Print

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

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|---|---|
| Application No | [redacted] |
| Candidate Name | |
| Roll No | |
| Test Date | [redacted] |
| Test Time | 3:00 PM - 6:00 PM |
| Subject | B TECH |

## Section : Physics Section A

**Q.1** At 300 K, the rms speed of oxygen molecules is $\sqrt{\frac{\alpha+5}{\alpha}}$ times to that of its average speed in the gas . Then, the value of $\alpha$ will be

(used $\pi = \frac{22}{7}$ )

Options
1. 24
2. 27
3. 32
4. 28

Question Type : MCQ
Question ID : 366694279
Option 1 ID : 366694846
Option 2 ID : 366694845
Option 3 ID : 366694843
Option 4 ID : 366694844
Status : Answered
Chosen Option : 2

**Q.2** The time taken by an object to slide down 45° rough inclined plane is n times as it takes to slide down a perfectly smooth 45° incline plane. The coefficient of kinetic friction between the object and the incline plane is:

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

Question Type : MCQ
Question ID : 366694273
Option 1 ID : 366694820
Option 2 ID : 366694819
Option 3 ID : 366694821
Option 4 ID : 366694822
Status : Answered
Chosen Option : 3

**Q.3** The ratio of de-Broglie wavelength of an α particle and a proton accelerated from rest by the same potential is $\frac{1}{\sqrt{m}}$, the value of m is-

Options
1. 8
2. 4
3. 2
4. 16

Question Type : MCQ
Question ID : 366694287
Option 1 ID : 366694876
Option 2 ID : 366694877
Option 3 ID : 366694875
Option 4 ID : 366694878
Status : Not Attempted and Marked For Review
Chosen Option : --

**Q.4** A point charge $2 \times 10^{-2}$ C is moved from P to S in a uniform electric field of 30 $NC^{-1}$ directed along positive x-axis. If coordinates of P and S are (1, 2, 0 ) m and (0, 0, 0) m respectively, the work done by electric field will be

Options
1. –600 mJ
2. –1200 mJ
3. 1200mJ
4. 600 mJ

Question Type : MCQ
Question ID : 366694280
Option 1 ID : 366694847
Option 2 ID : 366694849
Option 3 ID : 366694850
Option 4 ID : 366694848
Status : Answered
Chosen Option : 3

**Q.5** A square loop of area 25 $cm^2$ has a resistance of 10 Ω . The loop is placed in uniform magnetic field of magnitude 40.0 T. The plane of loop is perpendicular to the magnetic field. The work done in pulling the loop out of the magnetic field slowly and uniformly in 1.0 sec, will be

Options
1. $1.0 \times 10^{-3}$ J
2. $5 \times 10^{-3}$ J
3. $2.5 \times 10^{-3}$ J
4. $1.0 \times 10^{-4}$ J

Question Type : MCQ
Question ID : 366694282
Option 1 ID : 366694858
Option 2 ID : 366694855
Option 3 ID : 366694856
Option 4 ID : 366694857
Status : Answered
Chosen Option : 3

**Q.6** A fully loaded boeing aircraft has a mass of $5.4 \times 10^5$ kg. Its total wing area is 500 $m^2$. It is in level flight with a speed of 1080 km/h. If the density of air ρ is 1.2 kg $m^{-3}$, the fractional increase in the speed of the air on the upper surface of the wing relative to the lower surface in percentage will be. ($g = 10\ m/s^2$)

Options
1. 16
2. 6
3. 8
4. 10

Question Type : MCQ
Question ID : 366694277
Option 1 ID : 366694838
Option 2 ID : 366694837
Option 3 ID : 366694835
Option 4 ID : 366694836
Status : Answered
Chosen Option : 2

**Q.7** Heat energy of 184 kJ is given to ice of mass 600 g at –12°C. Specific heat of ice is 2222.3 J $kg^{-1}°C^{-1}$ and latent heat of ice in 336 $kJ/kg^{-1}$

A. Final temperature of system will be 0°C.

B. Final temperature of the system will be greater than 0°C .

C. The final system will have a mixture of ice and water in the ratio of 5:1.

D. The final system will have a mixture of ice and water in the ratio of 1:5.

E. The final system will have water only.

Question Type : MCQ
Question ID : 366694278
Option 1 ID : 366694842
Option 2 ID : 366694839
Option 3 ID : 366694840
Option 4 ID : 366694841
Status : Answered
Chosen Option : 3

Choose the correct answer from the options given below :

Options
1. A and E Only
2. A and C Only
3. B and D Only
4. A and D Only

Q.8 Substance A has atomic mass number 16 and half life of 1 day. Another substance B has atomic mass number 32 and half life of $\frac{1}{2}$ day. If both A and B simultaneously start undergo radio activity at the same time with initial mass 320 g each, how many total atoms of A and B combined would be left after 2 days.

Options
1. $1.69 \times 10^{24}$
2. $6.76 \times 10^{23}$
3. $3.38 \times 10^{24}$
4. $6.76 \times 10^{24}$

Question Type : MCQ
Question ID : 366694288
Option 1 ID : 366694881
Option 2 ID : 366694879
Option 3 ID : 366694880
Option 4 ID : 366694882
Status : Answered
Chosen Option : 3

Q.9 Given below are two statements :

Statement I: Electromagnetic waves are not deflected by electric and magnetic field.

Statement II: The amplitude of electric field and the magnetic field in electromagnetic waves are related to each other as $E_0 = \sqrt{\frac{\mu_0}{\epsilon_0}} B_0$.

