

# Banaras Hindu University

## Notations :

- 1.Options shown in green color and with ✓ icon are correct.
- 2.Options shown in red color and with ✗ icon are incorrect.

<b>Question Paper Name :</b>	881 16th Mar 2022 Shift 3
<b>Subject Name :</b>	881
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<b>Total Marks :</b>	300
<b>Display Marks:</b>	Yes
<b>Share Answer Key With Delivery Engine :</b>	Yes
<b>Actual Answer Key :</b>	Yes
<b>Calculator :</b>	None
<b>Magnifying Glass Required? :</b>	No
<b>Ruler Required? :</b>	No
<b>Eraser Required? :</b>	No
<b>Scratch Pad Required? :</b>	No
<b>Rough Sketch/Notepad Required? :</b>	No
<b>Protractor Required? :</b>	No
<b>Show Watermark on Console? :</b>	Yes
<b>Highlighter :</b>	No
<b>Auto Save on Console?</b>	No
<b>Change Font Color :</b>	No
<b>Change Background Color :</b>	No
<b>Change Theme :</b>	No
<b>Help Button :</b>	No
<b>Show Reports :</b>	No
<b>Show Progress Bar :</b>	No

## RET\_Physics

<b>Group Number :</b>	1
<b>Group Id :</b>	593452135
<b>Group Maximum Duration :</b>	0
<b>Group Minimum Duration :</b>	120
<b>Show Attended Group? :</b>	No
<b>Edit Attended Group? :</b>	No
<b>Break time :</b>	0
<b>Group Marks :</b>	300
<b>Is this Group for Examiner? :</b>	No
<b>Examiner permission :</b>	Cant View
<b>Show Progress Bar? :</b>	No

## Research\_Methodology

<b>Section Id :</b>	593452265
<b>Section Number :</b>	1
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	40
<b>Number of Questions to be attempted :</b>	40
<b>Section Marks :</b>	120
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Maximum Instruction Time :</b>	0
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	593452293
<b>Question Shuffling Allowed :</b>	Yes

**Question Number : 1 Question Id : 59345215048 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

What is a Research Design ?

शोध अभिकल्प क्या है ?

Options :

A way of conducting research that is not grounded in theory.

1. ✘ शोध संचालन का एक तरीका, जो सिद्धांत पर आधारित न हो।

The choice between using qualitative or quantitative methods.

2. ✘ गुणात्मक या परिमाणात्मक पद्धतियों के उपयोग के मध्य चुनाव।

The style in which you present your research findings e.g. a graph.

3. ✘ वह शैली जिसमें आप अपने शोध खोजों को प्रस्तुत करते हैं; जैसे - ग्राफ।

A framework for every stage of the collection and analysis of data.

4. ✔ आँकड़ों के संकलन और विश्लेषण के प्रत्येक स्तर के लिए एक ढाँचा।

**Question Number : 2 Question Id : 59345215049 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The study design of collecting data at a particular point of time is called :

किसी विशेष समय बिन्दु पर आँकड़े संग्रहण करने वाला अध्ययन अभिकल्प कहलाता है :

Options :

Cohort study

1. ✘ सहगण अध्ययन (कोहार्ट स्टडी)

Trend study

2. ✘ प्रवृत्ति अध्ययन

Cross sectional study

3. ✔ प्रतिनिध्यात्मक (समकालीन) अध्ययन

Longitudinal study

4. ✘ अनुदैर्घ्य (दीर्घकालिक) अध्ययन

**Question Number : 3 Question Id : 59345215050 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The value of middle position in a distribution of values is called :

मूल्यों के वितरण में मध्य स्थिति का मान कहलाता है :

Options :

Mean

1. ✘ माध्य

Median

2. ✔ माध्यिका

Mode

3. ✖ बहुलक

Mid-point

4. ✖ मध्य-बिन्दु

**Question Number : 4 Question Id : 59345215051 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

In order to pursue research, which of the following is priorly required ?

शोध को आगे बढ़ाने के लिए, निम्नलिखित में से किसकी पहले आवश्यकता होती है ?

**Options :**

Develop a research design

1. ✖ शोध अभिकल्प का विकास

Formulate research questions

2. ✔ शोध प्रश्नों का निर्माण

Deciding about the data analysis procedure

3. ✖ आंकड़ा विश्लेषण प्रक्रिया के बारे में निर्णय लेना

Formulating a research hypothesis

4. ✖ शोध परिकल्पना का निर्माण करना

**Question Number : 5 Question Id : 59345215052 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Which of the following is a basis of the quality of a research journal ?

निम्नलिखित में से किसी शोध पत्रिका की गुणवत्ता का आधार कौन है ?

**Options :**

Impact factor

1. ✓ प्रभाव गुण

h-index

2. ✘ एच-इंडेक्स

g-index

3. ✘ जी-इंडेक्स

i10-index

4. ✘ i10-इंडेक्स

**Question Number : 6 Question Id : 59345215053 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

If the population is heterogeneous, which one of the following probability sampling methods will be suitable ?

यदि जनसंख्या विजातीय है, तो निम्नलिखित में से कौन-सी सम्भाव्यता प्रतिदर्श विधि अधिक उपयुक्त होगी ?

Options :

- 1. ✘ Sequential sampling  
क्रमानुसार प्रतिचयन
- 2. ✘ Quota sampling  
कोटा प्रतिचयन
- 3. ✘ Double sampling  
दोहरा प्रतिचयन
- 4. ✔ Stratified sampling  
स्तरीकृत प्रतिचयन

Question Number : 7 Question Id : 59345215054 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

Manipulation is a part of :

प्रदस्तन ..... का एक हिस्सा है।

Options :

- 1. ✘ Historical research  
ऐतिहासिक शोध

- Fundamental research  
2. ✘ मौलिक शोध
- Descriptive research  
3. ✘ वर्णनात्मक शोध
- Experimental research  
4. ✔ प्रायोगिक शोध

**Question Number : 8 Question Id : 59345215055 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

p-value stands for :

पी-मूल्य से तात्पर्य है :

**Options :**

- Probability value  
1. ✔ सम्भाव्य मूल्य
- Preference value  
2. ✘ वरीयता मूल्य
- Pre-determined value  
3. ✘ पूर्व-निर्धारित मूल्य



Prescribed value

4. ✖ नियत मूल्य

Question Number : 9 Question Id : 59345215056 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

$R^2$  is known as the :

