

## Challenges regarding Answer Key

**Candidate Details**

Application Number :	_____	Roll Number :	_____
Candidate's Name :	_____	Date of Birth :	30-06-2005
Father's Name :	_____	Mother's Name :	_____

**Claimed Answer Key List**

Paper	Question Type	QuestionID	Correct Option(s)/ Answers	Option(s) ID for Challenge					
B TECH - Physics Section A	Objective	3666942007	3666946204	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942008	3666946206	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942009	3666946212	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942010	3666946214	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942011	3666946218	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942012	3666946221	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942013	3666946228	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942014	3666946229	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942015	3666946235	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942016	3666946239	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942017	3666946243	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942018	3666946246	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942019	3666946252	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942020	3666946253	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942021	3666946259	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942022	3666946262	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942023	3666946268	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942024	3666946271	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942025	3666946275	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section A	Objective	3666942026	3666946279	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Physics Section B	Numerical	3666942027	87	<input type="text"/>					
B TECH - Physics Section B	Numerical	3666942028	120	<input type="text"/>					
B TECH - Physics Section B	Numerical	3666942029	28	<input type="text"/>					
B TECH - Physics Section B	Numerical	3666942030	40	<input type="text"/>					
B TECH - Physics Section B	Numerical	3666942031	300	<input type="text"/>					
B TECH - Physics Section B	Numerical	3666942032	120	<input type="text"/>					
B TECH - Physics Section B	Numerical	3666942033	24	<input type="text"/>					
B TECH - Physics Section B	Numerical	3666942034	2	<input type="text"/>					
B TECH - Physics Section B	Numerical	3666942035	10	<input type="text"/>					
B TECH - Physics Section B	Numerical	3666942036	24	<input type="text"/>					
B TECH - Chemistry Section A	Objective	3666942037	3666946292	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942038	3666946295	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942039	3666946302	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942040	3666946304	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942041	3666946308	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942042	3666946311	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942043	3666946317	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942044	3666946320	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942045	3666946325	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942046	3666946327	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942047	3666946333	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942048	3666946336	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942049	3666946342	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942050	3666946343	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942051	3666946347	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942052	3666946353	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942053	3666946356	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942054	3666946362	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942055	3666946365	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section A	Objective	3666942056	3666946369	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Chemistry Section B	Numerical	3666942057	5	<input type="text"/>					
B TECH - Chemistry Section B	Numerical	3666942058	3	<input type="text"/>					
B TECH - Chemistry Section B	Numerical	3666942059	6	<input type="text"/>					
B TECH - Chemistry Section B	Numerical	3666942060	13	<input type="text"/>					
B TECH - Chemistry Section B	Numerical	3666942061	2	<input type="text"/>					
B TECH - Chemistry Section B	Numerical	3666942062	2	<input type="text"/>					
B TECH - Chemistry Section B	Numerical	3666942063	2	<input type="text"/>					
B TECH - Mathematics Section A	Objective	3666942067	3666946381	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942068	3666946385	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942069	3666946389	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942070	3666946394	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942071	3666946397	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942072	3666946401	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942073	3666946406	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942074	3666946412	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942075	3666946414	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942076	3666946420	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942077	3666946421	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942078	3666946426	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942079	3666946431	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
B TECH - Mathematics Section A	Objective	3666942080	3666946436	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942081	3666946440	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B TECH - Mathematics Section A	Objective	3666942082	3666946442	<input type="checkbox"/>	<input type="				

## JEE 2023 Session-1 24th Jan to 1st Feb 2023

Application No	
Candidate Name	
Roll No	
Test Date	29/01/2023
Test Time	9:00 AM - 12:00 PM
Subject	B TECH

Section : Physics Section A

**Q.1** A stone is projected at angle  $30^\circ$  to the horizontal. The ratio of kinetic energy of the stone at point of projection to its kinetic energy at the highest point of flight will be -

Options

1. 1 : 4
2. 4 : 1
3. 1 : 2
4. 4 : 3

Question Type : MCQ  
 Question ID : 3666942015  
 Option 1 ID : 3666946233  
 Option 2 ID : 3666946236  
 Option 3 ID : 3666946234  
 Option 4 ID : 3666946235  
 Status : Answered  
 Chosen Option : 2

**Q.2** Match List I with List II:

List I (Physical Quantity)	List II (Dimensional Formula)
A. Pressure gradient	I. $[M^0 L^2 T^{-2}]$
B. Energy density	II. $[M^1 L^{-1} T^{-2}]$
C. Electric Field	III. $[M^1 L^{-2} T^{-2}]$
D. Latent heat	IV. $[M^1 L^1 T^{-3} A^{-1}]$

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

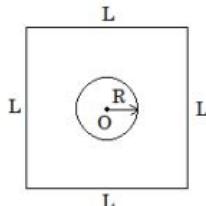
Options

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

Question Type : MCQ  
 Question ID : 3666942007  
 Option 1 ID : 3666946203  
 Option 2 ID : 3666946204  
 Option 3 ID : 3666946201  
 Option 4 ID : 3666946202  
 Status : Answered  
 Chosen Option : 2

**Q.3**

Find the mutual inductance in the arrangement, when a small circular loop of wire of radius ' $R$ ' is placed inside a large square loop of wire of side  $L$  ( $L \gg R$ ). The loops are coplanar and their centres coincide :

**Options**

1.  $M = \frac{2\sqrt{2}\mu_0 R}{L^2}$
2.  $M = \frac{\sqrt{2}\mu_0 R}{L^2}$
3.  $M = \frac{\sqrt{2}\mu_0 R^2}{L}$
4.  $M = \frac{2\sqrt{2}\mu_0 R^2}{L}$

Question Type : MCQ

Question ID : 3666942012

Option 1 ID : 3666946222

Option 2 ID : 3666946224

Option 3 ID : 3666946223

Option 4 ID : 3666946221

Status : Not Answered

Chosen Option : --

**Q.4**

If the height of transmitting and receiving antennas are 80 m each, the maximum line of sight distance will be:

Given: Earth's radius =  $6.4 \times 10^6$  m

- Options**
1. 36 km
  2. 28 km
  3. 64 km
  4. 32 km

Question Type : MCQ

Question ID : 3666942023

Option 1 ID : 3666946267

Option 2 ID : 3666946266

Option 3 ID : 3666946268

Option 4 ID : 3666946265

Status : Not Answered

Chosen Option : --

**Q.5** In a cuboid of dimension  $2L \times 2L \times L$ , a charge  $q$  is placed at the center of the surface 'S' having area of  $4 L^2$ . The flux through the opposite surface to 'S' is given by

**Options**

1.  $\frac{q}{6 \epsilon_0}$
2.  $\frac{q}{12 \epsilon_0}$
3.  $\frac{q}{3 \epsilon_0}$
4.  $\frac{q}{2 \epsilon_0}$

Question Type : MCQ

Question ID : 3666942008

Option 1 ID : 3666946206

Option 2 ID : 3666946207

Option 3 ID : 3666946205

Option 4 ID : 3666946208

Status : Answered

Chosen Option : 2

**Q.6** If a radioactive element having half-life of 30 min is undergoing beta decay, the fraction of radioactive element remains undecayed after 90 min. will be

**Options**

1.  $\frac{1}{4}$
2.  $\frac{1}{16}$
3.  $\frac{1}{2}$
4.  $\frac{1}{8}$

Question Type : MCQ

Question ID : 3666942025

Option 1 ID : 3666946274

Option 2 ID : 3666946276

Option 3 ID : 3666946273

Option 4 ID : 3666946275

Status : Not Attempted and  
Marked For Review

Chosen Option : --

- Q.7** A block of mass  $m$  slides down the plane inclined at angle  $30^\circ$  with an acceleration  $\frac{g}{4}$ . The value of coefficient of kinetic friction will be:

Options

1.  $\frac{1}{2\sqrt{3}}$
2.  $\frac{2\sqrt{3}-1}{2}$
3.  $\frac{2\sqrt{3}+1}{2}$
4.  $\frac{\sqrt{3}}{2}$

Question Type : MCQ

Question ID : 3666942016

Option 1 ID : 3666946239

Option 2 ID : 3666946237

Option 3 ID : 3666946238

Option 4 ID : 3666946240

Status : Answered

Chosen Option : 4

- Q.8** A bicycle tyre is filled with air having pressure of 270 kPa at  $27^\circ\text{C}$ . The approximate pressure of the air in the tyre when the temperature increases to  $36^\circ\text{C}$  is

Options

1. 278 kPa
2. 360 kPa
3. 262 kPa
4. 270 kPa

Question Type : MCQ

Question ID : 3666942021

Option 1 ID : 3666946259

Option 2 ID : 3666946260

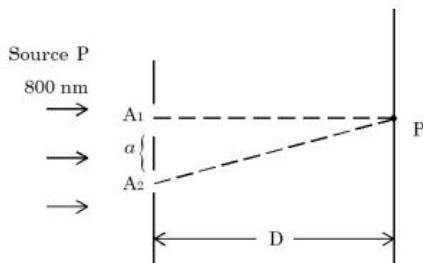
Option 3 ID : 3666946257

Option 4 ID : 3666946258

Status : Answered

Chosen Option : 3

- Q.9** In a Young's double slit experiment, two slits are illuminated with a light of wavelength 800 nm. The line joining  $A_1P$  is perpendicular to  $A_1A_2$  as shown in the figure. If the first minimum is detected at  $P$ , the value of slits separation 'a' will be:



The distance of screen from slits  $D = 5 \text{ cm}$

- Options**
1. 0.2 mm
  2. 0.4 mm
  3. 0.5 mm
  4. 0.1 mm

Question Type : MCQ  
 Question ID : 3666942014  
 Option 1 ID : 3666946229  
 Option 2 ID : 3666946232  
 Option 3 ID : 3666946231  
 Option 4 ID : 3666946230  
 Status : Not Answered  
 Chosen Option : --

- Q.10** Ratio of thermal energy released in two resistors  $R$  and  $3R$  connected in parallel in an electric circuit is :

- Options**
1. 3 : 1
  2. 1 : 1
  3. 1 : 27
  4. 1 : 3

Question Type : MCQ  
 Question ID : 3666942009  
 Option 1 ID : 3666946212  
 Option 2 ID : 3666946210  
 Option 3 ID : 3666946211  
 Option 4 ID : 3666946209  
 Status : Answered  
 Chosen Option : 2

**Q.11** The threshold wavelength for photoelectric emission from a material is 5500 Å. Photoelectrons will be emitted, when this material is illuminated with monochromatic radiation from a

- A. 75 W infra-red lamp
- B. 10 W infra-red lamp
- C. 75 W ultra-violet lamp
- D. 10 W ultra-violet lamp

Choose the correct answer from the options given below:

**Options** 1. B and C only

- 2. C only
- 3. A and D only
- 4. C and D only

Question Type : MCQ

Question ID : 3666942024

Option 1 ID : 3666946272

Option 2 ID : 3666946269

Option 3 ID : 3666946270

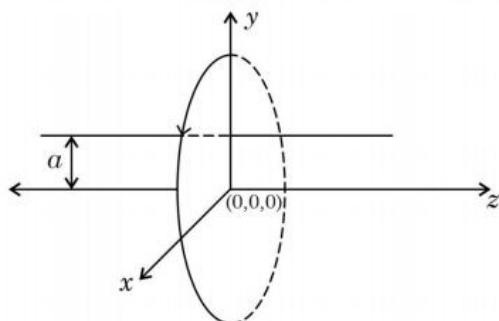
Option 4 ID : 3666946271

Status : Answered

Chosen Option : 2

**Q.12**

A single current carrying loop of wire carrying current  $I$  flowing in anticlockwise direction seen from +ve  $z$  direction and lying in  $xy$  plane is shown in figure. The plot of  $\hat{j}$  component of magnetic field ( $B_y$ ) at a distance ' $a$ ' (less than radius of the coil) and on  $yz$  plane vs  $z$  coordinate looks like

**Options**

1.  $B_y(0, a, z)$
2.  $B_y(0, a, z)$
3.  $B_y(0, a, z)$
4.  $B_y(0, a, z)$

Question Type : MCQ

Question ID : 3666942010

Option 1 ID : 3666946213

Option 2 ID : 3666946215

Option 3 ID : 3666946216

Option 4 ID : 3666946214

Status : Answered

Chosen Option : 4

**Q.13** Which one of the following statement is not correct in the case of light emitting diodes?

- A. It is a heavily doped p-n junction.
- B. It emits light only when it is forward biased.
- C. It emits light only when it is reverse biased.
- D. The energy of the light emitted is equal to or slightly less than the energy gap of the semiconductor used.

Choose the correct answer from the options given below:

**Options**

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

Question Type : MCQ

Question ID : 3666942026

Option 1 ID : 3666946277

Option 2 ID : 3666946278

Option 3 ID : 3666946280

Option 4 ID : 3666946279

Status : Answered

Chosen Option : 3

**Q.14** Two particles of equal mass 'm' move in a circle of radius 'r' under the action of their mutual gravitational attraction. The speed of each particle will be :

**Options**

1.  $\sqrt{\frac{Gm}{r}}$
2.  $\sqrt{\frac{Gm}{2r}}$
3.  $\sqrt{\frac{4Gm}{r}}$
4.  $\sqrt{\frac{Gm}{4r}}$

Question Type : MCQ

Question ID : 3666942018

Option 1 ID : 3666946245

Option 2 ID : 3666946247

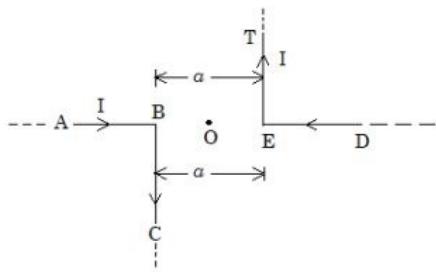
Option 3 ID : 3666946248

Option 4 ID : 3666946246

Status : Answered

Chosen Option : 3

- Q.15** The magnitude of magnetic induction at mid point O due to current arrangement as shown in Fig will be



Options

1.  $\frac{\mu_0 I}{2\pi a}$

2. 0

3.  $\frac{\mu_0 I}{\pi a}$

4.  $\frac{\mu_0 I}{4\pi a}$

Question Type : MCQ

Question ID : 3666942011

Option 1 ID : 3666946220

Option 2 ID : 3666946217

Option 3 ID : 3666946218

Option 4 ID : 3666946219

Status : Not Attempted and  
Marked For Review

Chosen Option : --

- Q.16** A person observes two moving trains, 'A' reaching the station and 'B' leaving the station with equal speed of 30 m/s. If both trains emit sounds with frequency 300 Hz, (Speed of sound: 330 m/s) approximate difference of frequencies heard by the person will be:

Options

1. 55 Hz

2. 80 Hz

3. 33 Hz

4. 10 Hz

Question Type : MCQ

Question ID : 3666942022

Option 1 ID : 3666946262

Option 2 ID : 3666946264

Option 3 ID : 3666946263

Option 4 ID : 3666946261

Status : Answered

Chosen Option : 2

Q.17

Given below are two statements: One is labelled as **Assertion A** and the other is labelled as **Reason R**.

**Assertion A:** If  $dQ$  and  $dW$  represent the heat supplied to the system and the work done on the system respectively. Then according to the first law of thermodynamics  $dQ = dU - dW$ .

**Reason R:** First law of thermodynamics is based on law of conservation of energy.

In the light of the above statements, choose the **correct** answer from the options given below:

Options

1. Both A and R are correct and R is the correct explanation of A
2. A is correct but R is not correct
3. A is not correct but R is correct
- 4.