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

Options
1. Both Statement I and Statement II are true
2. Statement I is false but statement II is true
3. Statement I is true but statement II is false
4. Both Statement I and Statement II are false

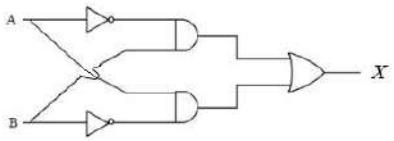
Question Type : MCQ
Question ID : 366694285
Option 1 ID : 366694867
Option 2 ID : 366694870
Option 3 ID : 366694869
Option 4 ID : 366694868
Status : Answered
Chosen Option : 1

Q.10 The electric current in a circular coil of four turns produces a magnetic induction 32 T at its centre. The coil is unwound and is rewound into a circular coil of single turn, the magnetic induction at the centre of the coil by the same current will be :

Options
1. 4 T
2. 2 T
3. 8 T
4. 16 T

Question Type : MCQ
Question ID : 366694283
Option 1 ID : 366694862
Option 2 ID : 366694860
Option 3 ID : 366694859
Option 4 ID : 366694861
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.11 For the given logic gates combination, the correct truth table will be




Options

1.

| A | B | X |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 0 |

2.

| A | B | X |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

3.

| A | B | X |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

4.

| A | B | X |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |

Question Type : MCQ
Question ID : 366694289
Option 1 ID : 366694886
Option 2 ID : 366694884
Option 3 ID : 366694883
Option 4 ID : 366694885
Status : Answered
Chosen Option : 4

Q.12 The modulation index for an A.M. wave having maximum and minimum peak-to-peak voltages of 14 mV and 6 mV respectively is-

Options
1. 0.6
2. 0.4
3. 0.2
4. 1.4

Question Type : MCQ
Question ID : 366694290
Option 1 ID : 366694887
Option 2 ID : 366694890
Option 3 ID : 366694889
Option 4 ID : 366694888
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.13 The time period of a satellite of earth is 24 hours.If the separation between the earth and the satellite is decreased to one fourth of the previous value, then its new time period will become.

Options
1. 4 hours

Question Ty
Question
Option 1
Option 2
Option 3

2. 6 hours
3. 12 hours
4. 3 hours

Option 4 ID : 366694833
Status : Answered
Chosen Option : 3

Q.14 With the help of potentiometer ,we can determine the value of emf of a given cell . The sensitivity of the potentiometer is

(A) directly proportional to the length of the potentiometer wire

(B) directly proportional to the potential gradient of the wire

(C) inversely proportional to the potential gradient of the wire

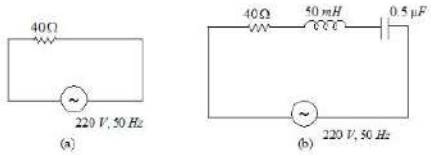
(D) inversely proportional to the length of the potentiometer wire

Choose the correct option for the above statements:

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

Question Type : MCQ
Question ID : 366694281
Option 1 ID : 366694854
Option 2 ID : 366694853
Option 3 ID : 366694852
Option 4 ID : 366694851
Status : Answered
Chosen Option : 1

Q.15 For the given figures, choose the correct options:




Options
1. At resonance, current in (b) is less than that in (a)
2. The rms current in circuit (b) can be larger than that in (a)
3. The rms current in figure(a) is always equal to that in figure (b)
4. The rms current in circuit (b) can never be larger than that in (a)

Question Type : MCQ
Question ID : 366694284
Option 1 ID : 366694865
Option 2 ID : 366694863
Option 3 ID : 366694866
Option 4 ID : 366694864
Status : Marked For Review
Chosen Option : 3

Q.16 The equation of a circle is given by $x^2 + y^2 = a^2$, where $a$ is the radius. If the equation is modified to change the origin other than (0, 0) , then find out the correct dimensions of A and B in a new equation : $(x - At)^2 + \left(y - \frac{1}{B}\right)^2 = a^2$ . The dimensions of t is given as $[T^{-1}]$.

Options
1. $A = [L^{-1}T^{-1}]$ , $B = [LT]$
2. $A = [L^{-1}T]$ , $B = [LT^{-1}]$
3. $A = [L^{-1}T^{-1}]$ , $B = [LT^{-1}]$
4. $A = [LT]$ , $B = [L^{-1}T^{-1}]$

Question Type : MCQ
Question ID : 366694271
Option 1 ID : 366694812
Option 2 ID : 366694814
Option 3 ID : 366694813
Option 4 ID : 366694811
Status : Answered
Chosen Option : 4

Q.17 A scientist is observing a bacteria through a compound microscope. For better analysis and to improve its resolving power he should. (Select the best option)

Options
1. Increase the wave length of the light
2. Decrease the diameter of the objective lens
3. Decrease the focal length of the eye piece.
4. Increase the refractive index of the medium between the object and objective lens

Question Type : MCQ
Question ID : 366694286
Option 1 ID : 366694872
Option 2 ID : 366694871
Option 3 ID : 366694873
Option 4 ID : 366694874
Status : Answered
Chosen Option : 1

Q.18 A force acts for 20 s on a body of mass 20 kg, starting from rest, after which the force ceases and then body describes 50 m in the next 10 s. The value of force will be:

Options
1. 5 N
2. 20 N
3. 40 N
4. 10 N

Question Type : MCQ
Question ID : 366694274
Option 1 ID : 366694823
Option 2 ID : 366694825
Option 3 ID : 366694826
Option 4 ID : 366694824
Status : Answered
Chosen Option : 4

Q.19 Identify the correct statements from the following:

A. Work done by a man in lifting a bucket out of a well by means of a rope tied to the bucket is negative.

B. Work done by gravitational force in lifting a bucket out of a well by a rope tied to the bucket is negative.

C. Work done by friction on a body sliding down an inclined plane is positive.

D. Work done by an applied force on a body moving on a rough horizontal plane with uniform velocity in zero.

E. Work done by the air resistance on an oscillating pendulum in negative.

Choose the correct answer from the options given below:

Options
1. A and C Only
2. B, D and E only
3. B and E only
4. B and D only

Question Type : MCQ
Question ID : 366694275
Option 1 ID : 366694827
Option 2 ID : 366694830
Option 3 ID : 366694829
Option 4 ID : 366694828
Status : Answered
Chosen Option : 3

Q.20 An object moves at a constant speed along a circular path in a horizontal plane with center at the origin. When the object is at $x = +2$ m, its velocity is $-4\hat{j}$ m/s . The object's velocity (v) and acceleration (a) at $x = -2$ m will be

Question Ty
Question
Option 1

Options 1. $v=-4\hat{j}\,m/s,\ a=8\hat{i}\,m/s^2$

2. $v=4\hat{i}\,m/s,\ a=8\hat{j}\,m/s^2$

3. $v=-4\hat{i}\,m/s,\ a=-8\hat{j}\,m/s^2$

4. $v=4\hat{j}\,m/s,\ a=8\hat{i}\,m/s^2$

Option 2 ID : 366694817
Option 3 ID : 366694818
Option 4 ID : 366694815
Status : Answered
Chosen Option : 3