$R^2$  को ..... के रूप में जाना जाता है।

Options :

Coefficient of determination

1. ✔ निर्धारण का गुणांक

Multiple correlation coefficient

2. ✖ बहु-सहसम्बन्ध गुणांक

Partial correlation coefficient

3. ✖ आंशिक सहसम्बन्ध गुणांक

Semi-partial correlation coefficient

4. ✖ अर्ध-आंशिक सहसम्बन्ध गुणांक

Question Number : 10 Question Id : 59345215057 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

Rejection of null hypothesis, when it is true, leads to :

शून्य परिकल्पना अस्वीकृत हो जाये जबकि यह सत्य है ..... को इंगित करती है।

Options :

Sampling Error

1. ✖ प्रतिचयन त्रुटि

Type II Error

2. ✖ टाइप II त्रुटि

Type I Error

3. ✔ टाइप I त्रुटि

Estimation Error

4. ✖ अनुमान त्रुटि

Question Number : 11 Question Id : 59345215058 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

Which of the following is first stage in Grounded Theory data analysis :

निम्नलिखित में से ग्राउंडेड थ्योरी के आँकड़ा विश्लेषण का प्रथम चरण कौन-सा होता है ?

Options :

Examination

1. ✖ परीक्षण

Open coding

2. ✔ खुली कूट संकेतन

Retardation

3. ✖ अवरोध

Comparison

4. ✖ तुलना

**Question Number : 12 Question Id : 59345215059 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The area of the rejection region for a two-tailed test in comparison with area of the one-tailed test for the same level of significance will be :

सार्थकता के समान स्तर के लिए एक-पुच्छीय परीक्षण के अस्वीकृति क्षेत्र की तुलना में द्वि-पुच्छीय परीक्षण का क्षेत्र :

**Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.**

Options :

Smaller

1. छोटा होगा

- Same
2. समान होगा
- Larger
3. बड़ा होगा
- One-fourth
4. एक चौथाई होगा

**Question Number : 13 Question Id : 59345215060 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Basic research is :

मौलिक शोध होता है :

Options :

- Practical and descriptive
1. ✖ व्यावहारिक और वर्णनात्मक
- Client-driven
2. ✖ ग्राहक-प्रेरित
- Expands current knowledge
3. ✔ वर्तमान ज्ञान का विस्तार करने वाला
- Advancement of technology
4. ✖ प्रौद्योगिकी में उन्नति लाने वाला

**Question Number : 14 Question Id : 59345215061 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The technique in which an individual is presented with a stimulus and asked to respond with the first thing that comes to mind is known as :

वह तकनीक जिसमें व्यक्ति के सामने एक उत्तेजना प्रस्तुत की जाती है और पहली बात जो दिमाग में आती है, उसका जवाब देने के लिए कहा जाता है, को जाना जाता है :

**Options :**

Completion techniques

1. ✘ पूर्ति तकनीक

Focus groups

2. ✘ केंद्रित समूह

Association techniques

3. ✔ साहचर्य तकनीक

In depth interviews

4. ✘ गहन साक्षात्कार

**Question Number : 15 Question Id : 59345215062 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

An Independent variable is defined as :

एक स्वतंत्र चर को परिभाषित किया जाता है :

Options :

- Change variable
- 1. ✓ परिवर्तनशील चर
- Confounding variable
- 2. ✘ भ्रमित चर
- Extraneous variable
- 3. ✘ वाह्य चर
- Outcome variable
- 4. ✘ परिणाम चर

Question Number : 16 Question Id : 59345215063 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

Which one of the following statements is *false* for Research ?

निम्नलिखित में से कौन-सा कथन अनुसंधान के लिए *गलत* है ?

Options :

- Research design is a logical and systematic plan for a research study
- 1. ✘ अनुसंधान अभिकल्प शोध अध्ययन के लिए एक तार्किक और व्यवस्थित योजना है

Applied research is conducted to solve theoretical problems

2. ✓ सैद्धान्तिक समस्याओं को हल करने के लिए व्यावहारिक अनुसंधान किया जाता है

The basic research is also called as fundamental research

3. ✖ मूल शोध को मौलिक शोध भी कहा जाता है

A hypothesis is a statement that is tested for its validity

4. ✖ परिकल्पना एक कथन है जिसकी वैधता का परीक्षण किया जाता है

**Question Number : 17 Question Id : 59345215064 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

A researcher has administered some drug for management of diabetes for 4 weeks in a group and measured pre and post data for blood glucose level. Which statistical tool will be used to analyze data ?

एक शोधकर्ता ने एक समूह में 4 सप्ताह के लिए मधुमेह के प्रबंधन के लिए कुछ दवा दी है और रक्त शर्करा के पूर्व और बाद के स्तरों का मापन किया। प्राप्त आँकड़ों के विश्लेषण के लिए किस सांख्यिकीय विधि का उपयोग किया जाएगा ?

**Options :**

Paired 't' test

1. ✓ युग्मित टी-परीक्षण

Independent t-test

2. ✖ स्वतंत्र टी-परीक्षण

ANOVA test

3. ✖ एनोवा परीक्षण

Chi-square test

4. ✖ काई-वर्ग परीक्षण

**Question Number : 18 Question Id : 59345215065 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Which of the following is a qualitative variable ?

निम्न में से कौन एक गुणात्मक चर है ?

Options :

Colour of hair

1. ✔ बालों का रंग

Body weight

2. ✖ शारीरिक भार

Body height

3. ✖ शारीरिक ऊँचाई

Percentage of haemoglobin

4. ✖ हीमोग्लोबिन का प्रतिशत



**Question Number : 19 Question Id : 59345215066 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

A researcher should consider which of the following to prepare good research proposal ?

एक शोधकर्ता को अच्छा शोध प्रस्ताव तैयार करने के लिए निम्नलिखित में से किस पर विचार करना चाहिए ?

- (a) Research question should be novel  
शोध प्रश्न नवीन होना चाहिए
- (b) Research protocol should be ethical and relevant  
अनुसंधान प्रोटोकॉल नैतिक और प्रासंगिक होना चाहिए
- (c) Research question should be interesting and feasible  
शोध प्रश्न दिलचस्प और व्यवहार्य होना चाहिए
- (d) Researcher should consider only his/her own interest and benefit  
शोधकर्ता को केवल अपनी स्वयं की रुचि एवम लाभ पर विचार करना चाहिए

Options :

- a & d are correct
- 1. ✘ a और d सही हैं
- c & d are incorrect
- 2. ✘ c और d गलत हैं
- a, c & d are correct
- 3. ✘ a, c और d सही हैं

a, b & c are correct

4. ✓ a, b और c सही हैं

**Question Number : 20 Question Id : 59345215067 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Why reviewing the existing literature is needed ?

