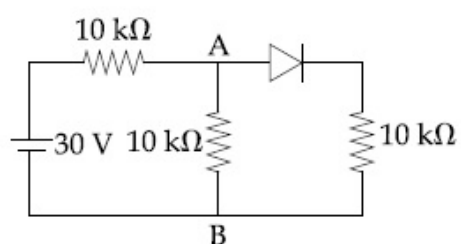


NTA JEE 7th to 9th Jan 2020

Application No.	
Candidate Name	
Roll No.	
Test Date	07/01/2020
Test Time	2:30 PM - 5:30 PM
Subject	BTECH

Section : Physics

Q.1 In the figure, potential difference between A and B is :



Options 1. 15 V

2. zero

3. 10 V

4. 5 V

Question Type : MCQ

Question ID : 4050361263

Option 1 ID : 4050364680

Option 2 ID : 4050364677

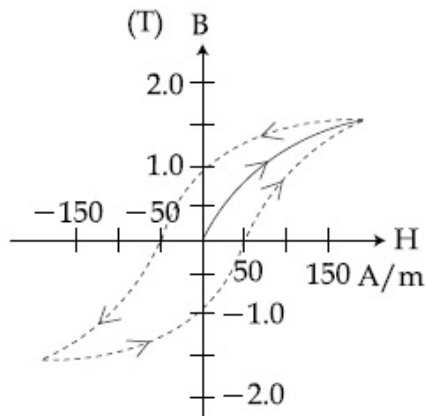
Option 3 ID : 4050364679

Option 4 ID : 4050364678

Status : Answered

Chosen Option : 2

Q.2



The figure gives experimentally measured B vs. H variation in a ferromagnetic material. The retentivity, co-ercivity and saturation, respectively, of the material are :

- Options
1. 1.5 T, 50 A/m and 1.0 T
 2. 1.0 T, 50 A/m and 1.5 T
 3. 1.5 T, 50 A/m and 1.0 T
 4. 150 A/m, 1.0 T and 1.5 T

Question Type : MCQ

Question ID : 4050361256

Option 1 ID : 4050364652

Option 2 ID : 4050364649

Option 3 ID : 4050364650

Option 4 ID : 4050364651

Status : Answered

Chosen Option : 3

Q.3

Two ideal Carnot engines operate in cascade (all heat given up by one engine is used by the other engine to produce work) between temperatures, T_1 and T_2 . The temperature of the hot reservoir of the first engine is T_1 and the temperature of the cold reservoir of the second engine is T_2 . T is temperature of the sink of first engine which is also the source for the second engine. How is T related to T_1 and T_2 , if both the engines perform equal amount of work ?

Options

1. $T = \sqrt{T_1 T_2}$
2. $T = 0$
3. $T = \frac{T_1 + T_2}{2}$
4. $T = \frac{2T_1 T_2}{T_1 + T_2}$

Question Type : MCQ

Question ID : 4050361250

Option 1 ID : 4050364626

Option 2 ID : 4050364628

Option 3 ID : 4050364625

Option 4 ID : 4050364627

Status : Answered

Chosen Option : 2

Q.4 A particle of mass m and charge q has an initial velocity $\vec{v} = v_0 \hat{j}$. If an electric field $\vec{E} = E_0 \hat{i}$ and magnetic field $\vec{B} = B_0 \hat{i}$ act on the particle, its speed will double after a time :

Options

1. $\frac{\sqrt{3}mv_0}{qE_0}$
2. $\frac{3mv_0}{qE_0}$
3. $\frac{\sqrt{2}mv_0}{qE_0}$
4. $\frac{2mv_0}{qE_0}$

Question Type : MCQ

Question ID : 4050361253

Option 1 ID : 4050364640

Option 2 ID : 4050364639

Option 3 ID : 4050364638

Option 4 ID : 4050364637

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.5 A planar loop of wire rotates in a uniform magnetic field. Initially, at $t = 0$, the plane of the loop is perpendicular to the magnetic field. If it rotates with a period of 10 s about an axis in its plane then the magnitude of induced emf will be maximum and minimum, respectively at :

Options

1. 2.5 s and 7.5 s
2. 5.0 s and 7.5 s
3. 5.0 s and 10.0 s
4. 2.5 s and 5.0 s

Question Type : MCQ

Question ID : 4050361255

Option 1 ID : 4050364648

Option 2 ID : 4050364646

Option 3 ID : 4050364647

Option 4 ID : 4050364645

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.6 In a Young's double slit experiment, the separation between the slits is 0.15 mm. In the experiment, a source of light of wavelength 589 nm is used and the interference pattern is observed on a screen kept 1.5 m away. The separation between the successive bright fringes on the screen is :

- Options
1. 4.9 mm
 2. 6.9 mm
 3. 5.9 mm
 4. 3.9 mm

Question Type : MCQ

Question ID : 4050361260

Option 1 ID : 4050364667

Option 2 ID : 4050364665

Option 3 ID : 4050364666

Option 4 ID : 4050364668

Status : Answered

Chosen Option : 3

Q.7 A mass of 10 kg is suspended by a rope of length 4 m, from the ceiling. A force F is applied horizontally at the mid-point of the rope such that the top half of the rope makes an angle of 45° with the vertical. Then F equals : (Take $g = 10 \text{ ms}^{-2}$ and the rope to be massless)

- Options
1. 90 N
 2. 75 N
 3. 70 N
 4. 100 N

Question Type : MCQ

Question ID : 4050361245

Option 1 ID : 4050364605

Option 2 ID : 4050364608

Option 3 ID : 4050364606

Option 4 ID : 4050364607

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.8 An elevator in a building can carry a maximum of 10 persons, with the average mass of each person being 68 kg. The mass of the elevator itself is 920 kg and it moves with a constant speed of 3 m/s. The frictional force opposing the motion is 6000 N. If the elevator is moving up with its full capacity, the power delivered by the motor to the elevator ($g = 10 \text{ m/s}^2$) must be at least :

