna

4. Memorization

Question Number : 85 Question Id : 6232178231 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The Buddhist Education was offered in

Options :

1. Home

2. Sanghas

3. Ashramas

4. Congregation

In an Open University one of the system of evaluation will be

Options :

1. Formal Assessment

2. Summative evaluation

3. Self – evaluation

4. Formative evaluation

'Build school in every village' was propagated by

Options :

1. Robert De Nobilli

2. St Xavier

3. St. Thomas

4. Robert Clive

An illiterate and ignorant nation can never make any solid progress and must fall back in the race for life" said by

Options :

1. M.K. Gandhi

2. Sarvepalli Radhakrishnan

3. G.K. Gokhale

4. Raja Ram Mohan Roy

Question Number : 89 Question Id : 6232178235 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The original meaning of 'Vandemataram' sung by students in the schools is

Options :

1. Long live the King

2. King is the God

3. King and God are alive

4. God save the King

Question Number : 90 Question Id : 6232178236 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

'Shikshak Samakhya' (Teacher Empowerment) was initiated and first began in the state of Madhya Pradesh by UNICEF emphases on

Options :

1. Teacher effectiveness

2. Teachers' creativity

3. Teacher autonomy

4. Teachers' creativity and Teacher autonomy

Section Id :	62321792
Section Number :	2
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	90
Number of Questions to be attempted:	90
Section Marks:	90
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	623217276
Question Shuffling Allowed :	Yes

Question Number : 91 Question Id : 6232178237 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Which of the following is a phase space trajectory of a one dimensional harmonic oscillator?

Options :

1. Circle

2. Ellipse

3. Parabola

4. Semicircle

Question Number : 92 Question Id : 6232178238 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

What is the number of degrees of freedom of a rigid body in two dimensions?

Options :

1. 6

2. 5

3. 3

Question Number : 93 Question Id : 6232178239 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Consider a point mass moving in a potential $V(x) = x^2 - x^4$. Number of stable equilibrium points are

Options :

1. 0

2. 1

3. 2

4. 3

Question Number : 94 Question Id : 6232178240 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

A particle moving under a central force which of the following is not a conserved quantity?

Options :

1. Areal velocity

2. Energy

3. Angular momentum

4. Linear momentum

Question Number : 95 Question Id : 6232178241 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Consider a point mass confined to move on the surface of a cone. The motion can be described by which of the following generalized coordinates?

Options :

1. (r, θ)

2. (z, θ)

3. (θ, φ)

4. (r, φ)

Question Number : 96 Question Id : 6232178242 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Consider a planar spring pendulum, where a bob is connected to a spring and hung from a support. Which of the following are normal coordinates of this system? Here x, y, r, θ have their usual meaning on a plane.

Options :

1. (r, θ)

2. (x, θ)

3. (y, θ)

4. (x, y)

Question Number : 97 Question Id : 6232178243 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The Lagrangian of a particle with charge q in an electromagnetic field is given by $L = \frac{1}{2}mv^2 - q\phi + \frac{q}{c}\vec{A}.\vec{v}$, where $(\vec{A}, \phi)$ are vector and scalar potentials. The Hamiltonian is

Options :

1. $\frac{p^2}{2m} + q\phi - \frac{q}{cm}\vec{A}.\vec{p}$

2. $\frac{1}{2m}\left(\vec{p} - \frac{q}{c}\vec{A}\right)^2 + q\phi$

$$\frac{1}{2m}\left(\vec{p} - \frac{q}{c}\vec{A}\right)^2 - q\phi$$

3.

$$\frac{1}{2m}\left(\vec{p} - \frac{q}{c}\vec{A}\right)^2$$

4.

Question Number : 98 Question Id : 6232178244 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Under what conditions $Q = \frac{\alpha p}{q}$ and $P = \frac{q}{\beta}$ where α and β are constants, represents a canonical transformation?

Options :

1. $\alpha = -\beta$

2. $\alpha = \beta$

3. $\alpha\beta = 1$

4. $\alpha\beta = -1$

Question Number : 99 Question Id : 6232178245 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Conservation of linear momentum is a consequence of which of the following invariance?

