

## PREVIEW QUESTION BANK

Module Name : SCPH30 Computational Biology and Bioinformatics Track - 1 TROH - ENG  
Exam Date : 26-Oct-2023 Batch : 09:30-12:30

| Sr. No.            | Client Question ID | Question Body and Alternatives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Marks | Negative Marks |
|--------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------|
| Objective Question |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                |
| 1                  | 996001             | <p>A population is divided into three strata so that <math>N_1 = 5000</math>, <math>N_2 = 2000</math> and <math>N_3 = 3000</math>. Respective standard deviations are: <math>\sigma_1 = 15</math>, <math>\sigma_2 = 18</math> and <math>\sigma_3 = 5</math>. How should a sample of size <math>n = 84</math> be allocated to the three strata, if we want optimum allocation using disproportionate sampling design?</p> <ol style="list-style-type: none"> <li>1. <math>n_1 = 5, n_2 = 2, n_3 = 1</math></li> <li>2. <math>n_1 = 50, n_2 = 24, n_3 = 10</math></li> <li>3. <math>n_1 = 500, n_2 = 240, n_3 = 100</math></li> <li>4. <math>n_1 = 25, n_2 = 12, n_3 = 5</math></li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                                                                                                                                                                                                                                                                                                                                                   | 4.0   | 0.00           |
| Objective Question |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                |
| 2                  | 996002             | <p>Spearman's coefficient of rank correlation .....</p> <ol style="list-style-type: none"> <li>1. <math display="block">\frac{\frac{\sum \hat{x}_i \cdot \hat{y}_i}{n} - \left( \frac{\sum \hat{x}_i}{n} \cdot \frac{\sum \hat{y}_i}{n} \right)}{\sqrt{\frac{\sum \hat{x}_i^2}{n} - \left( \frac{\sum \hat{x}_i}{n} \right)^2} \sqrt{\frac{\sum \hat{y}_i^2}{n} - \left( \frac{\sum \hat{y}_i}{n} \right)^2}}, \text{ where all notations have usual meanings.}</math></li> <li>2. <math display="block">\frac{\sum (X_i - \bar{X})(Y_i - \bar{Y})}{n \cdot \sigma_X \cdot \sigma_Y}, \text{ where all notations have usual meanings.}</math></li> <li>3. <math display="block">1 - \left[ \frac{6 \sum d_i^2}{n(n^2 - 1)} \right], \text{ where } d_i = \text{difference between ranks of } i\text{th pair of the two variables; } n = \text{number of pairs of observations.}</math></li> <li>4. <math display="block">\frac{\sum (X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum (X_i - \bar{X})^2} \cdot \sqrt{\sum (Y_i - \bar{Y})^2}}, \text{ where all notations have usual meanings.}</math></li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0   | 0.00           |
| Objective Question |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                |
| 3                  | 996003             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.0   | 0.00           |

A market research survey in which 64 consumers were contacted states that 64 per cent of all consumers of a certain product were motivated by the product's advertising. Find the confidence limits for the proportion of consumers motivated by advertising in the population, given a confidence level equal to 0.95.

given that z value for 95% confidence interval is 1.96.

1. lower confidence limit is 32.24%

upper confidence limit is 45.76%

2. lower confidence limit is 22.24%

upper confidence limit is 35.76%

3. lower confidence limit is 55.00%

upper confidence limit is 45.00%

4. lower confidence limit is 52.24%

upper confidence limit is 75.76%

A1 : 1

A2 : 2

A3 : 3

A4 : 4

#### Objective Question

4

996004

Match List I with List II

Suppose we want to test the hypothesis that the population mean  $\mu$  is equal to the hypothesised mean  $\mu_{H_0} = 100$ .

| Alternate Hypothesis |                            | To be read as follows |                                                                                                                  |
|----------------------|----------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------|
| A.                   | $H_a : \mu \neq \mu_{H_0}$ | I.                    | The null hypothesis is that the population mean is equal to the hypothesis mean 100                              |
| B.                   | $H_a : \mu > \mu_{H_0}$    | II.                   | The alternative hypothesis is that the population mean is not equal to 100 i.e., it may be more or less than 100 |
| C.                   | $H_a : \mu < \mu_{H_0}$    | III.                  | The alternative hypothesis is that the population mean is greater than 100                                       |
| D.                   | $H_a : \mu = \mu_{H_0}$    | IV.                   | The alternative hypothesis is that the population mean is less than 100                                          |

Choose the correct answer from the options given below:

1. A-I, B-II, C-III, D-IV

2. A-II, B-III, C-IV, D-I

3. A-III, B-IV, C-II, D-I

4. A-III, B-II, C-I, D-IV

A1 : 1

A2 : 2

4.0

0.00

|  |  |        |  |  |
|--|--|--------|--|--|
|  |  | A3 : 3 |  |  |
|  |  | A4 : 4 |  |  |

## Objective Question

|   |        |                                                                                                                                                                                                                                                                                                                            |     |      |
|---|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 5 | 996005 | <p>Which of the followings does not belong to probability sampling:</p> <p>I. Cluster Sampling<br/> II. Quota Sampling<br/> III. Purposive sampling<br/> IV. Systematic Sampling</p> <p>1. I &amp; IV only<br/> 2. II &amp; III only.<br/> 3. I only<br/> 4. IV only</p> <p>A1 : 1<br/> A2 : 2<br/> A3 : 3<br/> A4 : 4</p> | 4.0 | 0.00 |
|---|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|   |        |                                                                                                                                                                                                                                                                      |     |      |
|---|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 6 | 996006 | <p>SPSS stands for</p> <p>1. Statistical package for system sciences<br/> 2. Statistical package for social sciences<br/> 3. Statistical package for social system<br/> 4. Science package for social sciences</p> <p>A1 : 1<br/> A2 : 2<br/> A3 : 3<br/> A4 : 4</p> | 4.0 | 0.00 |
|---|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|   |        |                                                                                                                                           |     |      |
|---|--------|-------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 7 | 996007 | <p>Conversion of 0.625 into its equivalent binary fraction</p> <p>1. 0.101<br/> 2. 0.0101<br/> 3. 0.00101<br/> 4. 1.101</p> <p>A1 : 1</p> | 4.0 | 0.00 |
|---|--------|-------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