- Options
1. 48000 W
 2. 56300 W
 3. 66000 W
 4. 62360 W

Question Type : MCQ

Question ID : 4050361246

Option 1 ID : 4050364611

Option 2 ID : 4050364609

Option 3 ID : 4050364610

Option 4 ID : 4050364612

Status : Answered

Chosen Option : 4

Q.9 A stationary observer receives sound from two identical tuning forks, one of which approaches and the other one recedes with the same speed (much less than the speed of sound). The observer hears 2 beats/sec. The oscillation frequency of each tuning fork is $\nu_0 = 1400 \text{ Hz}$ and the velocity of sound in air is 350 m/s. The speed of each tuning fork is close to :

- Options
1. 1 m/s
 2. $\frac{1}{2}$ m/s
 3. $\frac{1}{8}$ m/s
 4. $\frac{1}{4}$ m/s

Question Type : MCQ

Question ID : 4050361252

Option 1 ID : 4050364633

Option 2 ID : 4050364634

Option 3 ID : 4050364636

Option 4 ID : 4050364635

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.10 A thin lens made of glass (refractive index = 1.5) of focal length $f = 16$ cm is immersed in a liquid of refractive index 1.42. If its focal length in liquid is f_l , then the ratio f_l/f is closest to the integer :

Options 1. 9

2. 1

3. 5

4. 17

Question Type : MCQ

Question ID : 4050361259

Option 1 ID : 4050364663

Option 2 ID : 4050364661

Option 3 ID : 4050364662

Option 4 ID : 4050364664

Status : Answered

Chosen Option : 2

Q.11 A box weighs 196 N on a spring balance at the north pole. Its weight recorded on the same balance if it is shifted to the equator is close to (Take $g = 10 \text{ ms}^{-2}$ at the north pole and the radius of the earth = 6400 km) :

Options 1. 194.66 N

2. 195.66 N

3. 194.32 N

4. 195.32 N

Question Type : MCQ

Question ID : 4050361248

Option 1 ID : 4050364620

Option 2 ID : 4050364618

Option 3 ID : 4050364617

Option 4 ID : 4050364619

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.12 In a building there are 15 bulbs of 45 W, 15 bulbs of 100 W, 15 small fans of 10 W and 2 heaters of 1 kW. The voltage of electric main is 220 V. The minimum fuse capacity (rated value) of the building will be :

- Options
1. 25 A
 2. 15 A
 3. 10 A
 4. 20 A

Question Type : MCQ

Question ID : 4050361254

Option 1 ID : 4050364644

Option 2 ID : 4050364643

Option 3 ID : 4050364641

Option 4 ID : 4050364642

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.13 An electron (of mass m) and a photon have the same energy E in the range of a few eV. The ratio of the de-Broglie wavelength associated with the electron and the wavelength of the photon is (c = speed of light in vacuum)

- Options
1. $\left(\frac{E}{2m}\right)^{1/2}$
 2. $\frac{1}{c} \left(\frac{2E}{m}\right)^{1/2}$
 3. $c (2mE)^{1/2}$
 4. $\frac{1}{c} \left(\frac{E}{2m}\right)^{1/2}$

Question Type : MCQ

Question ID : 4050361261

Option 1 ID : 4050364671

Option 2 ID : 4050364670

Option 3 ID : 4050364669

Option 4 ID : 4050364672

Status : Answered

Chosen Option : 4

Q.14 An emf of 20 V is applied at time $t = 0$ to a circuit containing in series 10 mH inductor and $5\ \Omega$ resistor. The ratio of the currents at time $t = \infty$ and at $t = 40\text{ s}$ is close to :
(Take $e^2 = 7.389$)

- Options
1. 1.06
 2. 1.15
 3. 0.84
 4. 1.46

Question Type : MCQ

Question ID : 4050361257

Option 1 ID : 4050364656

Option 2 ID : 4050364654

Option 3 ID : 4050364655

Option 4 ID : 4050364653

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.15 Mass per unit area of a circular disc of radius a depends on the distance r from its centre as $\sigma(r) = A + Br$. The moment of inertia of the disc about the axis, perpendicular to the plane and passing through its centre is :

- Options
1. $\pi a^4 \left(\frac{A}{4} + \frac{aB}{5} \right)$
 2. $2\pi a^4 \left(\frac{A}{4} + \frac{aB}{5} \right)$
 3. $2\pi a^4 \left(\frac{aA}{4} + \frac{B}{5} \right)$
 4. $2\pi a^4 \left(\frac{A}{4} + \frac{B}{5} \right)$

Question Type : MCQ

Question ID : 4050361247

Option 1 ID : 4050364614

Option 2 ID : 4050364613

Option 3 ID : 4050364616

Option 4 ID : 4050364615

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.16 Under an adiabatic process, the volume of an ideal gas gets doubled. Consequently the mean collision time between the gas molecule changes from τ_1 to τ_2 . If $\frac{C_p}{C_v} = \gamma$ for this gas then a good estimate for $\frac{\tau_2}{\tau_1}$ is given by :

Options

1. $\left(\frac{1}{2}\right)^{\frac{\gamma+1}{2}}$
2. $\frac{1}{2}$
3. $\left(\frac{1}{2}\right)^\gamma$
4. 2

Question Type : MCQ

Question ID : 4050361251

Option 1 ID : 4050364630

Option 2 ID : 4050364632

Option 3 ID : 4050364631

Option 4 ID : 4050364629

Status : Answered

Chosen Option : 4

Q.17 The dimension of $\frac{B^2}{2\mu_0}$, where B is magnetic field and μ_0 is the magnetic permeability of vacuum, is :

Options

1. ML^2T^{-2}
2. $ML^{-1}T^{-2}$
3. MLT^{-2}
4. ML^2T^{-1}

Question Type : MCQ

Question ID : 4050361244

Option 1 ID : 4050364601

Option 2 ID : 4050364604

Option 3 ID : 4050364602

Option 4 ID : 4050364603

Status : Answered

Chosen Option : 4

Q.18 The activity of a radioactive sample falls from 700 s^{-1} to 500 s^{-1} in 30 minutes. Its half life is close to :