## Section : Physics Section B

**Q.21** In an experiment of measuring the refractive index of a glass slab using travelling microscope in physics lab, a student measures real thickness of the glass slab as 5.25 mm and apparent thickness of the glass slab as 5.00 mm. Travelling microscope has 20 divisions in one cm on main scale and 50 divisions on vernier scale is equal to 49 divisions on main scale. The estimated uncertainty in the measurement of refractive index of the slab is $\frac{x}{10}\times10^{-3}$, where $x$ is _____

Question Type : SA
Question ID : 366694292
Status : Answered

Given Answer : 72

**Q.22** A car is moving on a circular path of radius 600 m such that the magnitudes of the tangential acceleration and centripetal acceleration are equal. The time taken by the car to complete first quarter of revolution , if it is moving with an initial speed of 54 km/hr is $t(1-e^{-\pi/2})s$. The value of t is _____.

Question Type : SA
Question ID : 366694300
Status : Not Attempted and Marked For Review

Given Answer : --

**Q.23** Unpolarised light is incident on the boundary between two dielectric media, whose dielectric constants are 2.8 (medium –1) and 6.8 (medium –2), respectively. To satisfy the condition, so that the reflected and refracted rays are perpendicular to each other, the angle of incidence should be $\tan^{-1}\left(1+\frac{10}{\theta}\right)^{\frac{1}{2}}$ the value of θ is _____.

(Given for dielectric media, $\mu_r = 1$)

Question Type : SA
Question ID : 366694293
Status : Not Attempted and Marked For Review

Given Answer : --

**Q.24** A null point is found at 200 cm in potentiometer when cell in secondary circuit is shunted by 5Ω. When a resistance of 15Ω is used for shunting, null point moves to 300 cm. The internal resistance of the cell is _____Ω.

Question Type : SA
Question ID : 366694295
Status : Not Attempted and Marked For Review

Given Answer : --

**Q.25** An inductor of inductance 2 μH is connected in series with a resistance, a variable capacitor and an AC source of frequency 7 kHz. The value of capacitance for which maximum current is drawn into the circuit is $\frac{1}{x}$F, where the value of $x$ is _____.

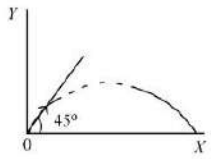
(Take $\pi=\frac{22}{7}$)

Question Type : SA
Question ID : 366694294
Status : Not Attempted and Marked For Review

Given Answer : --

**Q.26** A particle of mass 100 g is projected at time t = 0 with a speed 20 $ms^{-1}$ at an angle 45° to the horizontal as given in the figure. The magnitude of the angular momentum of the particle about the starting point at time t = 2s is found to be $\sqrt{K}$ kg $m^2/s$. The value of K is _____.

(Take g = 10 $ms^{-2}$)




Question Type : SA
Question ID : 366694299
Status : Not Attempted and Marked For Review

Given Answer : --

**Q.27** A particle of mass 250 g executes a simple harmonic motion under a periodic force F = (–25 $x$) N. The particle attains a maximum speed of 4 m/s during its oscillation. The amplitude of the motion is _____ cm.

Question Type : SA
Question ID : 366694297
Status : Answered

Given Answer : 40

**Q.28** For a charged spherical ball, electrostatic potential inside the ball varies with $r$ as $V = 2ar^2 + b$.
Here, $a$ and $b$ are constant and r is the distance from the center. The volume charge density inside the ball is $-\lambda a\varepsilon$ . The value of λ is _____.
ε = permittivity of the medium

Question Type : SA
Question ID : 366694296
Status : Not Attempted and Marked For Review

Given Answer : --

**Q.29** When two resistances $R_1$ and $R_2$ connected in series and introduced into the left gap of a meter bridge and a resistance of 10 Ω is introduced into the right gap, a null point is found at 60 cm from left side . When $R_1$ and $R_2$ are connected in parallel and introduced into the left gap, a resistance of 3 Ω is introduced into the right-gap to get null point at 40 cm from left end. The product of $R_1$ $R_2$ is _____$\Omega^2$

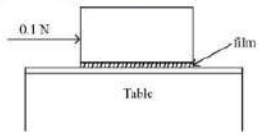
Question Type : SA
Question ID : 366694291
Status : Not Attempted and Marked For Review

Given Answer : --

**Q.30** A metal block of base area 0.20 $m^2$ is placed on a table, as shown in figure. A liquid film of thickness 0.25 mm is inserted between the block and the table. The

Question Type :
Question ID :

block is pushed by a horizontal force of 0.1 N and moves with a constant speed. If the viscosity of the liquid is $5.0 \times 10^{-3}$ Pl, the speed of block is _____ $\times 10^{-3}$ m/s.




Given Answer : --

Status : Not Attempted and Marked For Review

**Section : Chemistry Section A**

Q.31 An indicator 'X' is used for studying the effect of variation in concentration of iodide ion on the rate of reaction of iodide ion with $H_2O_2$ at room temp. The indicator 'X' forms blue colored complex with compound 'A' present in the solution. The indicator 'X' and compound 'A' respectively are

Options
1. Starch and iodine
2. Starch and $H_2O_2$
3. Methyl orange and iodine
4. Methyl orange and $H_2O_2$

Question Type : MCQ
Question ID : 366694320
Option 1 ID : 366694980
Option 2 ID : 366694978
Option 3 ID : 366694977
Option 4 ID : 366694979
Status : Answered
Chosen Option : 2

Q.32 Match **List I** and **List II**

| List I | List II |
|---|---|
| A. Osmosis | I. Solvent molecules pass through semi permeable membrane towards solvent side. |
| B. Reverse osmosis | II. Movement of charged colloidal particles under the influence of applied electric potential towards oppositely charged electrodes. |
| C. Electro osmosis | III. Solvent molecules pass through semi permeable membrane towards solution side. |
| D. Electrophoresis | IV. Dispersion medium moves in an electric field. |

Choose the correct answer from the options given below :

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

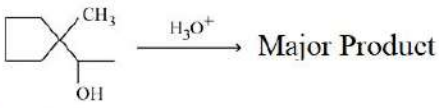
Question Type : MCQ
Question ID : 366694304
Option 1 ID : 366694913
Option 2 ID : 366694915
Option 3 ID : 366694916
Option 4 ID : 366694914
Status : Answered
Chosen Option : 4

Q.33 The concentration of dissolved Oxygen in water for growth of fish should be more than X ppm and Biochemical Oxygen Demand in clean water should be less than Y ppm. X and Y in ppm are, respectively.

