Sample Paper

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UG PCM (sections: Physics, Chemistry, Maths)

Q.No. 1

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

Assertion A: The preservation of meat by salting and fruits by adding sugar is done to protect them from bacteria action.

Reason R: Due to the reverse osmosis.

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

(A)

Both A and R are correct but R is the correct explanation of A

(B)

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

(C)

A is correct but R is not correct

(D)

A is not correct but R is correct

Q.No. 2

A force

$$\vec{F} = 7\hat{j} + 3\hat{j} - 5\hat{k}$$

acts on a particle with position vector

$$\hat{i} = \hat{i} - \hat{j}$$

. The torque acting on the particle is

(A)

$$5\hat{i} + 5\hat{j} + 10\hat{k}$$

(B)

$$5\hat{i} - 5\hat{j} + 10\hat{k}$$

(C)

$$5\hat{i} - 5\hat{j} - 10\hat{k}$$

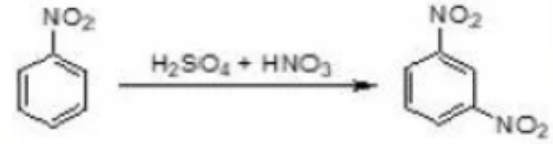
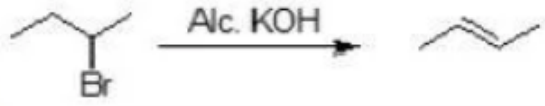
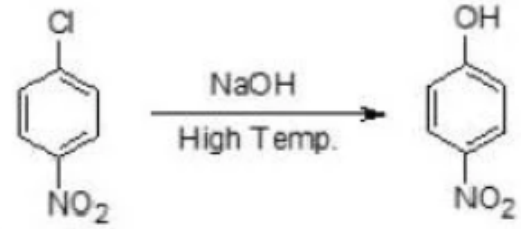
(D)

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$5\hat{i} + 5\hat{j} - 10\hat{k}$

Q.No. 3

Match List I with List II:

List I	List II
Reaction	**Type of reaction**
A. 	I. Nucleophilic substitution
B. 	II. Saytzeff elimination
C. 	III. Electrophilic addition
D. 	IV. Electrophilic substitution

Choose the correct answer from the options given below:

(A)

A-II, B-IV, C-III, D-I

(B)

A-IV, B-II, C-III,D-I

(C)

A-IV, B-II, C-I, D-III

(D)

A-II, B-IV, C-I, D-III

Q.No. 4

Benzoic acid and phenol can be distinguished in laboratory on the basis of:

A: Sodium bicarbonate test

B: Bromine water test

C: Tollens's test

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D: Lucas test

Choose the correct answer from the options given below:

(A)

A only

(B)

A and B only

(C)

A and C only

(D)

B and C only

Q.No. 5

If a, b, c are positive and $a+b+c=1$, then the minimum value of $\left(\frac{1}{a}-1\right)\left(\frac{1}{b}-1\right)\left(\frac{1}{c}-1\right)$ is

(A)

2

(B)

4

(C)

8

(D)

16

Q.No. 6

Considering the pK_a of acetic acid and pk_b of ammonium hydroxide are 4.5 and 4.4 respectively. The pH of ammonium acetate is:

(A)

7.005

(B)

8.9

(C)

4.45

(D)

7.5

Q.No. 7

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

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Assertion A: Ions of the same charge in a 3d series show progressive decreases in radius with increasing atomic number.

Reason R: As the new electron enters in a d-orbital, the nuclear charge increases by unity.

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

(A)

Both A and R are correct but R is the correct explanation of A

(B)

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

(C)

A is correct but R is not correct

(D)

A is not correct but R is correct

Q.No. 8

A non-volatile solute (Molar Mass 58g/mol) of 0.9 g was dissolved in 90 g of benzene (boiling point of benzene= 353.25K) . The boiling point of solution is: [Given K_b for benzene is =2.53k kg mol^{-1}]

(A)

351.79 K

(B)

353.67 K

(C)

353. 97 K

(D)

354.17 K

Q.No. 9

Given below are two statements:

Statement I: Generally, only non-metal oxides is acidic and oxides of some metals in high oxidation state also found to have acidic character.

Statement II: Oxides like CO, No and N_2O are neutral oxides.

Choose the correct answer from the options given below:

(A)

Both Statement I and Statement II are true

(B)

Both Statement I and Statement II are false

(C)

Statement I is true but Statement II is false

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(D)

Statement I is false but Statement II is true

Q.No. 10

Which of the following oxide is used to estimate CO?

(A)

Br_2O

(B)

BrO_3

(C)

I_2O_4

(D)

I_2O_5

Q.No. 11

Which of the following compounds was significantly used to control the malaria in World War II?

(A)

Chloroquine

(B)

DDT

(C)

Sodium Chlorate

(D)

Sodium arsinite

Q.No. 12

A body falling vertically downwards due to gravity, break into two equal parts of unequal masses. The centre of mass of the two masses taken together will-

(A)

shift towards heavier mass

(B)

shift towards lighter mass

(C)

does not shift horizontally

(D)

depends on vertical velocity at the time of breaking

Q.No. 13

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If

$$n \in N, \text{ then } 7^{2n} + 2^{3n-3} \cdot 3^{n-1}$$

is always divisible by

(A)

15

(B)

25

(C)

35

(D)

45

Q.No. 14

Match List I with List II :

List I	List II
A. $f(x) = \frac{x^2}{1+x^2}$	I. $R_f = [0, \infty)$
B. $f(x) = \frac{1}{1-x^2}$	II. $R_f = [0, 1)$
C. $f(x) = \sqrt{x^2 - 3x + 2}$	III. $R_f = [0, 1]$
D. $f(x) = \sqrt{1-x^2}$	IV. $R_f = (-\infty, 0) \cup [1, \infty)$

Choose the correct answer from the options given below:

(A)

A-II, B-I, C-IV, D-III

(B)

A-II, B-IV, C-I, D-III

(C)

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A-III, B-II, C-IV, D-I

(D)

A-I, B-II, C-IV, D-III

Q.No. 15

Let A and B be any two sets, which of the following are correct?