मौजूदा साहित्य की समीक्षा करने की आवश्यकता क्यों है ?

Options :

It does not provide references

1. ✘ यह संदर्भों को प्रदान नहीं करता

It does not provide required word-count

2. ✘ आवश्यक शब्द-गणना नहीं देता

To find out what is already known about area of interest

3. ✓ यह जानने के लिए कि रुचि के क्षेत्र के बारे में पहले से क्या ज्ञात है

To help in non-related disciplines

4. ✘ असम्बन्धित विषयों में सहयोग करने के लिए

**Question Number : 21 Question Id : 59345215068 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Which one is called non-probability sampling ?

किसे असंभाव्यता प्रतिचयन कहा जाता है ?

Options :

Quota sampling

1. ✓ कोटा प्रतिचयन

Cluster sampling

2. ✘ गुच्छ प्रतिचयन

Systematic sampling

3. ✘ व्यवस्थित प्रतिचयन

Stratified random sampling

4. ✘ स्तरीकृत यादृच्छिक प्रतिचयन

**Question Number : 22 Question Id : 59345215069 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Random error can be effectively handled by :

यादृच्छिक त्रुटि को ..... द्वारा प्रभावी ढंग से नियंत्रित किया जा सकता है ।

Options :

Adequate sample size

1. ✓ उपयुक्त नमूना आकार

Randomisation

2. ✖ यादृच्छीकरण

Blinding

3. ✖ अंधकरण

Representativeness

4. ✖ प्रतिनिधित्व

Question Number : 23 Question Id : 59345215070 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

The *correct* definition of h index is :

एच-इंडेक्स की *सही* परिभाषा है :

Options :

Largest number h such that h publications have at least h citations

1. ✔ सबसे बड़ी संख्या h जैसे कि h प्रकाशनों में कम से कम h उद्धरण हों

Lowest number h such that h publications have at least h citations

2. ✖ सबसे कम संख्या h जैसे कि h प्रकाशनों में कम से कम h उद्धरण हों

Total number of citations divided by the total number of publications

3. ✖ उद्धरणों की कुल संख्या को प्रकाशन की कुल संख्या से विभाजित करने पर

Another name for impact factor

4. ✘ प्रभाव कारक का दूसरा नाम

Question Number : 24 Question Id : 59345215071 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

Which of the following is *not* a reference management tool ?

निम्नलिखित में से कौन संदर्भ प्रबंधन उपकरण *नहीं* है ?

Options :

EndNote

1. ✘ एण्डनोट

Zotero

2. ✘ ज़ोटेरो

Mendeley

3. ✘ मेंडले

Scopus

4. ✔ स्कोपस

Question Number : 25 Question Id : 59345215072 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

Mean, Median and Mode are :  
माध्य, माध्यिका और बहुलक हैं :

Options :

Measures of dispersion

1. ✖ प्रसरण का मापन

Measures of central tendency

2. ✔ केंद्रीय प्रवृत्ति का मापन

Measures of probability

3. ✖ संभाव्यता का मापन

Sampling methods

4. ✖ प्रतिचयन विधि

**Question Number : 26 Question Id : 59345215073 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

What is the appropriate measure of dispersion to report when median is reported as the measure of central tendency for a given set of data ?

रिपोर्ट करने के लिए विचलन का उपयुक्त उपाय क्या है जब माध्यिका को आँकड़ों के एक समूह के लिए केंद्रीय प्रवृत्ति के मापन के रूप में प्रयुक्त किया जाता है ?

Options :

Standard deviation

1. ✖ मानक विचलन

Interquartile range

2. ✓ अंतश्चतुर्थक विस्तार

Variance

3. ✗ विचरण

Coefficient of variance

4. ✗ विचरण का गुणांक

**Question Number : 27 Question Id : 59345215074 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Open ended group discussion that promotes discussion among participants is called .....

विवृतांग (ओपन एंडेड ग्रुप) चर्चा जो प्रतिभागियों के बीच परिचर्चा को बढ़ावा देते हैं, कहलाते हैं .....

**Options :**

In-depth discussion

1. ✗ गहन चर्चा

Focus group discussions

2. ✓ फोकस ग्रुप चर्चा

Participant observation

3. ✘ प्रतिभागी अवलोकन

Structured interviews

4. ✘ संरचित साक्षात्कार

**Question Number : 28 Question Id : 59345215075 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The ability of a tool to correctly measure what it is supposed to measure is called as :

किसी उपकरण/साधन की 'जिस उद्देश्य के मापन के लिए प्रयोग हो रहा है उसे सही-सही मापने की क्षमता' कहलाती है :

**Options :**

Validity

1. ✔ वैधता

Reliability

2. ✘ विश्वसनीयता

Consistency

3. ✘ संगति

Accuracy

4. ✘ सटीकता



**Question Number : 29 Question Id : 59345215076 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

In an experimental study of the effects of time spent on studying on grade, time spent studying would be the :

ग्रेड पर अध्ययन में व्यतीत समय के प्रभावों के एक प्रायोगिक अध्ययन में, अध्ययन में बिताया गया समय होगा :

**Options :**

- Control group
- 1. ✘ नियंत्रण समूह
- Independent variable
- 2. ✔ स्वतंत्र चर
- Experimental group
- 3. ✘ प्रायोगिक समूह
- Dependent variable
- 4. ✘ आश्रित चर

**Question Number : 30 Question Id : 59345215077 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

A reasoning where we start with certain particular statements and conclude with a universal statement is called :

एक तर्क जहाँ हम कुछ विशिष्ट कथनों से शुरू करते हैं और एक सार्वभौमिक कथन के साथ निष्कर्ष निकालते हैं, कहलाता है :

Options :

Deductive Reasoning

1. ✘ निगमनात्मक तर्क

Inductive Reasoning

2. ✔ आगमनात्मक तर्क

Abnormal Reasoning

3. ✘ असामान्य तर्क

Transcendental Reasoning

4. ✘ प्राशनुभविक तर्क

Question Number : 31 Question Id : 59345215078 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

If a distribution is described as platykurtic, then it is :

यदि किसी वितरण को प्लेटिक्यूरटिक (सपाटक कुर्दी) के रूप में वर्णित किया जाता है, तो वह है :

Options :

Peaked

1. ✘ चोटीदार

- Flat
2. ✓ सपाट
- Bimodal
3. ✘ द्विबाहुलकी
- Thin
4. ✘ पतला

**Question Number : 32 Question Id : 59345215079 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

In a statistical table the row headings are referred to as :

एक सांख्यिकीय तालिका में, पंक्ति शीर्षकों को कहा जाता है :

**Options :**

- Source note
1. ✘ स्रोत नोट
- Captions
2. ✘ कैप्शन (अनुशीर्षक)
- Stubs
3. ✓ स्टब्स (टूठ)

Body

4. ✖ शरीर

**Question Number : 33 Question Id : 59345215080 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Which of the following techniques are used to control extraneous variables in research ?