Options
1. X Y
   6 5
2. X Y
   4 15
3. X Y
   4 8
4. X Y
   6 12

Question Type : MCQ
Question ID : 366694311
Option 1 ID : 366694941
Option 2 ID : 366694944
Option 3 ID : 366694942
Option 4 ID : 366694943
Status : Answered
Chosen Option : 2

Q.34 Find out the major product for the following reaction.




Options
1. 
2. 
3. 
4. 

Question Type : MCQ
Question ID : 366694312
Option 1 ID : 366694947
Option 2 ID : 366694945
Option 3 ID : 366694946
Option 4 ID : 366694948
Status : Answered
Chosen Option : 3

Q.35 The major component of which of the following ore is sulphide based mineral?

Options
1. Malachite
2. Calamine
3. Sphalerite
4. Siderite

Question Type : MCQ
Question ID : 366694306
Option 1 ID : 366694921
Option 2 ID : 366694922
Option 3 ID : 366694924
Option 4 ID : 366694923
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.36 Given below are two statements :

**Statement I** : The decrease in first ionization enthalpy from B to Al is much larger than that from Al to Ga.

**Statement II** : The d orbitals in Ga are completely filled.

Question Type : MCQ
Question ID : 366694305
Option 1 ID : 366694920
Option 2
Option 3
Option 4
Sta
Chosen Opt

In the light of the above statements, choose the most appropriate answer from the options given below

Options
1. Statement I is incorrect but statement II is correct
2. Both the statements I and II are incorrect
3. Both the statements I and II are correct
4. Statement I is correct but statement II is incorrect

Q.37 A solution of $C_7O_3$ in amyl alcohol has a _____ colour.

Options
1. Yellow
2. Green
3. Blue
4. Orange-Red

Question Type : MCQ
Question ID : 366694308
Option 1 ID : 366694932
Option 2 ID : 366694930
Option 3 ID : 366694929
Option 4 ID : 366694931
Status : Answered
Chosen Option : 4

Q.38 Which of the following relations are correct ?

(A) $\Delta U = q + p\Delta V$

(B) $\Delta G = \Delta H - T\Delta S$

(C) $\Delta S = \frac{q_{rev}}{T}$

(D) $\Delta H = \Delta U - \Delta nRT$

Choose the most appropriate answer from the options given below :

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

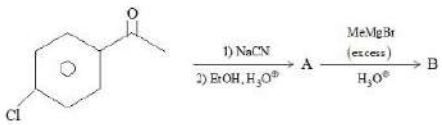
Question Type : MCQ
Question ID : 366694302
Option 1 ID : 366694907
Option 2 ID : 366694908
Option 3 ID : 366694906
Option 4 ID : 366694905
Status : Answered
Chosen Option : 4

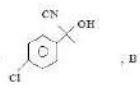
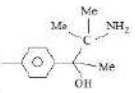
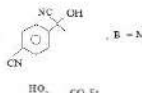
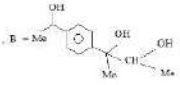
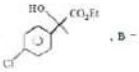
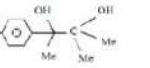
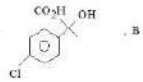
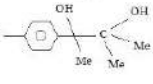
Q.39 Correct order of spin only magnetic moment of the following complex ions is:
(Given At.no. Fe: 26, Co:27)

Options
1. $[Co(C_2O_4)_3]^{3-} > [CoF_6]^{3-} > [FeF_6]^{3-}$
2. $[FeF_6]^{3-} > [Co(C_2O_4)_3]^{3-} > [CoF_6]^{3-}$
3. $[FeF_6]^{3-} > [CoF_6]^{3-} > [Co(C_2O_4)_3]^{3-}$
4. $[CoF_6]^{3-} > [FeF_6]^{3-} > [Co(C_2O_4)_3]^{3-}$

Question Type : MCQ
Question ID : 366694309
Option 1 ID : 366694935
Option 2 ID : 366694934
Option 3 ID : 366694933
Option 4 ID : 366694936
Status : Answered
Chosen Option : 3

Q.40 Find out the major products from the following reaction sequence.




Options
1. A =  , B = 
2. A =  , B = 
3. A =  , B = 
4. A =  , B = 

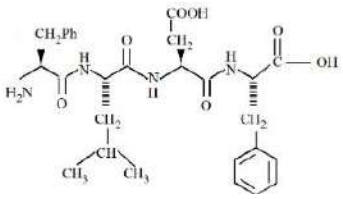
Question Type : MCQ
Question ID : 366694315
Option 1 ID : 366694957
Option 2 ID : 366694960
Option 3 ID : 366694959
Option 4 ID : 366694958
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.41 When a hydrocarbon A undergoes combustion in the presence of air, it requirs 9.5 equivalents of oxygen and produces 3 equivalents of water. What is the molecular formula of A ?

Options
1. $C_9H_6$
2. $C_8H_6$
3. $C_6H_6$
4. $C_5H_9$

Question Type : MCQ
Question ID : 366694313
Option 1 ID : 366694951
Option 2 ID : 366694949
Option 3 ID : 366694950
Option 4 ID : 366694952
Status : Answered
Chosen Option : 1

Q.42 Following tetrapeptide can be represented as



Question Type : MCQ
Question ID : 366694318
Option 1 ID : 366694972
Option 2 ID : 366694970
Option 3 ID : 366694971
Option 4 ID : 366694969
Status :
Chosen Option :

$\underset{OH}{|}$

(F, L, D, Y, I, Q, P are one letter codes for amino acids)

Options
1. YQLF
2. FIQY
3. PLDY
4. FLDY

Q.43 Reaction of propanamide with $Br_2/KOH\,(aq)$ produces :

Options
1. Ethylnitrile
2. Propylamine
3. Propanenitrile
4. Ethylamine

Question Type : MCQ
Question ID : 366694316
Option 1 ID : 366694964
Option 2 ID : 366694961
Option 3 ID : 366694963
Option 4 ID : 366694962
Status : Answered
Chosen Option : 4

Q.44 Match **List I** with **List II**

| List I | List II |
|---|---|
| A. van't Hoff factor, i | I. Cryoscopic constant |
| B. $k_f$ | II. Isotonic solutions |
| C. Solutions with same osmotic pressure | III. $\frac{\text{Normal molar mass}}{\text{Abnormal molar mass}}$ |
| D. Azeotropes | IV. Solutions with same composition of vapour above it |

Choose the correct answer from the options given below :

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

Question Type : MCQ
Question ID : 366694303
Option 1 ID : 366694910
Option 2 ID : 366694912
Option 3 ID : 366694909
Option 4 ID : 366694911
Status : Answered
Chosen Option : 4

Q.45 A doctor prescribed the drug Equanil to a patient. The patient was likely to have symptoms of which disease?