- Options
1. 72 min
 2. 62 min
 3. 66 min
 4. 52 min

Question Type : MCQ

Question ID : 4050361262

Option 1 ID : 4050364676

Option 2 ID : 4050364674

Option 3 ID : 4050364675

Option 4 ID : 4050364673

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.19 An ideal fluid flows (laminar flow) through a pipe of non-uniform diameter. The maximum and minimum diameters of the pipes are 6.4 cm and 4.8 cm, respectively. The ratio of the minimum and the maximum velocities of fluid in this pipe is :

- Options
1. $\frac{\sqrt{3}}{2}$
 2. $\frac{3}{4}$
 3. $\frac{81}{256}$
 4. $\frac{9}{16}$

Question Type : MCQ

Question ID : 4050361249

Option 1 ID : 4050364621

Option 2 ID : 4050364622

Option 3 ID : 4050364623

Option 4 ID : 4050364624

Status : Answered

Chosen Option : 4

Q.20 The electric field of a plane electromagnetic wave is given by

$$\vec{E} = E_0 \frac{\hat{i} + \hat{j}}{\sqrt{2}} \cos(kz + \omega t)$$

At $t=0$, a positively charged particle is at the point $(x, y, z) = \left(0, 0, \frac{\pi}{k}\right)$. If its instantaneous velocity at $(t=0)$ is $v_0 \hat{k}$, the force acting on it due to the wave is :

Options

1. parallel to $\frac{\hat{i} + \hat{j}}{\sqrt{2}}$
2. zero
3. antiparallel to $\frac{\hat{i} + \hat{j}}{\sqrt{2}}$
4. parallel to $\hat{k}$

Question Type : MCQ

Question ID : 4050361258

Option 1 ID : 4050364657

Option 2 ID : 4050364659

Option 3 ID : 4050364658

Option 4 ID : 4050364660

Status : Answered

Chosen Option : 4

Q.21 The balancing length for a cell is 560 cm in a potentiometer experiment. When an external resistance of 10Ω is connected in parallel to the cell, the balancing length changes by 60 cm. If the internal resistance of the cell is $\frac{N}{10} \Omega$, where N is an integer then value of N is _____.

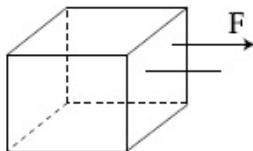
Given 25
Answer :

Question Type : SA

Question ID : 4050361268

Status : Answered

Q.22



Consider a uniform cubical box of side a on a rough floor that is to be moved by applying minimum possible force F at a point b above its centre of mass (see figure). If the coefficient of friction is $\mu = 0.4$, the maximum possible value of $100 \times \frac{b}{a}$ for box not to topple before moving is _____.

Given 4
Answer :

Question Type : SA

Question ID : 4050361267

Status : Answered

Q.23 A 60 pF capacitor is fully charged by a 20 V supply. It is then disconnected from the supply and is connected to another uncharged 60 pF capacitor in parallel. The electrostatic energy that is lost in this process by the time the charge is redistributed between them is (in nJ)

Given 52
Answer :

Question Type : SA

Question ID : 4050361266

Status : Answered

Q.24

The sum of two forces $\vec{P}$ and $\vec{Q}$ is $\vec{R}$ such that $|\vec{R}| = |\vec{P}|$. The angle θ (in degrees) that the resultant of $2\vec{P}$ and $\vec{Q}$ will make with $\vec{Q}$ is, _____.

Given 0
Answer :

Question Type : SA

Question ID : 4050361264

Status : Answered

Q.25 M grams of steam at 100°C is mixed with 200 g of ice at its melting point in a thermally insulated container. If it produces liquid water at 40°C [heat of vaporization of water is 540 cal/g and heat of fusion of ice is 80 cal/g], the value of M is _____.

Given 50
Answer :

Question Type : SA
Question ID : 4050361265
Status : Answered

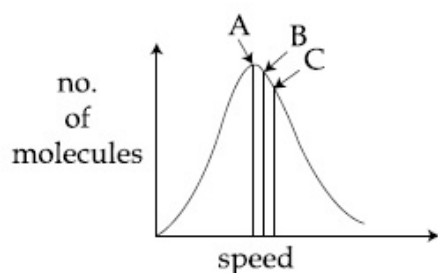
Section : Chemistry

Q.1 Within each pair of elements F & Cl, S & Se, and Li & Na, respectively, the elements that release more energy upon an electron gain are :

- Options
1. Cl, Se and Na
 2. Cl, S and Li
 3. F, S and Li
 4. F, Se and Na

Question Type : MCQ
Question ID : 4050361275
Option 1 ID : 4050364710
Option 2 ID : 4050364713
Option 3 ID : 4050364711
Option 4 ID : 4050364712
Status : Answered
Chosen Option : 3

Q.2 Identify the correct labels of A, B and C in the following graph from the options given below :



Root mean square speed (V_{rms}); most probable speed (V_{mp}); Average speed (V_{av})

- Options
1. A - V_{mp} ; B - V_{av} ; C - V_{rms}
 2. A - V_{mp} ; B - V_{rms} ; C - V_{av}
 3. A - V_{av} ; B - V_{rms} ; C - V_{mp}
 4. A - V_{rms} ; B - V_{mp} ; C - V_{av}

Question Type : MCQ

Question ID : 4050361273

Option 1 ID : 4050364703

Option 2 ID : 4050364705

Option 3 ID : 4050364704

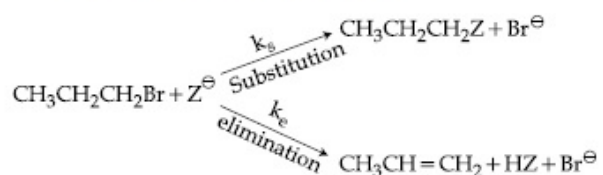
Option 4 ID : 4050364702

Status : Answered

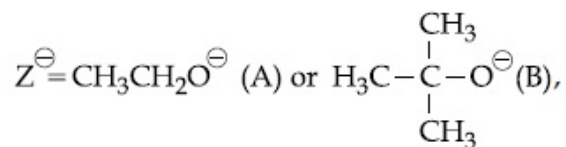
Chosen Option : 1

Q.3

For the following reactions



where,



k_s and k_e , are, respectively, the rate constants for substitution and elimination,

and $\mu = \frac{k_s}{k_e}$, the correct option is

- Options
1. $\mu_A > \mu_B$ and $k_e(\text{A}) > k_e(\text{B})$
 2. $\mu_B > \mu_A$ and $k_e(\text{A}) > k_e(\text{B})$
 3. $\mu_A > \mu_B$ and $k_e(\text{B}) > k_e(\text{A})$
 4. $\mu_B > \mu_A$ and $k_e(\text{B}) > k_e(\text{A})$