|                    |        |                                                                                                                                                                                                                                                                                                                                                           |     |      |
|--------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |        | A2 : 2                                                                                                                                                                                                                                                                                                                                                    |     |      |
|                    |        | A3 : 3                                                                                                                                                                                                                                                                                                                                                    |     |      |
|                    |        | A4 : 4                                                                                                                                                                                                                                                                                                                                                    |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                           |     |      |
| 8                  | 996008 | <p>A sample consists of three sub-samples with sizes 45,40 and 65 having their means 2.0, 2.5, 3.0 respectively. Mean of the combined sample is</p> <ol style="list-style-type: none"> <li>1. 3.57</li> <li>2. 2.57</li> <li>3. 1.57</li> <li>4. 4.57</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                  | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                           |     |      |
| 9                  | 996009 | <p>Which of the following is an example of primary source of information?</p> <ol style="list-style-type: none"> <li>1. A database curated from literature</li> <li>2. Direct outcome of an experiment</li> <li>3. Results of a novel analysis</li> <li>4. Highly cited research paper</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                           |     |      |
| 10                 | 996010 | <p>Plagiarism refers to</p> <ol style="list-style-type: none"> <li>1. Publishing results by faking data</li> <li>2. Allowing other to published our data</li> <li>3. Publishing work from sources without citation or permission</li> <li>4. Drawing conclusions without supporting data</li> </ol> <p>A1 : 1</p>                                         | 4.0 | 0.00 |

|  |  |        |  |  |
|--|--|--------|--|--|
|  |  | A2 : 2 |  |  |
|  |  | A3 : 3 |  |  |
|  |  | A4 : 4 |  |  |

## Objective Question

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|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 11 | 996011 | <p>Which of the following is an example of data fudging?</p> <ol style="list-style-type: none"> <li>1. Rounding off numerical values of data</li> <li>2. Creating data manually without performing experiment</li> <li>3. Using someone else's data without acknowledgement or permission</li> <li>4. Wrong Data entry</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
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## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                         |     |      |
|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 12 | 996012 | <p>Clustering analysis in a microarray experiment refers to?</p> <ol style="list-style-type: none"> <li>1. Cluster of cDNAs printed on the array</li> <li>2. Genes that are likely to work in concert in the given tissue/cell</li> <li>3. Genes clustered together in the genome</li> <li>4. Clusters of probes used to monitor the gene expression</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                      |     |      |
|----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 13 | 996013 | <p>Z Score Statistic is computed considering</p> <ol style="list-style-type: none"> <li>1. Mean</li> <li>2. Mean and Mode</li> <li>3. Mean and standard deviation</li> <li>4. Mean and Median</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> | 4.0 | 0.00 |
|----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

|                    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |      |
|--------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |        | A3 : 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |      |
|                    |        | A4 : 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 14                 | 996014 | <p>In an autoclave, equipment and reagents are sterilized by subjecting them to?</p> <ol style="list-style-type: none"> <li>1. Saturated steam under at least 15 psi pressure, 121°C temperature for 15-20 min</li> <li>2. Saturated steam under at least 35 psi pressure, 121°C temperature for 1.5 h</li> <li>3. Saturated steam under at least 15 psi pressure, 100°C temperature for 15-20 min</li> <li>4. Saturated steam under at least 10 psi pressure, 100°C temperature for 1.5 h</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 15                 | 996015 | <p>GUI refers to?</p> <ol style="list-style-type: none"> <li>1. Graphical Unit Intensity of Pixels</li> <li>2. Command like interfaces</li> <li>3. Graphical user interface</li> <li>4. Unix-like operating system</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                                                                                                                                                                                                         | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 16                 | 996016 | <p>Find the odd pair out considering their functional relationship:</p> <ol style="list-style-type: none"> <li>1. Cancer and healthy cells</li> <li>2. Gene and genome</li> <li>3. Enzyme and catalysts</li> <li>4. Glucose and Fructose</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p>                                                                                                                                                                                                                                                                               | 4.0 | 0.00 |

|                    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |
|--------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |        | A3 : 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |
|                    |        | A4 : 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |
| 17                 | 996017 | <p>In a U-shaped pipe, partially filled with a liquid, the right side is narrow and the left is broad. Under normal conditions of free movement of liquid and with enough liquid on the two sides, the levels will be as follows?</p> <ol style="list-style-type: none"> <li>1. Right side will always be higher than the left side</li> <li>2. Left side will always be higher than the right side</li> <li>3. The levels on the right and left will be equal</li> <li>4. It depends on the density of liquid</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |
| 18                 | 996018 | <p>Mean of two groups was calculated as M1 and M2 independently. If the two groups are merged, which of the following is true?</p> <ol style="list-style-type: none"> <li>1. The new mean is the mean of M1 and M2</li> <li>2. The new mean value will always be between or equal to M1 and M2</li> <li>3. The new mean can be computed from M1 and M2</li> <li>4. The new mean will be closer to the smaller of M1 and M2</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                     | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |
| 19                 | 996019 | <p>Type - I error is called as</p> <ol style="list-style-type: none"> <li>1. P (rejecting the null hypothesis when it is true)</li> <li>2. P (rejecting the null hypothesis when it is false)</li> <li>3. P (rejecting the null hypothesis when it is equal)</li> <li>4. Power of the study</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p>                                                                                                                                                                                                                                                | 4.0 | 0.00 |

|                    |        |                                                                                                                                                                                                                                                                                            |     |      |
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|                    |        | A3 : 3                                                                                                                                                                                                                                                                                     |     |      |
|                    |        | A4 : 4                                                                                                                                                                                                                                                                                     |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                            |     |      |
| 20                 | 996020 | <p>Which method used for checking the data normality in statistics</p> <ol style="list-style-type: none"> <li>1. T - Test</li> <li>2. ANOVA</li> <li>3. Q-Q Plot</li> <li>4. Chi-squared Test</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                           | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                            |     |      |
| 21                 | 996021 | <p>Which of the following is a negative number?</p> <ol style="list-style-type: none"> <li>1. <math>\log_{10}(2)</math></li> <li>2. <math>1e-10</math></li> <li>3. <math>10!</math></li> <li>4. <math>\log_2(10)</math></li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                            |     |      |
| 22                 | 996022 | <p>In experimental research "Controls" are used for</p> <ol style="list-style-type: none"> <li>1. Publication</li> <li>2. Data scaling</li> <li>3. Data reference</li> <li>4. Image construction</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p>                                      | 4.0 | 0.00 |