Options :

1. Rotational

2. Vibrational

3. Time

4. Translational

Question Number : 100 Question Id : 6232178246 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The relative magnetic permeability of a Type-I super conductor is

Options :

1. 0

2. -1

3. 2π

4. $1/4\ \pi$

Question Number : 101 Question Id : 6232178247 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

A train of proper length L moves with a speed 4c/5 (c is the speed of light) with respect to an observer in the ground. The length of the train with respect to the observer is

Options :

1. 4L/5

2. 5L/4

3. 5L/3

4. 3L/5

Question Number : 102 Question Id : 6232178248 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Consider a particle moving under attractive central potential $V(r) = -\dfrac{k}{r^{\alpha}}$, $k > 0$. For what value of α, the classification of orbits obtained using $-\dfrac{k}{r}$ potential is not valid?

Options :

1. 2.5

2. 1.5

3. 0.5

4. 0

Question Number : 103 Question Id : 6232178249 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Consider a charge q at the base center of a cone. The flux through the conical surface is

Options :

1. q/ε_0

2. $q/2\varepsilon_0$

3. $q/3\varepsilon_0$

4. $q/6\varepsilon_0$

Question Number : 104 Question Id : 6232178250 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Consider a grounded spherical conducting surface of radius *a* centered at the origin. If a point charge q is located at a distance R from the origin, what is the distance of the image charge from the origin in order to calculate the potential in the region outside the sphere?

Options :

1. a^2/R

2. a^3/R^2

3. R^2/a

4. R^3/a^2

Question Number : 105 Question Id : 6232178251 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The equipotential surface of a finite line charge segment of uniform charge per unit length is the surface of

Options :

1. a sphere

2. a cylinder

3. a plane

4. an ellipsoid

Question Number : 106 Question Id : 6232178252 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The trajectory of a charged particle moving in a uniform magnetic field is

Options :

1. a circle

2. a straight line

3. a helix

4. a cycloid

Question Number : 107 Question Id : 6232178253 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Consider the electrostatic energy due to a charged conducting sphere of radius R and charge Q. If the charge is halved and distance is doubled, what happens to electrostatic energy?

Options :

1. Increases by 8 times

2. Decreases by 8 times

3. Increases by 4 times

4. Decreases by 4 times

Question Number : 108 Question Id : 6232178254 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

An unpolarized light of intensity I_0 passes first through a polarizer and then through an analyzer whose axis of polarization is at angle $\pi/3$ to the axis of the polarizer. The intensity of the light after analyzer is

Options :

1. $I_0/2$

2. $I_0/4$

3. $3I_0/8$

4. $I_0/8$

Question Number : 109 Question Id : 6232178255 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Which of the following vectors can be a magnetic field?

Options :

1. $ar\hat{j}$

2. $a\left(x\hat{i} + y\hat{j}\right)$

3. $a\left(x\hat{i} + y\hat{k}\right)$

4. $a\left(y\hat{i} + x\hat{j}\right)$

Question Number : 110 Question Id : 6232178256 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

In an iron cored coil the iron core is removed so that the coil becomes an air cored coil. The inductance of the coil will

Options :

1. increase

decrease

2.

remains same

3.

initially increase and then decrease

4.

Question Number : 111 Question Id : 6232178257 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The pole of the function $f(z) = \cot(z)$, at z=0 is

Options :

A removable singularity

1.

An essential singularity

2.

A simple pole

3.

A second order pole

4.

Question Number : 112 Question Id : 6232178258 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

A dielectric sphere of radius R carries a polarization $\vec{P} = kr^3\hat{r}$, where r is the distance from the center and k is a constant. The bound volume charge density in side the sphere at a distance r from the center is

Options :

$-4kR$

1.

$-4kr$

2.

$-5kr^3$

3.

$-5kr^2$

4.

Question Number : 113 Question Id : 6232178259 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

At equilibrium there cannot be any free charge inside a metal. However if you put some charge in the interior then it takes some time to disappear, that is, move to the surface. If the conductivity of the metal is 10^6 $(\Omega m)^{-1}$ and the dielectric constant 8.85×10^{-12} Farad/m, this time will be

Options :

1. 10^{-5} s

2. 10^{-11} s

3. 10^{-9} s

4. 10^{-17} s

Question Number : 114 Question Id : 6232178260 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

In the anomalous dispersion region around a resonant frequency, what kind of change does the real part of dielectric constant exhibit with increase in frequency?