Options
1. Stomach ulcers
2. Hyperacidity
3. Anxiety and stress
4. Depression and hypertension

Question Type : MCQ
Question ID : 366694319
Option 1 ID : 366694975
Option 2 ID : 366694974
Option 3 ID : 366694975
Option 4 ID : 366694973
Status : Answered
Chosen Option : 4

Q.46 The one giving maximum number of isomeric alkenes on dehydrohalogenation reaction is (excluding rearrangement)

Options
1. 2-Bromopropane
2. 1-Bromo-2-methylbutane
3. 2-Bromopentane
4. 2-Bromo-3,3-dimethylpentane

Question Type : MCQ
Question ID : 366694314
Option 1 ID : 366694953
Option 2 ID : 366694954
Option 3 ID : 366694955
Option 4 ID : 366694956
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.47 Match **List I** with **List II**

| List I | List II |
|---|---|
| A. Elastomeric polymer | I. Urea formaldehyde resin |
| B. Fibre Polymer | II. Polystyrene |
| C. Thermosetting Polymer | III. Polyester |
| D. Thermoplastic Polymer | IV. Neoprene |

Choose the correct answer from the options given below :

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

Question Type : MCQ
Question ID : 366694317
Option 1 ID : 366694967
Option 2 ID : 366694968
Option 3 ID : 366694966
Option 4 ID : 366694965
Status : Answered
Chosen Option : 1

Q.48 Given below are two statements:

**Statement I :** Nickel is being used as the catalyst for producing syn gas and edible fats.

**Statement II :** Silicon forms both electron rich and electron deficient hydrides.

In the light of the above statements, choose the most appropriate answer from the options given below :

Options
1. Statement I is correct but statement II is incorrect
2. Statement I is incorrect but statement II is correct
3. Both the statements I and II are correct
4. Both the statements I and II are incorrect

Question Type : MCQ
Question ID : 366694307
Option 1 ID : 366694927
Option 2 ID : 366694928
Option 3 ID : 366694925
Option 4 ID : 366694926
Status : Answered
Chosen Option : 2

Q.49 The set of correct statements is :

(i) Manganese exhibits +7 oxidation state in its oxide.

(ii) Ruthenium and Osmium exhibit +8 oxidation in their oxides.

Question Ty
Question
Option 1
Option 2
Option 3

(iii) Sc shows +4 oxidation state which is oxidizing in nature.

(iv) Cr shows oxidising nature in +6 oxidation state.

Options
1. (ii), (iii) and (iv)
2. (i) and (iii)
3. (ii) and (iii)
4. (i), (ii) and (iv)

Option 4 ID : 366694938
Status : Answered
Chosen Option : 3

Q.50 According to MO theory the bond orders for $O_2^{2-}$, CO and $NO^+$ respectively, are

Options
1. 1, 3 and 2
2. 2, 3 and 3
3. 1, 3 and 3
4. 1, 2 and 3

Question Type : MCQ
Question ID : 366694301
Option 1 ID : 366694902
Option 2 ID : 366694904
Option 3 ID : 366694903
Option 4 ID : 366694901
Status : Answered
Chosen Option : 1

## Section : Chemistry Section B

Q.51 The volume of HCl, containing 73 g $L^{-1}$, required to completely neutralise NaOH obtained by reacting 0.69 g of metallic sodium with water, is _____mL. (Nearest Integer)
(Given : molar Masses of Na, Cl, O, H, are 23, 35.5, 16 and 1 g $mol^{-1}$ respectively)

Given Answer : 2

Question Type : SA
Question ID : 366694325
Status : Answered

Q.52 When 0.01 mol of an organic compound containing 60% carbon was burnt completely, 4.4 g of $CO_2$ was produced. The molar mass of compound is_____ g $mol^{-1}$ (Nearest integer).

Given Answer : --

Question Type : SA
Question ID : 366694330
Status : Not Attempted and Marked For Review

Q.53 For conversion of compound A → B, the rate constant of the reaction was found to be $4.6 \times 10^{-5}$ L $mol^{-1}$ $s^{-1}$. The order of the reaction is _____.

Given Answer : --

Question Type : SA
Question ID : 366694329
Status : Not Attempted and Marked For Review

Q.54 On heating, $LiNO_3$ gives how many compounds among the following?_____

$Li_2O$, $N_2$, $O_2$, $LiNO_2$, $NO_2$

Given Answer : 2

Question Type : SA
Question ID : 366694323
Status : Answered

Q.55 A metal M forms hexagonal close-packed structure. The total number of voids in 0.02 mol of it is _____ $\times 10^{21}$ (Nearest integer).

(Given $N_A = 6.02 \times 10^{23}$)

Given Answer : --

Question Type : SA
Question ID : 366694326
Status : Not Attempted and Marked For Review

Q.56 Total number of acidic oxides among $N_2O_3$, $NO_2$, $N_2O$, $Cl_2O_7$, $SO_2$, CO, CaO, $Na_2O$ and NO is _____,

Given Answer : 3

Question Type : SA
Question ID : 366694324
Status : Answered

Q.57 At 298 K

$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$, $K_1 = 4 \times 10^5$

$N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$, $K_2 = 1.6 \times 10^{12}$

$H_2(g) + \frac{1}{2} O_2(g) \rightleftharpoons H_2O(g)$, $K_3 = 1.0 \times 10^{-13}$

Based on above equilibria, the equilibrium constant of the reaction, $2NH_3(g) + \frac{5}{2} O_2(g) \rightleftharpoons 2NO(g) + 3H_2O(g)$ is _____ $\times 10^{-33}$ (Nearest integer).