|                    |        |                                                                                                                                                                                                                                                                                                                                      |     |      |
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|                    |        | A4 : 4                                                                                                                                                                                                                                                                                                                               |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                      |     |      |
| 23                 | 996023 | <p>One of the following is not a typical of a qualitative study</p> <ol style="list-style-type: none"> <li>1. FGD</li> <li>2. Case study</li> <li>3. Depth interview</li> <li>4. Correlation</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                      | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                      |     |      |
| 24                 | 996024 | <p>What is the name of the distribution in which the mean and the variance are equal</p> <ol style="list-style-type: none"> <li>1. Normal distribution</li> <li>2. Exponential distribution</li> <li>3. Poisson distribution</li> <li>4. Binomial distribution</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>    | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                      |     |      |
| 25                 | 996025 | <p>Four people finish a task in 4 hours, how much time will 2 people take in finishing it, assuming equal efficiency and no overhead or mutual interaction?</p> <ol style="list-style-type: none"> <li>1. 2 hours</li> <li>2. 32 hours</li> <li>3. 16 hours</li> <li>4. 8 hours</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> | 4.0 | 0.00 |

|                    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
|--------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |        | A4 : 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 26                 | 996026 | <p>The meaning of false positive in data analysis is:</p> <ol style="list-style-type: none"> <li>1. Concluding there is a difference between the groups being studied when, in fact, there is no difference.</li> <li>2. Concluding there is no difference between the groups being studied when, in fact, there is a difference.</li> <li>3. There is no error in the data structure.</li> <li>4. There is no relationship among the groups of the data.</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 27                 | 996027 | <p>Which of the following is used by researchers to attempt to explain, predict, and explore the phenomenon of interest?</p> <ol style="list-style-type: none"> <li>1. P-values</li> <li>2. Correlation</li> <li>3. Hypotheses</li> <li>4. Interpolation</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                                                                                                                                  | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 28                 | 996028 | <p>The most effective method of assigning participants to groups within a research study is through a procedure called as</p> <ol style="list-style-type: none"> <li>1. Selective assignment</li> <li>2. Group assignment</li> <li>3. Intervention</li> <li>4. Random assignment</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p>                                                                                                                                                                                        | 4.0 | 0.00 |

|                    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |      |
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|                    |        | A4 : 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |      |
| 29                 | 996029 | <p>Which of the following is an ethical practice in research publication?</p> <ol style="list-style-type: none"> <li>1. Stretching an image to improve readability</li> <li>2. Hiding details of experiments so that others cannot copy it</li> <li>3. Inviting friends to be co-authors even if they were not part of the study</li> <li>4. Giving proper citations at appropriate places in the manuscript</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |      |
| 30                 | 996030 | <p>A predatory journal refers to</p> <ol style="list-style-type: none"> <li>1. A journal that publishes papers with publication charges</li> <li>2. A journal that doesn't have a rigorous review process</li> <li>3. A journal that publishes articles about predatory wild animals</li> <li>4. A journal that reports predatory events</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                     | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |      |
| 31                 | 996031 | <p>In Linux, which command can read the content of another file in vi editor?</p> <ol style="list-style-type: none"> <li>1. erd</li> <li>2. ex</li> <li>3. r</li> <li>4. read</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                                                                                                                                                                | 4.0 | 0.00 |

## Objective Question

32

996032

4.0

0.00

Match List I with List II

| LIST I |            | LIST II |                                                                                                                       |
|--------|------------|---------|-----------------------------------------------------------------------------------------------------------------------|
| A.     | Conference | I.      | Academic meeting/ specialist delivers address/ Well-educated but not specialized                                      |
| B.     | Symposium  | II.     | Usually a formal meeting / Specialist delivers short address / Participants form audience and also make presentations |
| C.     | Workshop   | III.    | People conferring on a topic / Usually discussion based / People from different backgrounds                           |
| D.     | Colloquium | IV.     | Smaller and more intense / Practice new skill / students or researchers keen on learning new skill                    |

Choose the correct answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

2. (A) - (II), (B) - (I), (C) - (III), (D) - (IV)

3. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

4. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

## Objective Question

|    |        |                                                                                                                                                                                                                                                                        |     |      |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 33 | 996033 | <p>The acronym DOI points to</p> <ol style="list-style-type: none"> <li>Data of Interest</li> <li>Data of identifiable objects</li> <li>Digital Object Identifier</li> <li>Digital Object Inclusion</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |  |     |      |
|----|--------|--|-----|------|
| 34 | 996034 |  | 4.0 | 0.00 |
|----|--------|--|-----|------|

|  |  |                                                                                                                                                                                                                                                                                                                                 |  |  |
|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  |  | <p>For working on animal models, prior approval and clearance is generally provided by</p> <ol style="list-style-type: none"> <li>1. Purchase committee</li> <li>2. Disposal committee</li> <li>3. Ethical approval committee</li> <li>4. Academic Committee</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> |  |  |
|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                              |     |      |
|----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 35 | 996035 | <p>The molecular weight of a protein is 30 kDa. The minimal length of mRNA encoding this polypeptide will be close to?</p> <ol style="list-style-type: none"> <li>1. 900</li> <li>2. 800</li> <li>3. 1000</li> <li>4. 300</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                       |     |      |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 36 | 996036 | <p>Considering an equal probability of occurrence of all the bases, how many possible DNA strings can be generated for a DNA probe having a length of 5 bases?</p> <ol style="list-style-type: none"> <li>1. 20</li> <li>2. 2000</li> <li>3. 1024</li> <li>4. 3125</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |  |     |      |
|----|--------|--|-----|------|
| 37 | 996037 |  | 4.0 | 0.00 |
|----|--------|--|-----|------|

|  |  |                                                                                                                                                                                                                                                                                                                   |  |  |
|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  |  | <p>If 5 ml of 20% ethanol is mixed with 25 ml of 80% ethanol, the resulting solution will approximately be:</p> <ol style="list-style-type: none"> <li>1. 50% ethanol</li> <li>2. 70% ethanol</li> <li>3. 100% ethanol</li> <li>4. 80% ethanol</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> |  |  |
|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

## Objective Question

|    |        |                                                                                                                                                                                                                                             |     |      |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 38 | 996038 | <p>The best measure of dispersion is _____</p> <ol style="list-style-type: none"> <li>1. Mean</li> <li>2. Mode</li> <li>3. Mean deviation</li> <li>4. Standard deviation</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                          |     |      |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 39 | 996039 | <p>Length and breadth of a rectangle have been measured with a permissible error of 1 cm each. What is the permissible error in the estimate for its perimeter?</p> <ol style="list-style-type: none"> <li>1. 1 cm</li> <li>2. 2 cm</li> <li>3. 3 cm</li> <li>4. 4 cm</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |  |     |      |
|----|--------|--|-----|------|
| 40 | 996040 |  | 4.0 | 0.00 |
|----|--------|--|-----|------|

