

**PREVIEW QUESTION BANK**

Module Name : Group C Mathematics-E  
Exam Date : 31-Aug-2021 Batch : 10:00-11:30

| Sr. No.                                          | Client Question ID | Question Body and Alternatives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Marks | Negative Marks |
|--------------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------|
| Case Study from Question No. 2 to Question No. 4 |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                |
| 1                                                | 1                  | <p><b>Direction:</b> Read the following passage and answer these questions:</p> <p>Science engenders hope in the future of human achievement. In the study of Literature and Art, on the other hand, our attention is perpetually riveted upon the past; the men of Greece or the Renaissance did better than any men do now; the triumphs of former ages, so far from facilitating fresh triumphs in our own age, actually increase the difficulty of fresh triumphs by rendering originality harder of attainment. Not only is artistic achievement not cumulative, but it seems even to depend upon a certain freshness and 'naiveté of impulse' and vision which civilisation tends to destroy. Hence comes to those who have been nourished on the literary and artistic production of former ages, a certain peevishness and undue fastidiousness towards the present, from which there seems no escape into the deliberate vandalism which ignores tradition and in the search after originality achieves only the eccentric. But in such vandalism there is none of the simplicity and spontaneity out of which great art springs; theory is still the canker in its core, and insincerity destroys the advantages of a merely pretended ignorance.</p> | 9.0   | 3.00           |
| 2                                                | 2                  | <p>Science generates hope because the scientist</p> <p>A1 : studies human achievement.</p> <p>A2 : does not bother about past achievements.</p> <p>A3 : works for the future.</p> <p>A4 : studies natural phenomena.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3.0   | 1.00           |
| 3                                                | 3                  | <p>Great art springs from</p> <p>A1 : ignoring tradition.</p> <p>A2 : pure originality.</p> <p>A3 : acts of vandalism.</p> <p>A4 : simplicity and spontaneity.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3.0   | 1.00           |
| 4                                                | 4                  | <p>Modern literary and artistic productions are</p> <p>A1 : great.</p> <p>A2 : traditional.</p> <p>A3 : eccentric.</p> <p>A4 : original.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.0   | 1.00           |
| Case Study from Question No. 6 to Question No. 7 |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                |
| 5                                                | 5                  | <p><b>Direction:</b> In these questions, out of the four alternatives, choose the word which can be substituted for the given sentence.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6.0   | 2.00           |
| 6                                                | 6                  | <p>A funeral bell</p> <p>A1 : Honour</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3.0   | 1.00           |

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|----------------------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                                                    |    | <p>A2 : Epitaph</p> <p>A3 : Lyric</p> <p>A4 : Memento</p>                                                                                                                                                                       |     |      |
| 7                                                  | 7  | <p>A person who has just started learning</p> <p>A1 : Novice</p> <p>A2 : Apprentice</p> <p>A3 : Supervisor</p> <p>A4 : Foreman</p>                                                                                              | 3.0 | 1.00 |
| Case Study from Question No. 9 to Question No. 10  |    |                                                                                                                                                                                                                                 |     |      |
| 8                                                  | 8  | <p><b>Direction:</b> Four alternatives are given below each sentence. You are required to choose the most suitable alternative to complete the sentence to make it meaningful.</p>                                              | 6.0 | 2.00 |
| 9                                                  | 9  | <p>He tames animals because he _____</p> <p>A1 : is fond of them.</p> <p>A2 : hates them.</p> <p>A3 : wants to set them free.</p> <p>A4 : is afraid of them.</p>                                                                | 3.0 | 1.00 |
| 10                                                 | 10 | <p>He has no money now _____</p> <p>A1 : as he has given up all his wealth.</p> <p>A2 : although he was very poor once.</p> <p>A3 : because he was very rich once.</p> <p>A4 : because he had received huge donations once.</p> | 3.0 | 1.00 |
| Case Study from Question No. 12 to Question No. 13 |    |                                                                                                                                                                                                                                 |     |      |
| 11                                                 | 11 | <p><b>Direction:</b> fill in the blanks with the appropriate option out of the given alternatives.</p>                                                                                                                          | 6.0 | 2.00 |
| 12                                                 | 12 | <p>The office assistant is very efficient. He is _____ to his firm.</p> <p>A1 : a credit</p> <p>A2 : a blessing</p> <p>A3 : a boon</p> <p>A4 : an asset</p>                                                                     | 3.0 | 1.00 |