अनुसंधान में बाह्य चरों को नियंत्रित करने के लिए निम्नलिखित में से किस तकनीक का उपयोग किया जाता है ?

Options :

Change of instrument

1. ✖ साधन का परिवर्तन

Randomization

2. ✔ यादृच्छीकरण

Change the research method

3. ✖ अनुसंधान विधियों में परिवर्तन

Parameterization

4. ✖ पैरामीट्रिजेशन (प्राचलीकरण)

**Question Number : 34 Question Id : 59345215081 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Which of the following is the information and library network under UGC ?

यूजीसी के तहत निम्नलिखित में से कौन-सा सूचना और पुस्तकालय नेटवर्क है ?

**Options :**

INFLIBNET

1. ✓ इनफिलिबनेट

NISCAIR

2. ✗ निस्केयर

Association of Indian Universities

3. ✗ भारतीय विश्वविद्यालयों का संघ

NAAC

4. ✗ नैक

**Question Number : 35 Question Id : 59345215082 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

A research tool consisting of a series of questions is known as :

प्रश्नों की एक शृंखला से युक्त एक शोध उपकरण को कहा जाता है :

**Options :**

Observation schedule

1. ✗ अवलोकन अनुसूची

Interview schedule

2. ✘ साक्षात्कार अनुसूची

Questionnaire

3. ✔ प्रश्नावली

Psychological test

4. ✘ मनोवैज्ञानिक परीक्षण

**Question Number : 36 Question Id : 59345215083 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator :  
None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On  
Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

What does a good thesis involve ?

एक अच्छी थीसिस में क्या सम्मिलित होता है ?

- (a) Reducing punctuations as well as grammatical errors to minimal level.  
विराम-चिन्हों तथा व्याकरण अशुद्धियों को अल्पतम स्तर तक कम करना।
- (b) Correct reference citation.  
समुचित सन्दर्भ उद्धरण।
- (c) Consistency in the way of thesis writing.  
थीसिस लेखन के तरीके में सुसंगति।
- (d) All of the three  
तीनों में सभी

Choose the *correct* answer from the codes given below :

नीचे दिये गये कूट में से *सही* उत्तर चुनें :

*Codes :*

*कूट :*

**Options :**

a, b, c and d

1. ✓ a, b, c तथा d

a, c and d

2. ✗ a, c तथा d

a, b and c

3. ✓ a, b तथा c

c, b and d

4. ✘ c, b तथा d

**Note:** For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

**Question Number : 37 Question Id : 59345215084 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The difference between the expected value of a sample statistic and the estimated value of parameter is called :

नमूना आंकड़ों के अपेक्षित मूल्य और प्राचल के अनुमानित मूल्य के बीच के अन्तर को कहा जाता है :

**Options :**

Error

1. ✘ त्रुटि

Bias

2. ✔ पूर्वाग्रह

Contradiction

3. ✘ विरोधाभास

Difference

4. ✘ अंतर



**Question Number : 38 Question Id : 59345215085 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Among the following, widely used method for extracting factors is :

निम्नलिखित में से, कारकों को निकालने के लिए व्यापक रूप से इस्तेमाल की जाने वाली विधि है :

**Options :**

Path analysis

1. ✘ पथ विश्लेषण

Discriminant analysis

2. ✘ विभेदक विश्लेषण

Group analysis

3. ✘ समूह विश्लेषण

Principle component analysis

4. ✔ प्रमुख-घटक विश्लेषण

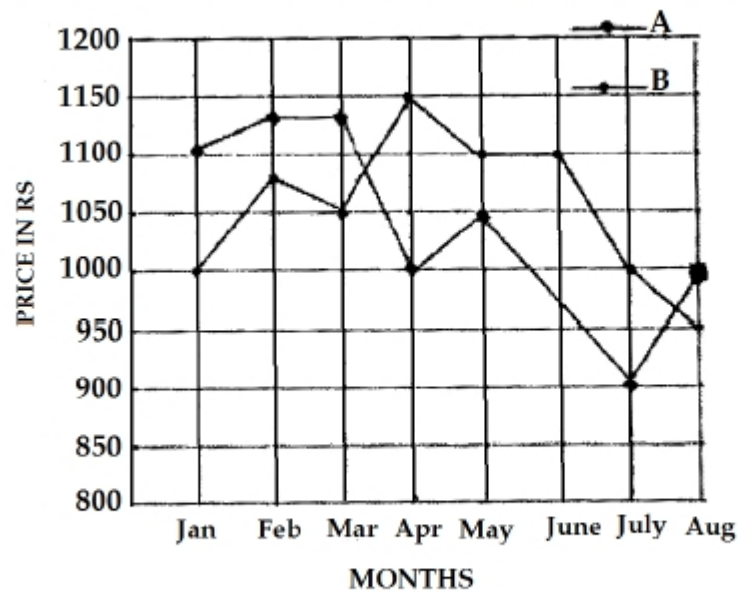
**Question Number : 39 Question Id : 59345215086 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Study the following given graph and answer the question :

निम्नलिखित ग्राफ का अध्ययन कीजिए तथा प्रश्न का उत्तर दीजिए :



What was the price difference between commodity A and B in the month of April ?

अप्रैल के महीने में सामग्री A और B के बीच मूल्य का अन्तर क्या था ?