A.

$$(A - B) \cap B = \emptyset$$

B.

$$(A - B) \cup B = \emptyset$$

C.

$$(A - B) \cap A = A \cap B'$$

D.

$$(A - B) \cup B = A \cup B$$

Choose the correct answer from the options given below :

(A)

A and D only

(B)

A, C and D only

(C)

B and D only

(D)

B,C and D only

Q.No. 16

The area in the first quadrant between $x^2+y^2=\pi^2$ and y=sin x is

(A)

$$\frac{\pi^3 - 8}{4}$$

sq.units

(B)

$$\frac{\pi^3}{4}$$

sq.units

(C)

$$\frac{\pi^3 - 16}{4}$$

sq.units

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(D)

$$\frac{\pi^3 - 8}{2}$$

sq.units

Q.No. 17

The ration in which the line segment joining the points A(4, 8, 10) and B(6, 10, -8) is divided by the yz-plane is given by

(A)

2:3 internally

(B)

2:3 externally

(C)

1:2 internally

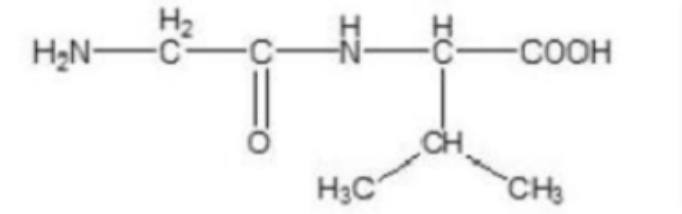
(D)

1:2 externally

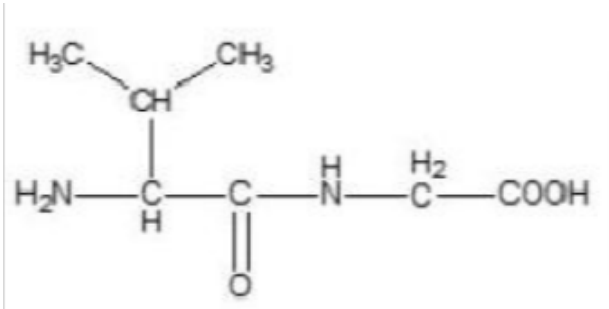
Q.No. 18

The correct structure of the dipeptide glycylvaline is:

(A)



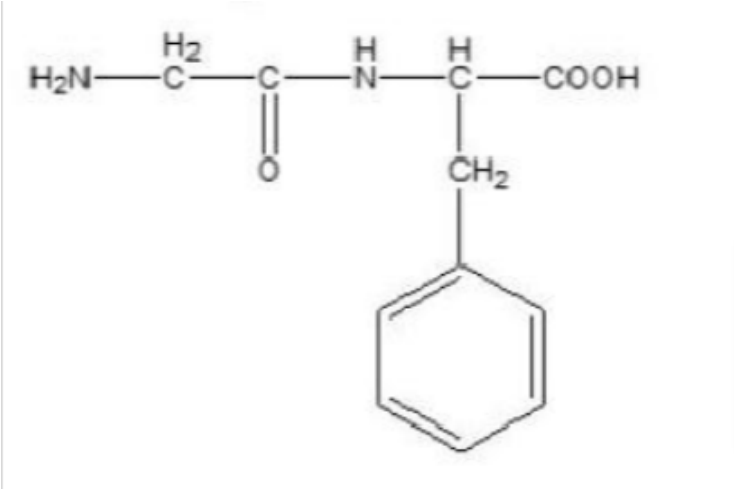
(B)



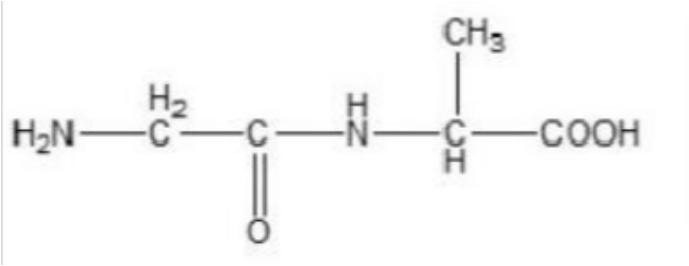
(C)

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(D)



Q.No. 19

$1.{}^{n}C_1+2.{}^{n}C_2+3.{}^{n}C_3+.....+n.{}^{n}C_n$ is equal to

(A)

$$\frac{n(n+1)}{4}\cdot 2^{n}$$

(B)

$$2^{2n-1}-1$$

(C)

$$11.2^{n-1}$$

(D)

$$2^{n}-1$$

Q.No. 20

If the earth stop rotating, the apparent value of acceleration due to gravity 'g' on it surface will

(A)

Increase everywhere

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(B)

Decrease everywhere

(C)

Remain same everywhere

(D)

Increase at some places and remain the same at other places

Q.No. 21

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

Assertion A: Among halogens, chlorine has highest negative electron gain enthalpy value.

Reason R: The ionic radius of Cl^- is 184pm.

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

(A)

Both A and R are correct but R is the correct explanation of A

(B)

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

(C)

A is correct but R is not correct

(D)

A is not correct but R is correct

Q.No. 22

Given below are two statements:

Statement I: On dissolution of large number of atoms or small molecules of a substance aggregate together to form species having size in the colloidal range (diameter>1nm)

Statement II: The word lyophobic means liquid hating.

Choose the correct answer from the options given below:

(A)

Both Statement I and Statement II are true

(B)

Both Statement I and Statement II are false

(C)

Statement I is true but Statement II is false

(D)

Statement I is false but Statement II is true

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Q.No. 23

Let

p: 57 is an odd prime number.

q: 5 is a divisor of 20 ,

r: 20 is the LCM of 4 and 5 ,

be three simple logical statements.

Which one of the following is true?

(A)

$$\mathrm{p} \vee (\sim \mathrm{q} \wedge \mathrm{r})$$

(B)

$$\backsim p \vee (q \wedge r)$$

(C)

$$(p \wedge q) \vee \backsim \mathbf{r}$$

(D)

$$(\mathrm{p} \vee \mathrm{q}) \wedge \backsim \mathbf{r}$$

Q.No. 24

The sum of all the solutions of the equation

$$\cos x \cdot \cos\left(\frac{\pi}{3}+x\right) \cdot \cos\left(\frac{\pi}{3}-x\right)=\frac{1}{4}; x \in [0,3\pi]$$

is

(A)

$$\frac{20\pi}{3}$$

(B)

$$4\pi$$

(C)

$$10\pi$$

(D)

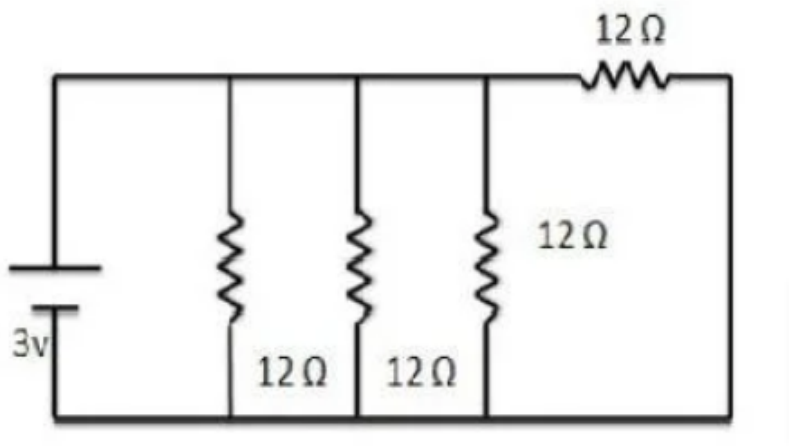
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$$\frac{19\pi}{3}$$