Question Type : MCQ

Question ID : 4050361288

Option 1 ID : 4050364762

Option 2 ID : 4050364764

Option 3 ID : 4050364763

Option 4 ID : 4050364765

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.4 The ammonia (NH_3) released on quantitative reaction of 0.6 g urea (NH_2CONH_2) with sodium hydroxide (NaOH) can be neutralized by :

- Options
1. 200 ml of 0.2 N HCl
 2. 200 ml of 0.4 N HCl
 3. 100 ml of 0.1 N HCl
 4. 100 ml of 0.2 N HCl

Question Type : MCQ

Question ID : 4050361272

Option 1 ID : 4050364699

Option 2 ID : 4050364701

Option 3 ID : 4050364698

Option 4 ID : 4050364700

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.5 The redox reaction among the following is :

- Options
1. formation of ozone from atmospheric oxygen in the presence of sunlight
 2. reaction of H_2SO_4 with NaOH
 3. combination of dinitrogen with dioxygen at 2000 K
 4. reaction of $[\text{Co}(\text{H}_2\text{O})_6]\text{Cl}_3$ with AgNO_3

Question Type : MCQ

Question ID : 4050361279

Option 1 ID : 4050364726

Option 2 ID : 4050364727

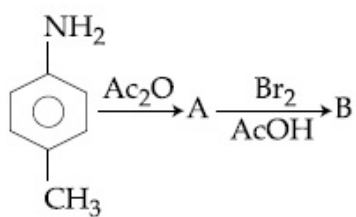
Option 3 ID : 4050364728

Option 4 ID : 4050364729

Status : Answered

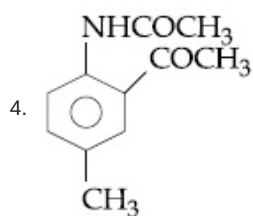
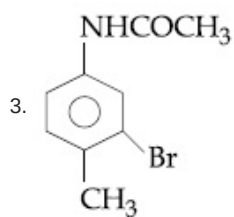
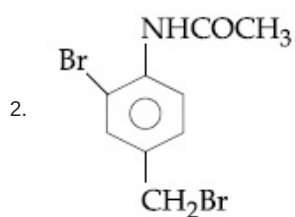
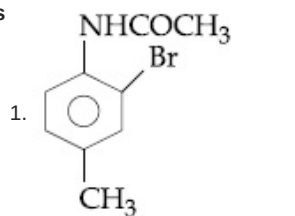
Chosen Option : 3

Q.6 In the following reaction sequence,



the major product B is :

Options



Question Type : MCQ

Question ID : 4050361283

Option 1 ID : 4050364742

Option 2 ID : 4050364745

Option 3 ID : 4050364744

Option 4 ID : 4050364743

Status : Answered

Chosen Option : 1

Q.7 A chromatography column, packed with silica gel as stationary phase, was used to separate a mixture of compounds consisting of (A) benzanilide (B) aniline and (C) acetophenone. When the column is eluted with a mixture of solvents, hexane : ethyl acetate (20 : 80), the sequence of obtained compounds is :

- Options
1. (B), (A) and (C)
 2. (C), (A) and (B)
 3. (B), (C) and (A)
 4. (A), (B) and (C)

Question Type : MCQ

Question ID : 4050361282

Option 1 ID : 4050364741

Option 2 ID : 4050364740

Option 3 ID : 4050364739

Option 4 ID : 4050364738

Status : Answered

Chosen Option : 3

Q.8 Which of the following statements is correct ?

- Options
1. Gluconic acid can form cyclic (acetal/hemiacetal) structure
 2. Gluconic acid is a dicarboxylic acid
 3. Gluconic acid is obtained by oxidation of glucose with HNO_3
 4. Gluconic acid is a partial oxidation product of glucose

Question Type : MCQ

Question ID : 4050361286

Option 1 ID : 4050364754

Option 2 ID : 4050364756

Option 3 ID : 4050364757

Option 4 ID : 4050364755

Status : Answered

Chosen Option : 4

Q.9 The refining method used when the metal and the impurities have low and high melting temperatures, respectively, is :

- Options
1. vapour phase refining
 2. distillation
 3. liquation
 4. zone refining

Question Type : MCQ

Question ID : 4050361276

Option 1 ID : 4050364716

Option 2 ID : 4050364714

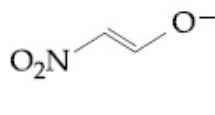
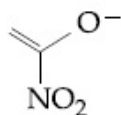
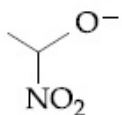
Option 3 ID : 4050364715

Option 4 ID : 4050364717

Status : Answered

Chosen Option : 1

Q.10 The correct order of stability for the following alkoxides is :



- Options
1. (C) > (A) > (B)
 2. (C) > (B) > (A)
 3. (B) > (A) > (C)
 4. (B) > (C) > (A)

Question Type : MCQ

Question ID : 4050361284

Option 1 ID : 4050364746

Option 2 ID : 4050364747

Option 3 ID : 4050364748

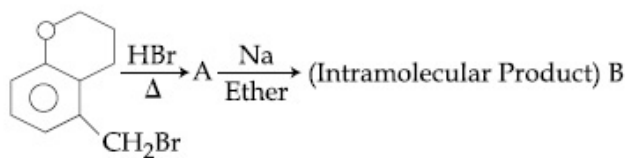
Option 4 ID : 4050364749

Status : Answered

Chosen Option : 2

Q.11

In the following reaction sequence, structures of A and B, respectively will be :



Options

1. &
2. &
3. &
4. &

Question Type : MCQ

Question ID : 4050361285

Option 1 ID : 4050364750

Option 2 ID : 4050364753

Option 3 ID : 4050364752

Option 4 ID : 4050364751

Status : Answered

Chosen Option : 1

Q.12 The number of possible optical isomers for the complexes MA_2B_2 with sp^3 and dsp^2 hybridized metal atom, respectively, is :

Note : A and B are unidentate neutral and unidentate monoanionic ligands, respectively.