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|----------------------------------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                                                    |    |                                                                                                                                                                          |     |      |
| 13                                                 | 13 | <p>The Government is confident that the standard of living will begin to _____ again soon.</p> <p>A1 : revive</p> <p>A2 : lift</p> <p>A3 : flourish</p> <p>A4 : rise</p> | 3.0 | 1.00 |
| Case Study from Question No. 15 to Question No. 16 |    |                                                                                                                                                                          |     |      |
| 14                                                 | 14 | <b>Direction:</b> Out of the four alternatives, choose the word opposite in meaning to the given word.                                                                   | 6.0 | 2.00 |
| 15                                                 | 15 | <p>PALPABLE</p> <p>A1 : Creative</p> <p>A2 : Imaginary</p> <p>A3 : Fresh</p> <p>A4 : Innovative</p>                                                                      | 3.0 | 1.00 |
| 16                                                 | 16 | <p>DELIRIOUS</p> <p>A1 : Responsive</p> <p>A2 : Insane</p> <p>A3 : Calm</p> <p>A4 : Large</p>                                                                            | 3.0 | 1.00 |
| Case Study from Question No. 18 to Question No. 19 |    |                                                                                                                                                                          |     |      |
| 17                                                 | 17 | <b>Direction:</b> Four alternatives are given for the idiom/phrase. Choose the alternative which best expresses the meaning of the idiom/phrase.                         | 6.0 | 2.00 |
| 18                                                 | 18 | <p>Fall flat</p> <p>A1 : To fall in love</p> <p>A2 : Fail to win appreciation</p> <p>A3 : Lose consciousness</p> <p>A4 : Lose confidence</p>                             | 3.0 | 1.00 |
| 19                                                 | 19 | <p>To look blue</p> <p>A1 : To be annoyed</p>                                                                                                                            | 3.0 | 1.00 |

|                                                    |    |                                                                                                                                                                                                                                                                                                                                                               |     |      |
|----------------------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                                                    |    | <p>A2 : To look sad</p> <p>A3 : To feel happy</p> <p>A4 : To look sick</p>                                                                                                                                                                                                                                                                                    |     |      |
| Case Study from Question No. 21 to Question No. 22 |    |                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 20                                                 | 20 | <b>Direction:</b> In these questions, choose the correct tense in the given sentence.                                                                                                                                                                                                                                                                         | 6.0 | 2.00 |
| 21                                                 | 21 | <p>The sentence “Many Indians have settled abroad in recent years” , has a</p> <p>A1 : Present perfect tense</p> <p>A2 : Present continuous tense</p> <p>A3 : Simple present tense</p> <p>A4 : Simple past tense</p>                                                                                                                                          | 3.0 | 1.00 |
| 22                                                 | 22 | <p>The sentence” However they had already been married outside the village” , has a</p> <p>A1 : Present perfect tense</p> <p>A2 : Past perfect tense</p> <p>A3 : Simple present tense</p> <p>A4 : Simple past tense</p>                                                                                                                                       | 3.0 | 1.00 |
| Objective Question                                 |    |                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 23                                                 | 23 | <p>The line of action of the resultant of two like parallel forces by one-fourth of the distance between the forces when the two forces are interchanged. The ratio of the two forces is</p> <p>A1 : 1 : 2</p> <p>A2 : 2 : 3</p> <p>A3 : 3 : 4</p> <p>A4 : 3 : 5</p>                                                                                          | 3.0 | 1.00 |
| Objective Question                                 |    |                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 24                                                 | 24 | <p>Power supplied to a particle of mass 2 kg varies with time as <math>P = 3t^2/2</math> watt. Here t is in seconds. If velocity of particle at <math>t = 0</math> is <math>v = 0</math>, then the velocity of particle at time <math>t = 2</math> s will be</p> <p>A1 : 6 m/s</p> <p>A2 : 4 m/s</p> <p>A3 : <math>2\sqrt{2}</math> m/s</p> <p>A4 : 2 m/s</p> | 3.0 | 1.00 |

| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |      |
|--------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 25                 | 25 | <p>A material has Poisson's ratio 0.5. If a uniform rod of it suffers a longitudinal strain of <math>2 \times 10^{-3}</math>, then the percentage increase in volume is</p> <p>A1 : 0</p> <p>A2 : <math>4 \times 10^{-3}</math></p> <p>A3 : <math>8 \times 10^{-3}</math></p> <p>A4 : <math>16 \times 10^{-3}</math></p>                                                                                                                                                                                                                                        | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |      |
| 26                 | 26 | <p>A plate of area <math>100 \text{ cm}^2</math> is placed on the upper surface of castor oil, 2 mm thick. Taking the coefficient of viscosity to be 15.5 poise, the horizontal force necessary to move the plate with a velocity of 3 cm/s is</p> <p>A1 : 2325 N</p> <p>A2 : 23.25 N</p> <p>A3 : 0.2325 N</p> <p>A4 : 2.325 N</p>                                                                                                                                                                                                                              | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |      |
| 27                 | 27 | <p>An oil drop falls through air with a terminal velocity of <math>5 \times 10^{-4} \text{ m/s}</math>. The viscosity of air = <math>1.8 \times 10^{-5} \text{ N s/m}^2</math> and the density of oil = <math>900 \text{ kg/m}^3</math>. Neglect density of air as compared to that of oil. Then, the radius of the drop will be</p> <p>A1 : <math>3.0 \times 10^{-6} \text{ m}</math></p> <p>A2 : <math>2.14 \times 10^{-6} \text{ m}</math></p> <p>A3 : <math>4.12 \times 10^{-6} \text{ m}</math></p> <p>A4 : <math>1.24 \times 10^{-6} \text{ m}</math></p> | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |      |
| 28                 | 28 | <p>A cone has a total charge Q distributed over its sloping surface uniformly. The sloping length is l. The energy required to bring up a test charge q from a very large distance to the vertex of the cone is</p> <p>A1 : <math>\frac{2Qq}{\epsilon_0 l}</math></p> <p>A2 : <math>\frac{Qq}{\pi \epsilon_0 l}</math></p> <p>A3 : <math>\frac{Qq}{2\pi \epsilon_0 l}</math></p> <p>A4 : <math>\frac{Qq}{4\pi \epsilon_0 l}</math></p>                                                                                                                          | 3.0 | 1.00 |

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| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 29                 | 29 | <p>A simple pendulum of length <math>l</math> has a bob of mass <math>m</math>, with a charge <math>q</math> on it. A vertical sheet of charge, with charge <math>\sigma</math> per unit area, passes through the point of suspension of the pendulum. At equilibrium, the string makes an angle <math>\theta</math> with the vertical. The value of <math>\tan \theta</math> is given by</p> <p>A1 : <math>\frac{\sigma q}{2mg\epsilon_0}</math></p> <p>A2 : <math>\frac{\sigma q}{mg\epsilon_0}</math></p> <p>A3 : <math>\frac{2\sigma q}{mg\epsilon_0}</math></p> <p>A4 : <math>\frac{\sigma q}{4mg\epsilon_0}</math></p> | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 30                 | 30 | <p>A milliammeter of range 10 mA has a coil of resistance <math>1 \Omega</math>. To use it as an ammeter of range 1 A, the required shunt must have a resistance of</p> <p>A1 : <math>1/101 \Omega</math></p> <p>A2 : <math>1/100 \Omega</math></p> <p>A3 : <math>1/99 \Omega</math></p> <p>A4 : <math>0.99 \Omega</math></p>                                                                                                                                                                                                                                                                                                | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 31                 | 31 | <p>Kirchoff's junction rule is a reflection of</p> <p>A1 : conservation of current density vector</p> <p>A2 : conservation of charge</p> <p>A3 : the fact that the momentum with which a charged particle approaches a junction is unchanged( as a vector )as the charged particle leaves the junction</p> <p>A4 : the fact that there is accumulation of charges at a junction</p>                                                                                                                                                                                                                                          | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 32                 | 32 | <p>A horizontal ring of radius <math>R</math> spins about its own axis with an angular velocity <math>w</math> in a uniform vertical magnetic field of magnitude <math>B</math>. The emf induced in the ring is</p> <p>A1 : <math>BR^2w</math></p> <p>A2 : <math>\frac{1}{2}BR^2w</math></p> <p>A3 : <math>\pi BR^2w</math></p>                                                                                                                                                                                                                                                                                              | 3.0 | 1.00 |