Q.No. 25

The current supplied by the battery in the circuit shown in the figure is, (neglect internal resistance of the battery)



(A)

1.0 A

(B)

3/16 A

(C)

3/12 A

(D)

3/6 A

Q.No. 26

The angle of projection which gives a range of 8 km when projected with the velocity of 400m/s is (use g=10m/s^2)

(A)

$$\frac{\pi}{12}$$

(B)

$$\frac{\pi}{6}$$

(C)

$$\frac{\pi}{4}$$

(D)

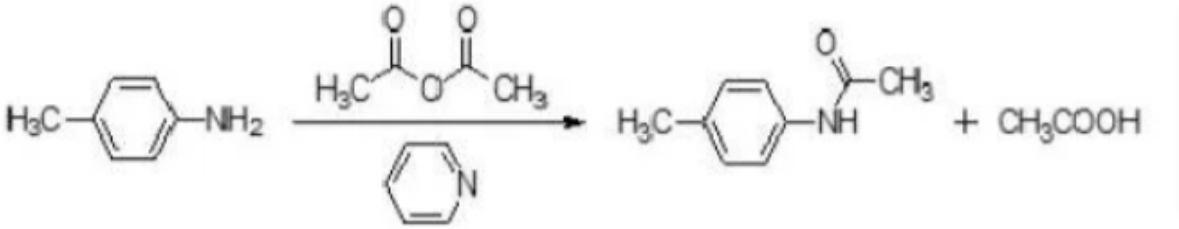
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$$\frac{2\pi}{3}$$

Q.No. 27

The reaction given below is an example of:



(A)

Nucleophilic substitution reaction

(B)

Elimination reaction

(C)

Electrophilic substitution reaction

(D)

Free radical substitution reaction

Q.No. 28

Thermal decomposition of Cl_2O_7 at 400 K in the gaseous phase to Cl_2 and O_2 is the first order reaction with rate constant $6.932 * 10^{-3}\ s^{-1}$. How much minutes are required for 90% decomposition of Cl_2O_7 at 400K?

(A)

5.54

(B)

16.61

(C)

33.32

(D)

332.2

Q.No. 29

If the value 1,1/2,1/3,.....1/n occur at frequencies 1,2,3,.....,n in a distribution, then the mean is given by

(A)

1

(B)

n

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(C)

1/n

(D)

2/n+1

Q.No. 30

The greatest term in the expansion of $(x+y)^{18}$ and x=2, y=1 is

(A)

$^{18}C_5.2^{13}$

(B)

$^{18}C_6.2^{12}$

(C)

$^{18}C_7.2^{11}$

(D)

$^{18}C_8.2^{10}$

Q.No. 31

Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: If S_n denotes the sum of n terms of a G.P. whose first term and common ratio are

$$a_{\text{and }} r_{\text{respectively, then }} s_1 + s_2 + s_3 + \cdots + s_n = \frac{na}{1-r} - \frac{ar\left(1-r^n\right)}{(1-r)^2}$$

$$s_1 + s_3 + s_5 + \cdots + s_{2n-1} = \frac{na}{1-r} - \frac{ar\left(1-r^{2n}\right)}{(1-r)^2 \cdot (1+r)}$$

Reason R: In light of the above statements,

choose the most appropriate answer from the options given below :

(A)

Both A and R are correct and R is the correct explanation of A

(B)

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

(C)

A is correct but R is not correct

(D)

A is not correct but R is correct

Q.No. 32

The normal to the curve $5x^5 - 10x^3+x+2y+6=0$ at A(0,-3) meets the curve again at two points B and C. The length of BC is

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(A)

$$\sqrt{5}$$

(B)

$$2\sqrt{5}$$

(C)

$$3\sqrt{5}$$

(D)

$$\frac{\sqrt{5}}{2}$$

Q.No. 33

If

$$\int \frac{dx}{x - x^3} = A \cdot \ln \left| \frac{x^2}{1 - x^2} \right| + C$$

, then the value of A is given by

(A)

2

(B)

1/2

(C)

1/√2

(D)

1/4

Q.No. 34

The maximum value of z=3x+4y subject to the constraints

$$x + y \leq 40, x + 2y \leq 6, x \geq 0, y \geq 0$$

is given by

(A)

140

(B)

170

(C)

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120

(D)

180

Q.No. 35

Let $n(U) = 700, n(A) = 200, n(B) = 300$ and $n(A \cap B) = 100$, then $n\left(A' \cap B'\right)$ is

(A)

400

(B)

600

(C)

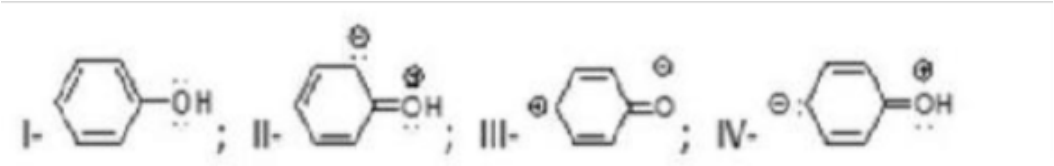
300

(D)

200

Q.No. 36

Consider the following structures:



Choose the correct answer with the given structure(s) which are resonating structures of phenol.

(A)

II and III only

(B)

I, II and III only

(C)

I, II and IV only

(D)

II and IV only

Q.No. 37

Which of the following compounds is most reactive towards sodium metal?

(A)

1-Propyne

(B)

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Methane

(C)

Ethyne

(D)

1-Butyne

Q.No. 38

If the imaginary part of $(1*i)^n.(1-i)^n$ is negative, where n $\in$ N, n<100; the the sum of all the possible value of n is

(A)

625

(B)

1025

(C)

1225

(D)

1238

Q.No. 39

Reaction of quick lime slaked with soda gives compound 'X'. 'X' is.....