Options :

1. ✘ 250
2. ✔ 150
3. ✘ 100
4. ✘ 90

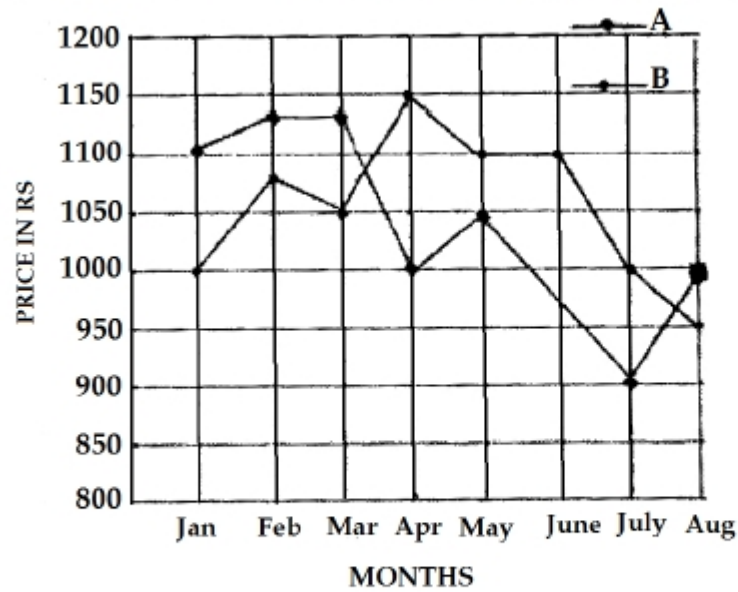
Question Number : 40 Question Id : 59345215087 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

Study the following given graph and answer the question :

निम्नलिखित ग्राफ का अध्ययन कीजिए तथा प्रश्न का उत्तर दीजिए :



What was the difference in average price between commodity A and B from April to August ?

अप्रैल से अगस्त तक सामग्री A और B के औसत मूल्य में कितना अन्तर था ?

Options :

1. ✘ 90

2. ✘ 86

3. ✘ 95

4. ✔ 75

## Subject\_&\_Area Concerned

Section Id :	593452266
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	60
Number of Questions to be attempted :	60
Section Marks :	180
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	593452294
Question Shuffling Allowed :	Yes

**Question Number : 41 Question Id : 59345215088 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The degree of freedom of a rigid body is :

Options :

1. ✘ 3

2. ✘ 4

3. ✘ 5

4. ✔ 6

**Question Number : 42 Question Id : 59345215089 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The Lagrangian of motion for simple pendulum (a particle is suspended by rigid, weightless and inextensible string from a fixed point) is :

**Options :**

1. ✘ 
$$L = \frac{1}{2} ml^2 \left( \frac{d\theta}{dt} \right)^2 - mgl \sin(\theta)$$

2. ✔ 
$$L = \frac{1}{2} ml^2 \left( \frac{d\theta}{dt} \right)^2 + mgl \cos(\theta)$$

3. ✘ 
$$L = \frac{1}{2} ml^2 \left( \frac{d\theta}{dt} \right)^2 + mgl \sin(\theta)$$

4. ✘ 
$$L = \frac{1}{2} ml^2 \left( \frac{d\theta}{dt} \right)^2 - mgl \cos(\theta)$$

**Question Number : 43 Question Id : 59345215090 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The relation between Hamiltonian and Lagrangian is described by Legendre transformation as :

Options :

1. ✘ 
$$H = \sum \frac{dq_j}{dt} p_j + L$$

2. ✔ 
$$H = \sum \frac{dq_j}{dt} p_j - L$$

3. ✘ 
$$H = L - \sum \frac{dq_j}{dt} p_j$$

4. ✘ 
$$H = L + \sum \frac{dq_j}{dt} p_j$$

**Question Number : 44 Question Id : 59345215091 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The phase diagram of a one-dimensional simple harmonic oscillator represents :

Options :

1. ✘ Circle

2. ✘ Parabola

3. ✔ Ellipse

#### 4. ✖ Hyperbola

**Question Number : 45 Question Id : 59345215092 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

For canonical transformation, the volume of phase space :

Options :

1. ✖ Increases
2. ✖ Decreases
3. ✔ Remains unchanged
4. ✖ Slightly changed

**Question Number : 46 Question Id : 59345215093 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The Hamilton's equations of motion are :

Options :

1. ✖  $\frac{dq_j}{dt} = \frac{\partial H}{\partial p_j}, \frac{dp_j}{dt} = \frac{\partial H}{\partial q_j},$

2. ✓  $\frac{dq_j}{dt} = \frac{\partial H}{\partial p_j}, \frac{dp_j}{dt} = -\frac{\partial H}{\partial q_j},$

3. ✗  $\frac{dq_j}{dt} = -\frac{\partial H}{\partial p_j}, \frac{dp_j}{dt} = \frac{\partial H}{\partial q_j},$

4. ✗  $\frac{dq_j}{dt} = -\frac{\partial H}{\partial p_j}, \frac{dp_j}{dt} = -\frac{\partial H}{\partial q_j},$

**Question Number : 47 Question Id : 59345215094 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

If  $f(x)$  is an even integrable function, then its Fourier transform is equal to :

**Options :**

1. ✗ Fourier sine transform

2. ✓ Fourier cosine transform

3. ✗ Laplace transform

4. ✗ Delta function

**Question Number : 48 Question Id : 59345215095 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator :**



None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

The macrostate for classical grand-canonical ensemble is :

Options :

1. ✘ N, V, E

2. ✘ N, V, T

3. ✘ N, P, T

4. ✔  $\mu, V, T$

Question Number : 49 Question Id : 59345215096 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

Gibbs paradox arises due to :

Options :

1. ✘ Indistinguishability of classical particles

2. ✔ Distinguishability of classical particles

3. ✘ Omittance of quantum nature of particles

4. ✖ Absence of inter-particle interaction

Question Number : 50 Question Id : 59345215097 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

For a Fermi gas composed of  $N$  particles in three-dimension at temperature  $T = 0$ , the fermi energy is proportional to :

Options :

1. ✖  $Ns$

2. ✖  $N^{1/3}$

3. ✔  $N^{2/3}$

4. ✖  $N^{4/3}$

Question Number : 51 Question Id : 59345215098 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

A one-dimensional random walker takes a unit step to the left or right with equal probability. The mean position after  $N$  time step is :

Options :

1. ✖  $N/2$

2. ✘  $N$

3. ✘  $N/4$

4. ✔  $0$

**Question Number : 52 Question Id : 59345215099 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The thermodynamic potential for micro-canonical ensemble is :