Options :

1. Increases

2. Decreases

3. Remains same

4. Oscillates

Question Number : 115 Question Id : 6232178261 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Consider a particle in a one dimensional box of size a. If the particle is in a ground state, what is the probability of finding the particle in the region $3/4 < x < 1$?

Options :

1. $1/2$

2. $1/4 + 1/2\pi$

3. $1/4 - 1/2\pi$

4. $1/4$

Question Number : 116 Question Id : 6232178262 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

A free particle with energy E and de Broglie wavelength λ enters into a region of constant potential $V_0 = -3E$. The wavelength of the particle in this region is

Options :

1. λ

2. 2λ

3. $\lambda/3$

4. $\lambda/2$

Question Number : 117 Question Id : 6232178263 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

A particle is located in three dimensional cubic box of side a. The degeneracy of the fourth energy level is

Options :

1. 1

2. 2

3. 3

4. 5

Question Number : 118 Question Id : 6232178264 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Let a particle move in a potential field given by harmonic oscillator potential for $x > 0$ and infinity for $x \leq 0$. The ground state energy of this particle is

Options :

1. $\hbar\omega/4$

2. $3\hbar\omega/2$

3. $\hbar\omega/2$

4. $\hbar\omega$

Question Number : 119 Question Id : 6232178265 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Given that the binding energy of hydrogen atom in the ground state is 13.6 eV, the binding energy for n=2 state of the positronium is

Options :

1. 13.6 eV

2. 6.8 eV

3. 3.4 eV

4. 1.7 eV

Question Number : 120 Question Id : 6232178266 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The p_x orbital of an electron in hydrogen atom is an eigen state of which of the following operators?

Options :

1. L_z

2. L_x

3. P_x

4. L^2

Question Number : 121 Question Id : 6232178267 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The velocity of the electron in its lowest orbit in Bohr model in terms of fine structure constant α and velocity of light c is given by

Options :

1. $c/(1+\alpha)$

2. αc

3. $\alpha^2 c$

4. $c(1-\alpha)$

Question Number : 122 Question Id : 6232178268 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

If $\hat{\vec{L}}$ is an angular momentum vector operator, what is $\hat{\vec{L}} \times \hat{\vec{L}}$?

Options :

1. 0

2. $i\hbar\hat{\vec{L}}$

3. $-i\hbar\hat{\vec{L}}$

4. $i\hbar$

Question Number : 123 Question Id : 6232178269 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The eigen values of the operator $\hat{\sigma}_x + \hat{\sigma}_y$ are

Options :

±1
1.

±2
2.

±√2
3.

±1/√2
4.

Question Number : 124 Question Id : 6232178270 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The possible values of total angular momentum J, resulting from the addition of two angular momenta J_1=1 and J_2=2 are

Options :

1, 2
1.

1, 3
2.

0, 1, 2
3.

1, 2, 3
4.

Question Number : 125 Question Id : 6232178271 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

How many components are there in Dirac wave function?

Options :

4
1.

3
2.

2
3.

4. $\dfrac{1}{4}$

The exchange degeneracy of the energy of a system of four identical particles is

Options :

1. 24

2. 16

3. 6

4. 2

Molar specific heat of a diatomic gas at high temperature in units of gas constant R is

Options :

1. 7/2

2. 3

3. 5/2

4. 3/2

Which of the following phase transitions is a first order phase transition?

Options :

1. Paramagnetic to ferromagnetic

2. Normal metal to superconductor

3. Liquid to gas at critical point

4. Solid to Liquid

Question Number : 129 Question Id : 6232178275 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Consider a thermodynamics system maintained at constant temperature and pressure. Which of the following thermodynamic potential is minimum at equilibrium for such a system?

Options :

1. Internal energy

2. Gibbs free energy

3. Enthalpy

4. Helmholtz free energy

Question Number : 130 Question Id : 6232178276 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

A one dimensional random walker starts at the origin and takes a step to the right or left with equal probability. What is the probability that the walker reaches the origin after four steps?