(A)

NaOH+CaO

(B)

NaOH+$Ca(OH)_2$

(C)

Na_2O+CaO

(D)

Na_2O+$Ca(OH)_2$

Q.No. 40

A normal at any point (x, y) to the curve y=f(x) cuts triangle of unit area with the axes. The equation of the curve is

(A)

$$y^2 - x^2\left(\frac{dy}{dx}\right)^2 = 4\frac{dy}{dx}$$

(B)

$$x^2 + 2xy\frac{dy}{dx} + y^2\left(\frac{dy}{dx}\right)^2 = 2\frac{dy}{dx}$$

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(C)

$$x^2 - y^2\left(\frac{dy}{dx}\right)^2 = \frac{dy}{dx}$$

(D)

$$x + y\frac{dy}{dx} = y$$

Q.No. 41

Match List I with List II :

List I	List II
A. $\lim\limits_{x\to\frac{\pi}{4}} \frac{\text{cosec}^2 x - 2}{\cot x - 1}$	I. 2
B. $\lim\limits_{x\to\frac{\pi}{2}} \frac{1-\sin^3 x}{\cos^2 x}$	II. $\frac{1}{4}$
C. $\lim\limits_{x\to 0} \frac{e^x + e^{-x} - 2}{x^2}$	III. $\frac{3}{2}$
D. $\lim\limits_{n\to\infty} \frac{1^3 + 2^3 + 3^3 + \cdots + n^3}{n^4}$	IV. 1

Choose the correct answer from the options given below:

(A)

A-I, B-III, C-IV, D-II

(B)

A-I, B-IV, C-III, D-II

(C)

A-II, B-III, C-I, D-IV

(D)

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A-IV, B-III, C-I, D-II

Q.No. 42

The total number of words (with or without meaning) that can be made with the letters of the words "INTERMEDIATE", if the vowels and the consonants occur alternatively in the words is

(A)

43200

(B)

21600

(C)

151200

(D)

75600

Q.No. 43

The De Broglie wavelength associated with an electron accelerated through a potential difference of 64 volt

(A)

0.153 nm

(B)

1.53 nm

(C)

15.3 nm

(D)

153 nm

Q.No. 44

Two conducting circular loops of radii R_1 and R_2 are placed in the same plane with their centres coinciding. The mutual inductance between them will be, ($R_2 << R_1$)

(A)

$$\frac{\mu_0 \pi R_1^2}{R_2}$$

(B)

$$\frac{\mu_0 \pi R_2^2}{R_1}$$

(C)

$$\frac{\mu_0 \pi R_1^2}{2R_2}$$

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(D)

$$\frac{\mu_0 \pi R_2^2}{2R_1}$$

Q.No. 45

Which of the following parameters is same for molecules of all gases at a given temperature?

(A)

density

(B)

speed

(C)

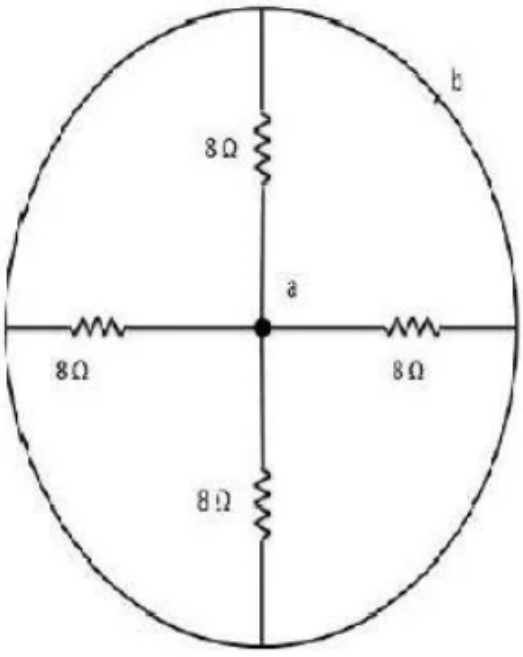
momentum

(D)

kinetic energy

Q.No. 46

The equivalent resistance of the network shown in the figure below between the point a and b is:



(A)

2 Ω

(B)

32 Ω

(C)

4 Ω

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(D)

0

Q.No. 47

Formalin is particularly used to preserve biological specimens laboratory. It is a:

(A)

50% aqueous solution of formaldehyde

(B)

50% ethanolic solution of formaldehyde

(C)

60% aqueous solution of acetaldehyde

(D)

40% aqueous solution of methanal

Q.No. 48

The temperature at which the real gas obeys ideal gas law over an appreciable range of pressure is called

(A)

Absolute temperature

(B)

Boyle temperature

(C)

Critical temperature

(D)

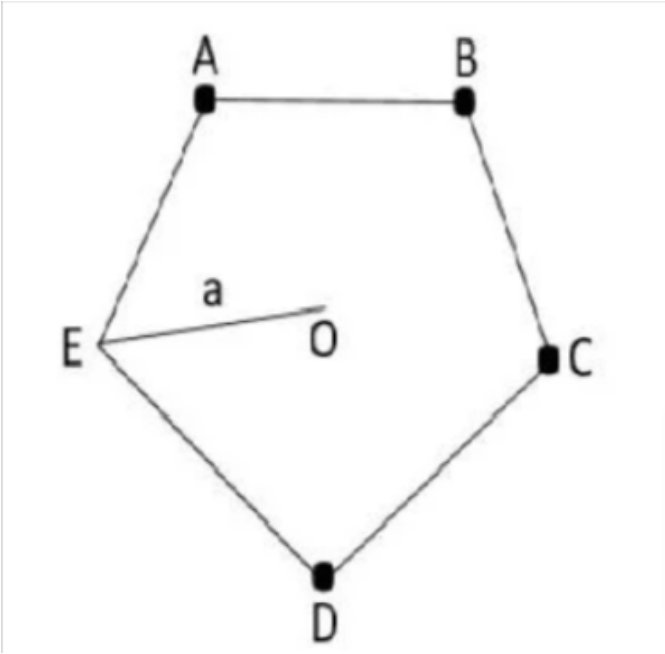
Kelvin temperature

Q.No. 49

Four particles each having a charge q are placed on the four vertices of the regular pentagon as shown in figure. The distance of each corner from the centre O is a. The electric field at the centre of the pentagon is

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(A)

Zero

(B)

$$4q/4\pi \in_0 a^2$$

along O E

(C)

$$q/4\pi E_0 a^2$$

along O E

(D)

$$q/4\pi E_C \alpha^2$$

along E O

Q.No. 50

Rainbow occurs due to the fact that when sunlight passes through the water drops in the atmosphere, it undergoes,

(A)

Dispersion

(B)

Scaltering

(C)

Polarization

(D)

Diffraction

Q.No. 51

When a transistor is used as amplifier, the circuit is designed in such a way that the transistor operate in:

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(A)

cut off and saturation region

(B)

cut-off and active region

(C)

saturation and active region

(D)

active region only

Q.No. 52

The resistance R=V/I, were V=(200±10)V and I=(10+1)A. The percentage error in R will be

(A)

15%

(B)

11%

(C)

10%

(D)

