

GUJCET 2024 Solved Paper

Mathematics

Question1

The Integrating Factor of the differential equation $(\tan^{-1}y - x)dy = (1 + y^2) dx$ is _____ .

Options:

A. $\frac{1}{1+y^2}$

B. $\tan^{-1}y$

C. $e^{\frac{1}{1+y^2}}$

D. $e^{\tan^{-1}y}$

Answer: D

Question2

The angle ' θ ' between the vectors $\vec{a} = \hat{i} - \hat{j} + \hat{k}$ and $\vec{b} = \hat{i} + \hat{j} - \hat{k}$ is _____

Options:

A. $\cos^{-1}\left(-\frac{1}{3}\right)$

B. $\cos^{-1}\frac{1}{3}$



C. $\sin^{-1} \frac{1}{3}$

D. $\sin^{-1} -\frac{1}{3}$

Answer: A

Question3

The area of a parallelogram, whose adjacent sides are given by the $\vec{a} = 2\hat{i} + 3\hat{j} + 4\hat{k}$ and $\vec{b} = -\hat{j} - 2\hat{k}$, is _____ .

Options:

A. $\sqrt{6}$

B. $2\sqrt{6}$

C. 24

D. $2\sqrt{3}$

Answer: B

Question4

The value of $\hat{j} \cdot \hat{i} \times \hat{k} + \hat{i} \cdot \hat{j} \times \hat{j} + \hat{k} \cdot \hat{j} \times \hat{i} + \hat{i} \cdot \hat{k} \times \hat{j}$ is _____

Options:

A. -2



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

Answer: C

Question5

The angle, between the pair of lines, given by $\frac{x-3}{1} = \frac{y-2}{2} = \frac{z+4}{2}$. and $\frac{x-5}{3} = \frac{y+2}{2} = \frac{z}{6}$ is _____ .

Options:

- A. $\cos^{-1} \frac{19}{21}$
- B. $\cos^{-1} \frac{\sqrt{19}}{21}$
- C. $\sin^{-1} \frac{19}{21}$
- D. $\cos^{-1} -\frac{19}{21}$

Answer: A

Question6



If the lines $\frac{x-1}{-3} = \frac{y-2}{2k} = \frac{z-3}{2}$ and $\frac{x-1}{3k} = \frac{y-1}{1} = \frac{6-z}{5}$ are perpendicular, then the value of k is _____ .

Options:

A. $-\frac{7}{10}$

B. $\frac{7}{10}$

C. $\frac{10}{7}$

D. $-\frac{10}{7}$

Answer: D

Question7

The Cartesian equation of the line which passes through the point (1, -3, 5) and parallel to the line given by $\frac{x+3}{3} = \frac{y-4}{5} = \frac{z+8}{6}$ is :

Options:

A. $\frac{x-1}{3} = \frac{y+3}{5} = \frac{z-5}{6}$

B. $\frac{x+3}{1} = \frac{y-4}{-3} = \frac{z+8}{5}$

C. $\frac{x+3}{-3} = \frac{y-4}{4} = \frac{z+8}{-8}$

D. $\frac{x-1}{-3} = \frac{y+3}{4} = \frac{z-5}{-8}$

Answer: A



Question8

The coordinates of the corner points of the bounded feasible region are $(0, 6)$, $(3, 3)$, $(9, 9)$, $(0, 12)$. The maximum of the objective function $z = 6x + 12y$ is :

Options:

- A. 152
- B. 162
- C. 144
- D. 166

Answer: B

Question9

Minimise objective function $z = 7x + 3y$ subject to the constraints :
 $x + y \leq 5$, $x + y \geq 10$, $x \geq 0$, $y \geq 0$ is :

Options:

- A. 15
- B. 35
- C. 70
- D. No feasible region and hence no feasible solution

Answer: D



Question10

If, for independent events A and B, $P(A) = p$, $P(B) = \frac{1}{2}$ and $P(A \cup B) = \frac{3}{5}$ are given then, the value of p is _____ .

Options:

- A. $\frac{1}{10}$
- B. $\frac{1}{5}$
- C. $\frac{3}{5}$
- D. $\frac{1}{3}$

Answer: B

Question11

The probability of obtaining an even prime number on each die, when a pair of dice is rolled is :

Options:

- A. $\frac{1}{3}$
- B. 0
- C. $\frac{1}{12}$
- D. $\frac{1}{36}$



Answer: D

Question12

If A and B are two events such that $P(B) \neq 0$ and $P(A | B) = 1$, then _____.

Options:

- A. $B \subset A$
- B. $A \subset B$
- C. $A \neq \varnothing$
- D. $B \neq \varnothing$

Answer: A

Question13

The relation $R = \{(a, a), (b, b), (c, c), (a, c)\}$, is defined on the set $\{a, b, c\}$, is _____.

Options:

- A. Reflexive and transitive but not symmetric
- B. Reflexive and symmetric but not transitive
- C. Transitive and symmetric but not reflexive
- D. An equivalence relation

Answer: A

Question14

$f : Z \rightarrow Z, f(x) = x^3 + 2$ is defined then function f is _____

Options:

- A. One - one but not onto
- B. One - one and onto
- C. Not one - one but onto
- D. Neither one - one nor onto

Answer: A

Question15

If $y = \tan^{-1}x$ then _____ .

Options:

- A. $0 \leq y \leq \pi$
- B. $0 < y < \pi$
- C. $-\pi/2 < y < \pi/2$
- D. $-\pi/2 \leq y \leq \pi/2$

Answer: C



Question16

The value of $\tan^{-1}(-1) + \sec^{-1}(-2) + \sin^{-1}\left(\frac{1}{\sqrt{2}}\right)$ is _____ .