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|                    |    | A4 : zero                                                                                                                                                                                                                                                                                                                                                                                                           |     |      |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                     |     |      |
| 33                 | 33 | <p>A particle with a specific charge <math>s</math> is fired with a speed <math>v</math> towards a wall at a distance <math>d</math>, perpendicular to the wall. What minimum magnetic field must exist in this region for the particle not to hit the wall?</p> <p>A1 : <math>v/sd</math></p> <p>A2 : <math>2v/sd</math></p> <p>A3 : <math>v/2sd</math></p> <p>A4 : <math>v/4sd</math></p>                         | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                     |     |      |
| 34                 | 34 | <p>In Young's double slit experiment, the intensity of light is <math>I</math> at a point on the screen where the path difference is <math>\lambda</math>. The intensity of light at a point where the path difference becomes <math>\lambda/3</math> is</p> <p>A1 : <math>I/2</math></p> <p>A2 : <math>I</math></p> <p>A3 : <math>I/3</math></p> <p>A4 : <math>I/4</math></p>                                      | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                     |     |      |
| 35                 | 35 | <p>A transparent sphere of radius <math>R</math> and refractive index <math>\mu</math> is kept in air. At what distance from the surface of the sphere should a point object be placed so as to form a real image at the same distance from the sphere?</p> <p>A1 : <math>\frac{R}{\mu}</math></p> <p>A2 : <math>\mu R</math></p> <p>A3 : <math>\frac{R}{\mu+1}</math></p> <p>A4 : <math>\frac{R}{\mu-1}</math></p> | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                     |     |      |
| 36                 | 36 | <p>A beam of light travelling in water strikes a glass plate which is also immersed in water. When the angle of incidence is <math>51^\circ</math>, (<math>\tan 51^\circ = 1.235</math>) the reflected beam is found to be plane polarised. The refractive index of glass is</p> <p>A1 : 1.235</p> <p>A2 : 1.64</p> <p>A3 : 1.5</p>                                                                                 | 3.0 | 1.00 |

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|                    |    | A4 : 4/3                                                                                                                                                                                                                                                                                                                                                   |     |      |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                            |     |      |
| 37                 | 37 | <p>Five elements A,B,C,D and E have work functions 1.2 eV, 2.4 eV, 3.6 eV, 4.8 eV and 6.0 eV respectively. If light of wavelength 400 nm is allowed to fall on these elements, then photo electrons are emitted by</p> <p>A1 : A,B and C</p> <p>A2 : A,B,C,D, and E</p> <p>A3 : A and B only</p> <p>A4 : E only</p>                                        | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                            |     |      |
| 38                 | 38 | <p>In Rutherford experiment, the number of alpha particles scattered through an angle of <math>90^\circ</math> is 28 per minute. Then the number of particles scattered through an angle of <math>4^\circ</math> by the same nucleus will be</p> <p>A1 : 28 per minute</p> <p>A2 : 112 per minute</p> <p>A3 : 7 per minute</p> <p>A4 : 12.5 per minute</p> | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                            |     |      |
| 39                 | 39 | <p>The radioactivity of a given sample of liquor due to tritium ( half life = 12 years ) was found to be only 3.125 % of that measured in a recently purchased bottle marked "10 years old ". By how many years ago the sample must have been prepared?</p> <p>A1 : 22 years</p> <p>A2 : 50 years</p> <p>A3 : 60 years</p> <p>A4 : 70 years</p>            | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                            |     |      |
| 40                 | 40 | <p>If 200 MeV energy is obtained per fission of <math>{}_{92}\text{U}^{235}</math>, then the number of fission per second to produce 1 kN power will be</p> <p>A1 : <math>3.125 \times 10^{13}</math></p> <p>A2 : <math>0.125 \times 10^{13}</math></p> <p>A3 : <math>1.25 \times 10^{18}</math></p> <p>A4 : <math>3.2 \times 10^8</math></p>              | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                            |     |      |
| 41                 | 41 | <p>For a transistor, current gain <math>\alpha = 0.96</math>. It is used as an amplifier in a common base circuit with a load resistance of 4 k<math>\Omega</math>. If the dynamic resistance of the emitter - base junction is 48 <math>\Omega</math>, the voltage gain is</p>                                                                            | 3.0 | 1.00 |