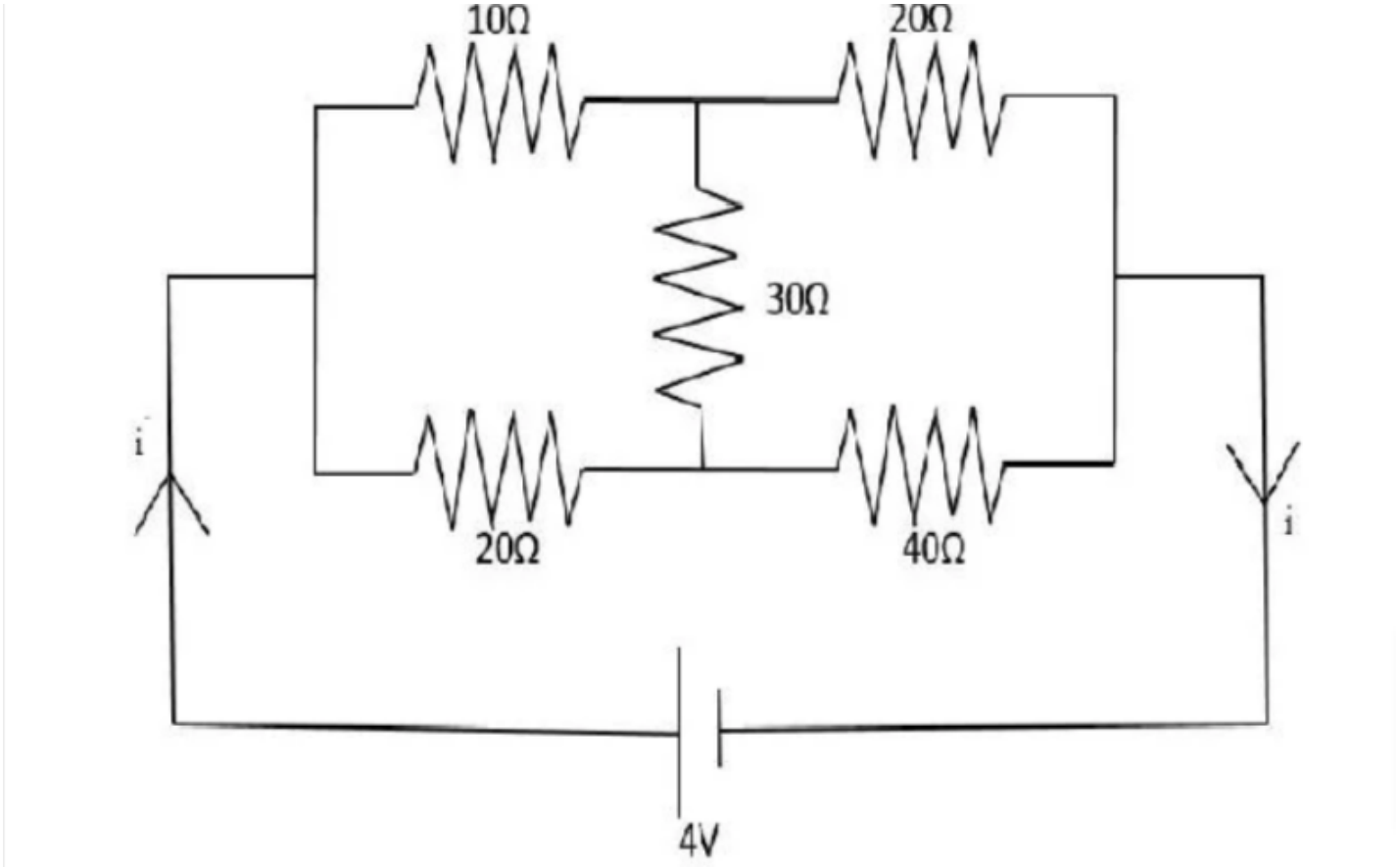
9%

Q.No. 53

In the circuit show below, the value of the current i will be

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(A)

0.2 A

(B)

2 A

(C)

0.075 A

(D)

0.75A

Q.No. 54

A cell of 2V and internal resistance 0.5Ω connected across a resistance of 9.5 Ω. How many electron cross through a cross section of the resistance in 1 second?

(A)

$1.25 * 10^{19}$

(B)

$1.25 * 10^{18}$

(C)

$1.25 * 10^{17}$

(D)

$1.25 * 10^{20}$

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Q.No. 55

An alternating current having peak value of 14 A is used to heat a meter wire. To produce the same heating effect , if we use constant current i, then it will be nearly-

(A)

14A

(B)

20 A

(C)

7 A

(D)

10 A

Q.No. 56

The position of an object moves along x-axis is given by $x=a+bt^2$ where a=11 m, b=3.5 m/s^2 and t is in seconds. The average velocity between t=3 s and t=5 s is

(A)

28m/s

(B)

14m/s

(C)

21m/s

(D)

7m/s

Q.No. 57

A bullet of mass m is fired with speed v_0 on soft plywood of thickness t. The bullet emerges with only half of the initial kinetic energy. What is the emergent speed of the bullet?

(A)

$v_0/8$

(B)

$v_0/4$

(C)

$v_0/2$

(D)

$v_0/\sqrt{2}$

Q.No. 58

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

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Assertion A: Nitration of chlorobenzene occurs at ortho and para positions.

Reason R: Chlorine is the ring deactivator.

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

(A)

Both A and R are correct but R is the correct explanation of A

(B)

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

(C)

A is correct but R is not correct

(D)

A is not correct but R is correct

Q.No. 59

There are two boxes, Box A and Box B. Box A contains 3 red and 6 black balls. Box B contains 5 red and n black balls. One of the two balls is selected at random and a ball is drawn at random. The ball drawn is found to be red. If the probability that this red ball comes out from Box B is 1/3, then the value of n is

(A)

10

(B)

12

(C)

20

(D)

25

Q.No. 60

The value of 'a' so that f(x)=sin x - cos x- ax + b decreases for all real value of x is given by

(A)

$a \geq \sqrt{2}$

(B)

$a \leq \sqrt{2}$

(C)

$a \geq 1$

(D) $a<1$

Q.No. 61

In the Modern Periodic table, Scandium is placed in

(A)

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Group-IIIA, Period 4

(B)

Group-IIIA, Period 3

(C)

Group-IIIB, Period 4

(D)

Group-IIIB, Period 3

Q.No. 62

The dimensional formula for binding energy of a nucleus is

(A)

$[ML^2T^2]$

(B)

$[ML^2T^{-2}]$

(C)

$[ML^{-2}T^{-2}]$

(D)

$[ML^{-2}T^2]$

Q.No. 63

For any two sets of A, B and C, which of the following are true?