Options :

1. 1/2

2. 1/4

3. 3/8

4. 3/4

Question Number : 131 Question Id : 6232178277 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Consider two indistinguishable particles to be placed in three boxes. The number of microstates is given by

Options :

1. 9

2. 8

3. 10

4. 6

Question Number : 132 Question Id : 6232178278 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Consider a system of particles in d dimension, with single particle energy as $\varepsilon \propto p^s$, where p is the momentum of the particle and $s > 0$. What is the value of PV/U, where P is the pressure, V is the volume and U is the internal energy of the system.

Options :

1. 2/d

2. s/3

3. d/s

4. s/d

Question Number : 133 Question Id : 6232178279 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

For which of the following system of particles, there exists a temperature dependent upper bound on the number of particles that can occupy all the excited single particle states?

Options :

1. Classical distinguishable particles

2. Classical Indistinguishable particles

3. Fermions

4. Bosons

Question Number : 134 Question Id : 6232178280 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

For a nonrelativistic particle moving in a potential $V(x) = V_0 x^4$, what is the average potential energy at temperature T according to equi partition theorem?

Options :

1. kT/2

2. kT/4

3. 3kT/4

4. kT/6

Question Number : 135 Question Id : 6232178281 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

White dwarf stars are stable because the gravitational pull is balanced by

Options :

1. Pressure exerted by degenerate electron gas

2. Pressure exerted by Helium gas

3. Radioactive decay

4. Thermonuclear fusion

Question Number : 136 Question Id : 6232178282 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

According to Debye theory, the specific heat of a two dimensional crystalline solid at low temperature varies with T as

Options :

1. T^3

2. T

3. T^2

4. $T^{3/2}$

Question Number : 137 Question Id : 6232178283 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

In a diffusive transport, the room means square distance moved by a particle varies with time t as

Options :

1. t

2. $t^{1/2}$

3. t^2

4. $t^{1/3}$

Question Number : 138 Question Id : 6232178284 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

An engine absorbs heat at a temperature of 1000 K and rejects heat at 600 K. If the engine operates at maximum possible efficiency, the amount of work performed by the engine for 2000 J of heat input is

Options :

1. 16600 J

2. 800 J

3. 1200 J

4. 400 J

Question Number : 139 Question Id : 6232178285 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

The solution for the first order differential equation

$$\frac{dy}{dx} = \frac{x}{y}; \text{ When } y=1 \text{ for } x = 0 \text{ is}$$

Options :

1. y=x

2. y= x²

3. $y = \sqrt{1 + x^2}$

4. $y = 1 + x^2$

Question Number : 140 Question Id : 6232178286 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

When the heat flows through a body with source at the centre of the body, the temperature T for rate R at which heat crosses an area A at a radial distance r is given by (*k and C are constants*)

Options :

1. $T = \frac{R}{4\pi kr} + C$

2. $T = \frac{R}{4\pi k} + C$

3. $T = 4\pi krR + C$

$$T = 4\pi k r^2 R + C$$

4.

Express the polynomial $3x^2 + x - 1$ as a linear combination of Legendre polynomials

Options :

1. $2P_2 - P_1$

2. $2P_2 + P_1$

3. $P_2 + 2P_1$

4. $2P_2 + 2P_1$

Area of the triangle with vertices A(1,0,-2), B(-1,1,2), C(1,3,3)

Options :

1. 185

2. 13.6

3. 6.8

4. $\sqrt{23}$

Find the value of integral $I = \int_0^{2\pi} \frac{d\theta}{5+4\cos\theta}$ (Hint: Use residue Theorem)

Options :

1. $2\pi/3$

2. 2π

3. $2/3$

4. π

Question Number : 144 Question Id : 6232178290 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

There are 3 red and 2 white balls in one box and 4 red and 5 white in the second box. You select a box at random and from it pick a ball at random. If the ball is red, what is the probability that it came from the second box?