|                    |        |                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
|--------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |        | <p>Which of the following is the computing layer with which a programmer interacts?</p> <ol style="list-style-type: none"> <li>1. Application programing interface (API)</li> <li>2. Operating System</li> <li>3. Assembly language</li> <li>4. Process controller</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                 |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
| 41                 | 996041 | <p>Open source for a computer program means?</p> <ol style="list-style-type: none"> <li>1. Software binaries available freely for sharing</li> <li>2. Software and code in the public domain</li> <li>3. Software available for purchase in the open market</li> <li>4. Program available with bugs</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
| 42                 | 996042 | <p>Observations of a parameter Y have fitted well with the observations of another parameter X on a given data set on a scatterplot. We can conclude that:</p> <ol style="list-style-type: none"> <li>1. X causes Y</li> <li>2. Y causes X</li> <li>3. Both X and Y cause each other</li> <li>4. Both X and Y shows the relationship to each other</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
| 43                 | 996043 |                                                                                                                                                                                                                                                                                                                                                                                                                       | 4.0 | 0.00 |

|  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |
|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  |  | <p>Which of the following factors must be taken into account in quantitative research?</p> <p>A. Measurement<br/>B. Causality<br/>C. Replication<br/>D. Exclusion of Statistical analysis<br/>E. Less importance to standardisation</p> <p>Choose the most appropriate answer from the options given below:</p> <p>1. (A), (B) and (C) only<br/>2. (B), (C) and (D) only<br/>3. (C), (D) and (E) only<br/>4. (A), (C) and (D) only</p> <p>A1 : 1<br/>A2 : 2<br/>A3 : 3<br/>A4 : 4</p> |  |  |
|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 44 | 996044 | <p>For empirical studies, the poster presentation can have:</p> <p>A. Abstract<br/>B. Method<br/>C. Data<br/>D. Results<br/>E. Conclusion</p> <p>Choose the most appropriate answer from the options given below:</p> <p>1. (B), (D) and (E) only<br/>2. (C), (D) and (E) only<br/>3. (A), (D) and (E) only<br/>4. (A), (B), (C), (D) and (E) only</p> <p>A1 : 1<br/>A2 : 2<br/>A3 : 3<br/>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                  |     |      |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 45 | 996045 | <p>According to post - positivists, it is impossible to achieve</p> <p>1. Objectivity<br/>2. Abstraction<br/>3. Predictability<br/>4. Qualitative assertions</p> | 4.0 | 0.00 |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

A1 : 1

A2 : 2

A3 : 3

A4 : 4

## Objective Question

46

996046

Match List I with List II

4.0

0.00

| LIST I<br>Type of Validity |                     | LIST II<br>Reflection |                                                                                   |
|----------------------------|---------------------|-----------------------|-----------------------------------------------------------------------------------|
| A.                         | Face Validity       | I.                    | Indicates adequacy of instrument                                                  |
| B.                         | Concurrent Validity | II.                   | Indicates the extent to which the measurement is used                             |
| C.                         | Construct           | III.                  | Compares a new test to an already established test                                |
| D.                         | Predictive          | IV.                   | The extent to which a score on a scale forecasts scores on same criterion measure |

Choose the correct answer from the options given below:

1. A-I, B-III, C-II, D-IV

2. A-III, B-I, C-II, D-IV

3. A-I, B-III, C-IV, D-II

4. A-I, B-II, C-III, D-IV

A1 : 1

A2 : 2

A3 : 3

A4 : 4

## Objective Question

47

996047

Creating a purpose statements, research questions and hypotheses that are narrow and measurable would mark the characteristic features of which research type?

4.0

0.00

1. Narrative research

2. Ethnographic research

3. Grounded theory research

4. Experimental research

A1 : 1

A2 : 2

A3 : 3

A4 : 4

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                              |     |      |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 48 | 996048 | <p>In which of the following research methods, process of hypothesis testing optimally safeguards the role of extraneous variables?</p> <ol style="list-style-type: none"> <li>1. Expost Facto method</li> <li>2. Experimental method</li> <li>3. Historical method</li> <li>4. Descriptive survey method</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                        |     |      |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 49 | 996049 | <p>A testing type called _____ is a systematic, thorough, independent evaluation of a product or service.</p> <ol style="list-style-type: none"> <li>1. alpha testing</li> <li>2. beta testing</li> <li>3. primary testing</li> <li>4. case testing</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |  |     |      |
|----|--------|--|-----|------|
| 50 | 996050 |  | 4.0 | 0.00 |
|----|--------|--|-----|------|

Match List I with List II

| LIST I |                                         | LIST II |                                                                                                      |
|--------|-----------------------------------------|---------|------------------------------------------------------------------------------------------------------|
| A.     | efficiency of a measurement instrument  | I.      | degree to which the instrument actually measures what it is supposed to measure.                     |
| B.     | validity of a measurement instrument    | II.     | ratio between the benefits and the costs of using the instrument.                                    |
| C.     | precision of a measurement instrument   | III.    | degree to which use of the instrument does not require special knowledge or the use of judgment.     |
| D.     | objectivity of a measurement instrument | IV.     | capacity of that instrument to resolve small differences in the parameter or quality being measured. |

Choose the correct answer from the options given below:

1. A-II, B-I, C-IV, D-III
2. A-I, B-II, C-IV, D-III
3. A-I, B-II, C-III, D-IV
4. A-II, B-I, C-III, D-IV

A1 : 1

A2 : 2

A3 : 3

A4 : 4

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |      |
|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 51 | 996051 | <p>In accordance with the sequence rules to assign R, S configuration, place the following groups/atoms, in the decreasing order of priority .</p> <p>-Cl, -COCH<sub>3</sub>, -CONH<sub>2</sub>, -COCl</p> <ol style="list-style-type: none"> <li>1. CONH<sub>2</sub> &gt; COCH<sub>3</sub> &gt; COCl &gt; Cl</li> <li>2. Cl &gt; COCl &gt; CONH<sub>2</sub> &gt; COCH<sub>3</sub></li> <li>3. COCH<sub>3</sub> &gt; CONH<sub>2</sub> &gt; COCl &gt; Cl</li> <li>4. CONH<sub>2</sub> &gt; COCl &gt; COCH<sub>3</sub> &gt; Cl</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |  |     |      |
|----|--------|--|-----|------|
| 52 | 996052 |  | 4.0 | 0.00 |
|----|--------|--|-----|------|

|  |  |                                                                                                                                                                                                                                                                                                                  |  |  |
|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  |  | <p>In which of the following reaction carbanion is not an intermediate:</p> <ol style="list-style-type: none"> <li>1. Aldol Condensation</li> <li>2. Perkin Condensation</li> <li>3. Reimer-Tiemann reaction</li> <li>4. Knoevenagel reaction</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> |  |  |
|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