Options:

- A. $-\pi/6$
- B. $-\pi/3$
- C. π
- D. $2\pi/3$

Answer: D

Question17

$\sin^{-1}\left(\sin \frac{23\pi}{6}\right) =$ _____

Options:

- A. $-\pi/6$
- B. $\pi/6$
- C. $23\pi/6$
- D. $-5\pi/6$

Answer: A



Question18

If A is square matrix such that $A^2 = A$, then $(I - A)^3 - (I + A)^2 =$

Options:

- A. $2(I - A)$
- B. $I - A$
- C. I
- D. 0
- E. None of above

Answer: E

Question19

If $A = \begin{bmatrix} \sin \alpha & -\cos \alpha \\ \cos \alpha & \sin \alpha \end{bmatrix}$ and $A + A' = I$, then the value of $\cos \alpha$ is _____

Options:

- A. $1/2$
- B. $\sqrt{3}/2$
- C. -1
- D. 0

Answer: B



Question20

If $A = \begin{bmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$ then $I + A^2 = \underline{\hspace{2cm}}$.

Options:

- A. 0
- B. $I + A$
- C. A
- D. $2I$

Answer: D

Question21

If area of $\triangle PQR$ is 3 sq. units with vertices $P(k, 1)$, $Q(2, 4)$ and $R(1, 1)$. Then value of k is $\underline{\hspace{2cm}}$.

Options:

- A. -3, 1
- B. 0, 2
- C. -1, 3
- D. 1, 3



Answer: C

Question22

If $\begin{pmatrix} 2017 & 2018 \\ 2019 & 2020 \end{pmatrix} + \begin{pmatrix} 2021 & 2022 \\ 2023 & 2024 \end{pmatrix} = 2k$, then $k^3 =$

Options:

A. -8

B. 8

C. 0

D. -64

Answer: A

Question23

If $A = \begin{pmatrix} 2 & -4 \\ -3 & 6 \end{pmatrix}$ then $A^{-1} = \underline{\hspace{2cm}}$.

Options:

A. $\frac{1}{24} \begin{pmatrix} -2 & 4 \\ 3 & -6 \end{pmatrix}$



B. $\frac{1}{24} \begin{matrix} 6 & 4 \\ 3 & 2 \end{matrix}$

C. $\frac{1}{24} \begin{matrix} -6 & 4 \\ 3 & -2 \end{matrix}$

D. Does not exist

Answer: D

Question24

If function f is continuous at point $x = \pi/2$ and $f(x) = \begin{cases} \frac{2k \cos x}{\pi - 2x}, & x \neq \pi/2 \\ 2024, & x = \pi/2 \end{cases}$;
then the value of k is _____ .

Options:

A. 1012

B. 506

C. 2024

D. 4048

Answer: C

Question25



$$\frac{d}{dx}(e^{x \log x} + e^3) = \underline{\hspace{2cm}} .$$

Options:

- A. $(1 + \log x)$
- B. $x^x(1 + \log x)$
- C. $x^x \log x$
- D. $x^x(1 + \log x) + e^3$

Answer: B

Question26

If $x = a(1 - \cos \theta)$, $y = a(\theta + \sin \theta)$ then $\frac{dy}{dx} = \underline{\hspace{2cm}} .$

Options:

- A. $\cot \theta/2$
- B. $\tan \theta/2$
- C. $-\cot \theta/2$
- D. $-\tan \theta/2$

Answer: A

Question27

If $\frac{d^2y}{dx^2} - my = 0$ satisfies for $y = 7\sin x + 5\cos x$ then the value of m is _____

Options:

- A. 1
- B. 0
- C. -1
- D. -2

Answer: C

Question28

The rate of change of the surface area of a sphere with respect to its radius r , when $r = 6\text{cm}$, is _____ cm^2/s .

Options:

- A. 24π
- B. 12π
- C. 48π
- D. 144π

Answer: C

Question29



For function $f(x) = \sin 3x$; $x \in [0, \frac{\pi}{2}]$, f is _____ .

Options:

- A. Increasing in $[0, \frac{\pi}{2}]$
- B. Decreasing in $[0, \frac{\pi}{2}]$
- C. Decreasing in $[0, \pi/6)$ and increasing in $(\pi/6, \pi/2)$
- D. Increasing in $[0, \pi/6)$ and decreasing in $(\pi/6, \pi/2)$

Answer: D

Question30

The absolute maximum value of the function $f(x) = \sin x + \cos x$, $x \in [0, \pi]$ is _____ .

Options:

- A. 0
- B. $\frac{1}{\sqrt{2}}$
- C. 1
- D. $\sqrt{2}$

Answer: D



Question31

$$\int \frac{e^{2x}-1}{e^{2x}+1} dx = +C$$

Options:

- A. $\log(e^{2x}-1) + x$
- B. $\log(e^{2x}+1) - x$
- C. $\log(e^{2x}+1) + x$
- D. $\log(e^{2x}-1) - x$

Answer: B

Question32

$$\int \frac{1}{4x-x^2} dx = C$$

Options:

- A. $\sin^{-1} \frac{x-2}{2}$
- B. $\frac{1}{2} \tan^{-1} \frac{x-2}{2}$
- C. $\log(x-2) + \sqrt{4x-x^2}$
- D. $\frac{1}{4} \log \frac{x}{x-4}$

Answer: A



Question33

$$\int e^x \left(\frac{1 + \sin x}{1 + \cos x} \right) dx = \underline{\hspace{2cm}} + C$$

Options:

A. $e^x \tan \frac{x}{2}$

B. $e^x \tan x$

C. $e^x \cot \frac{x}{2}$

D. $e^x \cot x$

Answer: A

Question34

$$\int_{-\pi/2}^{\pi/2} (x^5 - x^3 \cos x + \sin^3 x - 3) dx =$$

Options:

A. 3π

B. $-\pi$

C. -3π

D. 0

Answer: C



Question35

$$\int_0^1 x e^x dx = \underline{\hspace{2cm}}$$

Options:

- A. 1
- B. 0
- C. e
- D. -1

Answer: A

Question36

Area lying in the first quadrant and bounded by ellipse $9x^2 + 16y^2 = 1$ is _____

Options:

- A. $\frac{\pi}{12}$
- B. $\frac{\pi}{48}$
- C. 12π
- D. 3π

Answer: B



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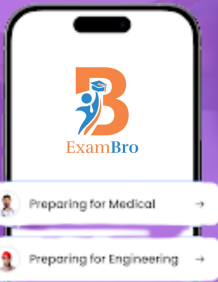


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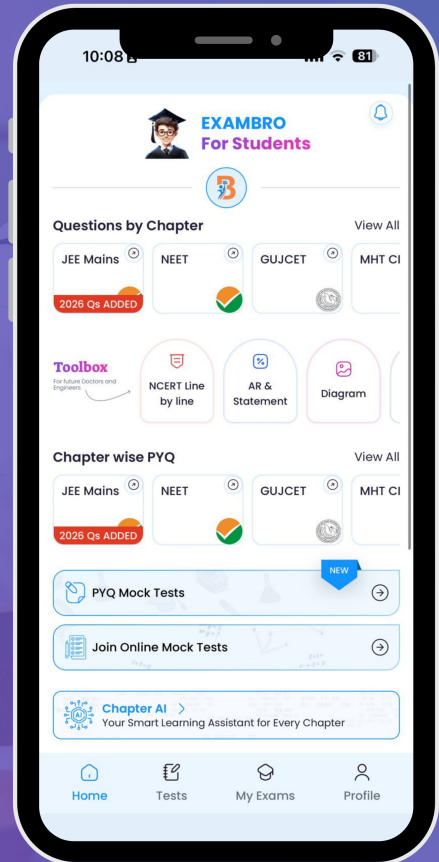
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Question37

Area of the region bounded by the curve $x^2 = 4y$, X-axis and the line $x = 3$ is _____ .

Options:

- A. $\frac{9}{4}$
- B. 2
- C. $\frac{9}{3}$
- D. $\frac{9}{2}$

Answer: A

Question38

The area bounded by the curve $y = \cos x$ between $x = -\pi/2$ and $x = \pi/2$ is _____

Options:

- A. 1
- B. 4
- C. 0
- D. 2

Answer: D



Question39

The order and the degree of the differential equation

$$\sqrt{\frac{d^2y}{dx^2}} = {}^3\sqrt{\left(\frac{dy}{dx}\right)^4 + 2} \text{ is respectively } \underline{\hspace{1cm}} \text{ and } \underline{\hspace{1cm}} .$$

Options:

- A. 3,2
- B. 2,3
- C. 2,8
- D. 1,8

Answer: B

Question40

The general solution of the differential equation $\frac{xdy - ydx}{y} = 0$ is _____ .

Options:

- A. $x = cy^2$
- B. $xy = c$
- C. $y = cx$
- D. $y = cx^2$

Answer: C

Physics

Question1

A short bar magnet placed with its axis at 30° with a uniform external magnetic field of 0.5 T experiences a torque of magnitude equal to $4.5 \times 10^{-2} \text{ J}$. Then the magnitude of magnetic moment of the magnet will be _____

Options:

- A. $18 \times 10^{-2} \text{ J T}^{-1}$
- B. $36 \times 10^{-2} \text{ J T}^{-1}$
- C. $1.8 \times 10^2 \text{ J T}^{-1}$
- D. $3.6 \times 10^2 \text{ J T}^{-1}$

Answer: A

Question2

A square loop of side 10 cm and resistance 0.5Ω is placed vertically in the east-west plane. A uniform magnetic field of 0.10 T is setup across the plane in the north-east direction. The magnetic field is decreased to zero in 0.70 S at a steady rate. Then the magnitude of induced current during this time interval will be _____



Options:

A. $8.0 \times 10^{-3} \text{ A}$

B. $4.0 \times 10^{-3} \text{ A}$

C. $6.0 \times 10^{-3} \text{ A}$

D. $2.0 \times 10^{-3} \text{ A}$

Answer: D

Question3

A coil has N turns and current passes through it is I ampere then we obtain L Henry of self inductance. Now if current change to 5 I then new self inductance will be ____ H.

Options:

A. L

B. $1/5L$

C. $25 L$

D. $5 L$

Answer: A

Question4



A pure inductor of 50.0 mH is connected to a source of 220 V . Then rms current in the circuit will be ____ . The frequency of the source is 50 Hz .

Options:

A. 21 A

B. 7 A

C. 14 A

D. 28 A

Answer: C

Question5

In LCR series a.c. circuit at resonance the value of power factor will be ____

Options:

A. ∞

B. 1

C. -1

D. 0

Answer: B

Question6



If the primary coil of a transformer has 100 turns and the secondary has 200 turns. Then for a input of 220 V at 10 A find output current, in step up transformer.

Options:

- A. 5.0 A
- B. 50.0 A
- C. 0.5 A
- D. 0.05 A

Answer: A

Question7

For obtaining wattless current _____ is connected with a.c. supply.

Options:

- A. Only R
- B. R – L in series
- C. Only L
- D. R – C in series

Answer: C

Question8

As indicated below which one is the equation of Ampere-Maxwell law?

Options:

A. $\oint \vec{E} \cdot d\vec{l} = \mu_0 i_c + \mu_0 \epsilon_0 \frac{d\phi_E}{dt}$

B. $\oint \vec{B} \cdot d\vec{l} = \mu_0 i_c + \mu_0 \epsilon_0 \frac{d\phi_E}{dt}$

C. $\oint \vec{B} \cdot d\vec{A} = \mu_0 i_c + \mu_0 \epsilon_0 \frac{d\phi_E}{dt}$

D. $\oint \vec{B} \cdot d\vec{l} = \mu_0 i_c + \mu_0 \epsilon_0 \frac{d\phi_B}{dt}$

Answer: B

Question9

Cellular phones use radio waves to transmit voice communication in the _____ band.

Options:

A. LF

B. HF

C. VHF

D. UHF

Answer: D

Question10

For plane mirror focal length is _____ m.

Options:

- A. -1
- B. ∞
- C. 1
- D. 0

Answer: A

Question11

A rays coming from an object which is situated at ∞ spherical glass surface ($n = 1.5$). Then the distance of image will be _____ R is the radius of curvature of a spherical glass.