Both A and R are correct but R is not the correct explanation of A

Question Type : MCQ

Question ID : 3666942020

Option 1 ID : 3666946253

Option 2 ID : 3666946255

Option 3 ID : 3666946256

Option 4 ID : 3666946254

Status : Answered

Chosen Option : 3

Q.18

Surface tension of a soap bubble is  $2.0 \times 10^{-2} \text{ Nm}^{-1}$ . Work done to increase the radius of soap bubble from 3.5 cm to 7 cm will be:

$$\text{Take } \left[ \pi = \frac{22}{7} \right]$$

Options

1.  $9.24 \times 10^{-4} \text{ J}$
2.  $5.76 \times 10^{-4} \text{ J}$
3.  $0.72 \times 10^{-4} \text{ J}$
4.  $18.48 \times 10^{-4} \text{ J}$

Question Type : MCQ

Question ID : 3666942019

Option 1 ID : 3666946249

Option 2 ID : 3666946251

Option 3 ID : 3666946250

Option 4 ID : 3666946252

Status : Not Answered

Chosen Option : --

**Q.19** Which of the following are true?

- A. Speed of light in vacuum is dependent on the direction of propagation.
- B. Speed of light in a medium is independent of the wavelength of light.
- C. The speed of light is independent of the motion of the source.
- D. The speed of light in a medium is independent of intensity.

Choose the correct answer from the options given below:

**Options** 1. A and C only

- 2. B and C only
- 3. B and D only
- 4. C and D only

Question Type : MCQ  
Question ID : 3666942013  
Option 1 ID : 3666946225  
Option 2 ID : 3666946226  
Option 3 ID : 3666946227  
Option 4 ID : 3666946228  
Status : Answered  
Chosen Option : 1

**Q.20** A car is moving on a horizontal curved road with radius 50 m. The approximate maximum speed of car will be, if friction between tyres and road is 0.34. [take  $g = 10 \text{ ms}^{-2}$ ]

**Options** 1.  $22.4 \text{ ms}^{-1}$   
2.  $17 \text{ ms}^{-1}$   
3.  $3.4 \text{ ms}^{-1}$   
4.  $13 \text{ ms}^{-1}$

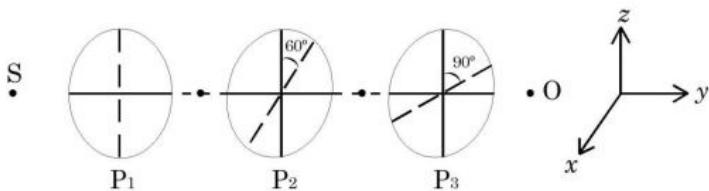
Question Type : MCQ  
Question ID : 3666942017  
Option 1 ID : 3666946244  
Option 2 ID : 3666946242  
Option 3 ID : 3666946241  
Option 4 ID : 3666946243  
Status : Answered  
Chosen Option : 2

Section : Physics Section B

**Q.21**

As shown in the figure, three identical polaroids  $P_1$ ,  $P_2$  and  $P_3$  are placed one after another. The pass axis of  $P_2$  and  $P_3$  are inclined at angle of  $60^\circ$  and  $90^\circ$  with respect to axis of  $P_1$ . The source  $S$  has an intensity of  $256 \frac{W}{m^2}$ .

The intensity of light at point  $O$  is \_\_\_\_\_  $\frac{W}{m^2}$ .



Given--

Answer :

Question Type : SA

Question ID : 3666942036

Status : Not Answered

**Q.22**

A solid sphere of mass 2 kg is making pure rolling on a horizontal surface with kinetic energy 2240 J. The velocity of centre of mass of the sphere will be \_\_\_\_\_  $ms^{-1}$ .

Given--

Answer :

Question Type : SA

Question ID : 3666942030

Status : Not Answered

**Q.23**

In a metre bridge experiment the balance point is obtained if the gaps are closed by  $2\Omega$  and  $3\Omega$ . A shunt of  $X\Omega$  is added to  $3\Omega$  resistor to shift the balancing point by 22.5 cm. The value of  $X$  is \_\_\_\_\_

Given--

Answer :

Question Type : SA

Question ID : 3666942034

Status : Not Answered

**Q.24**

Two simple harmonic waves having equal amplitudes of 8 cm and equal frequency of 10 Hz are moving along the same direction. The resultant amplitude is also 8 cm. The phase difference between the individual waves is \_\_\_\_\_ degree.

Given--

Answer :

Question Type : SA

Question ID : 3666942028

Status : Not Answered

**Q.25**

A certain elastic conducting material is stretched into a circular loop. It is placed with its plane perpendicular to a uniform magnetic field  $B = 0.8 \text{ T}$ . When released the radius of the loop starts shrinking at a constant rate of  $2 \text{ cms}^{-1}$ . The induced emf in the loop at an instant when the radius of the loop is 10 cm will be \_\_\_\_\_ mV.

Given --

Answer :

Question Type : SA

Question ID : 3666942035

Status : Not Answered

**Q.26**

A point charge  $q_1 = 4q_0$  is placed at origin. Another point charge  $q_2 = -q_0$  is placed at  $x = 12 \text{ cm}$ . Charge of proton is  $q_0$ . The proton is placed on  $x$  axis so that the electrostatic force on the proton is zero. In this situation, the position of the proton from the origin is \_\_\_\_\_ cm.

Given 12

Answer :

Question Type : SA

Question ID : 3666942033

Status : Answered

**Q.27**

A radioactive element  $^{242}_{92}\text{X}$  emits two  $\alpha$ -particles, one electron and two positrons. The product nucleus is represented by  $^{234}_{\text{P}}\text{Y}$ . The value of P is \_\_\_\_\_

Given 92

Answer :

Question Type : SA

Question ID : 3666942027

Status : Answered

**Q.28**

A tennis ball is dropped on to the floor from a height of 9.8 m. It rebounds to a height 5.0 m. Ball comes in contact with the floor for 0.2s. The average acceleration during contact is \_\_\_\_\_  $\text{ms}^{-2}$ .

(Given  $g = 10 \text{ ms}^{-2}$ )

Given 7

Answer :

Question Type : SA

Question ID : 3666942032

Status : Answered

**Q.29**

A 0.4 kg mass takes 8s to reach ground when dropped from a certain height 'P' above surface of earth. The loss of potential energy in the last second of fall is \_\_\_\_\_ J.

(Take  $g = 10 \text{ m/s}^2$ )

Given 1200

Answer :

Question Type : SA

Question ID : 3666942031

Status : Answered

- Q.30** A body cools from  $60^{\circ}\text{C}$  to  $40^{\circ}\text{C}$  in 6 minutes. If, temperature of surroundings is  $10^{\circ}\text{C}$ . Then, after the next 6 minutes, its temperature will be \_\_\_\_\_  $^{\circ}\text{C}$ .

Given 20  
Answer :

Question Type : **SA**  
Question ID : **3666942029**  
Status : **Answered**

Section : Chemistry Section A

- Q.31** "A" obtained by Ostwald's method involving air oxidation of  $\text{NH}_3$ , upon further air oxidation produces "B". "B" on hydration forms an oxoacid of Nitrogen along with evolution of "A". The oxoacid also produces "A" and gives positive brown ring test.

Identify A and B, respectively.

Options

1.  $\text{NO}_2, \text{N}_2\text{O}_5$
2.  $\text{NO}, \text{NO}_2$
3.  $\text{NO}_2, \text{N}_2\text{O}_4$
4.  $\text{N}_2\text{O}_3, \text{NO}_2$

Question Type : **MCQ**  
Question ID : **3666942045**  
Option 1 ID : **3666946324**  
Option 2 ID : **3666946325**  
Option 3 ID : **3666946326**  
Option 4 ID : **3666946323**  
Status : **Answered**  
Chosen Option : **1**

- Q.32** The reaction representing the Mond process for metal refining is \_\_\_\_\_.