|                    |    |                                                                                                                                                                                                                                                                  |     |      |
|--------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |    | <p>A1 : 40</p> <p>A2 : 80</p> <p>A3 : 120</p> <p>A4 : 160</p>                                                                                                                                                                                                    |     |      |
| Objective Question |    |                                                                                                                                                                                                                                                                  |     |      |
| 42                 | 42 | <p>In a NOT gate, if the input signal is zero, the output signal is</p> <p>A1 : 0</p> <p>A2 : either 0 or 1</p> <p>A3 : 1</p> <p>A4 : both 0 and 1</p>                                                                                                           | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                  |     |      |
| 43                 | 43 | <p>A gas is found to have the formula <math>(\text{CO})_x</math>. Its vapour density is 70. The value of x must be</p> <p>A1 : 2</p> <p>A2 : 3</p> <p>A3 : 4</p> <p>A4 : 5</p>                                                                                   | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                  |     |      |
| 44                 | 44 | <p>At constant temperature, if pressure increases by 1%, the percentage decrease in volume is</p> <p>A1 : 1%</p> <p>A2 : (100/101)%</p> <p>A3 : (1/100)%</p> <p>A4 : (1/101)%</p>                                                                                | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                  |     |      |
| 45                 | 45 | <p>The rms speed of <math>\text{N}_2</math> molecules in a gas is u. If the temperature is doubled and the nitrogen molecules dissociate into nitrogen atoms, the rms speed becomes</p> <p>A1 : <math>u/2</math></p> <p>A2 : u</p> <p>A3 : 2u</p> <p>A4 : 4u</p> | 3.0 | 1.00 |

| Objective Question |    |                                                                                                                                                                                                                                                                                 |     |      |
|--------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| 46                 | 46 | <p>How many sigma and pi bonds are present in tetracyanoethylene?</p> <p>A1 : Nine sigma and nine pi</p> <p>A2 : Five sigma and nine pi</p> <p>A3 : Nine sigma and seven pi</p> <p>A4 : Eight sigma and eight pi</p>                                                            | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                 |     |      |
| 47                 | 47 | <p>The enthalpy of combustion of cyclohexane, cyclohexene and hydrogen molecule are respectively – 3920, -3820 and -241 kJ/mol. The heat of hydrogenation of cyclohexene is</p> <p>A1 : 121 kJ/mol</p> <p>A2 : – 121 kJ/mol</p> <p>A3 : 242 kJ/mol</p> <p>A4 : – 242 kJ/mol</p> | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                 |     |      |
| 48                 | 48 | <p>Which has the highest pH?</p> <p>A1 : <math>\text{CH}_3\text{COONH}_4</math></p> <p>A2 : <math>\text{Na}_2\text{CO}_3</math></p> <p>A3 : <math>\text{NH}_4\text{Cl}</math></p> <p>A4 : <math>\text{NaNO}_3</math></p>                                                        | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                 |     |      |
| 49                 | 49 | <p>Oxidation numbers of iodine in iodate and periodate are respectively</p> <p>A1 : +3, +5</p> <p>A2 : +1, +3</p> <p>A3 : +5, +7</p> <p>A4 : +3, +7</p>                                                                                                                         | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                 |     |      |
| 50                 | 50 | <p>The highest electrical conductivity of the following aqueous solutions, is of</p> <p>A1 : 0.1 M fluoroacetic acid</p> <p>A2 : 0.1 M difluoroacetic acid</p>                                                                                                                  | 3.0 | 1.00 |