Options:

- A. 1.5R
- B. R
- C. 3R
- D. 2R

Answer: A



Question12

For a thin prism, the angle of prism is 4° having refractive index 1.6 , then the angle of minimum deviation will be _____

Options:

A. 0.4°

B. 2.0°

C. 2.4°

D. 1.6°

Answer: C

Question13

Consider a refracting telescope whose objective has a focal length of 1 m and the eyepiece a focal length of 1 cm , then magnifying power of this telescope will be _____ .

Options:

A. 100

B. 50

C. 200

D. 1

Answer: A



Question14

The phase difference between any two particle of a given wave front is _____ rad.

Options:

A. $\pi/4$

B. 0

C. $\pi/2$

D. π

Answer: B

Question15

In a Young's double-slit experiment, the slits are separated by 0.28 mm and the screen is placed 1.4 m away. The distance between the central bright fringe and the fourth bright fringe is measured to be 1.2 cm . Then the wavelength of light used in the experiment is _____ .

Options:

A. 500 nm

B. 660 nm

C. 600 nm

D. 550 nm

Answer: C



Question16

The refractive index of glass is 1.6 then the speed of light in glass will be _____ speed of light in vacuum is $3.0 \times 10^8 \text{ms}^{-1}$.

Options:

- A. $1.48 \times 10^8 \text{ms}^{-1}$
- B. $1.66 \times 10^8 \text{ms}^{-1}$
- C. $1.22 \times 10^8 \text{ms}^{-1}$
- D. $1.88 \times 10^8 \text{ms}^{-1}$

Answer: D

Question17

Js is the unit of _____ physical quantity.

Options:

- A. Angular momentum
- B. Work function
- C. Moment of Inertia
- D. Rydberg constant

Answer: A



Question18

To emit an electron from the metal, minimum electric field required is ____ .

Options:

- A. 10^4V m^{-1}
- B. 10^6V m^{-1}
- C. 10^5V m^{-1}
- D. 10^8V m^{-1}

Answer: D

Question19

A ball of mass 0.12 kg moving with a speed of 20ms^{-1} has de-Broglie wavelength-

____ ($h = 6.63 \times 10^{-34} \text{J s}$)

Options:

- A. $4.76 \times 10^{-34} \text{m}$
- B. $2.76 \times 10^{-34} \text{m}$
- C. $3.76 \times 10^{-34} \text{m}$
- D. $1.76 \times 10^{-34} \text{m}$

Answer: B



Question20

The ratio of radius for second and third orbit of hydrogen atom is ____ .

Options:

- A. 4 : 9
- B. 3 : 2
- C. 9 : 4
- D. 2 : 3

Answer: A

Question21

In Geiger-Marsden scattering experiment the thickness of a thin foil of gold is ____ m.

Options:

- A. 6.2×10^{-7}
- B. 5.5×10^{-7}
- C. 2.1×10^{-7}
- D. 4.2×10^{-7}

Answer: C



Question22

The ground state energy of hydrogen atom is -13.6 eV , then the potential energy of the electron in this state will be _____ .

Options:

- A. -6.8 eV
- B. -27.2 eV
- C. 13.6 eV
- D. 27.2 eV

Answer: B

Question23

Some atomic species of the same element differing in mass are called _____

Options:

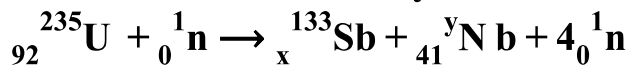
- A. Isotope
- B. Isotone
- C. Isomar
- D. Isobar

Answer: A



Question24

Find the value of x and y from below given nuclear reaction



Options:

- A. (133, 41)
- B. (51, 95)
- C. (92, 1)
- D. (51, 99)

Answer: D

Question25

The ratio of the nuclear radii of the ${}_1^1\text{H}$ and ${}_{13}^{27}\text{Al}$ is _____

Options:

- A. 3 : 5
- B. 1 : 2
- C. 2 : 1
- D. 1 : 3

Answer: D



Question26

Which impurity is used to convert pure semiconductor into p-type semiconductor?

Options:

- A. Phosphorous
- B. Antimony
- C. Indium
- D. Arsenic

Answer: C

Question27

The energy required for electron to jump the forbidden band for germanium at room temperature in the intrinsic semiconductor is ____ eV .

Options:

- A. 0.05
- B. 0.72
- C. 5.4
- D. 1.1

Answer: B



Question28

The Dimensional formula for Electric Flux is ____ .

Options:

A. $M^1 L^3 T^{-3} A^1$

B. $M^1 L^1 T^{-3} A^{-1}$

C. $M^{-1} L^{-3} T^3 A^1$

D. $M^1 L^3 T^{-3} A^{-1}$

Answer: D

Question29

For an electric dipole an angle between \vec{E} and \vec{P} at a point on the equatorial plane is ____ .

Options:

A. 45°

B. 180°

C. 0°

D. 90°

Answer: B



Question30

An infinite line charge produces an electric field of $9 \times 10^4 \text{ N/C}$ at a distance of 2 cm . Then the linear charge density will be ($K = 9 \times 10^9 \text{ N m}^2/\text{C}^2$)

Options:

- A. $0.1 \mu\text{C/m}$
- B. $10 \mu\text{C/m}$
- C. $0.01 \mu\text{C/m}$
- D. $1 \mu\text{C/m}$

Answer: B

Question31

If an electron is accelerated by a potential difference of 2.5 V it would gain energy of ____ .

(Take charge of electron $1 \times 10^{-19} \text{ C}$)

Options:

- A. 2.5 erg
- B. 2.5 MeV
- C. 2.5 eV
- D. 2.5 J

Answer: C



Question32

A radius of spherical charged shell is 10 cm and electric potential on its surface is 100 V , then the potential at 2 cm from the centre of the shell will be _____

Options:

- A. 0 V
- B. 1 V
- C. 200 V
- D. 100 V

Answer: D

Question33

A parallel plate capacitor with air between the plates has a capacitance of 4 pF . If the distance between the plates is reduced by half and the space between them is filled with a substance of dielectric constant 6 then the value of capacitance will be _____ .