Options

1.  $2\text{K}[\text{Au}(\text{CN})_2] + \text{Zn} \xrightarrow{\Delta} \text{K}_2[\text{Zn}(\text{CN})_4] + 2\text{Au}$
2.  $\text{ZnO} + \text{C} \xrightarrow{\Delta} \text{Zn} + \text{CO}$
3.  $\text{Zr} + 2\text{I}_2 \xrightarrow{\Delta} \text{Zr I}_4$
4.  $\text{Ni} + 4\text{CO} \xrightarrow{\Delta} \text{Ni}(\text{CO})_4$

Question Type : **MCQ**  
Question ID : **3666942041**  
Option 1 ID : **3666946309**  
Option 2 ID : **3666946307**  
Option 3 ID : **3666946310**  
Option 4 ID : **3666946308**  
Status : **Not Answered**  
Chosen Option : --

**Q.33** During the borax bead test with  $\text{CuSO}_4$ , a blue green colour of the bead was observed in oxidising flame due to the formation of

**Options**

1.  $\text{CuO}$
2.  $\text{Cu}$
3.  $\text{Cu}(\text{BO}_2)_2$
4.  $\text{Cu}_3\text{B}_2$

Question Type : MCQ

Question ID : 3666942053

Option 1 ID : 3666946358

Option 2 ID : 3666946355

Option 3 ID : 3666946356

Option 4 ID : 3666946357

Status : Answered

Chosen Option : 1

**Q.34** Compound that will give positive Lassaigne's test for both nitrogen and halogen is:

**Options**

1.  $\text{NH}_4\text{Cl}$
2.  $\text{NH}_2\text{OH} \cdot \text{HCl}$
3.  $\text{CH}_3\text{NH}_2 \cdot \text{HCl}$
4.  $\text{N}_2\text{H}_4 \cdot \text{HCl}$

Question Type : MCQ

Question ID : 3666942056

Option 1 ID : 3666946368

Option 2 ID : 3666946370

Option 3 ID : 3666946369

Option 4 ID : 3666946367

Status : Not Answered

Chosen Option : --

**Q.35** Correct statement about smog is:

**Options**

1. Classical smog also has high concentration of oxidizing agents
2. Photochemical smog has high concentration of oxidizing agents
3. Both  $\text{NO}_2$  and  $\text{SO}_2$  are present in classical smog
4.  $\text{NO}_2$  is present in classical smog

Question Type : MCQ

Question ID : 3666942047

Option 1 ID : 3666946334

Option 2 ID : 3666946333

Option 3 ID : 3666946332

Option 4 ID : 3666946331

Status : Answered

Chosen Option : 3

**Q.36**

The correct order of hydration enthalpies is

- (A) K<sup>+</sup>
- (B) Rb<sup>+</sup>
- (C) Mg<sup>2+</sup>
- (D) Cs<sup>+</sup>
- (E) Ca<sup>2+</sup>

Choose the correct answer from the options given below:

**Options**

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

Question Type : MCQ  
Question ID : 3666942043  
Option 1 ID : 3666946316  
Option 2 ID : 3666946318  
Option 3 ID : 3666946315  
Option 4 ID : 3666946317  
Status : Answered  
Chosen Option : 2

**Q.37**

The standard electrode potential ( $M^{3+}/M^{2+}$ ) for V, Cr, Mn & Co are -0.26 V, -0.41 V, +1.57 V and +1.97 V, respectively. The metal ions which can liberate H<sub>2</sub> from a dilute acid are

**Options**

- 1. V<sup>2+</sup> and Cr<sup>2+</sup>
- 2. Cr<sup>2+</sup> and Co<sup>2+</sup>
- 3. V<sup>2+</sup> and Mn<sup>2+</sup>
- 4. Mn<sup>2+</sup> and Co<sup>2+</sup>

Question Type : MCQ  
Question ID : 3666942046  
Option 1 ID : 3666946327  
Option 2 ID : 3666946329  
Option 3 ID : 3666946328  
Option 4 ID : 3666946330  
Status : Answered  
Chosen Option : 1

**Q.38** Number of cyclic tripeptides formed with 2 amino acids A and B is:

- Options
1. 2
  2. 4
  3. 5
  4. 3

Question Type : MCQ

Question ID : 3666942055

Option 1 ID : 3666946366

Option 2 ID : 3666946365

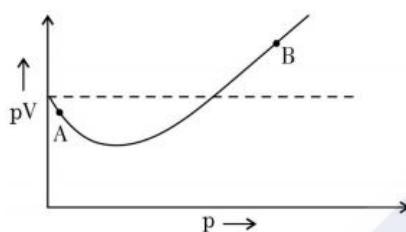
Option 3 ID : 3666946363

Option 4 ID : 3666946364

Status : Answered

Chosen Option : 1

**Q.39** For 1 mol of gas, the plot of  $pV$  vs.  $p$  is shown below.  $p$  is the pressure and  $V$  is the volume of the gas



What is the value of compressibility factor at point A?

Options

1.  $1 - \frac{b}{V}$
2.  $1 + \frac{b}{V}$
3.  $1 - \frac{a}{RTV}$
4.  $1 + \frac{a}{RTV}$

Question Type : MCQ

Question ID : 3666942037

Option 1 ID : 3666946294

Option 2 ID : 3666946293

Option 3 ID : 3666946292

Option 4 ID : 3666946291

Status : Not Answered

Chosen Option : --

**Q.40**

Match List I with List II.

List I	List II
Antimicrobials	Names
(A) Narrow Spectrum Antibiotic	(I) Furacin
(B) Antiseptic	(II) Sulphur dioxide
(C) Disinfectants	(III) Penicillin G
(D) Broad spectrum antibiotic	(IV) Chloramphenicol

Choose the correct answer from the options given below:

**Options**

1. (A) – III, (B) – I, (C) – IV, (D) – II
2. (A) – III, (B) – I, (C) – II, (D) – IV
3. (A) – I, (B) – II, (C) – IV, (D) – III
4. (A) – II, (B) – I, (C) – IV, (D) – III

Question Type : MCQ  
 Question ID : 3666942054  
 Option 1 ID : 3666946361  
 Option 2 ID : 3666946362  
 Option 3 ID : 3666946360  
 Option 4 ID : 3666946359  
 Status : Answered  
 Chosen Option : 2

**Q.41**

Identify the correct order for the given property for following compounds.

- (A) Boiling Point:  $\text{Cl} < \text{Cl} < \text{Cl}$
- (B) Density:  $\text{Br} < \text{Cl} < \text{I}$
- (C) Boiling Point:  $\text{Br} < \text{Br} < \text{Br}$
- (D) Density:  $\text{I} < \text{Br} < \text{Cl}$
- (E) Boiling Point:  $\text{Cl} > \text{Cl} > \text{Cl}$

Choose the correct answer from the option given below:

**Options**

1. (A), (B) and (E) only
2. (A), (C) and (D) only
3. (B), (C) and (D) only
4. (A), (C) and (E) only

Question Type : MCQ  
 Question ID : 3666942049  
 Option 1 ID : 3666946339  
 Option 2 ID : 3666946341  
 Option 3 ID : 3666946340  
 Option 4 ID : 3666946342  
 Status : Answered  
 Chosen Option : 1

**Q.42** Chiral complex from the following is:

Here en = ethylene diamine

**Options** 1. cis –  $[\text{PtCl}_2(\text{NH}_3)_2]$

2. trans –  $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$

3. cis –  $[\text{PtCl}_2(\text{en})_2]^{2+}$

4. trans –  $[\text{PtCl}_2(\text{en})_2]^{2+}$

Question Type : MCQ

Question ID : 3666942048

Option 1 ID : 3666946335

Option 2 ID : 3666946337

Option 3 ID : 3666946336

Option 4 ID : 3666946338

Status : Not Answered

Chosen Option : --

**Q.43** Which of the following salt solutions would coagulate the colloid solution formed when  $\text{FeCl}_3$  is added to  $\text{NaOH}$  solution, at the fastest rate?