|                    |    |                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
|--------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |    | A3 : 0.1 M acetic acid                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |
|                    |    | A4 : 0.1 M chloroacetic acid                                                                                                                                                                                                                                                                                                                                                                                                 |     |      |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 51                 | 51 | <p>Four successive members of the first row transition elements are listed below with their atomic numbers. Which one of them is expected to have the highest third ionization energy?</p> <p>A1 : Vanadium(<math>Z = 23</math>)</p> <p>A2 : Chromium(<math>Z = 24</math>)</p> <p>A3 : Iron(<math>Z = 26</math>)</p> <p>A4 : Manganese(<math>Z = 25</math>)</p>                                                              | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 52                 | 52 | <p>In which of the following mineral aluminium is not present?</p> <p>A1 : Cryolite</p> <p>A2 : Mica</p> <p>A3 : Feldspar</p> <p>A4 : Fluorspar</p>                                                                                                                                                                                                                                                                          | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 53                 | 53 | <p>Which gas is passed through in Merck's process for making hydrogen peroxide?</p> <p>A1 : CO</p> <p>A2 : O<sub>2</sub></p> <p>A3 : CO<sub>2</sub></p> <p>A4 : O<sub>3</sub></p>                                                                                                                                                                                                                                            | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 54                 | 54 | <p>Which of the following characters about alkaline earth metals is not correct?</p> <p>A1 : Their atomic radii and ionic radii increase down the group.</p> <p>A2 : Their ionization energies decrease down the group.</p> <p>A3 : Their melting and boiling points are higher than alkali metals.</p> <p>A4 : They are less electropositive than alkali metals and electropositive character increases down the group.</p> | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                              |     |      |
| 55                 | 55 | <p>When a solution of sodium hydroxide is added in excess to the solution of potash alum, one obtains</p> <p>A1 : A white precipitate</p>                                                                                                                                                                                                                                                                                    | 3.0 | 1.00 |

|                    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |      |
|--------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                    |    | <p>A2 : Bluish white precipitate</p> <p>A3 : A clear solution</p> <p>A4 : A crystalline mass</p>                                                                                                                                                                                                                                                                                                                                                              |     |      |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 56                 | 56 | <p>The basic character of the hydrides of V group elements decreases in the order</p> <p>A1 : <math>\text{NH}_3 &gt; \text{PH}_3 &gt; \text{AsH}_3 &gt; \text{SbH}_3</math></p> <p>A2 : <math>\text{SbH}_3 &gt; \text{AsH}_3 &gt; \text{PH}_3 &gt; \text{NH}_3</math></p> <p>A3 : <math>\text{NH}_3 &gt; \text{SbH}_3 &gt; \text{PH}_3 &gt; \text{AsH}_3</math></p> <p>A4 : <math>\text{SbH}_3 &gt; \text{PH}_3 &gt; \text{AsH}_3 &gt; \text{NH}_3</math></p> | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 57                 | 57 | <p>The EAN in the complex <math>\text{K}_2[\text{PdCl}_4]</math> is</p> <p>A1 : 51</p> <p>A2 : 52</p> <p>A3 : 53</p> <p>A4 : 54</p>                                                                                                                                                                                                                                                                                                                           | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 58                 | 58 | <p>Minamata disease is because of pollution of</p> <p>A1 : Organic waste going into drinking water</p> <p>A2 : Oil spill in water</p> <p>A3 : Industrial waste containing mercury into fishing water</p> <p>A4 : Arsenic going into the atmosphere</p>                                                                                                                                                                                                        | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 59                 | 59 | <p>The IUPAC name of <math>\text{Cl}_2\text{CHCHBrCl}</math> is</p> <p>A1 : 1 – bromo – 1, 2, 2 - trichloroethene</p> <p>A2 : 1, 1, 2 – trichloro - 2 - bromoethene</p> <p>A3 : 1 – bromo – 1, 2, 2 - trichloroethane</p> <p>A4 : 2 – bromo – 1, 1, 2 - trichloroethane</p>                                                                                                                                                                                   | 3.0 | 1.00 |

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| Objective Question |    |                                                                                                                                                                                                                                                                           |     |      |
| 60                 | 60 | <p>The number of isomers for the compound with molecular formula <math>C_2BrClFI</math> is</p> <p>A1 : 4</p> <p>A2 : 5</p> <p>A3 : 6</p> <p>A4 : 8</p>                                                                                                                    | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                           |     |      |
| 61                 | 61 | <p>Ethylene reacts with <math>O_2</math> at <math>200^\circ C</math> in the presence of silver powder to produce</p> <p>A1 : Ethanal</p> <p>A2 : Ethanol</p> <p>A3 : Ethanoic acid</p> <p>A4 : Oxirane</p>                                                                | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                           |     |      |
| 62                 | 62 | <p>Friedel – Crafts reaction of bromobenzene with methyl chloride gives</p> <p>A1 : o – bromotoluene</p> <p>A2 : p – bromotoluene</p> <p>A3 : o – and p - bromotoluene</p> <p>A4 : m – bromotoluene</p>                                                                   | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                           |     |      |
| 63                 | 63 | <p>Which set of ordered pairs does not represent a function?</p> <p>A1 : { (6, 0), (3, -2), (-5, 4), (-7, 0) }</p> <p>A2 : { (-4, -7), (-2, -5), (-3, 4), (-1, 6) }</p> <p>A3 : { (3, 5), (4, -6), (6, 8), (7, -9) }</p> <p>A4 : { (1, 4), (2, 7), (3, 10), (1, -2) }</p> | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                           |     |      |
| 64                 | 64 | <p>The origin and the complex numbers represented by the roots of the equation <math>Z^2 + aZ + b = 0</math> form an equilateral triangle if</p> <p>A1 : <math>a = 2b</math></p> <p>A2 : <math>a^2 = 3b</math></p>                                                        | 3.0 | 1.00 |