Options:

- A. 48 pF
- B. 24 pF
- C. 12 pF



D. 98 pF

Answer: A

Question34

The SI units of the current density is _____

Options:

A. Am^{-2}

B. Am^{-1}

C. Am^{-3}

D. Am^2

Answer: A

Question35

The magnitude of the drift velocity per unit electric field is known as _____ .

Options:

A. Charge density

B. Conductivity

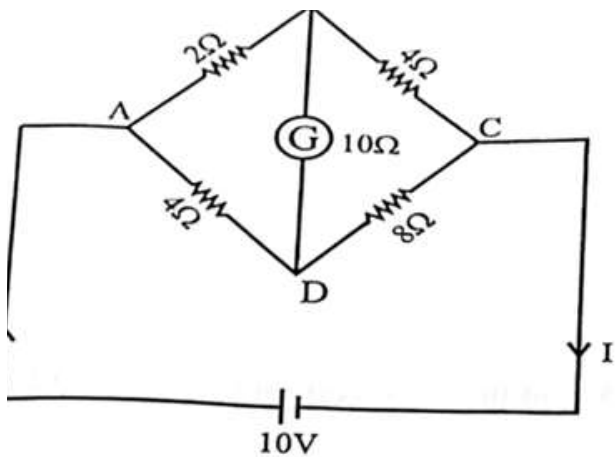
C. Mobility

D. Resistivity



Answer: C

Question36



As shown in the circuit diagram find the value of I _____

Options:

A.

2.8 A

B.

0.4 A

C.

1.8 A

D.

2.5 A

Answer: D

Question37

A silver wire has a resistance of 2.1Ω at 27.5°C and a resistance of 2.7Ω at 100°C . Then the temperature coefficient of resistivity of silver will be ____ .

Options:

- A. $3.9 \times 10^{3^\circ}\text{C}$
- B. $3.9 \times 10^{3^\circ}\text{C}^{-1}$
- C. $3.9 \times 10^{-3^\circ}\text{C}$
- D. $3.9 \times 10^{-3^\circ}\text{C}^{-1}$

Answer: D

Question38

$\frac{\text{Vs}}{\text{Am}}$ is the unit of which physical quantity?

Options:

- A. χ_m
- B. μ_0
- C. χ_c
- D. ϵ_0

Answer: B



Question39

An ideal ammeter and an ideal voltmeter has resistance _____ Ω and _____ Ω respectively.

Options:

- A. $(0, \infty)$
- B. $(\infty, 0)$
- C. (∞, ∞)
- D. $(0, 0)$

Answer: A

Question40

A solenoid has a core of a material with relative permeability 400. The windings of the solenoid are insulated from the core and carry a current of 2 A . If the number turns is 1000 per meter then the value of magnetic intensity will be _____

Options:

- A. $8 \times 10^{-5} \text{Am}^{-1}$
- B. $2 \times 10^3 \text{Am}^{-1}$
- C. $2 \times 10^{-3} \text{Am}^{-1}$



D. $8 \times 10^5 \text{Am}^{-1}$

Answer: B

Chemistry

Question1

Reaction $2A \rightarrow B + 3C$ is zero order reaction. If $K = 3.5 \times 10^{-4} \text{mol L}^{-1}\text{S}^{-1}$; What will be the rate of production of ' C '?

Options:

A. $3.5 \times 10^{-4} \text{mol L}^{-1}\text{S}^{-1}$

B. $10.5 \times 10^{-4} \text{mol L}^{-1}\text{S}^{-1}$

C. $7.0 \times 10^{-4} \text{mol L}^{-1}\text{S}^{-1}$

D. $1.167 \times 10^{-4} \text{mol L}^{-1}\text{S}^{-1}$

Answer: B

Question2

KMnO_4 acts as an oxidising agent in acidic medium. The number of moles of KMnO_4 that will be needed to react with one mole of sulphide ion in acidic solution is ____ .

Options:



A. $4/5$

B. $3/5$

C. $2/5$

D. $1/5$

Answer: C

Question3

Which one of the following is amphoteric oxide?

Options:

A. Cr_2O_3

B. CrO

C. CrO_3

D. V_2O_3

Answer: A

Question4

Which of the following ion show highest spin only magnetic moment value?

Options:

A. Ti^{2+}



B. Mn^{2+}

C. Fe^{2+}

D. Co^{2+}

Answer: B

Question5

Name the member of lanthanide series which is well known to exhibit +4 oxidation state?

Options:

A. Gadolinium

B. Thulium

C. Samarium

D. Cerium

Answer: D

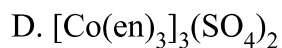
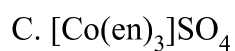
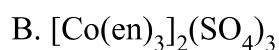
Question6

Which one is the correct formula for coordination compound tris [ethane-1,2-diamine] cobalt (III) sulphate

Options:

A. $[\text{Co}(\text{en})_3](\text{SO}_4)_2$



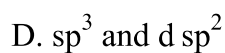
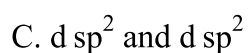
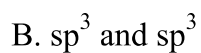
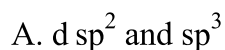


Answer: B

Question7

Hybridizations in $[\text{Ni}(\text{CO})_4]$ and $[\text{Ni}(\text{CN})_4]^{-2}$ are respectively

Options:

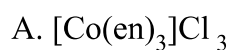


Answer: D

Question8

Identify the optically active compound from the following.