**Options**

1. 10 mL of  $0.1 \text{ mol dm}^{-3} \text{ Na}_2\text{SO}_4$

2. 10 mL of  $0.15 \text{ mol dm}^{-3} \text{ CaCl}_2$

3. 10 mL of  $0.1 \text{ mol dm}^{-3} \text{ Ca}_3(\text{PO}_4)_2$

4. 10 mL of  $0.2 \text{ mol dm}^{-3} \text{ AlCl}_3$

Question Type : MCQ

Question ID : 3666942039

Option 1 ID : 3666946299

Option 2 ID : 3666946301

Option 3 ID : 3666946300

Option 4 ID : 3666946302

Status : Not Answered

Chosen Option : --

**Q.44** The bond dissociation energy is highest for

**Options**

1.  $\text{Br}_2$

2.  $\text{F}_2$

3.  $\text{I}_2$

4.  $\text{Cl}_2$

Question Type : MCQ

Question ID : 3666942040

Option 1 ID : 3666946305

Option 2 ID : 3666946303

Option 3 ID : 3666946306

Option 4 ID : 3666946304

Status : Answered

Chosen Option : 3

**Q.45** The shortest wavelength of hydrogen atom in Lyman series is  $\lambda$ . The longest wavelength in Balmer series of  $He^+$  is

**Options**

1.  $\frac{5}{9\lambda}$
2.  $\frac{36\lambda}{5}$
3.  $\frac{9\lambda}{5}$
4.  $\frac{5\lambda}{9}$

Question Type : MCQ  
Question ID : 3666942038  
Option 1 ID : 3666946297  
Option 2 ID : 3666946296  
Option 3 ID : 3666946295  
Option 4 ID : 3666946298  
Status : Answered  
Chosen Option : 3

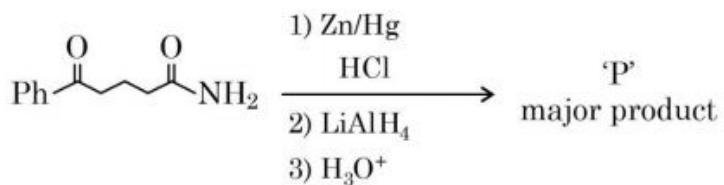
**Q.46** The magnetic behavior of  $Li_2O$ ,  $Na_2O_2$  and  $KO_2$ , respectively, are

**Options**

1. diamagnetic, diamagnetic and paramagnetic
2. paramagnetic, paramagnetic and diamagnetic
3. paramagnetic, diamagnetic and paramagnetic
4. diamagnetic, paramagnetic and diamagnetic

Question Type : MCQ  
Question ID : 3666942044  
Option 1 ID : 3666946320  
Option 2 ID : 3666946322  
Option 3 ID : 3666946319  
Option 4 ID : 3666946321  
Status : Answered  
Chosen Option : 2

**Q.47** The major product 'P' for the following sequence of reactions is:



**Options**

1.  $\text{Ph}-\text{CH}(\text{OH})-\text{CH}_2-\text{CH}_2-\text{C}(=\text{O})-\text{NH}_2$
2.  $\text{Ph}-\text{CH}(\text{OH})-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{OH}$
3.  $\text{Ph}-\text{CH}(\text{OH})-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{NH}_2$
4.  $\text{Ph}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{NH}_2$

Question Type : MCQ  
 Question ID : 3666942052  
 Option 1 ID : 3666946351  
 Option 2 ID : 3666946354  
 Option 3 ID : 3666946352  
 Option 4 ID : 3666946353  
 Status : Answered  
 Chosen Option : 4

**Q.48** Which of the given compounds can enhance the efficiency of hydrogen storage tank?

**Options**

1. Li/P<sub>4</sub>
2. Di-isobutylaluminium hydride
3. SiH<sub>4</sub>
4. NaNi<sub>5</sub>

Question Type : MCQ  
 Question ID : 3666942042  
 Option 1 ID : 3666946312  
 Option 2 ID : 3666946314  
 Option 3 ID : 3666946313  
 Option 4 ID : 3666946311  
 Status : Not Answered  
 Chosen Option : --

**Q.49**

Match List I with List II.

List I	List II
Reaction	Reagents
(A) Hoffmann Degradation	(I) Conc.KOH, $\Delta$
(B) Clemenson reduction	(II) $\text{CHCl}_3$ , $\text{NaOH}/\text{H}_3\text{O}^+$
(C) Cannizaro reaction	(III) $\text{Br}_2$ , NaOH
(D) Reimer-Tiemann Reaction	(IV) Zn-Hg/HCl

Choose the correct answer from the options given below:

**Options**

1. (A) – III, (B) – IV, (C) – I, (D) – II
2. (A) – III, (B) – IV, (C) – II, (D) – I
3. (A) – II, (B) – I, (C) – III, (D) – IV
4. (A) – II, (B) – IV, (C) – I, (D) – III

Question Type : MCQ

Question ID : 3666942051

Option 1 ID : 3666946347

Option 2 ID : 3666946349

Option 3 ID : 3666946348

Option 4 ID : 3666946350

Status : Answered

Chosen Option : 1

**Q.50**The increasing order of  $\text{pK}_a$  for the following phenols is

- (A) 2, 4 - Dinitrophenol
- (B) 4 - Nitrophenol
- (C) 2, 4, 5 - Trimethylphenol
- (D) Phenol
- (E) 3-Chlorophenol

Choose the correct answer from the option given below:

**Options**

1. (C), (E), (D), (B), (A)
2. (C), (D), (E), (B), (A)
3. (A), (B), (E), (D), (C)
4. (A), (E), (B), (D), (C)

Question Type : MCQ

Question ID : 3666942050

Option 1 ID : 3666946345

Option 2 ID : 3666946344

Option 3 ID : 3666946343

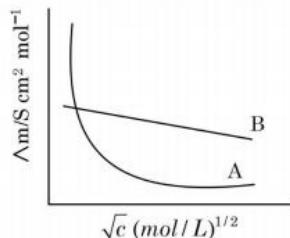
Option 4 ID : 3666946346

Status : Answered

Chosen Option : 4

Q.51

Following figure shows dependence of molar conductance of two electrolytes on concentration.  $\Lambda_m^\circ$  is the limiting molar conductivity.



The number of **incorrect** statement(s) from the following is \_\_\_\_\_

- (A)  $\Lambda_m^\circ$  for electrolyte A is obtained by extrapolation
- (B) For electrolyte B,  $\Lambda_m$  vs  $\sqrt{c}$  graph is a straight line with intercept equal to  $\Lambda_m^\circ$
- (C) At infinite dilution, the value of degree of dissociation approaches zero for electrolyte B.
- (D)  $\Lambda_m^\circ$  for any electrolyte A or B can be calculated using  $\lambda^\circ$  for individual ions

Given 2

Answer :

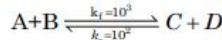
Question Type : SA

Question ID : 3666942062

Status : Answered

Q.52

Consider the following reaction approaching equilibrium at 27°C and 1 atm pressure



The standard Gibb's energy change ( $\Delta_r G^\circ$ ) at 27°C is (-) \_\_\_\_\_ kJ mol<sup>-1</sup>  
(Nearest integer).

(Given: R = 8.3 J K<sup>-1</sup> mol<sup>-1</sup> and ln 10 = 2.3)

Given--

Answer :

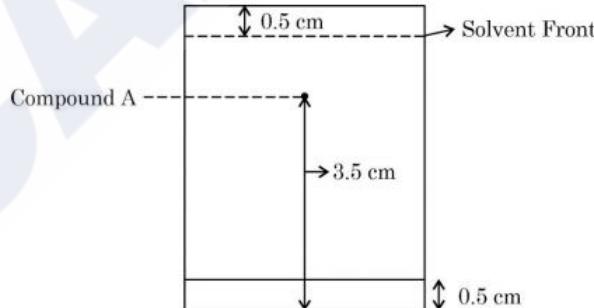
Question Type : SA

Question ID : 3666942059

Status : Not Answered

Q.53

Following chromatogram was developed by adsorption of compound 'A' on a 6 cm TLC glass plate. Retardation factor of the compound 'A' is \_\_\_\_\_  $\times 10^{-1}$ .