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|                    |    | <p>A3 : <math>b^2 = 3a</math></p> <p>A4 : <math>b = 2a</math></p>                                                                                                                                                                                                                                                                                                             |     |      |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 65                 | 65 | <p>The number of different words which can be formed from the letters of the word LUCKNOW when the vowels always occupy even places is</p> <p>A1 : 120</p> <p>A2 : 400</p> <p>A3 : 720</p> <p>A4 : 960</p>                                                                                                                                                                    | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 66                 | 66 | <p>If <math>\cos\theta</math>, <math>\sin\phi</math>, <math>\sin\theta</math> are in geometric progression, then the roots of equation <math>x^2 + 2x\cot\phi + 1 = 0</math> are</p> <p>A1 : Imaginary</p> <p>A2 : Greater than 1</p> <p>A3 : Equal</p> <p>A4 : Real</p>                                                                                                      | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 67                 | 67 | <p>There are 10 pairs of shoes in an almirah from which 4 shoes are picked at random. If p is the probability that there is at least one pair, then p is</p> <p>A1 : <math>99/323</math></p> <p>A2 : <math>224/323</math></p> <p>A3 : <math>99/224</math></p> <p>A4 : <math>125/224</math></p>                                                                                | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 68                 | 68 | <p>P is a point on the line <math>y + 2x = 1</math> and Q and R are two points on line <math>3y + 6x = 36</math> such that the triangle PQR is an equilateral triangle. The length of the side of the triangle is</p> <p>A1 : <math>22/\sqrt{15}</math></p> <p>A2 : <math>33/\sqrt{15}</math></p> <p>A3 : <math>48/\sqrt{15}</math></p> <p>A4 : <math>15/\sqrt{15}</math></p> | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                               |     |      |
| 69                 | 69 | <p>A triangle PQR is inscribed in the circle <math>x^2 + y^2 = 25</math>. If Q and R have coordinates (3, 4) and (-4, 3) respectively, then angle QPR</p>                                                                                                                                                                                                                     | 3.0 | 1.00 |

|                    |    |                                                                                                                                                                                                                                                     |     |      |
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|                    |    | <p>is equal to</p> <p>A1 : <math>90^\circ</math></p> <p>A2 : <math>60^\circ</math></p> <p>A3 : <math>45^\circ</math></p> <p>A4 : <math>30^\circ</math></p>                                                                                          |     |      |
| Objective Question |    |                                                                                                                                                                                                                                                     |     |      |
| 70                 | 70 | <p>Equation of a common tangent to the curves <math>y^2 = 8x</math> and <math>xy = -1</math> is</p> <p>A1 : <math>3y = 9x + 2</math></p> <p>A2 : <math>y = 2x + 1</math></p> <p>A3 : <math>2y = x + 8</math></p> <p>A4 : <math>y = x + 2</math></p> | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                     |     |      |
| 71                 | 71 | <p>The latus rectum of hyperbola <math>9x^2 - 16y^2 - 18x - 32y - 151 = 0</math> is</p> <p>A1 : <math>9/4</math></p> <p>A2 : 9</p> <p>A3 : <math>3/2</math></p> <p>A4 : <math>9/2</math></p>                                                        | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                     |     |      |
| 72                 | 72 | <p>If <math>y = e^{3x} \cos x</math> is a solution to <math>\frac{d^2 y}{dx^2} - 6 \frac{dy}{dx} + ky = 0</math>, then the value of k is</p> <p>A1 : 1</p> <p>A2 : 4</p> <p>A3 : 8</p> <p>A4 : 10</p>                                               | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                     |     |      |
| 73                 | 73 | <p>Given that <math>g(x) = 1 + \sqrt{x}</math> and <math>f(g(x)) = 3 + 2\sqrt{x} + x</math>, then <math>f(x)</math> is equal to</p> <p>A1 : <math>1 + 2x^2</math></p> <p>A2 : <math>2 + x^2</math></p> <p>A3 : <math>1 + x</math></p>               | 3.0 | 1.00 |