Options:





Answer: A

Question9

In the complex $\text{K} [\text{Cr}(\text{H}_2\text{O})_2(\text{C}_2\text{O}_4)_2] \cdot 3\text{H}_2\text{O}$, oxidation state and coordination number of the central metal ion is ____ and ____

Options:

A. +4, 6.

B. +3, 4.

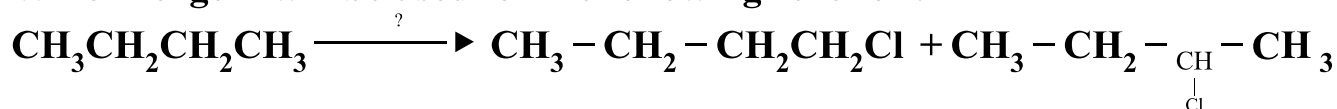
C. +3, 6

D. +4, 4

Answer: C

Question10

Which reagent will be used for the following reaction?



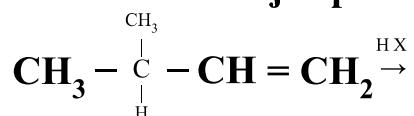
Options:

- A. Cl₂ /UV light
- B. NaCl + H₂SO₄
- C. Cl₂, air/dark
- D. Cl₂, air, Fe/dark

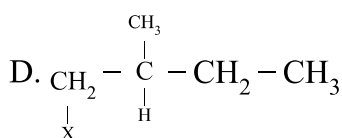
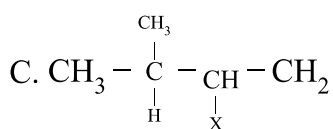
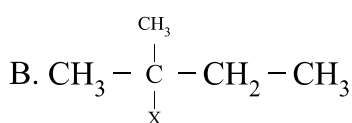
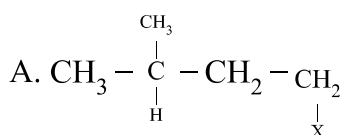
Answer: A

Question11

What is the major product in the following reaction?



Options:

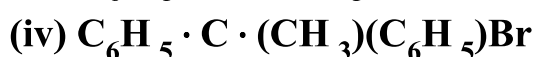
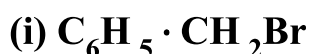


Answer: B

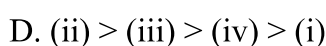
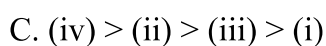
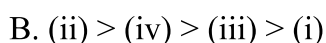
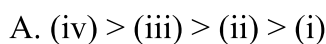


Question12

Predict the order of reactivity of the following compounds in S_N1 reaction



Options:

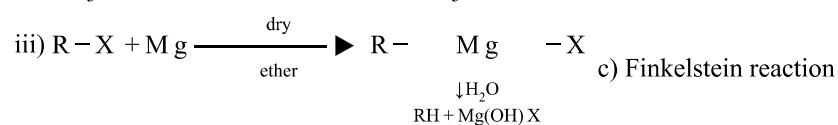
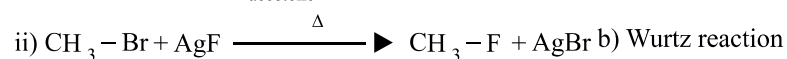
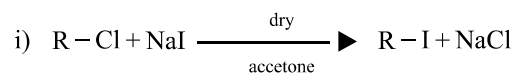


Answer: C

Question13

Match the reactions given in column - I with the names given in column - II.

Column I



Column II

a) Swarts reaction

b) Wurtz reaction

c) Finkelstein reaction



d) Grignard reaction

Options:

A. (i) → (a); (ii) → (c); (iii) → (d)

B. (i) → (d); (ii) → (c); (iii) → (b)

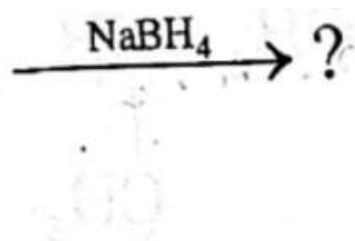
C. (i) → (b); (ii) → (a); (iii) → (d)

D. (i) → (c); (ii) → (a); (iii) → (d)

Answer: D

Question14

Which product will be obtained in the following reaction



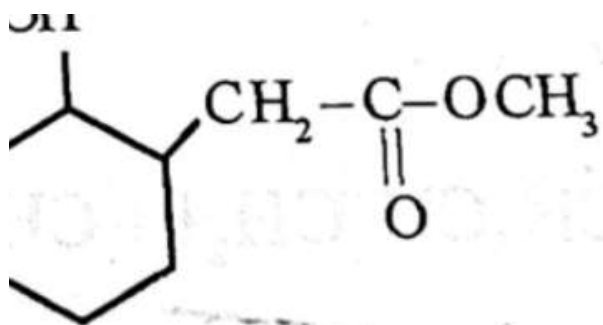
Options:

A.

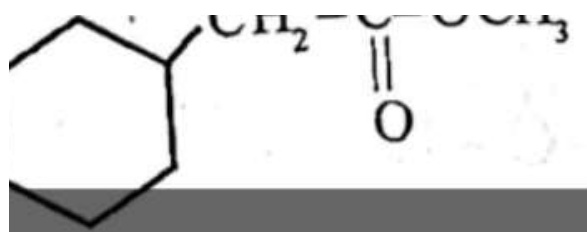
I_3



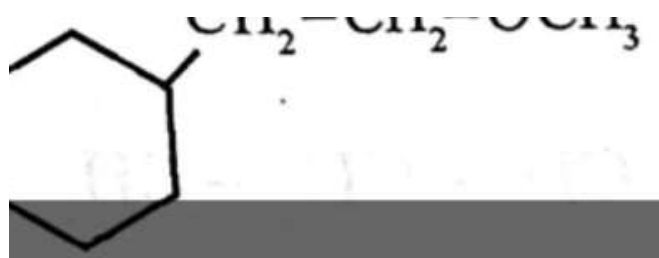
B.



C.



D.



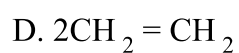
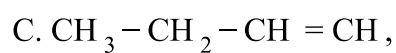
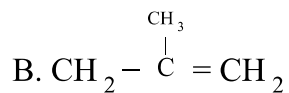
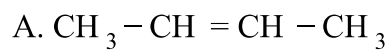
Answer: B

Question 15

Predict the major product of acid catalysed dehydration of butan-1-ol.