Given--

Answer :

Question Type : SA

Question ID : 3666942065

Status : Not Answered

**Q.54** The sum of bridging carbonyls in  $\text{W}(\text{CO})_6$  and  $\text{Mn}_2(\text{CO})_{10}$  is \_\_\_\_\_.

Given 2

Answer :

Question Type : SA

Question ID : 3666942064

Status : Answered

**Q.55** The number of molecules or ions from the following, which do not have odd number of electrons are \_\_\_\_\_.

- (A)  $\text{NO}_2$
- (B)  $\text{ICl}_4^-$
- (C)  $\text{BrF}_3$
- (D)  $\text{ClO}_2$
- (E)  $\text{NO}_2^+$
- (F) NO

Given--

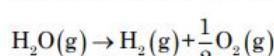
Answer :

Question Type : SA

Question ID : 3666942058

Status : Not Answered

**Q.56** Water decomposes at 2300 K



The percent of water decomposing at 2300 K and 1 bar is \_\_\_\_\_ (Nearest integer).

Equilibrium constant for the reaction is  $2 \times 10^{-3}$  at 2300 K.

Given--

Answer :

Question Type : SA

Question ID : 3666942061

Status : Not Answered

**Q.57** Millimoles of calcium hydroxide required to produce 100 mL of the aqueous solution of pH 12 is  $x \times 10^{-1}$ . The value of  $x$  is \_\_\_\_\_ (Nearest integer).

Assume complete dissociation.

Given--

Answer :

Question Type : SA

Question ID : 3666942057

Status : Not Answered

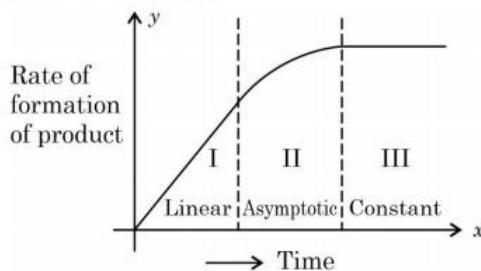
- Q.58** Solid Lead nitrate is dissolved in 1 litre of water. The solution was found to boil at  $100.15^{\circ}\text{C}$ . When 0.2 mol of NaCl is added to the resulting solution, it was observed that the solution froze at  $-0.8^{\circ}\text{C}$ . The solubility product of  $\text{PbCl}_2$  formed is \_\_\_\_\_  $\times 10^{-6}$  at 298 K. (Nearest integer)

Given :  $K_b = 0.5 \text{ K kg mol}^{-1}$  and  $K_f = 1.8 \text{ K kg mol}^{-1}$ . Assume molality to be equal to molarity in all cases.

Given--  
Answer :

Question Type : SA  
Question ID : 3666942060  
Status : Not Answered

- Q.59** For certain chemical reaction  $X \rightarrow Y$ , the rate of formation of product is plotted against the time as shown in the figure. The number of correct statement/s from the following is \_\_\_\_\_

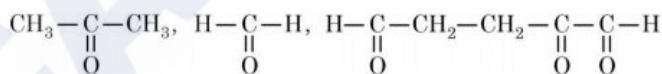


- (A) Over all order of this reaction is one
- (B) Order of this reaction can't be determined
- (C) In region I and III, the reaction is of first and zero order respectively
- (D) In region-II, the reaction is of first order
- (E) In region-II, the order of reaction is in the range of 0.1 to 0.9.

Given 2  
Answer :

Question Type : SA  
Question ID : 3666942063  
Status : Marked For Review

- Q.60** 17 mg of a hydrocarbon (M.F.  $\text{C}_{10}\text{H}_{16}$ ) takes up 8.40 mL of the  $\text{H}_2$  gas measured at  $0^{\circ}\text{C}$  and 760 mm of Hg. Ozonolysis of the same hydrocarbon yields



The number of double bond/s present in the hydrocarbon is \_\_\_\_\_.

Given 5  
Answer :

Question Type : SA  
Question ID : 3666942066  
Status : Answered

**Q.61**

Three rotten apples are mixed accidentally with seven good apples and four apples are drawn one by one without replacement. Let the random variable  $X$  denote the number of rotten apples. If  $\mu$  and  $\sigma^2$  represent mean and variance of  $X$ , respectively, then  $10(\mu^2 + \sigma^2)$  is equal to

**Options**

1. 25
2. 250
3. 20
4. 30

Question Type : MCQ

Question ID : 3666942085

Option 1 ID : 3666946454

Option 2 ID : 3666946456

Option 3 ID : 3666946453

Option 4 ID : 3666946455

Status : Answered

Chosen Option : 2

**Q.62**

Let  $x = 2$  be a root of the equation  $x^2 + px + q = 0$  and

$$f(x) = \begin{cases} \frac{1 - \cos(x^2 - 4px + q^2 + 8q + 16)}{(x - 2p)^4}, & x \neq 2p \\ 0, & x = 2p \end{cases}$$

Then  $\lim_{x \rightarrow 2p^+} [f(x)],$

where  $[ \cdot ]$  denotes greatest integer function, is

**Options**

1. -1
2. 1
3. 2
4. 0

Question Type : MCQ

Question ID : 3666942073

Option 1 ID : 3666946407

Option 2 ID : 3666946408

Option 3 ID : 3666946405

Option 4 ID : 3666946406

Status : Answered

Chosen Option : 1

Q.63

Let  $A = \{(x, y) \in \mathbb{R}^2 : y \geq 0, 2x \leq y \leq \sqrt{4-(x-1)^2}\}$  and

$B = \{(x, y) \in \mathbb{R} \times \mathbb{R} : 0 \leq y \leq \min\{2x, \sqrt{4-(x-1)^2}\}\}$ .

Then the ratio of the area of  $A$  to the area of  $B$  is

Options

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

Question Type : MCQ

Question ID : 3666942075

Option 1 ID : 3666946414

Option 2 ID : 3666946416

Option 3 ID : 3666946415

Option 4 ID : 3666946413

Status : Not Answered

Chosen Option : --

Q.64

Let  $\Delta$  be the area of the region  $\{(x, y) \in \mathbb{R}^2 : x^2 + y^2 \leq 21, y^2 \leq 4x, x \geq 1\}$ .

Then  $\frac{1}{2}(\Delta - 21 \sin^{-1} \frac{2}{\sqrt{7}})$  is equal to

Options

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

Question Type : MCQ

Question ID : 3666942076

Option 1 ID : 3666946420

Option 2 ID : 3666946419

Option 3 ID : 3666946417

Option 4 ID : 3666946418

Status : Not Answered

Chosen Option : --

**Q.65** Let  $[x]$  denote the greatest integer  $\leq x$ . Consider the function

$$f(x) = \max\{x^2, 1+[x]\}. \text{ Then the value of the integral } \int_0^2 f(x) dx \text{ is}$$

**Options**

1.  $\frac{8+4\sqrt{2}}{3}$

2.  $\frac{1+5\sqrt{2}}{3}$

3.  $\frac{5+4\sqrt{2}}{3}$

4.  $\frac{4+5\sqrt{2}}{3}$

Question Type : MCQ

Question ID : 3666942080

Option 1 ID : 3666946435

Option 2 ID : 3666946433

Option 3 ID : 3666946436

Option 4 ID : 3666946434

Status : Answered

Chosen Option : 1

**Q.66** If the vectors  $\vec{a} = \lambda\hat{i} + \mu\hat{j} + 4\hat{k}$ ,  $\vec{b} = -2\hat{i} + 4\hat{j} - 2\hat{k}$  and  $\vec{c} = 2\hat{i} + 3\hat{j} + \hat{k}$  are coplanar and the projection of  $\vec{a}$  on the vector  $\vec{b}$  is  $\sqrt{54}$  units, then the sum of all possible values of  $\lambda + \mu$  is equal to