- Options
1. 0 and 1
 2. 0 and 0
 3. 2 and 2
 4. 0 and 2

Question Type : MCQ

Question ID : 4050361280

Option 1 ID : 4050364732

Option 2 ID : 4050364733

Option 3 ID : 4050364730

Option 4 ID : 4050364731

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.13 Among statements (a)-(d), the correct ones are :

- (a) Decomposition of hydrogen peroxide gives dioxygen.
- (b) Like hydrogen peroxide, compounds, such as $KClO_3$, $Pb(NO_3)_2$ and $NaNO_3$ when heated liberate dioxygen.
- (c) 2-Ethylanthraquinone is useful for the industrial preparation of hydrogen peroxide.
- (d) Hydrogen peroxide is used for the manufacture of sodium perborate.

- Options
1. (a), (b), (c) and (d)
 2. (a), (b) and (c) only
 3. (a), (c) and (d) only
 4. (a) and (c) only

Question Type : MCQ

Question ID : 4050361277

Option 1 ID : 4050364721

Option 2 ID : 4050364719

Option 3 ID : 4050364720

Option 4 ID : 4050364718

Status : Answered

Chosen Option : 4

Q.14 Among the statements (a)-(d), the incorrect ones are :

- (a) Octahedral Co(III) complexes with strong field ligands have very high magnetic moments
- (b) When $\Delta_0 < P$, the d-electron configuration of Co(III) in an octahedral complex is $t_{eg}^4 e_g^2$
- (c) Wavelength of light absorbed by $[\text{Co(en)}_3]^{3+}$ is lower than that of $[\text{CoF}_6]^{3-}$
- (d) If the Δ_0 for an octahedral complex of Co(III) is $18,000 \text{ cm}^{-1}$, the Δ_t for its tetrahedral complex with the same ligand will be $16,000 \text{ cm}^{-1}$

- Options
- 1. (b) and (c) only
 - 2. (a) and (b) only
 - 3. (a) and (d) only
 - 4. (c) and (d) only

Question Type : MCQ

Question ID : 4050361281

Option 1 ID : 4050364737

Option 2 ID : 4050364734

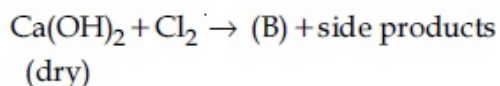
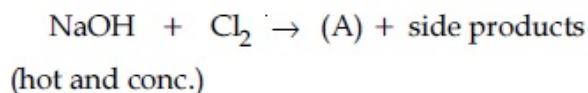
Option 3 ID : 4050364736

Option 4 ID : 4050364735

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.15 In the following reactions, products (A) and (B), respectively, are :



- Options
1. NaClO_3 and $\text{Ca(ClO}_3)_2$
 2. NaOCl and $\text{Ca(ClO}_3)_2$
 3. NaOCl and Ca(OCI)_2
 4. NaClO_3 and Ca(OCI)_2

Question Type : MCQ

Question ID : 4050361278

Option 1 ID : 4050364724

Option 2 ID : 4050364725

Option 3 ID : 4050364722

Option 4 ID : 4050364723

Status : Answered

Chosen Option : 3

Q.16 Two open beakers one containing a solvent and the other containing a mixture of that solvent with a non volatile solute are together sealed in a container. Over time :

- Options
1. the volume of the solution and the solvent does not change
the volume of the solution increases
 2. and the volume of the solvent decreases
the volume of the solution decreases
 3. and the volume of the solvent increases
the volume of the solution does not change
 4. change and the volume of the solvent decreases

Question Type : MCQ

Question ID : 4050361270

Option 1 ID : 4050364693

Option 2 ID : 4050364690

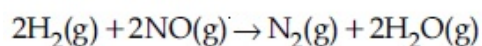
Option 3 ID : 4050364691

Option 4 ID : 4050364692

Status : Answered

Chosen Option : 1

Q.17 For the reaction



the observed rate expression is, rate
= $k_f[\text{NO}]^2[\text{H}_2]$. The rate expression for the
reverse reaction is :

- Options
1. $k_b[\text{N}_2][\text{H}_2\text{O}]^2$
 2. $k_b[\text{N}_2][\text{H}_2\text{O}]$
 3. $k_b[\text{N}_2][\text{H}_2\text{O}]^2/[\text{H}_2]$
 4. $k_b[\text{N}_2][\text{H}_2\text{O}]^2/[\text{NO}]$

Question Type : MCQ

Question ID : 4050361269

Option 1 ID : 4050364687

Option 2 ID : 4050364686

Option 3 ID : 4050364689

Option 4 ID : 4050364688

Status : Answered

Chosen Option : 1

Q.18 The bond order and the magnetic
characteristics of CN^- are :

- Options
1. 3, paramagnetic
 2. $2\frac{1}{2}$, diamagnetic
 3. 3, diamagnetic
 4. $2\frac{1}{2}$, paramagnetic

Question Type : MCQ

Question ID : 4050361274

Option 1 ID : 4050364707

Option 2 ID : 4050364706

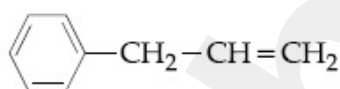
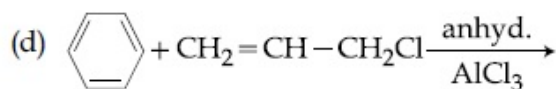
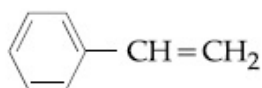
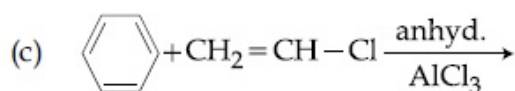
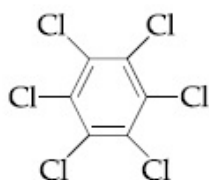
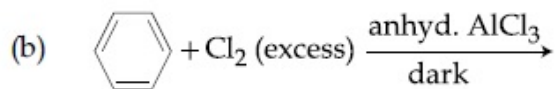
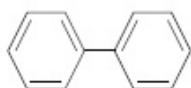
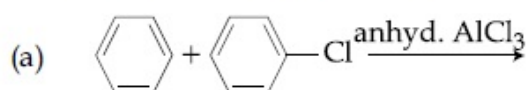
Option 3 ID : 4050364709

Option 4 ID : 4050364708

Status : Answered

Chosen Option : 3

Q.19 Consider the following reactions :



Which of these reactions are possible ?