Options :

1. 20/47

2. 27/47

3. 23/49

4. 32/49

Question Number : 145 Question Id : 6232178291 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Solution for differential equation $\frac{dy}{dx} = e^{-x} - y$ at x=0.2 using Runge-Kutta Method (Initial condition $x_0=0$, $y_0=0$) is

Options :

1. 0.0905

2. 0.0907

3. 0.1638

4. 0.1641

Question Number : 146 Question Id : 6232178292 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Evaluate $\int_0^{1.5} \frac{x^3}{e^x-1} dx$ by Simpson's One-Third Rule is

Options :

1. 0.619082

2. 0.615495

3. 0.623405

4. 0.615550

Question Number : 147 Question Id : 6232178293 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Find the steady state temperature distribution inside a sphere of radius 1 when the surface temperatures are given as $\cos\theta - (\cos\theta)^3$ under usual notation

Options :

1. $\frac{2}{5} r P_1(\cos\theta) - \frac{2}{5} r^3 P_3(\cos\theta)$

2. $\frac{2}{5} r P_1(\cos\theta) + \frac{2}{5} r^3 P_3(\cos\theta)$

3. $\frac{2}{5} r P_1(\cos\theta)$

4. $\frac{2}{5} r^3 P_3(\cos\theta)$

Question Number : 148 Question Id : 6232178294 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The following data were obtained in the calibration of a platinum-rhodium thermocouple. Find the temperature corresponding to a reading of 9.000 millivolts.

t , °C	630.5	960.5	1063.0
e, millivolts	5.535	9.117	10.301

Options :

1. 950.4°C

2. 640.5°C

3. 1050.4°C

4. 1070°C

Question Number : 149 Question Id : 6232178295 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Find the eigen values and eigen vectors of the following matrices

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

Options :

1. 4 (2,1,3); -1(1,-1,0); 5(1,1,0)

2. 1 (0,0,1); -1 (1,-1,0); 5 (1,1,0)

3. 2 (0,-3,1); -1 (1,-1,0); 5 (1,1,0)

4. 1 (0,0,1); -3 (5,-1,-3); 5 (1,1,0)

Question Number : 150 Question Id : 6232178296 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The Dyadic of the vector $\overrightarrow{5i} + \overrightarrow{3k}$ and vector $\vec{i} - \vec{j}$ is

Options :

$$1. \begin{pmatrix} 5 & -5 & 0 \\ 0 & 0 & 0 \\ 3 & -3 & 0 \end{pmatrix}$$

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

$$3. \begin{pmatrix} 5 & 5 & 0 \\ 0 & 0 & 0 \\ 1 & -1 & 0 \end{pmatrix}$$

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

Question Number : 151 Question Id : 6232178297 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Which of the rays are not emitted during radioactivity

Options :

1. Alpha rays

2. Beta-Rays

3. Gamma Rays

4. X-Rays

Question Number : 152 Question Id : 6232178298 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

When the uranium U^{235} is split into two daughter with equal nuclei, the amount of energy released per nucleon would be

Options :

1. 1.8 MeV

2. 0.9MeV

3. 2.7 MeV

4. 0.45MeV

Which of the following is the $\beta+$ particle?

Options :

1. $_{+1}^{0}e$

2. $_{-1}^{0}e$

3. $_{1}^{0}n$

4. $_{2}^{4}He$

The following reaction: $_{1}^{2}H + _{1}^{3}H \rightarrow _{2}^{4}He + _{1}^{0}n$ is called:

Options :

1. Fusion

2. Fission

3. alpha decay

4. beta decay

Question Number : 155 Question Id : 6232178301 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The Q value of the reaction $Fe^{54}(n,\Upsilon)Fe^{55}$ from the semi-empirical mass formula (Mass Fe^{54}=53.96011, Mass Fe^{55}=54.96045,Mass n=1.00898) is

Options :

1. 18.97 MeV

2. 8.97 MeV

3. 9.87 MeV

4. 14.97 MeV

Question Number : 156 Question Id : 6232178302 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Speed of alpha particles with energy of 4 MeV is

Options :

1. 1.39×10^9 cm/s

2. 6.94×10^8 cm/s

3. 9.82×10^8 cm/s

4. 1.55×10^9 cm/s

Question Number : 157 Question Id : 6232178303 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Energy of the First excited rotational energy level (J=1) of the linear molecule H_2 is (Average separation between two hydrogen atom in its ground state is 0.107 nm

Options :

1. 14.5 meV

2. 29.0 meV

3. 21.75 meV

4. 7.25 meV

Question Number : 158 Question Id : 6232178304 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

A Rhodamine-B dye mixture in ethyl alcohol emits over a spectral bandwidth ranging from 525 nm to 625 nm with a peak spontaneous emission wavelength at 565 nm. Assume that the emission is homogeneously broadened and it originates from lowest energy of the S_1 level. The energy width of the lower level S_0 to which transition occurs from S_1 level is

Options :

1. 0.389 eV

2. 3.89 eV

3. 0.195 eV

4. 1.95 eV

Question Number : 159 Question Id : 6232178305 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

A laser produced plasma consisting of a 500 microns diameter ball radiates strongly at a wavelength of 50 nm. At a distance of 2.5 m from the source, what is the spatial coherence resulting from light emitted from opposite sides of plasma?