## Objective Question

|    |        |                                                                                                                                                                                                                                  |     |      |
|----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 53 | 996053 | <p>The number of structural isomers for <math>C_6H_{14}</math> is :</p> <ol style="list-style-type: none"> <li>1. 3</li> <li>2. 4</li> <li>3. 5</li> <li>4. 6</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                   |     |      |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 54 | 996054 | <p>For Infrared spectrum, only those vibrations are effective in causing absorption which are centrosymmetric. This is the statement of:</p> <ol style="list-style-type: none"> <li>1. Beer's law</li> <li>2. Hooke's law</li> <li>3. Lambert's law</li> <li>4. Selection rule</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

| Objective Question |        |                                                                                                                                                                                                                                                          |     |      |
|--------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 55                 | 996055 | <p>Nitroalkanes, on reaction with Sn/HCl give:</p> <ol style="list-style-type: none"> <li>1. Alcohol</li> <li>2. Primary amine</li> <li>3. Secondary amine</li> <li>4. Tertiary amine</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |

| Objective Question |        |                                                                                                                                                                                                                                                                         |     |      |
|--------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 56                 | 996056 | <p>The opium alkaloids are present in plants as the salt of;</p> <ol style="list-style-type: none"> <li>1. Tartaric acid</li> <li>2. Aspartic acid</li> <li>3. Meconic acid</li> <li>4. Oxalic acid.</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |

| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                         |     |      |
|--------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 57                 | 996057 | <p>What is a Zymogen ?</p> <ol style="list-style-type: none"> <li>1. It is another name of Zymase</li> <li>2. An enzyme that is initially inactive and converted to active form by proteolytic cleavage</li> <li>3. It is a hormone also known as esterogen</li> <li>4. It is a complex carbohydrate forming long saccharide chains.</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |

| Objective Question |        |  |     |      |
|--------------------|--------|--|-----|------|
| 58                 | 996058 |  | 4.0 | 0.00 |

|                    |        |                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
|--------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |        | <p>Benzylic halides are very reactive to:</p> <ol style="list-style-type: none"> <li>1. Nucleophilic addition</li> <li>2. Nucleophilic substitution</li> <li>3. Electrophilic addition</li> <li>4. Electrophilic substitution</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                                      |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
| 59                 | 996059 | <p>Which of the following statement is true with respect to <math>S_N2</math> reaction:</p> <ol style="list-style-type: none"> <li>1. A good leaving group is a strong base</li> <li>2. A good leaving group is a weak base</li> <li>3. A leaving group must be negatively charged</li> <li>4. A good leaving group must be halide</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
| 60                 | 996060 | <p>The pair of compounds in which both the compounds give positive test with Tollen's reagent:</p> <ol style="list-style-type: none"> <li>1. glucose and sucrose</li> <li>2. fructose and sucrose</li> <li>3. acetophenone and hexanal</li> <li>4. glucose and fructose</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                            | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
| 61                 | 996061 |                                                                                                                                                                                                                                                                                                                                                                                                       | 4.0 | 0.00 |

At pH = 2 Glycine exists as:

1.  $\text{H}_3\text{N}^+ - \text{CH}_2 - \text{COO}^-$
2.  $\text{H}_3\text{N}^+ - \text{CH}_2 - \text{COOH}$
3.  $\text{H}_2\text{N} - \text{CH}_2 - \text{COOH}$
4.  $\text{H}_2\text{N} - \text{CH}_2 - \text{COO}^-$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

#### Objective Question

|                                                                                                                                   |        |                                          |     |      |
|-----------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------|-----|------|
| 62                                                                                                                                | 996062 | Which of the following is a nucleotide ? | 4.0 | 0.00 |
| <ol style="list-style-type: none"> <li>1. Cytidine</li> <li>2. Guanosine</li> <li>3. Uridine</li> <li>4. Adenylic acid</li> </ol> |        |                                          |     |      |
| A1 : 1                                                                                                                            |        |                                          |     |      |
| A2 : 2                                                                                                                            |        |                                          |     |      |
| A3 : 3                                                                                                                            |        |                                          |     |      |
| A4 : 4                                                                                                                            |        |                                          |     |      |

#### Objective Question

|                                                                                                                                                                              |        |                                                   |     |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------|-----|------|
| 63                                                                                                                                                                           | 996063 | Which of the following is/are extensive variables | 4.0 | 0.00 |
| <ol style="list-style-type: none"> <li>A. emf of a dry cell</li> <li>B. heat capacity</li> <li>C. viscosity</li> <li>D. specific heat capacity</li> <li>E. length</li> </ol> |        |                                                   |     |      |
| Now choose the correct option from the following                                                                                                                             |        |                                                   |     |      |
| <ol style="list-style-type: none"> <li>1. A, B and C only</li> <li>2. C, D and E only</li> <li>3. B and E only</li> <li>4. D and E only</li> </ol>                           |        |                                                   |     |      |
| A1 : 1                                                                                                                                                                       |        |                                                   |     |      |
| A2 : 2                                                                                                                                                                       |        |                                                   |     |      |

|  |  |        |  |  |
|--|--|--------|--|--|
|  |  | A3 : 3 |  |  |
|  |  | A4 : 4 |  |  |

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                           |     |      |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 64 | 996064 | <p>An electron is confined to a molecule of length 1nm. The minimum energy required for its excitation is around</p> <ol style="list-style-type: none"> <li>1. <math>6.025 \times 10^{-20}</math> J</li> <li>2. <math>18.075 \times 10^{-20}</math> J</li> <li>3. <math>24.1 \times 10^{-20}</math> J</li> <li>4. <math>6.025 \times 10^{-23}</math> J</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |      |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 65 | 996065 | <p>Which of the following relations is not correct</p> <ol style="list-style-type: none"> <li>1. <math>\left(\frac{\partial U}{\partial S}\right)_V = T</math></li> <li>2. <math>\left(\frac{\partial H}{\partial S}\right)_P = T</math></li> <li>3. <math>\left(\frac{\partial A}{\partial T}\right)_V = -S</math></li> <li>4. <math>\left(\frac{\partial G}{\partial T}\right)_P = S</math></li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                               |     |      |
|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 66 | 996066 | <p>On passing electric current, the quantity of deposition of a metal on cathode depends on</p> <ol style="list-style-type: none"> <li>1. Shape of cathode</li> <li>2. Size of cathode</li> <li>3. Quantity of electricity passed through the cell</li> <li>4. Concentration of electrolyte solution</li> </ol> <p>A1 : 1</p> | 4.0 | 0.00 |
|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