**Options**

1. 18

2. 0

3. 24

4. 6

Question Type : MCQ

Question ID : 3666942081

Option 1 ID : 3666946439

Option 2 ID : 3666946437

Option 3 ID : 3666946440

Option 4 ID : 3666946438

Status : Answered

Chosen Option : 4

**Q.67** A light ray emits from the origin making an angle  $30^\circ$  with the positive  $x$ -axis. After getting reflected by the line  $x + y = 1$ , if this ray intersects  $x$ -axis at  $Q$ , then the abscissa of  $Q$  is

Options

1.  $\frac{2}{3 - \sqrt{3}}$
2.  $\frac{2}{3 + \sqrt{3}}$
3.  $\frac{\sqrt{3}}{2(\sqrt{3} + 1)}$
4.  $\frac{2}{(\sqrt{3} - 1)}$

Question Type : MCQ

Question ID : 3666942077

Option 1 ID : 3666946424

Option 2 ID : 3666946421

Option 3 ID : 3666946422

Option 4 ID : 3666946423

Status : Not Answered

Chosen Option : --

**Q.68**

Let  $f : \mathbf{R} \rightarrow \mathbf{R}$  be a function such that  $f(x) = \frac{x^2 + 2x + 1}{x^2 + 1}$ . Then

Options

1.  $f(x)$  is one-one in  $[1, \infty)$  but not in  $(-\infty, \infty)$
2.  $f(x)$  is one-one in  $(-\infty, \infty)$
3.  $f(x)$  is many-one in  $(-\infty, -1)$
4.  $f(x)$  is many-one in  $(1, \infty)$

Question Type : MCQ

Question ID : 3666942068

Option 1 ID : 3666946385

Option 2 ID : 3666946386

Option 3 ID : 3666946388

Option 4 ID : 3666946387

Status : Answered

Chosen Option : 2

**Q.69** Let  $y = f(x)$  be the solution of the differential equation  $y(x+1)dx - x^2dy = 0$ ,  $y(1) = e$ . Then  $\lim_{x \rightarrow 0^+} f(x)$  is equal to

**Options**

1.  $e^2$
2.  $\frac{1}{e}$
3.  $\frac{1}{e^2}$
4. 0

Question Type : MCQ

Question ID : 3666942086

Option 1 ID : 3666946459

Option 2 ID : 3666946458

Option 3 ID : 3666946460

Option 4 ID : 3666946457

Status : Marked For Review

Chosen Option : 2

**Q.70**

Consider the following system of equations

$$\alpha x + 2y + z = 1$$

$$2\alpha x + 3y + z = 1$$

$$3x + \alpha y + 2z = \beta$$

for some  $\alpha, \beta \in \mathbb{R}$ . Then which of the following is NOT correct.

**Options**

1. It has no solution if  $\alpha = -1$  and  $\beta \neq 2$
2. It has a solution for all  $\alpha \neq -1$  and  $\beta = 2$
3. It has no solution for  $\alpha = -1$  and for all  $\beta \in \mathbb{R}$
4. It has no solution for  $\alpha = 3$  and for all  $\beta \neq 2$

Question Type : MCQ

Question ID : 3666942071

Option 1 ID : 3666946398

Option 2 ID : 3666946399

Option 3 ID : 3666946397

Option 4 ID : 3666946400

Status : Not Attempted and  
Marked For Review

Chosen Option : --

**Q.71** Let  $f(\theta) = 3\left(\sin^4\left(\frac{3\pi}{2} - \theta\right) + \sin^4(3\pi + \theta)\right) - 2(1 - \sin^2 2\theta)$  and

$S = \left\{ \theta \in [0, \pi] : f'(\theta) = -\frac{\sqrt{3}}{2} \right\}$ . If  $4\beta = \sum_{\theta \in S} \theta$ , then  $f(\beta)$  is equal to

Options

1.  $\frac{5}{4}$

2.  $\frac{11}{8}$

3.  $\frac{9}{8}$

4.  $\frac{3}{2}$

Question Type : MCQ

Question ID : 3666942083

Option 1 ID : 3666946445

Option 2 ID : 3666946448

Option 3 ID : 3666946447

Option 4 ID : 3666946446

Status : Not Answered

Chosen Option : --

**Q.72** Let the tangents at the points  $A(4, -11)$  and  $B(8, -5)$  on the circle  $x^2 + y^2 - 3x + 10y - 15 = 0$ , intersect at the point  $C$ . Then the radius of the circle, whose centre is  $C$  and the line joining  $A$  and  $B$  is its tangent, is equal to

Options

1.  $\frac{3\sqrt{3}}{4}$

2.  $\sqrt{13}$

3.  $\frac{2\sqrt{13}}{3}$

4.  $2\sqrt{13}$

Question Type : MCQ

Question ID : 3666942079

Option 1 ID : 3666946429

Option 2 ID : 3666946430

Option 3 ID : 3666946431

Option 4 ID : 3666946432

Status : Answered

Chosen Option : 1

**Q.73** Let  $\alpha$  and  $\beta$  be real numbers. Consider a  $3 \times 3$  matrix A such that  $A^2 = 3A + \alpha I$ . If  $A^4 = 21A + \beta I$ , then

- Options**
1.  $\alpha = 1$
  2.  $\beta = -8$
  3.  $\beta = 8$
  4.  $\alpha = 4$

Question Type : MCQ

Question ID : 3666942072

Option 1 ID : 3666946404

Option 2 ID : 3666946401

Option 3 ID : 3666946402

Option 4 ID : 3666946403

Status : Answered

Chosen Option : 1

**Q.74** If  $p$ ,  $q$  and  $r$  are three propositions, then which of the following combination of truth values of  $p$ ,  $q$  and  $r$  makes the logical expression  $\{(p \vee q) \wedge ((\sim p) \vee r)\} \rightarrow ((\sim q) \vee r)$  false?

- Options**
1.  $p = T, q = F, r = F$
  2.  $p = F, q = T, r = F$
  3.  $p = T, q = F, r = T$
  4.  $p = T, q = T, r = F$

Question Type : MCQ

Question ID : 3666942084

Option 1 ID : 3666946450

Option 2 ID : 3666946451

Option 3 ID : 3666946452

Option 4 ID : 3666946449

Status : Not Answered

Chosen Option : --

**Q.75** Fifteen football players of a club-team are given 15 T-shirts with their names written on the backside. If the players pick up the T-shirts randomly, then the probability that at least 3 players pick the correct T-shirt is

Options     $\frac{2}{15}$

1.  $\frac{1}{6}$

2.  $\frac{5}{36}$

3.  $\frac{5}{24}$

Question Type : MCQ  
 Question ID : 3666942082  
 Option 1 ID : 3666946444  
 Option 2 ID : 3666946442  
 Option 3 ID : 3666946441  
 Option 4 ID : 3666946443  
 Status : Answered  
 Chosen Option : 2

**Q.76** Let  $B$  and  $C$  be the two points on the line  $y+x=0$  such that  $B$  and  $C$  are symmetric with respect to the origin. Suppose  $A$  is a point on  $y-2x=2$  such that  $\Delta ABC$  is an equilateral triangle. Then, the area of the  $\Delta ABC$  is

Options     $\frac{8}{\sqrt{3}}$

1.  $2\sqrt{3}$

2.  $\frac{10}{\sqrt{3}}$

3.  $3\sqrt{3}$

Question Type : MCQ  
 Question ID : 3666942078  
 Option 1 ID : 3666946426  
 Option 2 ID : 3666946427  
 Option 3 ID : 3666946428  
 Option 4 ID : 3666946425  
 Status : Marked For Review  
 Chosen Option : 1