Given Answer : --

Question Type : SA
Question ID : 366694327
Status : Not Attempted and Marked For Review

Q.58 The denticity of the ligand present in the Fehling's reagent is _____.

Given Answer : --

Question Type : SA
Question ID : 366694322
Status : Not Attempted and Marked For Review

Q.59 The equilibrium constant for the reaction

$Zn(s) + Sn^{2+}(aq) \rightleftharpoons Zn^{2+}(aq) + Sn(s)$ is $1 \times 10^{20}$ at 298 K. The magnitude of standard electrode potential of $Sn/Sn^{2+}$ if $E^{\theta}_{Zn^{2+}/Zn} = -0.76$ V is _____ $\times 10^{-2}$ V. (Nearest integer).

Given : $\frac{2.303RT}{F} = 0.059$ V

Given Answer : --

Question Type : SA
Question ID : 366694328
Status : Not Attempted and Marked For Review

Q.60 Assume that the radius of the first Bohr orbit of hydrogen atom is 0.6 Å. The radius of the third Bohr orbit of $He^+$ is _____ picometer. (Nearest Integer)

Given Answer : 2

Question Type : SA
Question ID : 366694321
Status : ...

## Section : Mathematics Section A

Q.61 Let S = $\{w_1, w_2, \ldots\}$ be the sample space associated to a random experiment. Let $P(w_n) = \frac{P(w_{n-1})}{2}$, $n \geq 2$. Let $A = \{2k + 3l : k, l \in \mathbb{N}\}$ and $B = \{w_n : n \in A\}$. Then $P(B)$ is equal to

Options
1. $\frac{1}{32}$
2. $\frac{3}{64}$
3. $\frac{3}{32}$
4. $\frac{1}{16}$

Question Type : MCQ
Question ID : 366694347
Option 1 ID : 3666941057
Option 2 ID : 3666941058
Option 3 ID : 3666941056
Option 4 ID : 3666941055
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.62 The statement $B \Rightarrow ((\sim A) \vee B)$ is equivalent to :

Options
1. $B \Rightarrow (A \Rightarrow B)$
2. $B \Rightarrow ((\sim A) \Rightarrow B)$
3. $A \Rightarrow (A \Leftrightarrow B)$
4. $A \Rightarrow ((\sim A) \Rightarrow B)$

Question Type : MCQ
Question ID : 366694350
Option 1 ID : 3666941070
Option 2 ID : 3666941069
Option 3 ID : 3666941068
Option 4 ID : 3666941067
Status : Answered
Chosen Option : 4

Q.63 The number of 3 digit numbers, that are divisible by either 3 or 4 but not divisible by 48, is

Options
1. 472
2. 432
3. 507
4. 400

Question Type : MCQ
Question ID : 366694341
Option 1 ID : 3666941032
Option 2 ID : 3666941034
Option 3 ID : 3666941031
Option 4 ID : 3666941033
Status : Answered
Chosen Option : 1

Q.64 Consider a function $f : \mathbb{N} \to \mathbb{R}$, satisfying

$f(1) + 2f(2) + 3f(3) + \ldots + xf(x) = x(x+1)f(x); x \geq 2$ with $f(1) = 1$.

Then $\frac{1}{f(2022)} + \frac{1}{f(2028)}$ is equal to

Options
1. 8100
2. 8200
3. 8000
4. 8400

Question Type : MCQ
Question ID : 366694333
Option 1 ID : 3666941001
Option 2 ID : 3666941000
Option 3 ID : 3666941002
Option 4 ID : 366694999
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.65 Let K be the sum of the coefficients of the odd powers of $x$ in the expansion of $(1 + x)^{99}$. Let $a$ be the middle term in the expansion of $\left(2 + \frac{1}{\sqrt{2}}\right)^{200}$. If $\frac{^{200}C_{99}K}{a} = \frac{2^l m}{n}$, where m and n are odd numbers, then the ordered pair $(l, n)$ is equal to

Options
1. (51,99)
2. (50,101)
3. (50,51)
4. (51,101)

Question Type : MCQ
Question ID : 366694334
Option 1 ID : 3666941004
Option 2 ID : 3666941003
Option 3 ID : 3666941006
Option 4 ID : 3666941005
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.66 The shortest distance between the lines $\frac{x-1}{2} = \frac{y+8}{-7} = \frac{z-4}{5}$ and $\frac{x-1}{2} = \frac{y-2}{1} = \frac{z-6}{-3}$ is

Options
1. $3\sqrt{3}$
2. $2\sqrt{3}$
3. $5\sqrt{3}$
4. $4\sqrt{3}$

Question Type : MCQ
Question ID : 366694343
Option 1 ID : 3666941041
Option 2 ID : 3666941042
Option 3 ID : 3666941039
Option 4 ID : 3666941040
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.67 The value of the integral $\int_1^2 \left(\frac{t^4+1}{t^6+1}\right) dt$ is

Options
1. $\tan^{-1}2 - \frac{1}{3}\tan^{-1}8 + \frac{\pi}{3}$
2. $\tan^{-1}2 + \frac{1}{3}\tan^{-1}8 - \frac{\pi}{3}$
3. $\tan^{-1}\frac{1}{2} + \frac{1}{3}\tan^{-1}8 - \frac{\pi}{3}$
4. $\tan^{-1}\frac{1}{2} - \frac{1}{3}\tan^{-1}8 + \frac{\pi}{3}$

Question Type : MCQ
Question ID : 366694337
Option 1 ID : 3666941018
Option 2 ID : 3666941017
Option 3 ID : 3666941015
Option 4 ID : 3666941016
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.68 Let $f$ and $g$ be twice differentiable functions on $\mathbb{R}$ such that

$f''(x) = g''(x) + 6x$

$f'(1) = 4g'(1) - 3 = 9$

$f(2) = 3g(2) = 12$.

Then which of the following is **NOT** true?