A2 : 2

A3 : 3

A4 : 4

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |      |
|----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 67 | 996067 | <p>For the reaction <math>A \rightleftharpoons B</math></p> <p>If <math>k_1</math> and <math>k_{-1}</math> are the rate constants for forward and backward reactions respectively, the equilibrium constant of the reaction is given by</p> <ol style="list-style-type: none"> <li>1. <math>K_{eq.} = \frac{1}{k_1 k_{-1}}</math></li> <li>2. <math>K_{eq.} = k_1 k_{-1}</math></li> <li>3. <math>K_{eq.} = \frac{k_{-1}}{k_1}</math></li> <li>4. <math>K_{eq.} = \frac{k_1}{k_{-1}}</math></li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                           |     |      |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 68 | 996068 | <p>The molecule having nonzero dipole moment is</p> <ol style="list-style-type: none"> <li>1. <math>\text{NF}_3</math></li> <li>2. <math>\text{BF}_3</math></li> <li>3. <math>\text{CCl}_4</math></li> <li>4. <math>\text{CO}_2</math></li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |  |     |      |
|----|--------|--|-----|------|
| 69 | 996069 |  | 4.0 | 0.00 |
|----|--------|--|-----|------|

|  |  |                                                                                                                                                                                                                                                                                                                                    |  |  |
|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  |  | <p>The rate of diffusion of a gas is _____ proportional to the _____ of density or Molar mass</p> <ol style="list-style-type: none"> <li>1. Inversely, square root</li> <li>2. Directly, square</li> <li>3. Directly, square root</li> <li>4. Inversely, square</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> |  |  |
|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                          |     |      |
|----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 70 | 996070 | <p>A real gas is expected to behave more or less ideally at</p> <ol style="list-style-type: none"> <li>1. Low temperature and low pressure</li> <li>2. Low temperature and high pressure</li> <li>3. High temperature and low pressure</li> <li>4. High temperature and high pressure</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |      |
|----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 71 | 996071 | <p>Which of the following particle(s) is/are fermions</p> <p>A. Nitrogen (<math>N_2</math>)</p> <p>B. Deuterium (<math>D_2</math>)</p> <p>C. Helium-3 (<math>^3He</math>)</p> <p>D. Protons</p> <p>E. Electrons</p> <p>Choose the correct answer from the following</p> <ol style="list-style-type: none"> <li>1. A, B, C only</li> <li>2. C, D, E only</li> <li>3. B, C, D only</li> <li>4. B, D, E only</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> | 4.0 | 0.00 |
|----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

|  |  |        |  |  |
|--|--|--------|--|--|
|  |  | A3 : 3 |  |  |
|  |  | A4 : 4 |  |  |

## Objective Question

|    |        |                                                                                                                                                                                                                                                             |     |      |
|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 72 | 996072 | <p>Which of the following nuclei is NMR in-active</p> <p>1. <math>^{16}\text{O}</math></p> <p>2. <math>^1\text{H}</math></p> <p>3. <math>^2\text{H}</math></p> <p>4. <math>^{13}\text{C}</math></p> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 73 | 996073 | <p>The Miller indices of crystal planes which cut through the crystal axes at <math>(2a, -3b, -3c)</math> are</p> <p>1. <math>(\overline{3}\overline{2}\overline{2})</math></p> <p>2. <math>(3\overline{2}6)</math></p> <p>3. <math>\left(\frac{1}{3}\frac{1}{2}\frac{1}{2}\right)</math></p> <p>4. <math>\left(-\frac{1}{2}\frac{1}{3}\frac{1}{3}\right)</math></p> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                 |     |      |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 74 | 996074 | <p>The angular momentum of a rigid diatomic rotating molecule (HCl) in the second rotational energy level is</p> <p>1. <math>1.055 \times 10^{-34} \text{ J s}</math></p> <p>2. <math>2.58 \times 10^{-34} \text{ J s}</math></p> <p>3. <math>3.65 \times 10^{-34} \text{ J s}</math></p> <p>4. <math>1.49 \times 10^{-34} \text{ J s}</math></p> <p>A1 : 1</p> | 4.0 | 0.00 |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

|                    |        |                                                                                                                                                                                                                                                                                                                                        |     |      |
|--------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |        | A2 : 2                                                                                                                                                                                                                                                                                                                                 |     |      |
|                    |        | A3 : 3                                                                                                                                                                                                                                                                                                                                 |     |      |
|                    |        | A4 : 4                                                                                                                                                                                                                                                                                                                                 |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                        |     |      |
| 75                 | 996075 | <p>The oxidation number of nitrogen in nitrate ion is</p> <p>1. -3</p> <p>2. +5</p> <p>3. +6</p> <p>4. +3</p> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                                                                                                  | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                        |     |      |
| 76                 | 996076 | <p>The Fourier transform of the function <math>f(cx)</math>, where, c is a constant, is given by,</p> <p>1. <math>\frac{1}{c} F\left(\frac{k}{c}\right)</math></p> <p>2. <math>F\left(\frac{k}{c}\right)</math></p> <p>3. <math>cF(ck)</math></p> <p>4. <math>F(ck)</math></p> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                        |     |      |
| 77                 | 996077 |                                                                                                                                                                                                                                                                                                                                        | 4.0 | 0.00 |

The value of the integral  $\int_0^{\infty} \frac{dx}{1+x^2}$  is

1.  $\pi$
2.  $\frac{\pi}{2}$
3.  $-\frac{\pi}{2}$
4.  $-\pi$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

#### Objective Question

78 996078

The Hamiltonian of a particle is given by,  $H = \frac{1}{\beta} p^\beta$ . The Lagrangian of the particle is given by,

1.  $L = \frac{\beta-1}{\beta} u^{\frac{\beta}{\beta-1}}$
2.  $L = u + u^{\frac{\beta}{\beta-1}}$
3.  $L = u + u^\beta$
4.  $L = \frac{\beta}{\beta-1} u^{\frac{\beta}{\beta-1}}$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