- Options
1. (a) and (d)
 2. (b) and (d)
 3. (b), (c) and (d)
 4. (a) and (b)

Question Type : MCQ

Question ID : 4050361287

Option 1 ID : 4050364761

Option 2 ID : 4050364759

Option 3 ID : 4050364758

Option 4 ID : 4050364760

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.20 The equation that is incorrect is :

Options

1. $(\Lambda_m^0)_{\text{NaBr}} - (\Lambda_m^0)_{\text{NaI}} = (\Lambda_m^0)_{\text{KBr}} - (\Lambda_m^0)_{\text{NaBr}}$
2. $(\Lambda_m^0)_{\text{NaBr}} - (\Lambda_m^0)_{\text{NaCl}} = (\Lambda_m^0)_{\text{KBr}} - (\Lambda_m^0)_{\text{KCl}}$
3. $(\Lambda_m^0)_{\text{KCl}} - (\Lambda_m^0)_{\text{NaCl}} = (\Lambda_m^0)_{\text{KBr}} - (\Lambda_m^0)_{\text{NaBr}}$
4. $(\Lambda_m^0)_{\text{H}_2\text{O}} = (\Lambda_m^0)_{\text{HCl}} + (\Lambda_m^0)_{\text{NaOH}} - (\Lambda_m^0)_{\text{NaCl}}$

Question Type : MCQ

Question ID : 4050361271

Option 1 ID : 4050364696

Option 2 ID : 4050364694

Option 3 ID : 4050364695

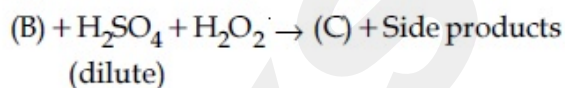
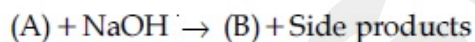
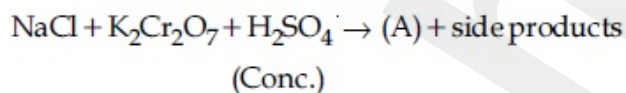
Option 4 ID : 4050364697

Status : Answered

Chosen Option : 1

Q.21

Consider the following reactions :



The sum of the total number of atoms in one molecule each of (A), (B) and (C) is

_____.

Given 15

Answer :

Question Type : SA

Question ID : 4050361292

Status : Answered

Q.22

The number of sp^2 hybridised carbons present in "Aspartame" is _____.

Given 3

Answer :

Question Type : SA

Question ID : 4050361293

Status : Answered

Q.23 The flocculation value of HCl for arsenic sulphide sol. is 30 m mol L^{-1} . If H_2SO_4 is used for the flocculation of arsenic sulphide, the amount, in grams, of H_2SO_4 in 250 ml required for the above purpose is _____.

(molecular mass of $\text{H}_2\text{SO}_4 = 98 \text{ g/mol}$)

Given 60

Answer :

Question Type : SA

Question ID : 4050361291

Status : Answered

Q.24 The standard heat of formation ($\Delta_f H_{298}^0$) of ethane (in kJ/mol), if the heat of combustion of ethane, hydrogen and graphite are -1560 , -393.5 and -286 kJ/mol , respectively is _____.

Given -1560

Answer :

Question Type : SA

Question ID : 4050361289

Status : Answered

Q.25 3 g of acetic acid is added to 250 mL of 0.1 M HCl and the solution made up to 500 mL. To 20 mL of this solution $\frac{1}{2}$ mL of 5 M NaOH is added. The pH of the solution is _____.

[Given : pK_a of acetic acid = 4.75, molar mass of acetic acid = 60 g/mol, $\log 3 = 0.4771$]

Neglect any changes in volume.

Given 6.5

Answer :

Question Type : SA

Question ID : 4050361290

Status : Answered

Section : Mathematics

Q.1 If $3x + 4y = 12\sqrt{2}$ is a tangent to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{9} = 1$ for some $a \in \mathbb{R}$, then the distance between the foci of the ellipse is :

- Options
1. $2\sqrt{5}$
 2. $2\sqrt{7}$
 3. $2\sqrt{2}$
 4. 4

Question Type : MCQ

Question ID : 4050361309

Option 1 ID : 4050364833

Option 2 ID : 4050364832

Option 3 ID : 4050364831

Option 4 ID : 4050364834

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.2 Let A, B, C and D be four non-empty sets. The contrapositive statement of "If $A \subseteq B$ and $B \subseteq D$, then $A \subseteq C$ " is :

- Options
1. If $A \subseteq C$, then $B \subset A$ or $D \subset B$
 2. If $A \not\subseteq C$, then $A \subseteq B$ and $B \subseteq D$
 3. If $A \not\subseteq C$, then $A \not\subseteq B$ and $B \subseteq D$
 4. If $A \not\subseteq C$, then $A \not\subseteq B$ or $B \not\subseteq D$

Question Type : MCQ

Question ID : 4050361313

Option 1 ID : 4050364850

Option 2 ID : 4050364849

Option 3 ID : 4050364847

Option 4 ID : 4050364848

Status : Answered

Chosen Option : 4

Q.3 The coefficient of x^7 in the expression $(1+x)^{10} + x(1+x)^9 + x^2(1+x)^8 + \dots + x^{10}$ is :

- Options
1. 420
 2. 330
 3. 210
 4. 120

Question Type : MCQ

Question ID : 4050361298

Option 1 ID : 4050364790

Option 2 ID : 4050364789

Option 3 ID : 4050364788

Option 4 ID : 4050364787

Status : Answered

Chosen Option : 2

Q.4 In a workshop, there are five machines and the probability of any one of them to be out of service on a day is $\frac{1}{4}$. If the probability that at most two machines will be out of service on the same day is $\left(\frac{3}{4}\right)^3 k$, then k is equal to :