Options :

1. 50 microns

2. 10 microns

3. 250 microns

4.   25 microns

Question Number : 160 Question Id : 6232178306 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

A parallel plate Fabry Perot interferometer with two identical mirrors, separated by 1 cm with dielectric of n=1.5 filled in between the mirrors with reflectivity of R=0.9999. Laser is operating at 800nm. The Quality factor Q for this cavity would be

Options :

1. 1.18×10^9

2. 7.85×10^8

3. 5.23×10^8

4. 78.5×10^8

Question Number : 161 Question Id : 6232178307 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Consider a "d" electron in a one electron atomic system. Calculate the values of possible angles between orbital angular momentum vector L and Spin angular momentum S

Options :

1. 42^0 and 135^0

2. 28^0 and -44^0

3. 42^0 and 28^0

4. 28^0 and 45^0

Question Number : 162 Question Id : 6232178308 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The calcium line of wavelength 4226.73 Angstrom (P to S transition) exhibits normal Zeeman splitting when placed in uniform magnetic field of 4 Webers/m². The amount of splitting would be

Options :

1. 1.32 Angstrom

2. 0.167 Angstrom

3. 0.33 Angstrom

4. 3.3 Angstrom

Question Number : 163 Question Id : 6232178309 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Consider a Si semiconductor with intrinsic charge carrier concentration $n_i = 1.5 \times 10^{10}$ cm^{-3} at T= 300 K and is doped with donor atoms of $N_d = 10^{17}$ cm^{-3}. Estimate the electron & hole charge carrier concentration densities at thermal equilibrium.

Options :

1. $n_0 \approx 1 \times 10^{17}$ cm^{-3}
   $p_0 \approx 2 \times 10^3$ cm^{-3}

2. $n_0 \approx 1 \times 10^{17}$ cm^{-3},
   $p_0 \approx 1 \times 10^{17}$ cm^{-3}

3. $n_0 \approx 1.5 \times 10^{10}$ cm^{-3},
   $p_0 \approx 1.5 \times 10^{10}$ cm^{-3}

4. $n_0 \approx 2 \times 10^3$ cm^{-3},
   $p_0 \approx 2 \times 10^{10}$ cm^{-3}

Question Number : 164 Question Id : 6232178310 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Consider a Si pn junction diode in Forward Bias mode where forward diode current flows across the junction. Time required for the diode current to reach zero when the diode is switched off.

Options :

1. ~ milli seconds

2. ~ micro seconds

3. ~ nano seconds

4. ~ pico seconds

Question Number : 165 Question Id : 6232178311 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

For a common emitter BJT voltage amplifier, the gain is given as 30 dB. Calculate the output voltage if an input voltage of 10 mV is applied to this amplifier?

Options :

1. ~100 mV

2. ~ 200 mV

3. ~300 mV

4. ~ 400 mV

Question Number : 166 Question Id : 6232178312 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Wrong Marks : 0

Determine the Z_i in a voltage divider biased FET amplifier network with the given parameters: $V_{DD} = 16$ V, $R_1 = 2.1$ MΩ, $R_2 = 270$ kΩ, $R_D = 2.4$ kΩ, $R_S = 1.5$ kΩ, $I_{DSS} = 8$ mA, $V_P = -4$V.

Options :

1. $Z_i \approx 240$ kΩ

2. $Z_i \approx 2.4$ kΩ

3. $Z_i \approx 1.5$ kΩ

Z_i ≈ 2.1 MΩ

$Z_i \approx 2.1 \text{ M}\Omega$

4.

**Question Number : 167 Question Id : 6232178313 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0**

Consider a 4-bit successive approximation A/D converter with a 3.18 V input voltage. Estimate the output if the reference voltage is 5V.