4.0

0.00

#### Objective Question

79 996079

The repulsive force experienced by a particle is given by the potential

$$V(q) = -\frac{1}{2} a q^2 \quad (a > 0)$$

Then, the energy contours are,

1. Ellipse
2. Hyperbola
3. Parabola
4. Circle

4.0

0.00

|                    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                |     |      |
|--------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |        | <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                                                                                                                                                                                                                                                                                                        |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                |     |      |
| 80                 | 996080 | <p>Generalized momentum conjugate to a cyclic coordinate is,</p> <ol style="list-style-type: none"> <li>1. Conserved</li> <li>2. Not conserved</li> <li>3. Accelerated</li> <li>4. Retarded</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                                                                                                 | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                |     |      |
| 81                 | 996081 | <p>A current of 2A exists in a square loop of edge 10cm. The magnetic field B at the centre of the square loop is given by,</p> <ol style="list-style-type: none"> <li>1. <math>3.74 \times 10^{-7}</math> T</li> <li>2. <math>7.12 \times 10^{-7}</math> T</li> <li>3. <math>12.35 \times 10^{-6}</math> T</li> <li>4. <math>22.64 \times 10^{-6}</math> T</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                |     |      |
| 82                 | 996082 | <p>Electromagnetic waves are produced by</p> <ol style="list-style-type: none"> <li>1. a static charge</li> <li>2. a moving charge</li> <li>3. an accelerating charge</li> <li>4. chargeless particles</li> </ol>                                                                                                                                                                                                              | 4.0 | 0.00 |

|                    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |      |
|--------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |        | <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                                                                                                                                                                                                                                                                                                                  |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |      |
| 83                 | 996083 | <p>A free electron is placed in the path of a plane electromagnetic wave. The electron will start moving</p> <ol style="list-style-type: none"> <li>1. along the magnetic field</li> <li>2. along the electric field</li> <li>3. along the direction of propagation of the wave</li> <li>4. in a plane containing the magnetic field and the direction of propagation</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |      |
| 84                 | 996084 | <p>Suppose the operators A and B commute with the commutator</p> $[A, [A, B]] = [B, [A, B]] = 0$ <p>Then, <math>[A, B^N]</math> is equal to</p> <ol style="list-style-type: none"> <li>1. <math>NB^N</math></li> <li>2. <math>NB^{N-1}</math></li> <li>3. <math>NB^{N-1}[A, B]</math></li> <li>4. <math>(N-1)B^N[A, B]</math></li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                         | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |      |
| 85                 | 996085 |                                                                                                                                                                                                                                                                                                                                                                                                                                          | 4.0 | 0.00 |

Consider the following operator,

$$\hat{U} = \hat{A} + \hat{A}^\dagger$$

where,  $\hat{A}$  is any operator. Then, the operator  $\hat{U}$  is always,

1. Hermitian
2. Anti-Hermitian
3. Skew-Hermitian
4. Projection operator

A1 : 1

A2 : 2

A3 : 3

A4 : 4

#### Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 86 | 996086 | <p>For any operator <math>\hat{A}</math>, if there exists <math>\hat{A}^{-1}</math>, then the eigenvalues of <math>\hat{A}^{-1}</math> are,</p> <ol style="list-style-type: none"> <li>1. the same eigenvalues of the operator <math>\hat{A}</math></li> <li>2. not related to the eigenvalues of the operator <math>\hat{A}</math></li> <li>3. the inverse of the eigenvalues of the operator <math>\hat{A}</math></li> <li>4. the square of the eigenvalues of the operator <math>\hat{A}</math></li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

#### Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                      |     |      |
|----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 87 | 996087 | <p>The root mean square speed of oxygen molecules in a gas at 300K temperature is approximately,</p> <p>(Take <math>R=8.3J/(K \text{ mol})</math>, For oxygen take 32 g/mol)</p> <ol style="list-style-type: none"> <li>1. 483 m/s</li> <li>2. 273 m/s</li> <li>3. 162 m/s</li> <li>4. 43 m/s</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> | 4.0 | 0.00 |
|----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

|                    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |      |
|--------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |        | A3 : 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |      |
|                    |        | A4 : 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |      |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |      |
| 88                 | 996088 | <p>The wavelength of radiation emitted when <math>He^+</math> makes a transition from the state <math>n=3</math> to <math>n=2</math> is approximately given by,</p> <ol style="list-style-type: none"> <li>1. 489nm</li> <li>2. 378nm</li> <li>3. 110nm</li> <li>4. 164nm</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |      |
| 89                 | 996089 | <p>The first law of thermodynamics is a statement of</p> <ol style="list-style-type: none"> <li>1. conservation of heat</li> <li>2. conservation of work</li> <li>3. conservation of momentum</li> <li>4. conservation of energy</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.0 | 0.00 |
| Objective Question |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |      |
| 90                 | 996090 | <p>Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R</p> <p><b>Assertion A:</b> The commutator of the two Hermitian operators <math>\hat{A}</math> and <math>\hat{B}</math> is anti-commutator.</p> <p><b>Reason R :</b> The operators <math>\hat{A}</math> and <math>\hat{B}</math> are Hermitian.</p> <p>In the light of the above statements, choose the <i>most appropriate answer</i> from the options given below.</p> <ol style="list-style-type: none"> <li>1. Both A and R are correct and R is the correct explanation of A</li> <li>2. Both A and R are correct but R is NOT the correct explanation of A</li> <li>3. A is correct but R is not correct</li> <li>4. A is not correct but R is correct</li> </ol> | 4.0 | 0.00 |

A1 : 1

A2 : 2

A3 : 3

A4 : 4

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 91 | 996091 | <p>Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R</p> <p><b>Assertion A :</b> <math>2^2 P_{5/2}</math> state is impossible to exists.</p> <p><b>Reason R :</b> A P state has <math>L = 1, J = L \pm S</math> and hence <math>J = \frac{5}{2}</math> is impossible.</p> <p>In the light of the above statements, choose the <i>most appropriate answer</i> from the options given below</p> <ol style="list-style-type: none"> <li>Both A and R are correct and R is the correct explanation of A</li> <li>Both A and R are correct but R is NOT the correct explanation of A</li> <li>A is correct but R is not correct</li> <li>A is not correct but R is correct</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |      |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 92 | 996092 | <p>Consider a particle moving under constant force along x-axis. The Lagrangian of the particle is given by,</p> $L = -mc^2 \sqrt{1 - \left(\frac{\dot{x}}{c}\right)^2} - \max, \text{ where, } c \text{ is the velocity of light and 'a' is a constant and 'm' is the mass of the particle.}$ <ol style="list-style-type: none"> <li>Equation of motion of the relativistic particle in (x,t) plane is hyperbolic.</li> <li>Equation of motion in (x,t) plane in the non-relativistic approximation is hyperbolic.</li> <li>The Hamiltonian of the particle is <math>H = H(x, p_x)</math></li> <li>Equation of motion in (x,t) plane in the non-relativistic approximation is parabolic.</li> <li>Equation of motion in (x,t) plane in the non-relativistic approximation is elliptic.</li> </ol> <p>Choose the most appropriate answer from the options given below:</p> <ol style="list-style-type: none"> <li>A, B, C, D and E</li> <li>A, C and D only</li> <li>B, D and E only</li> <li>C, D and E only.</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> | 4.0 | 0.00 |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