**Options :**

1. ✘  $S = -k \ln W$

2. ✔  $S = k \ln W$

3. ✘  $S = -kT \ln W$

4. ✘  $S = kT \ln W$

**Question Number : 53 Question Id : 59345215100 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Consider the following series :

$$x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} \dots\dots\dots$$

When  $x$  tends to 1, the given series converges to :

Options :

1. ✘  $\pi/2$

2. ✔  $\pi/4$

3. ✘ Unity

4. ✘ 0

Question Number : 54 Question Id : 59345215101 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

A necessary condition that  $f(z) = u(x, y) + v(x, y)$  be analytic in a region R satisfies Cauchy-Riemann equations :

Options :

1. ✘  $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}, \frac{\partial u}{\partial y} = \frac{\partial v}{\partial x}$

2. ✔  $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}, \frac{\partial u}{\partial y} = -\frac{\partial v}{\partial x}$

3. ✖  $\frac{\partial u}{\partial x} = -\frac{\partial v}{\partial y}, \frac{\partial u}{\partial y} = \frac{\partial v}{\partial x}$

4. ✖  $\frac{\partial u}{\partial x} = -\frac{\partial v}{\partial y}, \frac{\partial u}{\partial y} = -\frac{\partial v}{\partial x}$

**Question Number : 55 Question Id : 59345215102 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

For canonical partition function  $Z$  with  $\beta = 1/k_B T$ , the average energy is computed as :

**Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.**

**Options :**

1.  $\frac{-\partial \ln}{\partial \beta}$

2.  $\frac{\partial \ln Z}{\partial \beta}$

3.  $\frac{-\partial \ln Z}{\beta \partial \beta}$

4.  $\frac{\partial \ln Z}{\beta \partial \beta}$

**Question Number : 56 Question Id : 59345215103 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

A glow discharge tube has plasma density  $n = 10^{16} \text{ m}^{-3}$ , and  $KT_e = 2 \text{ eV}$ . The Debye length of the plasma is :

Options :

1. ✘  $2.3 \times 10^{-3} \text{ m}$
2. ✘  $6.6 \times 10^{-7} \text{ m}$
3. ✔  $1.0 \times 10^{-4} \text{ m}$
4. ✘  $5.2 \times 10^{-4} \text{ m}$

**Question Number : 57 Question Id : 59345215104 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Which of the following is not magnetohydrodynamic (MHD) wave ?

Options :

1. ✘ Sound wave
2. ✔ Light wave

3. ✘ Magnetosonic wave

4. ✘ Alfvén wave

**Question Number : 58 Question Id : 59345215105 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The Poynting theorem is a mathematical statement of the conservation of :

**Options :**

1. ✘ Momentum

2. ✘ Charge

3. ✔ Electromagnetic energy

4. ✘ Velocity

**Question Number : 59 Question Id : 59345215106 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

A material has  $\sigma = 10^{-2}$  S/m and  $\epsilon = 3 \epsilon_0$ . At what frequency (Hz) will the conduction current equal the displacement current ?

**Options :**

1. ✘ 30 MHz
2. ✔ 60 MHz
3. ✘ 80 MHz
4. ✘ 100 MHz

**Question Number : 60 Question Id : 59345215107 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The phase velocity of an electromagnetic wave in free space is given as :

**Options :**

1. ✔  $3 \times 10^8$  m/s
2. ✘  $8 \times 10^9$  m/s
3. ✘  $5 \times 10^7$  m/s
4. ✘  $7 \times 10^8$  m/s

**Question Number : 61 Question Id : 59345215108 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question



The charge builds up in the capacitor is due to which quantity :

Options :

1. ✘ Conduction current
2. ✔ Displacement current
3. ✘ Convection current
4. ✘ Direct current

Question Number : 62 Question Id : 59345215109 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

For the propagation of electromagnetic waves in free space, the conditions (in usual notations) which must be satisfied, are :

Options :

1. ✘  $E^2 = H^2$  and  $\vec{E} \cdot \vec{H} \neq 0$
2. ✘  $E^2 = H^2$  and  $\vec{E} \cdot \vec{H} = 0$
3. ✔  $E^2 \neq H^2$  and  $\vec{E} \cdot \vec{H} = 0$
4. ✘  $E^2 \neq H^2$  and  $\vec{E} \cdot \vec{H} \neq 0$

Question Number : 63 Question Id : 59345215110 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator :

**None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The phenomenon employed in the waveguide operation is :

**Options :**

1. ✘ Reflection
2. ✘ Refraction
3. ✘ Absorption
4. ✔ Total internal reflection

**Question Number : 64 Question Id : 59345215111 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

For an air-filled waveguide, having dimensions  $a = 2.29$  cm and  $b = 1.02$  cm. The cut off frequency of the  $TM_{11}$  mode is :

**Options :**

1. ✔ 16.16 GHz
2. ✘ 19.75 GHz
3. ✘ 30.25 GHz

4. ✘ 20.15 GHz

**Question Number : 65 Question Id : 59345215112 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Along the axis of a waveguide :

**Options :**

1. ✘ TEM waves can be propagated
2. ✔ TEM waves cannot be propagated
3. ✘ TEM wave can be propagated at cut-off frequency
4. ✘ TEM wave propagation depends on the frequency of incoming EM

**Question Number : 66 Question Id : 59345215113 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Hamiltonian operator for simple harmonic oscillator is  $H =$  :

**Options :**

1. ✔  $p^2/2m + \frac{1}{2} kx^2$
2. ✘  $p^2/2m$

3. ✘  $p^2/2m + 1/2 kx$

4. ✘  $1/2 kx$

**Question Number : 67 Question Id : 59345215114 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

How does the momentum of a photon change if the wavelength is halved ?

**Options :**

1. ✔ Doubles

2. ✘ Quadruples

3. ✘ Stays the same

4. ✘ Is cut to one-half

**Question Number : 68 Question Id : 59345215115 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The operators  $x$  and  $d/dx$  will commute when operating on which of the following :

**Options :**

1. ✘  $x$
2. ✘  $\sin x$
3. ✘  $xe^x$
4. ✔  $0$

**Question Number : 69 Question Id : 59345215116 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Consider a particle of mass  $m$  moving freely between  $x = 0$  and  $x = a$  inside an infinite square well potential. The value of  $\langle p^2 \rangle$  is :

**Options :**

1. ✔  $n^2h^2/4a^2$
2. ✘  $n^2h^2/8ma^2$
3. ✘  $0$
4. ✘  $n^2h^2/8a^2$

**Question Number : 70 Question Id : 59345215117 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On**

Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

Consider a particle located in a potential well  $V(x)$  given by :

$$V(x) = \infty \text{ for } x \leq 0, V(x) = -V_0 \text{ for } 0 < x \leq a \text{ and } V(x) = 0 \text{ for } x > a$$

Which of the following is true ?