A.

$$(\mathrm{A} \cap \mathrm{B}) \cup (\mathrm{A} - \mathrm{B}) = \mathrm{A}$$

B.

$$A \cdot (B \cap C) = (A - B) \cap (A - C)$$

C.

$$(A \cup B) - C = (A - C) \cup (B - C)$$

D.

$$A \cap (\mathrm{A} \cup \mathrm{B})' = \emptyset$$

Choose the correct answer from the options given below:

(A)

A and D only

(B)

A, C and D only

(C)

A,B and D only

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(D)

C and D only

Q.No. 64

Which of the following noble gases has highest positive electron gain enthalpy?

(A)

Ne

(B)

Ar

(C)

Kr

(D)

Xe

Q.No. 65

Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : The sum of the first n terms of the series 1/2 + 3/4 +7/8 + 15/16.....is2^{-n} + n-1

Reason R: 1-2+3+.....+n

$$= \sum n = \frac{n(n+1)}{2}$$

In light of the above statements,

choose the most appropriate answer from the options given below

(A)

Both A and R are correct and R is the correct explanation of A

(B) Both A and R are correct but R is NOT the correct explanation of A

(C)

A is correct but R is not correct

(D)

A is not correct but R is correct

Q.No. 66

The maximum value of

$$f(x) = \sin\left(x + \frac{\pi}{6}\right) + \cos\left(x + \frac{\pi}{6}\right)$$

lies in the interval

$$\left[0, \frac{\pi}{2}\right]$$

if the value of x is

(A)

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$$\frac{\pi}{6}$$

(B)

$$\frac{\frac{\pi}{12}}{\frac{\pi}{3}}$$

(C)

$$\frac{\pi}{3}$$

(D)

$$\frac{\pi}{4}$$

Q.No. 67

Ninhydrin reacts with amino acid to form colored complex. The equivalent ratio of ninhydrin and amino acid used in the reaction is respectively:

(A)

1:1

(B)

1:2

(C)

2:1

(D)

1:3

Q.No. 68

Which of the following are true statements?

A. The vector represented by the complex number 2-i is rotated about the crigin through an angle

$$\frac{\pi}{2}$$

in the clockwise direction. Then, the new position of the point is -1-2i.

B. If

$$z = \frac{1 + 7\mathrm{i}}{(2 - \mathrm{i})^2}$$

, then arg(z) is

$$\frac{3\pi}{4}$$

C. If

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$$a = \cos\theta + i\sin\theta$$

, then

$$\frac{1+a}{1-a} = i\tan\frac{\theta}{2}$$

D. There exists no value of x for which sin x+ icos 2x and cos x-isin 2x are conjugate to each other

Choose the correct answer from the options given below:

(A)

B and D only

(B)

A, B and D only

(C)

A and D only

(D)

B only

Q.No. 69

For the following molecules/intermediates/species:

$$\mathrm{A-BH_3};\quad \mathrm{B-SiH_4; C-PCl_3; D-:CH_2; E-NH_3}$$

Select the correct option for electrophile(s):

(A)

A. B, C and D only

(B)

A, B and C only

(C)

A only

(D)

A and D only

Q.No. 70

Which of the following statements is true for cathode ray discharge tube experiments?

(A)

The electric discharge through the gases could be observed only at very high pressure and high voltages.

(B)

The characteristics of Cathode rays depend upon the material of electrode.

(C)

The properties of Cathode rays do not depend upon the nature of gas present in the cathode ray tube.

(D)

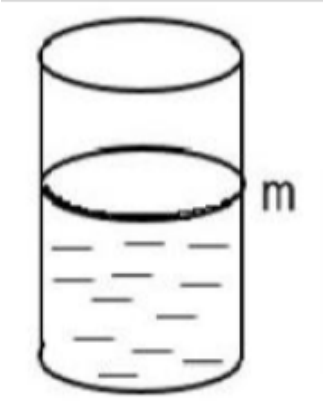
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On applying high voltage across the electrodes, currents starts flowing from positive electrode to negative electrode.

Q.No. 71

A cylindrical vessel containing a liquid is closed by the smooth piston of mass m as shown in a figure. The area of cross-section of the piston is A. If the atmosphere pressure is P_0, the pressure of the liquid just below the piston is:



(A)

P_0

(B)

P_0+mg

(C)

P_0+mg/A

(D)

mg/A

Q.No. 72

In a moving coil galvanometer, if we double the number of turns in the coil, the current sensitive doubles. The voltage sensitivity will be-

(A)

remain unchanged

(B)

become 1/4

(C)

become 1/2

(D)

become double

Q.No. 73

$$2PbO + 4HNO_3 \rightarrow 2\ Pb(NO_3)_2 + 2H_2O$$

Which type of reaction is taking place?

(A)

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Combination reaction

(B)

Redox reaction

(C)

Acid-base reaction

(D)

Disproportion reaction

Q.No. 74

At a certain place on the earth surface the horizontal component of earth's magnetic field is 0.29G and the dip angle is 60^o. What is the magnetic field of the earth at this place?

(A)

0.58G

(B)

$0.58/\sqrt{3}G$

(C)

$0.29/\sqrt{3}G$

(D)

0.29G

Q.No. 75

The coefficient of the term independent of x in the expansion of $(\sqrt{x}+1/\sqrt{x})^{10}$ is equal to

(A)

10

(B)

252

(C)

20

(D)

256

Q.No. 76

The number of moles of carbon and oxygen required to produce $6.023 * 10^{23}$ molecules of CO_2

(A)

0.01 mol and 0.01mol

(B)

o.5 mol and 0.1 mol

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(C)

10.0 mol and 5.0 mol

(D)

1.0 mol and 1.0 mol

Q.No. 77

Consider the first 10 positive integers. If we multiply each number by -1 and then add 1 to each number, the variance of the numbers so obtained is

(A)

8.25

(B)

6.5

(C)

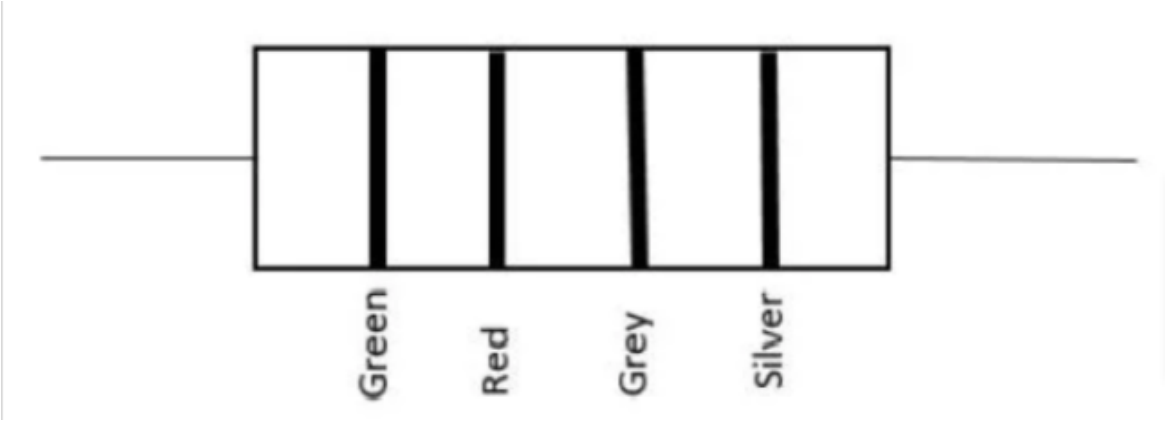
3.87

(D)