Question Type : MCQ
Question ID : 366694336
Option 1 ID : 3666941013
Option 2 ID : 3666941014
Option 3 ID : [illegible]
Option 4 [illegible]
Status [illegible]
Chosen Opt[illegible]

Options
1. If $-1 < x < 2$, then $|f(x) - g(x)| < 8$
2. $|f'(x) - g'(x)| < 6 \Rightarrow -1 < x < 1$
3. $g(-2) - f(-2) = 20$
4. There exists $x_0 \in (1,3/2)$ such that $f(x_0) = g(x_0)$

Q.69 Let R be a relation defined on $\mathbb{N}$ as $a$ R $b$ if $2a + 3b$ is a multiple of 5, $a, b \in \mathbb{N}$. Then R is

Options
1. transitive but not symmetric
2. an equivalence relation
3. not reflexive
4. symmetric but not transitive

Question Type : MCQ
Question ID : 366694331
Option 1 ID : 366694993
Option 2 ID : 366694994
Option 3 ID : 366694991
Option 4 ID : 366694992
Status : Answered
Chosen Option : 2

Q.70 If the tangent at a point P on the parabola $y^2 = 3x$ is parallel to the line $x + 2y = 1$ and the tangents at the points Q and R on the ellipse $\frac{x^2}{4} + \frac{y^2}{1} = 1$ are perpendicular to the line $x - y = 2$, then the area of the triangle PQR is :

Options
1. $\frac{3}{2}\sqrt{5}$
2. $5\sqrt{3}$
3. $3\sqrt{5}$
4. $\frac{9}{\sqrt{5}}$

Question Type : MCQ
Question ID : 366694342
Option 1 ID : 3666941035
Option 2 ID : 3666941038
Option 3 ID : 3666941036
Option 4 ID : 3666941037
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.71 If $\vec{a} = \hat{i} + 2\hat{k}$, $\vec{b} = \hat{i} + \hat{j} + \hat{k}$, $\vec{c} = 7\hat{i} - 3\hat{j} + 4\hat{k}$, $\vec{r} \times \vec{b} + \vec{b} \times \vec{c} = \vec{0}$ and $\vec{r} \cdot \vec{a} = 0$. Then $\vec{r} \cdot \vec{c}$ is equal to

Options
1. 30
2. 32
3. 36
4. 34

Question Type : MCQ
Question ID : 366694348
Option 1 ID : 3666941062
Option 2 ID : 3666941061
Option 3 ID : 3666941059
Option 4 ID : 3666941060
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.72 If the lines $\frac{x-1}{1} = \frac{y-2}{2} = \frac{z+3}{1}$ and $\frac{x-a}{2} = \frac{y+2}{3} = \frac{z-3}{1}$ intersect at the point P, then the distance of the point P from the plane $z = a$ is :

Options
1. 10
2. 22
3. 28
4. 16

Question Type : MCQ
Question ID : 366694344
Option 1 ID : 3666941043
Option 2 ID : 3666941045
Option 3 ID : 3666941046
Option 4 ID : 3666941044
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.73 The value of the integral $\int_{\frac{1}{2}}^{2} \frac{\tan^{-1} x}{x}\,dx$ is equal to

Options
1. $\frac{\pi}{4}\log_e 2$
2. $\pi \log_e 2$
3. $\frac{\pi}{2}\log_e 2$
4. $\frac{1}{2}\log_e 2$

Question Type : MCQ
Question ID : 366694338
Option 1 ID : 3666941019
Option 2 ID : 3666941022
Option 3 ID : 3666941020
Option 4 ID : 3666941021
Status : Answered
Chosen Option : 3

Q.74 The plane $2x - y + z = 4$ intersects the line segment joining the points A $(a, -2, 4)$ and B $(2, b, -3)$ at the point C in the ratio 2:1 and the distance of the point C from the origin is $\sqrt{5}$. If $ab < 0$ and P is the point $(a - b, b, 2b - a)$ then $CP^2$ is equal to

Options
1. $\frac{16}{3}$
2. $\frac{17}{3}$
3. $\frac{73}{3}$
4. $\frac{97}{3}$

Question Type : MCQ
Question ID : 366694345
Option 1 ID : 3666941047
Option 2 ID : 3666941048
Option 3 ID : 3666941049
Option 4 ID : 3666941050
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.75 The area of the region $A = \left\{(x,y) : |\cos x - \sin x| \le y \le \sin x, 0 \le x \le \frac{\pi}{2}\right\}$ is

Options
1. $\sqrt{5} - 2\sqrt{2} + 1$
2. $1 - \frac{3}{\sqrt{2}} + \frac{4}{\sqrt{5}}$
3. $\frac{3}{\sqrt{5}} - \frac{3}{\sqrt{2}} + 1$
4. $\sqrt{5} + 2\sqrt{2} - 4.5$

Question Type : MCQ
Question ID : 366694339
Option 1 ID : 3666941025
Option 2 ID : 3666941026
Option 3 ID : 3666941023
Option 4 ID : 3666941024
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.76 The letters of the word OUGHT are written in all possible ways and these words are arranged as in a dictionary, in a series. Then the serial number of the word TOUGH is

Options
1. 79
2. 86
3. 84
4. 89

Question Type : MCQ
Question ID : 366694335
Option 1 ID : 3666941008
Option 2 ID : 3666941010
Option 3 ID : 3666941009
Option 4
Sta
Chosen Opt

Q.77 Let $\vec{a}=4\hat{i}+3\hat{j}$ and $\vec{b}=3\hat{i}-4\hat{j}+5\hat{k}$. If $\vec{c}$ is a vector such that $\vec{c}\cdot\left(\vec{a}\times\vec{b}\right)+25=0$, $\vec{c}\cdot(\hat{i}+\hat{j}+\hat{k})=4$, and projection of $\vec{c}$ on $\vec{a}$ is 1, then the projection of $\vec{c}$ on $\vec{b}$ equals

Options
1. $\frac{5}{\sqrt{2}}$
2. $\frac{1}{5}$
3. $\frac{1}{\sqrt{2}}$
4. $\frac{3}{\sqrt{2}}$

Question Type : MCQ
Question ID : 366694346
Option 1 ID : 3666941051
Option 2 ID : 3666941053
Option 3 ID : 3666941052
Option 4 ID : 3666941054
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.78 The set of all values of $\lambda$ for which the equation $\cos^2 2x - 2\sin^4 x - 2\cos^2 x = \lambda$ has a real solution $x$, is