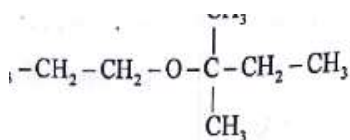
Options:



Answer: A

Question16

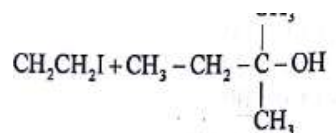
Give the major product formed by heating



With HI

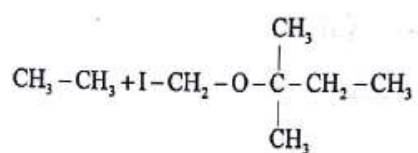
Options:

A.

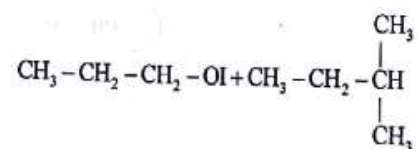


B.

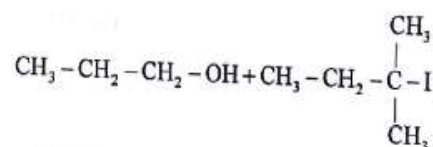




C.



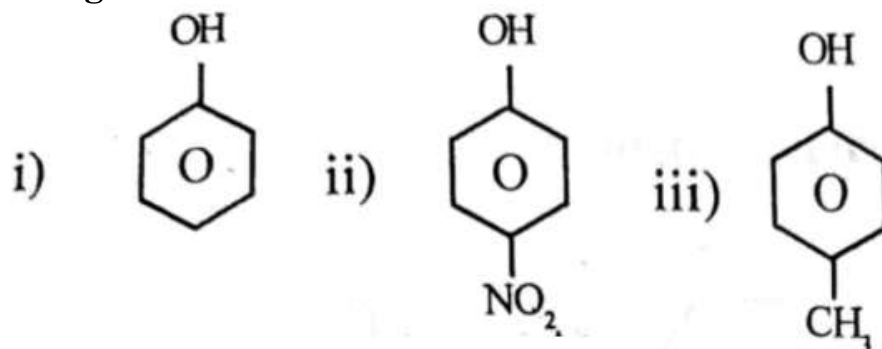
D.



Answer: D

Question 17

Arrange the following compounds in decreasing order of their acidic strength



Options:

A.

(i) > (ii). > (iii)

B.

(iii) > (i) > (ii)

C.

(ii) > (i) > (iii)

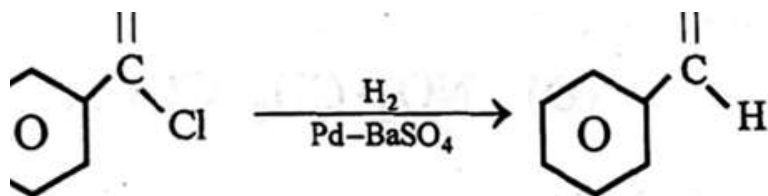
D.

(ii) > (iii) > (i)

Answer: C

Question18

Name the following reaction.



Options:

A.

Etard reaction

B.

Stephen reaction

C.

Rosenmund reduction

D.



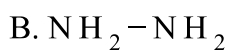
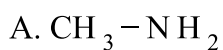
Clemmensen reduction

Answer: C

Question19

'R' + $\text{CH}_3 - \text{CO} - \text{CH}_3 \xrightarrow{\text{H}^+}$ Schiff's base what is 'R' in this reaction?

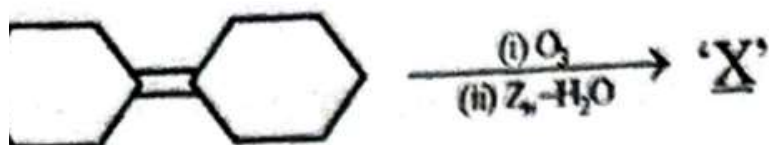
Options:



Answer: A

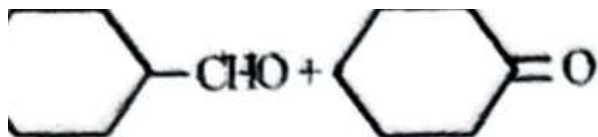
Question20

What is X in this reaction?

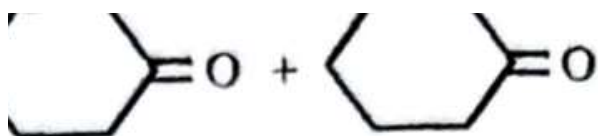


Options:

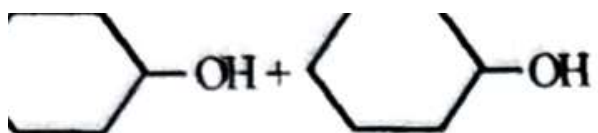
A.



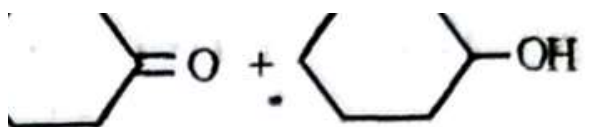
B.



C.



D.



Answer: B

Question21

Which of the following carboxylic acid has least pKa value among all?

Options:



- A. HCOOH
- B. CH₃ · COOH
- C. C₆H₅ · COOH
- D. NO₂ · CH₂ · COOH

Answer: D

Question22

Identify ' C ' in the following reaction.

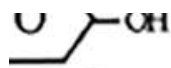


Options:

A.



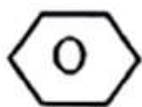
B.



C.



D.

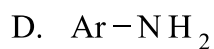
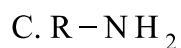
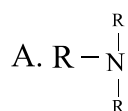


Answer: A

Question23

Which amine is prepared by Gabriel phthalimide synthesis?

Options:

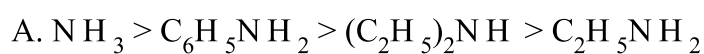


Answer: C

Question24

Which is the correct order of the basic strength of given amines?