Options :

1. ✘ The number of energy levels increases as the well width decreases
2. ✘ The number of energy levels decreases with increasing well depth
3. ✔ The number of energy levels increases as the well depth increases
4. ✘ The number of energy levels is independent of the well depth

Question Number : 71 Question Id : 59345215118 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

Rotational spectra in a molecule is seen if :

Options :

1. ✔ the molecule has permanent dipole moment
2. ✘ the molecule does not have permanent dipole moment
3. ✘ the molecule is placed in a magnetic field

4. ✘ the molecule is placed in an electric field

**Question Number : 72 Question Id : 59345215119 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Raman effect is observed in a molecule when :

**Options :**

1. ✘ there is a transition from higher to lower vibrational state
2. ✘ there is a transition from higher to lower rotational state
3. ✘ there is a transition from higher to lower electronic state
4. ✔ there is a change in the polarizability of the molecule

**Question Number : 73 Question Id : 59345215120 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The limit of the Lyman series for H atom is :

**Options :**

1. ✔ 912 Å
2. ✘ 1216 Å



3. ✘ 6563 Å

4. ✘ 4000 – 8000 Å

**Question Number : 74 Question Id : 59345215121 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The correct order of different types of energies in a molecule is :

**Options :**

1. ✘ Eel > Erot > Evib > Etran

2. ✔ Eel > Evib > Erot > Etran

3. ✘ Eel > Etran > Evib > Erot

4. ✘ Etran > Eel > Evib > Erot

**Question Number : 75 Question Id : 59345215122 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Pertaining to the Beer-Lambert law, which of the following is correct :

**Options :**



1. ✘ concentration and absorbance are not proportional to one other
2. ✘ the law works very well for samples that fluoresce
3. ✘ the law is valid for scattering of light due to particulates in the sample
4. ✔ the absorbance of a solution is proportional to its concentration

**Question Number : 76 Question Id : 59345215123 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The magnetic susceptibility of a paramagnetic material is proportional to :

**Options :**

1. ✘  $T$
2. ✔  $1/T$
3. ✘  $T^2$
4. ✘  $1/T^3$

**Question Number : 77 Question Id : 59345215124 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The ratio of the intercepts on the three axes by  $(1\ 3\ -2)$  planes in a single cubic lattice are :

Options :

1. ✘  $1 : 3 : -2$

2. ✔  $6 : 2 : -3$

3. ✘  $2 : 3 : 6$

4. ✘  $6 : -2 : 3$

**Question Number : 78 Question Id : 59345215125 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Minimum interplanar spacing required for Bragg's diffraction is :

Options :

1. ✘  $\lambda/4$

2. ✔  $\lambda/2$

3. ✘  $2\lambda$

4. ✘  $\lambda$

**Question Number : 79 Question Id : 59345215126 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator :**

**None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

According to Meissner effect, the substance in the superconducting state :

**Options :**

1. ✘ shows zero magnetization
2. ✘ shows the ferromagnetic behaviour
3. ✘ behaves like a paramagnetic substance
4. ✔ shows the perfect diamagnetic behaviour

**Question Number : 80 Question Id : 59345215127 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

What is the necessary condition (in terms of miller indices) for the occurrence of constructive interference in an FCC crystal ?

**Options :**

1. ✘  $h, k, l$  should be mixed
2. ✘  $h+k+l$  should be even
3. ✘  $h+k+l$  should be odd

4. ✓ h, k, l should be unmixed

**Question Number : 81 Question Id : 59345215128 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The minimum energy of electrons needed to reveal the nuclear charge distribution is equivalent to :

Options :

1. ✘ 100 keV

2. ✓ 200 MeV

3. ✘ 2 MeV

4. ✘ 400 MeV

**Question Number : 82 Question Id : 59345215129 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

In the Geiger-Nuttall law  $\log \lambda = A + B \log R$ , which factor is constant for almost all the radioactive series :

Options :

1. ✓ B

2. ✘ A

3. ✘ R

4. ✘  $\lambda$

**Question Number : 83 Question Id : 59345215130 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Pairing energy term in liquid drop model formula is equal to zero for :

**Options :**

1. ✔ Odd A nuclei

2. ✘ Even-even nuclei

3. ✘ Odd-Odd nuclei

4. ✘ For e-e and O – O

**Question Number : 84 Question Id : 59345215131 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

How do we see "quarks" in a detector ?

**Options :**

1. ✘ Not at all
2. ✘ By their characteristic spiral trajectory
3. ✔ Via "jets" of hadrons they generate
4. ✘ As two individual straight tracks in opposite directions

**Question Number : 85 Question Id : 59345215132 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The Franck-Hertz experiment and related scattering experiments show that :

**Options :**

1. ✘ Electrons are always scattered elastically from atoms
2. ✘ Electrons are never scattered elastically from atoms
3. ✔ Electrons of a certain energy range can be scattered inelastically, and the energy lost by electrons is discrete
4. ✘ Electron always lose the same energy when they are scattered inelastically

**Question Number : 86 Question Id : 59345215133 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On**

Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

The muon decays with a characteristic lifetime of about  $10^{-6}$  second into an electron, a muon neutrino, and an electron antineutrino. The muon is forbidden from decaying into an electron and just a single neutrino by the law of conservation of :

Options :

1. ✘ Charge
2. ✘ Energy and momentum
3. ✘ Baryon number
4. ✔ Lepton number

Question Number : 87 Question Id : 59345215134 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

Which of the following is NOT compatible with the selection rule that controls electric dipole emission of photons by excited states of atoms ?

Options :

1. ✘  $\Delta n$  may have any negative integral value
2. ✘  $\Delta l = \pm 1$
3. ✘  $\Delta m_l = 0, \pm 1$



4. ✓  $\Delta s = \pm 1$

**Question Number : 88 Question Id : 59345215135 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

A particle leaving a cyclotron has a total relativistic energy of 10 GeV and a relativistic momentum of 8 GeV/c. What is the rest mass of this particle ?