- Options
1. $\frac{17}{2}$
 2. 4
 3. $\frac{17}{4}$
 4. $\frac{17}{8}$

Question Type : MCQ

Question ID : 4050361311

Option 1 ID : 4050364840

Option 2 ID : 4050364841

Option 3 ID : 4050364839

Option 4 ID : 4050364842

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.5 The locus of the mid-points of the perpendiculars drawn from points on the line, $x = 2y$ to the line $x = y$ is :

- Options
1. $2x - 3y = 0$
 2. $3x - 2y = 0$
 3. $5x - 7y = 0$
 4. $7x - 5y = 0$

Question Type : MCQ

Question ID : 4050361308

Option 1 ID : 4050364828

Option 2 ID : 4050364827

Option 3 ID : 4050364830

Option 4 ID : 4050364829

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.6 The value of α for which

$$4\alpha \int_{-1}^2 e^{-\alpha|x|} dx = 5, \text{ is :}$$

- Options
1. $\log_e 2$
 2. $\log_e \sqrt{2}$
 3. $\log_e \left(\frac{4}{3}\right)$
 4. $\log_e \left(\frac{3}{2}\right)$

Question Type : MCQ

Question ID : 4050361304

Option 1 ID : 4050364812

Option 2 ID : 4050364813

Option 3 ID : 4050364811

Option 4 ID : 4050364814

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.7 If the sum of the first 40 terms of the series,
 $3 + 4 + 8 + 9 + 13 + 14 + 18 + 19 + \dots$ is
 $(102)m$, then m is equal to :

- Options
1. 10
 2. 25
 3. 5
 4. 20

Question Type : MCQ

Question ID : 4050361300

Option 1 ID : 4050364797

Option 2 ID : 4050364795

Option 3 ID : 4050364798

Option 4 ID : 4050364796

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.8 If $\frac{3 + i \sin \theta}{4 - i \cos \theta}$, $\theta \in [0, 2\pi]$, is a real number,
 then an argument of $\sin \theta + i \cos \theta$ is :

- Options
1. $\pi - \tan^{-1}\left(\frac{4}{3}\right)$
 2. $-\tan^{-1}\left(\frac{3}{4}\right)$
 3. $\pi - \tan^{-1}\left(\frac{3}{4}\right)$
 4. $\tan^{-1}\left(\frac{4}{3}\right)$

Question Type : MCQ

Question ID : 4050361295

Option 1 ID : 4050364777

Option 2 ID : 4050364775

Option 3 ID : 4050364776

Option 4 ID : 4050364778

Status : Answered

Chosen Option : 1

Q.9 Let $A = [a_{ij}]$ and $B = [b_{ij}]$ be two 3×3 real matrices such that $b_{ij} = (3)^{(i+j-2)}a_{ji}$, where $i, j = 1, 2, 3$. If the determinant of B is 81, then the determinant of A is :

- Options
1. $1/9$
 2. $1/81$
 3. $1/3$
 4. 3

Question Type : MCQ

Question ID : 4050361296

Option 1 ID : 4050364780

Option 2 ID : 4050364781

Option 3 ID : 4050364779

Option 4 ID : 4050364782

Status : Answered

Chosen Option : 1

Q.10 Let $f(x)$ be a polynomial of degree 5 such that $x = \pm 1$ are its critical points. If $\lim_{x \rightarrow 0} \left(2 + \frac{f(x)}{x^3} \right) = 4$, then which one of the following is not true ?

- Options
1. $f(1) - 4f(-1) = 4$.
 2. $x = 1$ is a point of maxima and $x = -1$ is a point of minimum of f .
 3. f is an odd function.
 4. $x = 1$ is a point of minima and $x = -1$ is a point of maxima of f .

Question Type : MCQ

Question ID : 4050361303

Option 1 ID : 4050364809

Option 2 ID : 4050364808

Option 3 ID : 4050364807

Option 4 ID : 4050364810

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.11 The number of ordered pairs (r, k) for which $6 \cdot {}^{35}C_r = (k^2 - 3) \cdot {}^{36}C_{r+1}$, where k is an integer, is :

- Options
1. 4
 2. 6
 3. 2
 4. 3

Question Type : MCQ

Question ID : 4050361297

Option 1 ID : 4050364784

Option 2 ID : 4050364783

Option 3 ID : 4050364786

Option 4 ID : 4050364785

Status : Answered

Chosen Option : 3

Q.12 Let $a_1, a_2, a_3, \dots$ be a G. P. such that $a_1 < 0$,

$a_1 + a_2 = 4$ and $a_3 + a_4 = 16$. If $\sum_{i=1}^9 a_i = 4\lambda$,

then λ is equal to :

- Options
1. 171
 2. $\frac{511}{3}$
 3. -171
 4. -513

Question Type : MCQ

Question ID : 4050361299

Option 1 ID : 4050364794

Option 2 ID : 4050364792

Option 3 ID : 4050364793

Option 4 ID : 4050364791

Status : Answered

Chosen Option : 3

Q.13

Let $\vec{a}$, $\vec{b}$ and $\vec{c}$ be three unit vectors such

that $\vec{a} + \vec{b} + \vec{c} = \vec{0}$. If

$$\lambda = \vec{a} \cdot \vec{b} + \vec{b} \cdot \vec{c} + \vec{c} \cdot \vec{a} \quad \text{and}$$

$$\vec{d} = \vec{a} \times \vec{b} + \vec{b} \times \vec{c} + \vec{c} \times \vec{a}, \quad \text{then}$$

the ordered pair, $(\lambda, \vec{d})$ is equal to :

Options

1. $\left(\frac{3}{2}, 3\vec{a} \times \vec{c}\right)$

2. $\left(-\frac{3}{2}, 3\vec{c} \times \vec{b}\right)$

3. $\left(-\frac{3}{2}, 3\vec{a} \times \vec{b}\right)$

4. $\left(\frac{3}{2}, 3\vec{b} \times \vec{c}\right)$

Question Type : MCQ

Question ID : 4050361310

Option 1 ID : 4050364836

Option 2 ID : 4050364837

Option 3 ID : 4050364835

Option 4 ID : 4050364838

Status : Answered

Chosen Option : 3

Q.14

Let $y=y(x)$ be the solution curve of the

differential equation, $(y^2 - x)\frac{dy}{dx} = 1$,

satisfying $y(0) = 1$. This curve intersects the x -axis at a point whose abscissa is :