A4 : 4

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |      |
|----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 93 | 996093 | <p>A charge moves along a circular loop of radius 'a' along the anticlockwise direction.</p> <p>A. If 'I' is the current due to the motion of the charge, then the magnetic field due to it at the centre of the circular loop is <math>B = \frac{\mu_0 I}{2a}</math>.</p> <p>B. The direction of the magnetic field is given by right-hand thumb rule.</p> <p>C. The direction of the magnetic field is given by left-hand thumb rule.</p> <p>D. The direction of the magnetic field is upwards perpendicular to the circular plane.</p> <p>E. The direction of the magnetic field is downwards perpendicular to the circular plane.</p> <p>Choose the most appropriate answer from the options given below:</p> <ol style="list-style-type: none"> <li>1. A, B, C, D, E</li> <li>2. A, B and C only</li> <li>3. A, C and E only</li> <li>4. A, B and D only</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |      |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 94 | 996094 | <p>The internal energy of an ideal gas decreases by the same amount as the work done by the system</p> <p>A. The process must be adiabatic.</p> <p>B. The process must be isothermal.</p> <p>C. The process must be isobaric.</p> <p>D. The process must not be isochoric.</p> <p>E. The temperature must decrease</p> <p>Choose the most appropriate answer from the options given below:</p> <ol style="list-style-type: none"> <li>1. A, B, C, D and E</li> <li>2. A, B and D only</li> <li>3. A, D and E only</li> <li>4. A, B and E only</li> </ol> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

## Objective Question

|    |        |  |     |      |
|----|--------|--|-----|------|
| 95 | 996095 |  | 4.0 | 0.00 |
|----|--------|--|-----|------|

The X-ray beam coming from an X-ray tube

- A. is monochromatic
- B. has all wavelengths smaller than a certain threshold wavelength
- C. has all wavelengths larger than a certain threshold wavelength
- D. has all wavelengths lying between a minimum and a maximum wavelength

Choose the most appropriate answer from the options given below:

- 1. A
- 2. B
- 3. C
- 4. D

A1 : 1

A2 : 2

A3 : 3

A4 : 4

#### Objective Question

|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |      |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 96 | 996096 | <p>The quantity <math>\frac{pV}{kT}</math>, represents, (Here, p, V and T are thermodynamical variables and k is the Boltzmann constant).</p> <ul style="list-style-type: none"> <li>A. mass of the gas</li> <li>B. kinetic energy of the gas</li> <li>C. number of moles of the gas</li> <li>D. number of molecules in the gas</li> </ul> <p>Choose the most appropriate answer from the options given below:</p> <ul style="list-style-type: none"> <li>1. A</li> <li>2. B</li> <li>3. C</li> <li>4. D</li> </ul> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p> | 4.0 | 0.00 |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|

#### Objective Question

|    |        |  |     |      |
|----|--------|--|-----|------|
| 97 | 996097 |  | 4.0 | 0.00 |
|----|--------|--|-----|------|

Consider a function  $F(r) = r^m$ , where  $m$  is a constant. Then,  $\vec{\nabla} \cdot F(r)\hat{r}$  is equal to

1.  $(m-1)r^{m-2}$
2.  $mr^{m-1}$
3.  $(m+1)r^{m-1}$
4.  $(m+2)r^{m-1}$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

#### Objective Question

98

996098

Match List I with List II

4.0

0.00

| LIST I |                                                                                           | LIST II |                   |
|--------|-------------------------------------------------------------------------------------------|---------|-------------------|
| A.     | The dimension of $\frac{1}{\mu_0 \epsilon_0}$                                             | I.      | $\frac{T}{L}$     |
| B.     | For plane electromagnetic waves, the dimension of $\frac{B_0}{E_0}$ is                    | II.     | Ampere's law      |
| C.     | For plane electromagnetic waves, $\oint E \cdot dl = -\frac{d\phi_B}{dt}$                 | III.    | Faraday's law     |
| D.     | For plane electromagnetic waves, $\oint B \cdot dl = \mu_0 \epsilon_0 \frac{d\phi_E}{dt}$ | IV.     | $\frac{L^2}{T^2}$ |

Choose the correct answer from the options given below:

1. A-IV, B-I, C-III, D-II
2. A-III, B-I, C-II, D-IV
3. A-II, B-III, C-IV, D-I
4. A-I, B-II, C-III, D-IV

A1 : 1

A2 : 2

A3 : 3

A4 : 4

#### Objective Question

|    |        |  |     |      |
|----|--------|--|-----|------|
| 99 | 996099 |  | 4.0 | 0.00 |
|----|--------|--|-----|------|

Match List I with List II

| LIST I |                                                                                                                                          | LIST II |                                      |
|--------|------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------------------------|
| A.     | $ \psi\rangle$ and $ \phi\rangle$ belongs to same vector space, then $ \psi\rangle \phi\rangle$ and $\langle\psi \langle\phi $ are       | I.      | Forbidden                            |
| B.     | $ \psi\rangle$ and $ \phi\rangle$ belongs to different vector spaces, then $\langle\psi \langle\phi $ and $ \psi\rangle \phi\rangle$ are | II.     | allowed                              |
| C.     | The product of two commuting projection operators is                                                                                     | III.    | a projection operator                |
| D.     | The sum of two projection operators is                                                                                                   | IV.     | generally not a projection operator. |

Choose the correct answer from the options given below:

1. A-I, B-II, C-III, D-IV
2. A-II, B-I, C-III, D-IV
3. A-I, B-II, C-IV, D-III
4. A-IV, B-II, C-III, D-I

A1 : 1

A2 : 2

A3 : 3

A4 : 4

## Objective Question

100 996100

Match List I with List II

| LIST I |                                                                            | LIST II |                                                |
|--------|----------------------------------------------------------------------------|---------|------------------------------------------------|
| A.     | When a photon stimulates the emission of another photon, the two photons   | I.      | $\frac{h}{\lambda}$                            |
| B.     | In a laser tube, all photons                                               | II.     | $\frac{h}{2\pi}$                               |
| C.     | The minimum orbital angular momentum of the electron in a hydrogen atom is | III.    | have same energy, direction, phase, wavelength |
| D.     | The de-Broglie momentum of free electron of wavelength $\lambda$ is        | IV.     | move with same speed                           |

Choose the correct answer from the options given below:

1. A-III, B-IV, C-II, D-I
2. A-IV, B-III, C-II, D-I
3. A-II, B-III, C-IV, D-I
4. A-I, B-II, C-III, D-IV

A1 : 1

A2 : 2

A3 : 3

4.0

0.00

|  |  |        |  |  |
|--|--|--------|--|--|
|  |  | A4 : 4 |  |  |
|--|--|--------|--|--|