Options :

1. ✗ 0.25 GeV/c<sup>2</sup>

2. ✗ 1.20 GeV/c<sup>2</sup>

3. ✗ 2.00 GeV/c<sup>2</sup>

4. ✓ 6.00 GeV/c<sup>2</sup>

**Question Number : 89 Question Id : 59345215136 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

A proton beam is incident on a scatterer 0.1 cm thick. The scatterer contains  $10^{20}$  target nuclei per cm<sup>3</sup>. In passing through the scatterer, one proton per incident million is scattered. The scattering cross section is :

Options :

1. ✗  $10^{-29}$  cm<sup>2</sup>



2. ✘  $10^{-27} \text{ cm}^2$

3. ✔  $10^{-25} \text{ cm}^2$

4. ✘  $10^{-23} \text{ cm}^2$

**Question Number : 90 Question Id : 59345215137 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

An operational amplifier is working as an inverting amplifier with gain of 13 and operating with  $\pm 22 \text{ V}$  power supply. The values of input for which it would be in the linear region are :

**Options :**

1. ✔  $\pm 1.69 \text{ V}$

2. ✘  $\pm 1.35 \text{ V}$

3. ✘  $\pm 2.28 \text{ V}$

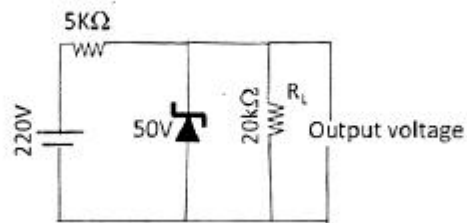
4. ✘  $\pm 0.50 \text{ V}$

**Question Number : 91 Question Id : 59345215138 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

From the Zener diode circuit shown in figure. the current through the Zener diode is :



Options :

1. ✘ 34 mA
2. ✔ 31.5 mA
3. ✘ 36.5 mA
4. ✘ 2.5 mA

Question Number : 92 Question Id : 59345215139 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

Correct Marks : 3 Wrong Marks : 1

Question Label : Multiple Choice Question

The conversion of 2F59 hexadecimal number in to the decimal number is :

Options :

1. ✘ 21559
2. ✘ 22111

3. ✘ 12211

4. ✔ 12121

**Question Number : 93 Question Id : 59345215140 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The value of stability factor for a base-resistor bias of NPN transistor is :

**Options :**

1. ✘  $R_B (\beta + 1)$

2. ✘  $(\beta + 1)R_C$

3. ✔  $(\beta + 1)$

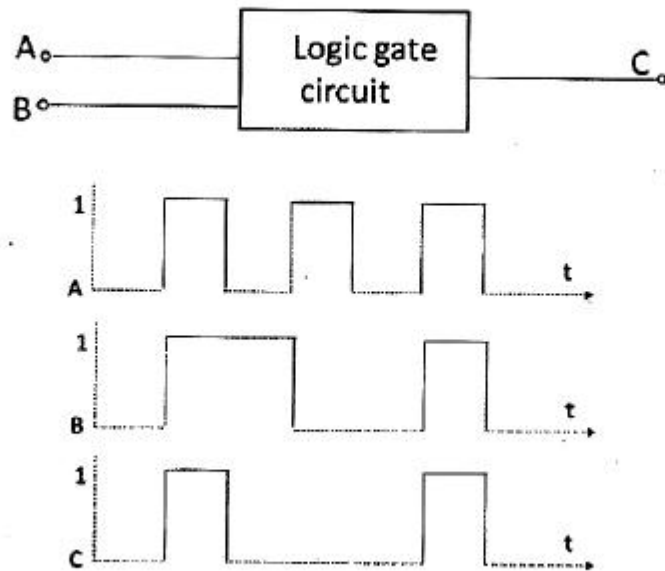
4. ✘  $(1 - \beta)$

**Question Number : 94 Question Id : 59345215141 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The following figure shows a logic gate circuit with two inputs A and B and the output C.  
The voltage waveforms of A, B and C as shown below :



The logic circuit gate is :

Options :

1. ✓ AND
2. ✗ OR
3. ✗ NOT
4. ✗ NOR

Question Number : 95 Question Id : 59345215142 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The time base generation circuit in a CRO is :

**Options :**

1. ✘ Connected to vertical amplifier
2. ✔ Connected to horizontal amplifier
3. ✘ Connected to electron gun
4. ✘ Connected to directly to deflecting plate

**Question Number : 96 Question Id : 59345215143 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The hybrid parameter of common base short circuit current gain ( $h_{fb}$ ) can be expressed in terms of common emitter short circuit current gain ( $h_{fe}$ ) as :

**Options :**

1. ✘  $h_{fb} = -h_{fe}$
2. ✘  $h_{fb} = \frac{(1 + h_{fe})}{h_{fe}}$
3. ✔  $h_{fb} = \frac{h_{fe}}{1 + h_{fe}}$

4. ✘  $h_{fb} = 1 - h_{fe}$

**Question Number : 97 Question Id : 59345215144 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

What will be the percentage resolution of a 'five-bit' digital to analog converter ?

**Options :**

1. ✔ 3.22%

2. ✘ 1/32%

3. ✘ 0.03125%

4. ✘ 3.125%

**Question Number : 98 Question Id : 59345215145 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

The slowest roll-off rate is obtained in the :

**Options :**

1. ✘ Butterworth filter

2. ✓ Bessel filter
3. ✘ Elliptic filter
4. ✘ Chebyshev filter

**Question Number : 99 Question Id : 59345215146 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Maxwell's equation  $\nabla \times E = - dB/dt$  is the statement of :

**Options :**

1. ✘ Gauss' s law of electrostatics
2. ✘ Equation of continuity
3. ✓ Faraday's law of electro-magnetic induction
4. ✘ Modified form of Ampere's law

**Question Number : 100 Question Id : 59345215147 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Allowed Progression : Yes Number of Replay : 999 Play On Load : No Control Enable : Yes Time interval to replay(In Seconds) : 0 Allow Volume Control : No**

**Correct Marks : 3 Wrong Marks : 1**

Question Label : Multiple Choice Question

Mercury has magnetization  $-2.9$  emu at  $20^\circ\text{C}$  and  $1000$  Oe. It is :

**Options :**

1. ✘ paramagnetic

2. ✔ diamagnetic

3. ✘ ferromagnetic

4. ✘ ferrimagnetic