Options

1. $2+e$

2. 2

3. $2-e$

4. $-e$

Question Type : MCQ

Question ID : 4050361306

Option 1 ID : 4050364820

Option 2 ID : 4050364819

Option 3 ID : 4050364821

Option 4 ID : 4050364822

Status : Answered

Chosen Option : 2

Q.15 If θ_1 and θ_2 be respectively the smallest and the largest values of θ in $(0, 2\pi) - \{\pi\}$ which satisfy the equation,

$$2\cot^2\theta - \frac{5}{\sin\theta} + 4 = 0, \quad \text{then}$$

$$\int_{\theta_1}^{\theta_2} \cos^2 3\theta \, d\theta \text{ is equal to :}$$

Options

1. $\frac{2\pi}{3}$
2. $\frac{\pi}{3}$
3. $\frac{\pi}{3} + \frac{1}{6}$
4. $\frac{\pi}{9}$

Question Type : MCQ

Question ID : 4050361312

Option 1 ID : 4050364846

Option 2 ID : 4050364845

Option 3 ID : 4050364843

Option 4 ID : 4050364844

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.16 Let α and β be the roots of the equation $x^2 - x - 1 = 0$. If $p_k = (\alpha)^k + (\beta)^k$, $k \geq 1$, then which one of the following statements is not true ?

- Options
1. $(p_1 + p_2 + p_3 + p_4 + p_5) = 26$
 2. $p_5 = 11$
 3. $p_5 = p_2 \cdot p_3$
 4. $p_3 = p_5 - p_4$

Question Type : MCQ

Question ID : 4050361294

Option 1 ID : 4050364773

Option 2 ID : 4050364771

Option 3 ID : 4050364774

Option 4 ID : 4050364772

Status : Answered

Chosen Option : 2

Q.17 The area (in sq. units) of the region $\{(x, y) \in \mathbb{R}^2 | 4x^2 \leq y \leq 8x + 12\}$ is :

Options

1. $\frac{125}{3}$
2. $\frac{128}{3}$
3. $\frac{124}{3}$
4. $\frac{127}{3}$

Question Type : MCQ

Question ID : 4050361305

Option 1 ID : 4050364816

Option 2 ID : 4050364818

Option 3 ID : 4050364815

Option 4 ID : 4050364817

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.18 The value of c in the Lagrange's mean value theorem for the function $f(x) = x^3 - 4x^2 + 8x + 11$, when $x \in [0, 1]$ is :

Options

1. $\frac{4 - \sqrt{7}}{3}$
2. $\frac{2}{3}$
3. $\frac{\sqrt{7} - 2}{3}$
4. $\frac{4 - \sqrt{5}}{3}$

Question Type : MCQ

Question ID : 4050361302

Option 1 ID : 4050364803

Option 2 ID : 4050364806

Option 3 ID : 4050364804

Option 4 ID : 4050364805

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.19 Let $y=y(x)$ be a function of x satisfying $y\sqrt{1-x^2} = k - x\sqrt{1-y^2}$ where k is a constant and $y\left(\frac{1}{2}\right) = -\frac{1}{4}$. Then $\frac{dy}{dx}$ at $x = \frac{1}{2}$, is equal to :

Options

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

Question Type : MCQ

Question ID : 4050361301

Option 1 ID : 4050364801

Option 2 ID : 4050364802

Option 3 ID : 4050364800

Option 4 ID : 4050364799

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.20 Let the tangents drawn from the origin to the circle, $x^2 + y^2 - 8x - 4y + 16 = 0$ touch it at the points A and B. The $(AB)^2$ is equal to :

Options

1. $\frac{32}{5}$
2. $\frac{64}{5}$
3. $\frac{52}{5}$
4. $\frac{56}{5}$

Question Type : MCQ

Question ID : 4050361307

Option 1 ID : 4050364823

Option 2 ID : 4050364826

Option 3 ID : 4050364824

Option 4 ID : 4050364825

Status : Not Attempted and
Marked For Review

Chosen Option : --

- Q.21 If the system of linear equations,
$$x + y + z = 6$$
$$x + 2y + 3z = 10$$
$$3x + 2y + \lambda z = \mu$$
has more than two solutions, then $\mu - \lambda^2$ is equal to _____.

Given 13
Answer :

Question Type : SA
Question ID : 4050361315
Status : Answered

- Q.22 If the foot of the perpendicular drawn from the point $(1, 0, 3)$ on a line passing through $(\alpha, 7, 1)$ is $\left(\frac{5}{3}, \frac{7}{3}, \frac{17}{3}\right)$, then α is equal to _____.

Given 5
Answer :

Question Type : SA
Question ID : 4050361317
Status : Answered

- Q.23 If the function f defined on $\left(-\frac{1}{3}, \frac{1}{3}\right)$ by
$$f(x) = \begin{cases} \frac{1}{x} \log_e \left(\frac{1+3x}{1-2x} \right), & \text{when } x \neq 0 \\ k, & \text{when } x = 0 \end{cases}$$
is continuous, then k is equal to _____.

Given 0
Answer :

Question Type : SA
Question ID : 4050361316
Status : Answered

- Q.24 If the mean and variance of eight numbers 3, 7, 9, 12, 13, 20, x and y be 10 and 25 respectively, then $x \cdot y$ is equal to _____.

Given 54
Answer :

Question Type : SA
Question ID : 4050361318
Status : Answered

Q.25 Let $X = \{n \in \mathbb{N} : 1 \leq n \leq 50\}$. If $A = \{n \in X : n \text{ is a multiple of } 2\}$ and $B = \{n \in X : n \text{ is a multiple of } 7\}$, then the number of elements in the smallest subset of X containing both A and B is _____.

Given 7
Answer :

Question Type : SA
Question ID : 4050361314
Status : Answered