|                    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |      |
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|                    |    | A4 : $2 + x$                                                                                                                                                                                                                                                                                                                                                                                                                           |     |      |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |      |
| 74                 | 74 | <p>If <math>f(x)</math> and <math>g(x)</math> are periodic functions with period 7 and 11 respectively, then the period of <math>F(x) = f(x)g\left(\frac{x}{5}\right) - g(x)f\left(\frac{x}{3}\right)</math> is</p> <p>A1 : 1155</p> <p>A2 : 177</p> <p>A3 : 222</p> <p>A4 : 433</p>                                                                                                                                                   | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |      |
| 75                 | 75 | <p>If <math>f'(1) = 2</math> and <math>g'(\sqrt{2}) = 4</math>, then the derivative of <math>f(\tan x)</math> with respect to <math>g(\sec x)</math> at <math>x = \frac{\pi}{4}</math> is</p> <p>A1 : 1</p> <p>A2 : <math>\sqrt{2}</math></p> <p>A3 : <math>1/\sqrt{2}</math></p> <p>A4 : 2</p>                                                                                                                                        | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |      |
| 76                 | 76 | <p>A spherical balloon is being inflated so that its volume increases uniformly at the rate of <math>40 \text{ cm}^3/\text{min}</math>. At <math>r = 8 \text{ cm}</math>, its surface area increases at the rate of</p> <p>A1 : <math>8 \text{ cm}^3/\text{min}</math></p> <p>A2 : <math>10 \text{ cm}^3/\text{min}</math></p> <p>A3 : <math>12 \text{ cm}^3/\text{min}</math></p> <p>A4 : <math>16 \text{ cm}^3/\text{min}</math></p> | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |      |
| 77                 | 77 | <p><math>\int_0^{\infty} \frac{x \, dx}{(1+x)(1+x^2)}</math> is equal to</p> <p>A1 : <math>\pi/4</math></p> <p>A2 : <math>\pi/2</math></p> <p>A3 : <math>\pi</math></p> <p>A4 : <math>2\pi</math></p>                                                                                                                                                                                                                                  | 3.0 | 1.00 |

|                    |    |                                                                                                                                                                                                                  |     |      |
|--------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| Objective Question |    |                                                                                                                                                                                                                  |     |      |
| 78                 | 78 | <p>The area enclosed between the curves <math>y^2 = x</math> and <math>y =  x </math> is</p> <p>A1 : 1</p> <p>A2 : 1/6</p> <p>A3 : 1/3</p> <p>A4 : 2/3</p>                                                       | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                  |     |      |
| 79                 | 79 | <p><math>\sum a^3 \cos(B - C)</math> is equal to</p> <p>A1 : 3abc</p> <p>A2 : 3(a + b + c)</p> <p>A3 : abc(a + b + c)</p> <p>A4 : zero</p>                                                                       | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                  |     |      |
| 80                 | 80 | <p>If <math>y = (1 + \tan A)(1 - \tan B)</math> where <math>A - B = \pi/4</math>, then <math>(y + 1)^{y+1}</math> is equal to</p> <p>A1 : 4</p> <p>A2 : 9</p> <p>A3 : 27</p> <p>A4 : 64</p>                      | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                  |     |      |
| 81                 | 81 | <p>If <math>\Theta = \cot^{-1} 7 + \cot^{-1} 8 + \cot^{-1} 18</math>, then <math>\cot \Theta</math> is equal to</p> <p>A1 : 1</p> <p>A2 : 2</p> <p>A3 : 3</p> <p>A4 : 4</p>                                      | 3.0 | 1.00 |
| Objective Question |    |                                                                                                                                                                                                                  |     |      |
| 82                 | 82 | <p>If the standard deviation of a variate <math>X</math> is <math>\sigma</math>, then the standard deviation of <math>aX + b</math> is</p> <p>A1 : <math>a\sigma + b</math></p> <p>A2 : <math>a\sigma</math></p> | 3.0 | 1.00 |

A3 :  $\sigma$

A4 :  $|a|\sigma$