Options:



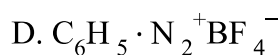
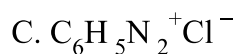
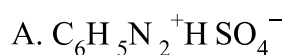


Answer: B

Question25

Which diazonium salt is water insoluble and stable at room temperature?

Options:



Answer: D

Question26

Lactose is composed of which units?

Options:

A. β -D-Galactose and β -D-Glucose

B. α -D-Glucose and β -D-Fructose



C. α -D-Glucose and β -D-Galactose

D. α -D-Glucose and α -D-Glucose

Answer: A

Question27

Which of the following gives Zwitter ion in its aqueous solution?

Options:

A. $\text{NH}_2 - \text{CH}_2 - \text{CH}_2 - \text{NH}_2$

B. $\text{NH}_2 - \text{CH}_2 - \text{COOH}$

C. $\text{CH}_3\text{CH}_2\text{NH}_2$

D. $\text{COOH} - \text{CH}_2 - \text{COOH}$

Answer: B

Question28

Deficiency of which vitamin is responsible for RBC deficient in haemoglobin?

Options:

A. Vitamin B₂

B. Vitamin B₆



- C. Vitamin B₁
D. Vitamin B₁₂

Answer: D

Question29

Which of the following statement is incorrect for the structure of Nucleic acids?

Options:

- A. A unit formed by the attachment of a base 1' position of sugar is known as nucleoside
B. In DNA molecule, the sugar moiety is β -D-2-deoxyribose
C. RNA contains four bases adenine, guanine, cytosine and thymine
D. Nucleotides are joined together by phosphodiester linkage

Answer: C

Question30

Calculate the mass of Glucose (C₆H₁₂O₆) required in making 2.5 kg of 0.25 molal aqueous solution.

[Atomic wt : H = 1, O = 16, C = 12amu]

Options:

- A. 90.0 g



- B. 107.65 g
C. 112.5 g
D. 135.0 g

Answer: B

Question31

The vapour pressure of pure liquids ' P ' and ' Q ' are 450 and 750 mm of Hg respectively at 350 K . If total vapour pressure is 600 mm of Hg , the mole fractions of ' P ' and ' Q ' respectively will be ____ and ____

Options:

- A. 0.6 and 0.4 .
B. 0.4 and 0.6
C. 0.5 and 0.5
D. 0.7 and 0.3

Answer: C

Question32

The freezing point depression of 645 g of aqueous solution of ethylene glycol ($C_2H_6O_2$) is 2.25 K . Find weight of ethylene glycol in the solution.

[$K_f = 1.86K \text{ kgmol}^{-1}$; H = 1, C = 12, O = 16amu]



Options:

A. 48.375 g

B. 50 g

C. 42.50 g

D. 45.0 g

Answer: A

Question33

Van't Hoff factor (i) for dilute aqueous solution of $K_4[Fe(CN)_6]$, $Fe[Fe(CN)_6]_3$ and $[CoCl_2(en)_2]Cl_2$ are respectively _____ , _____ , _____ ?

Options:

A. 5, 7, 3

B. 2, 5, 7

C. 7, 5, 2

D. 2, 7, 5

Answer: A

Question34



Calculate the potential of hydrogen electrode in contact with a solution whose pH is 10 .

Options:

- A. +0.59 V
- B. -0.059 V
- C. -0.59 V
- D. +0.059 V

Answer: C

Question35

Which of the statements for solution of electrolyte is not correct?

Options:

- A. Conductivity of solution does not depend upon temperature
- B. Conductivity of solution depends on the nature of electrolyte
- C. Conductivity of solution depends on the nature of solvent and its viscosity
- D. Conductivity of solution depends on the concentration of electrolyte

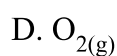
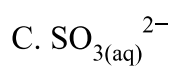
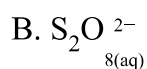
Answer: A

Question36



During the electrolysis of higher concentration of H_2SO_4 , the product obtained at anode is _____ .

Options:



Answer: B

Question37

How much Faraday of electricity is required to reduce 1.5 mole KMnO_4 into Mn in basic medium?

Options:

A. 6.0 F

B. 7.5 F

C. 3.0 F

D. 4.5 F

Answer: D



Question38

For any reaction the rate constant $K = 2.3 \times 10^{-5} \text{ mol}^{-3/2} \text{ L}^{3/2} \text{ S}^{-1}$; then the order of reaction will be ____ .

07.49

Options:

- A. 0.5
- B. 1.5
- C. 2.5
- D. 0.0

Answer: C

Question39

Which of the following statements is incorrect for a reaction carried out in presence of catalyst?

Options:

- A. There is no change in Gibbs energy of the reaction
- B. Equilibrium constant of the reaction does not change
- C. The activation energy of the reaction decreases
- D. Potential energy of reactants and products change

Answer: D

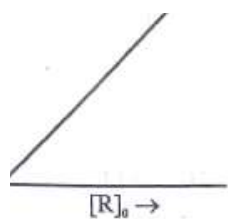


Question40

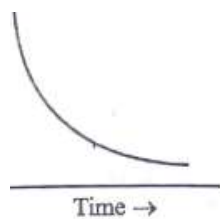
Which of the following graphs is correct for a first order reaction $R \rightarrow P$?

Options:

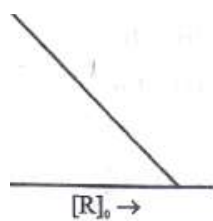
A.



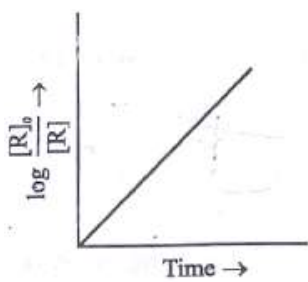
B.



C.



D.



Answer: D

FREE!

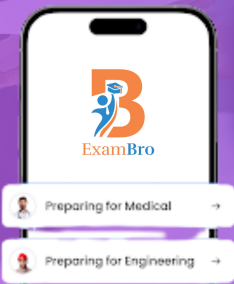


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