**Q.77** Let  $\lambda \neq 0$  be a real number. Let  $\alpha, \beta$  be the roots of the equation  $14x^2 - 31x + 3\lambda = 0$  and  $\alpha, \gamma$  be the roots of the equation  $35x^2 - 53x + 4\lambda = 0$ . Then  $\frac{3\alpha}{\beta}$  and  $\frac{4\alpha}{\gamma}$  are the roots of the equation

**Options** 1.  $7x^2 + 245x - 250 = 0$

2.  $49x^2 + 245x + 250 = 0$

3.  $7x^2 - 245x + 250 = 0$

4.  $49x^2 - 245x + 250 = 0$

Question Type : MCQ

Question ID : 3666942070

Option 1 ID : 3666946395

Option 2 ID : 3666946393

Option 3 ID : 3666946396

Option 4 ID : 3666946394

Status : Not Answered

Chosen Option : --

**Q.78** Let  $f(x) = x + \frac{a}{\pi^2 - 4} \sin x + \frac{b}{\pi^2 - 4} \cos x$ ,  $x \in \mathbb{R}$  be a function which satisfies  $f(x) = x + \int_0^{\pi/2} \sin(x+y) f(y) dy$ . Then  $(a+b)$  is equal to

**Options** 1.  $-2\pi(\pi+2)$

2.  $-\pi(\pi-2)$

3.  $-2\pi(\pi-2)$

4.  $-\pi(\pi+2)$

Question Type : MCQ

Question ID : 3666942074

Option 1 ID : 3666946412

Option 2 ID : 3666946409

Option 3 ID : 3666946410

Option 4 ID : 3666946411

Status : Not Answered

Chosen Option : --

**Q.79** For two non-zero complex numbers  $z_1$  and  $z_2$ , if  $\operatorname{Re}(z_1 z_2) = 0$  and  $\operatorname{Re}(z_1 + z_2) = 0$ , then which of the following are possible?

- A.  $\operatorname{Im}(z_1) > 0$  and  $\operatorname{Im}(z_2) > 0$
- B.  $\operatorname{Im}(z_1) < 0$  and  $\operatorname{Im}(z_2) > 0$
- C.  $\operatorname{Im}(z_1) > 0$  and  $\operatorname{Im}(z_2) < 0$
- D.  $\operatorname{Im}(z_1) < 0$  and  $\operatorname{Im}(z_2) < 0$

Choose the correct answer from the options given below:

**Options**

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

Question Type : MCQ

Question ID : 3666942069

Option 1 ID : 3666946392

Option 2 ID : 3666946390

Option 3 ID : 3666946389

Option 4 ID : 3666946391

Status : Answered

Chosen Option : 3

**Q.80** The domain of  $f(x) = \frac{\log_{(x+1)}(x-2)}{e^{2\log_e x} - (2x+3)}$ ,  $x \in \mathbb{R}$  is

**Options**

1.  $\mathbb{R} - \{-1, 3\}$
2.  $(2, \infty) - \{3\}$
3.  $\mathbb{R} - \{3\}$
4.  $(-1, \infty) - \{3\}$

Question Type : MCQ

Question ID : 3666942067

Option 1 ID : 3666946382

Option 2 ID : 3666946381

Option 3 ID : 3666946384

Option 4 ID : 3666946383

Status : Not Answered

Chosen Option : --

Section : Mathematics Section B

**Q.81** Let the coefficients of three consecutive terms in the binomial expansion of  $(1+2x)^n$  be in the ratio  $2 : 5 : 8$ . Then the coefficient of the term, which is in the middle of these three terms, is \_\_\_\_\_.

Given --  
Answer :

Question Type : SA

Question ID : 3666942095

Status : Not Answered

**Q.82**

If all the six digit numbers  $x_1 x_2 x_3 x_4 x_5 x_6$  with  $0 < x_1 < x_2 < x_3 < x_4 < x_5 < x_6$  are arranged in the increasing order, then the sum of the digits in the 72<sup>th</sup> number is \_\_\_\_\_.

Given--  
Answer :

Question Type : SA

Question ID : 3666942092

Status : Not Answered

**Q.83**

Suppose  $f$  is a function satisfying  $f(x+y) = f(x) + f(y)$  for all  $x, y \in \mathbb{N}$  and  $f(1) = \frac{1}{5}$ . If  $\sum_{n=1}^m \frac{f(n)}{n(n+1)(n+2)} = \frac{1}{12}$ , then  $m$  is equal to \_\_\_\_\_.

Given--  
Answer :

Question Type : SA

Question ID : 3666942089

Status : Not Answered

**Q.84**

Let  $f: \mathbb{R} \rightarrow \mathbb{R}$  be a differentiable function that satisfies the relation  $f(x+y) = f(x) + f(y) - 1$ ,  $\forall x, y \in \mathbb{R}$ . If  $f'(0) = 2$ , then  $|f(-2)|$  is equal to \_\_\_\_\_.

Given--  
Answer :

Question Type : SA

Question ID : 3666942093

Status : Not Answered

**Q.85**

Let  $a_1, a_2, a_3, \dots$  be a GP of increasing positive numbers. If the product of fourth and sixth terms is 9 and the sum of fifth and seventh terms is 24, then  $a_1 a_9 + a_2 a_4 a_9 + a_5 + a_7$  is equal to \_\_\_\_\_.

Given--  
Answer :

Question Type : SA

Question ID : 3666942090

Status : Not Answered

**Q.86**

Let  $\vec{a}$ ,  $\vec{b}$  and  $\vec{c}$  be three non-zero non-coplanar vectors. Let the position vectors of four points  $A, B, C$  and  $D$  be  $\vec{a} - \vec{b} + \vec{c}$ ,  $\lambda\vec{a} - 3\vec{b} + 4\vec{c}$ ,  $-\vec{a} + 2\vec{b} - 3\vec{c}$  and  $2\vec{a} - 4\vec{b} + 6\vec{c}$  respectively. If  $\overrightarrow{AB}$ ,  $\overrightarrow{AC}$  and  $\overrightarrow{AD}$  are coplanar, then  $\lambda$  is equal to \_\_\_\_\_.

Given--  
Answer :

Question Type : SA

Question ID : 3666942091

Status : Not Answered

Q.87

Let the co-ordinates of one vertex of  $\Delta ABC$  be  $A(0, 2, \alpha)$  and the other two vertices lie on the line  $\frac{x+\alpha}{5} = \frac{y-1}{2} = \frac{z+4}{3}$ . For  $\alpha \in \mathbb{Z}$ , if the area of  $\Delta ABC$  is 21 sq. units and the line segment  $BC$  has length  $2\sqrt{21}$  units, then  $\alpha^2$  is equal to \_\_\_\_\_.

Given--

Answer :

Question Type : SA

Question ID : 3666942087

Status : Not Answered

Q.88

If the co-efficient of  $x^9$  in  $\left(\alpha x^3 + \frac{1}{\beta x}\right)^{11}$  and the co-efficient of  $x^{-9}$  in  $\left(\alpha x - \frac{1}{\beta x^3}\right)^{11}$  are equal, then  $(\alpha\beta)^2$  is equal to \_\_\_\_\_.

Given--

Answer :

Question Type : SA

Question ID : 3666942094

Status : Not Answered

Q.89

Let the equation of the plane  $P$  containing the line  $x+10 = \frac{8-y}{2} = z$  be  $ax+by+3z=2(a+b)$  and the distance of the plane  $P$  from the point  $(1, 27, 7)$  be  $c$ . Then  $a^2 + b^2 + c^2$  is equal to \_\_\_\_\_.

Given--

Answer :

Question Type : SA

Question ID : 3666942088

Status : Not Answered

Q.90

Five digit numbers are formed using the digits 1, 2, 3, 5, 7 with repetitions and are written in descending order with serial numbers. For example, the number 77777 has serial number 1. Then the serial number of 35337 is \_\_\_\_\_.

Given--

Answer :

Question Type : SA

Question ID : 3666942096

Status : Not Answered