Options
1. $\left[-1, -\frac{1}{2}\right]$
2. $\left[-\frac{3}{2}, -1\right]$
3. $\left[-2, -\frac{3}{2}\right]$
4. $[-2, -1]$

Question Type : MCQ
Question ID : 366694349
Option 1 ID : 3666941063
Option 2 ID : 3666941065
Option 3 ID : 3666941066
Option 4 ID : 3666941064
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.79 The set of all values of $t \in \mathbb{R}$, for which the matrix $\begin{bmatrix} e^t & e^{-t}(\sin t - 2\cos t) & e^{-t}(-2\sin t - \cos t) \\ e^t & e^{-t}(2\sin t + \cos t) & e^{-t}(\sin t - 2\cos t) \\ e^t & e^{-t}\cos t & e^{-t}\sin t \end{bmatrix}$ is invertible, is

Options
1. $\left\{(2k+1)\frac{\pi}{2}, k \in \mathbb{Z}\right\}$
2. $\mathbb{R}$
3. $\left\{k\pi + \frac{\pi}{4}, k \in \mathbb{Z}\right\}$
4. $\{k\pi, k \in \mathbb{Z}\}$

Question Type : MCQ
Question ID : 366694332
Option 1 ID : 366694995
Option 2 ID : 366694997
Option 3 ID : 366694996
Option 4 ID : 366694998
Status : Not Attempted and Marked For Review
Chosen Option : --

Q.80 Let $y = y(x)$ be the solution of the differential equation $x\log_e x\frac{dy}{dx} + y = x^2\log_e x, (x>1)$. If $y(2) = 2$, then $y(e)$ is equal to

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

Question Type : MCQ
Question ID : 366694340
Option 1 ID : 3666941030
Option 2 ID : 3666941029
Option 3 ID : 3666941028
Option 4 ID : 3666941027
Status : Answered
Chosen Option : 2

## Section : Mathematics Section B

Q.81 The total number of 4-digit numbers whose greatest common divisor with 54 is 2, is _____.

Given Answer : --

Question Type : SA
Question ID : 366694354
Status : Not Attempted and Marked For Review

Q.82 If the equation of the normal to the curve $y=\frac{x-a}{(x+b)(x-2)}$ at the point $(1, -3)$ is $x - 4y = 13$, then the value of $a+b$ is equal to _____.

Given Answer : -1

Question Type : SA
Question ID : 366694357
Status : Answered

Q.83 Let $X = \{11, 12, 13, \ldots, 40, 41\}$ and $Y = \{61, 62, 63, \ldots, 90, 91\}$ be the two sets of observations. If $\bar{x}$ and $\bar{y}$ are their respective means and $\sigma^2$ is the variance of all the observations in X ∪ Y, then $\left|\bar{x}+\bar{y}-\sigma^2\right|$ is equal to _____.

Given Answer : --

Question Type : SA
Question ID : 366694360
Status : Not Attempted and Marked For Review

Q.84 A triangle is formed by the tangents at the point (2, 2) on the curves $y^2 = 2x$ and $x^2 + y^2 = 4x$, and the line $x + y + 2 = 0$. If $r$ is the radius of its circumcircle, then $r^2$ is equal to _____.

Given Answer : --

Question Type : SA
Question ID : 366694359
Status : Not Attempted and Marked For Review

Q.85 Let $\alpha_1, \alpha_2, \ldots, \alpha_7$ be the roots of the equation $x^7 + 3x^5 - 13x^3 - 15x = 0$ and $|\alpha_1| \geq |\alpha_2| \geq \ldots \geq |\alpha_7|$. Then $\alpha_1\alpha_2 - \alpha_3\alpha_4 + \alpha_5\alpha_6$ is equal to _____

Given Answer : --

Question Type : SA
Question ID : 366694351
Status : Not Attempted and Marked For Review

Q.86 Let A be a symmetric matrix such that $|A| = 2$ and $\begin{bmatrix} 2 & 1 \\ 3 & \frac{3}{2} \end{bmatrix} A = \begin{bmatrix} 1 & 2 \\ \alpha & \beta \end{bmatrix}$.

If the sum of the diagonal elements of A is $s$, then $\frac{\beta s}{\alpha^2}$ is equal to _____.

Given Answer : --

Question Type : SA
Question ID : 366694353
Status : Not Attempted and Marked For Review

Q.87

Let $a_1 = b_1 = 1$ and $a_n = a_{n-1} + (n-1)$, $b_n = b_{n-1} + a_{n-1}$, $\forall\ n \geq 2$. If $S = \sum_{n=1}^{} \frac{b_n}{2^n}$ and $T = \sum_{n=1}^{8} \frac{n}{2^{n-1}}$, then $2^7(2S - T)$ is equal to _____.

Question Type : SA
Question ID : 366694356
Status : Not Attempted and Marked For Review

Given Answer : --

Q.88 A circle with centre (2, 3) and radius 4 intersects the line $x + y = 3$ at the points $P$ and $Q$. If the tangents at $P$ and $Q$ intersect at the point $S(\alpha, \beta)$, then $4\alpha - 7\beta$ is equal to _____.

Question Type : SA
Question ID : 366694358
Status : Not Attempted and Marked For Review

Given Answer : --

Q.89 Let $\{a_k\}$ and $\{b_k\}$, $k \in \mathbb{N}$, be two G.P.s with common ratios $r_1$ and $r_2$ respectively such that $a_1 = b_1 = 4$ and $r_1 < r_2$. Let $c_k = a_k + b_k$, $k \in \mathbb{N}$. If $c_2 = 5$ and $c_3 = \frac{13}{4}$ then $\sum_{k=1}^{\infty} c_k - (12a_6 + 8b_4)$ is equal to _____.

Question Type : SA
Question ID : 366694355
Status : Not Attempted and Marked For Review

Given Answer : --

Q.90 Let $\alpha = 8 - 14i$, $A = \left\{z \in \mathbb{C} : \frac{\alpha z - \bar{\alpha}\bar{z}}{z^2 - (\bar{z})^2 - 112i} = 1\right\}$ and $B = \{z \in \mathbb{C} : |z + 3i| = 4\}$.

Then $\sum_{z \in A \cap B} (\mathrm{Re}\, z - \mathrm{Im}\, z)$ is equal to _____.

Question Type : SA
Question ID : 366694352
Status : Not Attempted and Marked For Review

Given Answer : --