Options :

1. 1001

2. 0011

3. 1100

4. 1010

**Question Number : 168 Question Id : 6232178314 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0**

Convert the following fractional binary to decimal: 0101.011

Options :

1. 5.375

2. 5.750

3. 5.25

4. 5.15

**Question Number : 169 Question Id : 6232178315 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0**

Hall Probe is kept in between an electromagnetic coil perpendicular to the direction of magnetic field with Hall voltage measured as 0.3 μV. If the applied current to the probe is given as 0.5 A, electron charge carrier density is 8.47×10^{28} m^{-3} & the thickness of the probe is 100 μm. Estimate the magnetic field between the electromagnetic coils?

Options :

1. 0.1 T

2. 1 T

3. 0.01 T

4. 0.001 T

Question Number : 170 Question Id : 6232178316 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

What is the Nyquist rate for the following continuous-time signal?

$$S(t) = \text{Sin}(6000\pi t)\ \text{Sin}(3000\pi t)$$

Options :

1. 3000 Hz

2. 6000 Hz

3. 9000 Hz

4. 4500 Hz

Question Number : 171 Question Id : 6232178317 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Fourier Transform of the function $f(t) = \begin{cases} 1 & t \le 0 \\ 0 & t > 0 \end{cases}$ is

Options :

1. $2\dfrac{\sin \omega T1}{\omega}$

2. $2\dfrac{\tan \omega T1}{\omega}$

3. $\left[\pi\delta(\omega) - \frac{1}{j\omega}\right]$

4. 1

Question Number : 172 Question Id : 6232178318 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The negative differential resistivity in materials is useful in designing.

Options :

1. Amplifiers

2. Oscillators

3. Switches

4. Rectifiers

Question Number : 173 Question Id : 6232178319 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

If the effective mass of the electron is 10 times greater than the free electron mass, What happens to the radius of curvature of E-k diagram?
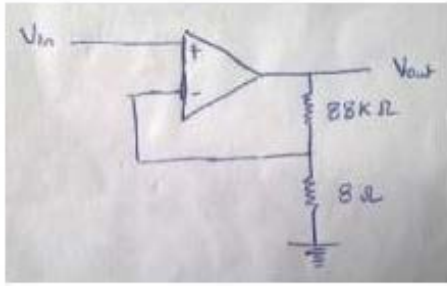
Options :

1. increases

2. decreases

3. remains same

4. becomes straight line

Question Number : 174 Question Id : 6232178320 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Evaluate the gain of the following op-amp amplifier circuit;

Options :

1. 10

2. 11

3. 12

4. 13

Question Number : 175 Question Id : 6232178321 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

If the radius of the sphere is measured as 3 ± 0.1 cm, what would be the volume of sphere;

Options :

1. 3 ± 0.1 cm^3

2. 9 ± 0.3 cm^3

3. 113 ± 11 cm^3

4. 100 ± 10 cm^3

Question Number : 176 Question Id : 6232178322 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The atoms in a body centered cubic crystal lattice are separated with a distance of 4.2 A°. Calculate the nearest neighbor distance of the same lattice.

Options :

1. ~ 3.6 A°

2. ~ 4.2 A°

3. ~ 10.2 A°

4. ~ 5.2 A°

Question Number : 177 Question Id : 6232178323 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

Calculate the Fermi energy of Au (FCC) whose lattice constant is 4.08 A°.

Options :

1. ~ 8 eV

2. ~ 5.5 eV

3. ~ 10 eV

4. ~16 eV

Question Number : 178 Question Id : 6232178324 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The average K.E of the electron at an absolute temperature T by free electron model is

Options :

1. kT

2. ½ kT

3. 2kT

4. $3/2 \, kT$

Question Number : 179 Question Id : 6232178325 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The spectral density of white noise process with mean 0 and variance σ^2 is _____

Options :

1. $\pi \sigma^2$

2. σ^2

3. π / σ^2

4. σ^2 / π

Question Number : 180 Question Id : 6232178326 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Wrong Marks : 0

The first Brillouin zone of a Body centered cubic crystal lattice is

Options :

1. Truncated Octahedron

2. Body centered cubic

3. Rhombic dodecahedron

4. Simple cubic