2.87

Q.No. 78

Value of resistor shown below is:



(A)

$5.2 \times 10^8 \Omega \pm 10\%$

(B)

$5.2 \times 10^7 \Omega \pm 5\%$

(C)

$52 \times 10^8 \Omega \pm 10\%$

(D)

$52 \times 10^7 \Omega \pm 5\%$

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Q.No. 79

An instrument called the sphygmomanometer is used for instruments for

(A)

Flow speed of fluid

(B)

Atmospheric pressure

(C)

Pressure difference

(D)

Blood pressure of humans

Q.No. 80

The line

$$\frac{x-4}{-2}=\frac{y-7}{1}=\frac{z+3}{3}$$

intersects the curve $xy=c^2$, $z=0$ if c is equal to

(A)

±1

(B)

±2

(C)

±4

(D)

±√2

Q.No. 81

For a hydrogen like atom, the kinetic energy of the electron in a certain orbit is 9.4 eV. The total energy and potential energy respectively in this case will be

(A)

18.8 eV, 9.4 eV

(B)

9.4 eV. 9.4 eV

(C)

-9.4 eV, -18.8 eV

(D)

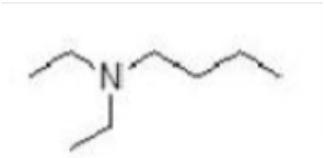
9.4 eV, -18.8 eV

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Q.No. 82

The IUPAC name of the following amine is:



(A)

N, N-Diethylbuty1amine

(B)

N, N-Diethyl-N-butylamine

(C)

N,N-Diethylbutan-1-amine

(D)

N,N-Diethylbutan-4-amine

Q.No. 83

6.241 g of a substance occupies 2.3cm^3, The density of the substance keeping the significant figures in view will be-

(A)

2.7134

(B)

2.713

(C)

2.71

(D)

2.7

Q.No. 84

The value of $\sin[2\cos^{-1}\sqrt{5/3}]$ is

(A)

$\sqrt{5/3}$

(B)

$2\sqrt{5/3}$

(C)

$4\sqrt{5/9}$

(D)

$2\sqrt{5/9}$

Q.No. 85

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

Assertion A: Combustion of all organic compounds is an endothermic reaction.

Reason R: The standard enthalpy of formation of an element in reference state is taken as zero.

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

(A)

Both A and R are correct but R is the correct explanation of A

(B)

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

(C)

A is correct but R is not correct

(D)

A is not correct but R is correct

Q.No. 86

Match List I with List II:

List I	List II
Material	Conductance (Sm^{-1})
A. Teflon	I. 2.1×10^{3}
B. Pure Water	II. 1.5×10^{-2}
C. Sodium	III. 1.0×10^{-18}
D. Silicon	IV. 3.5×10^{-5}

Choose the correct answer from the options given below:

(A)

A-IV, B-I, C-II, D-III

(B)

A-IV, B-III, C-II, D-I

(C)

A-III, B-IV, C-II, D-I

(D)

A-III, B-IV, C-I, D-II

Q.No. 87

Match List I with List II:

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List I	List II
Enzyme	Source
A. Zymase	I. Soyabean
B. Urease	II. Yeast
C. Pepsin	III. Malt
D. Diastase	IV. Stomach

Choose the correct answer from the options given below:

(A)

A-II, B-I, C-III, D-IV

(B)

A-II, B-I, C-IV, D-III

(C)

A-I, B-II, C-IV, D-III

(D)

A-I, B-II, C-III, D-IV

Q.No. 88

Two strings A and B, made of same material, are streched by same tension. The radius of A is double of the radius of B, A transverse wave travels in A with speed velocity v_A and in B with speed v_B. The ratio v_A/v_B is:

(A)

1/4

(B)

1/2

(C)

2

(D)

4

Q.No. 89

The minimum area of a triangle formed by any tangent to the ellipse $x^2/a^2 + y^2/b^2 = 1$ with the coordinate axes is

(A)

$a^2 + b^2$ sq.units

(B)

$(a+b)^2/2$ sq.units

(C)

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$(a-b)^2/2$ sq.units

(D)

ab sq.units

Q.No. 90

Given below are two statements:

Statement I: A process or change is said to be reversible, if the change is brought out in such a way that the process could at any time be reversed by finite change.

Statement II: A reversible process proceeds infinitely slowly by a series of equilibrium states such that system and the surrounding are always in near equilibrium with each other.

Choose the correct answer from the options given below:

(A)

Both Statement I and Statement II are true

(B)

Both Statement I and Statement II are false

(C)

Statement I is true but Statement II is false

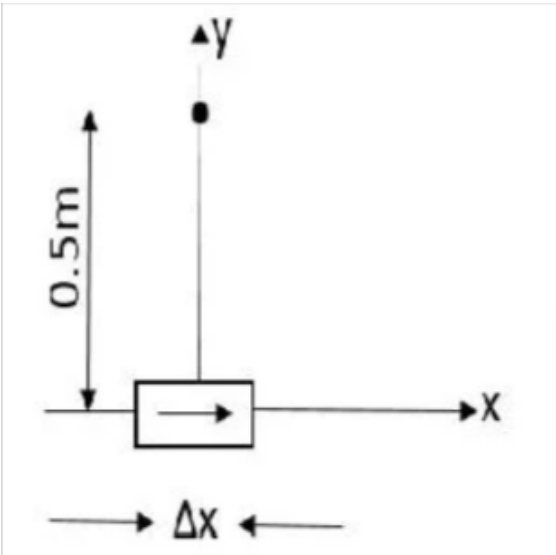
(D)

Statement I is false but Statement II is true

Q.No. 91

An element of length $\triangle x$=1 cm is placed at the origin and carrier current I=4A as shown in the figure. The magnitude of the magnetic field on the y-axis at a distance of 0.5 m is,

$$\left(\mu_0/4\pi = 10^{-7}\ \mathrm{T\ m'A}\right)$$



(A)

$1.6 * 10^{-7}$ T

(B)

$1.6 * 10^{-8}$ T

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(C)

$1.6 * 10^{-9}$ T

(D)

0

Q.No. 92

If the temperature of a uniform rod is slightly increased by Δt, it moment of inertia / about a perpendicular bisector will increases by, (L=length of rod, α =coefficient of linear expansion)

(A)

Zero

(B)

$$\alpha L \Delta t$$

(C)

$$2\alpha L \Delta t$$

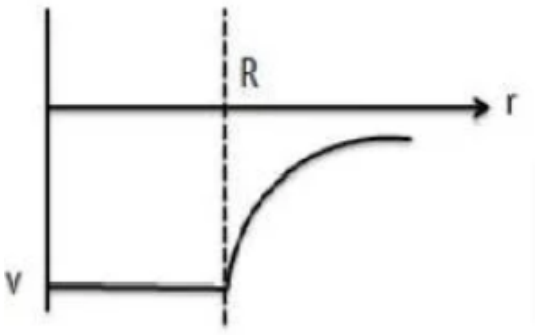
(D)

$$3\alpha L \Delta t$$

Q.No. 93

Which of the following show graphically correct variation of gravitational potential with distance r from the centre of the uniform thin spherical shell? (R=Radius of shell)

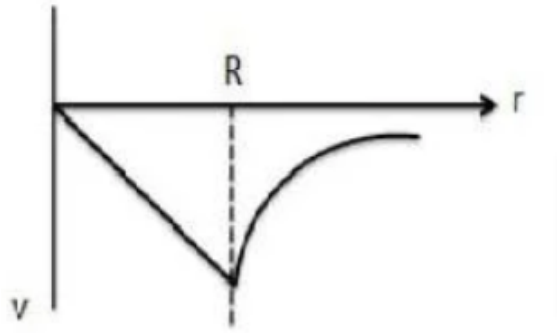
(A)



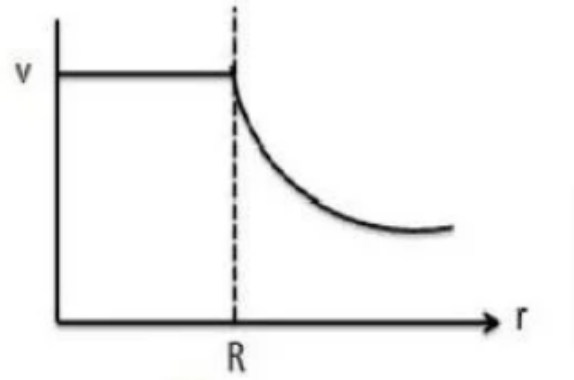
(B)

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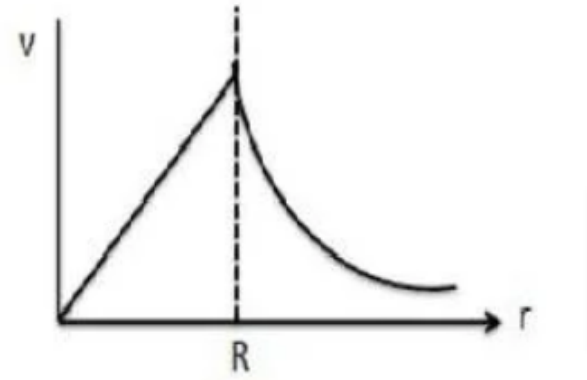
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(C)



(D)



Q.No. 94

Arrange 1st ionization enthalpy of group 13 elements in the increasing order:

(TI, In, Ga, Al)

(A)

TI<In<Ga<Al

(B)

In<Ga<Al<TI

(C)

In<Al<Ga<TI

(D)

TI<In<Al<Ga

Q.No. 95

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The differential equations of all conics whose axes coincide with the coordinate axes is

(A)

$$xy\frac{d^2y}{dx^2}+x\left(\frac{dy}{dx}\right)^2+y\frac{dy}{dx}=0$$

(B)

$$xy\frac{d^2y}{dx^2}+x\left(\frac{dy}{dx}\right)^2+x\frac{dy}{dx}=0$$

(C)

$$xy\frac{d^2y}{dx^2}+x\left(\frac{dy}{dx}\right)^2-y\frac{dy}{dx}=0$$

(D)

$$xy\frac{d^2y}{dx^2}-x\left(\frac{dy}{dx}\right)^2+y\frac{dy}{dx}=0$$

Q.No. 96

Given below are two statements:

Statement I: Expansion of a gas against external pressure is called free expansion.

Statement II: No work is done during the expansion of an ideal gas when the process is reversible only.

Choose the correct answer from the options given below:

(A)

Both Statement I and Statement II are true

(B)

Both Statement I and Statement II are false

(C)

Statement I is true but Statement II is false

(D)

Statement I is false but Statement II is true

Q.No. 97

Which of the following polymers is not an example of chain growth polymerization?

(A)

Polythene

(B)

Bakelite

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(C)

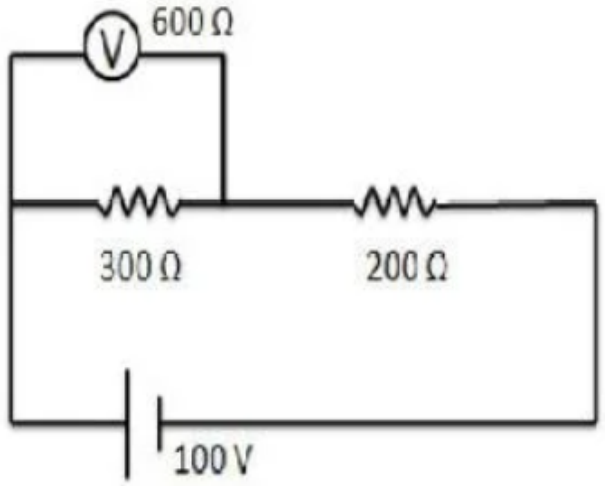
Teflon

(D)

Polyacrylonitrile

Q.No. 98

What will be reading of the Voltmeter in the circuit shown below? Resistance of the voltmeter is 600 Ω.



(A)

60 V

(B)

75 V

(C)

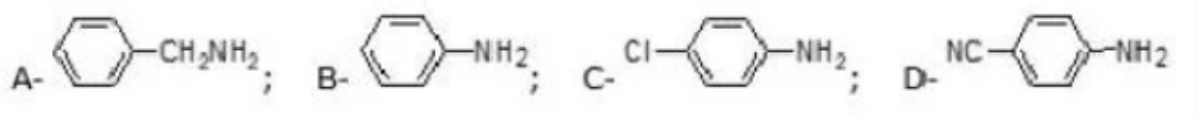
50 V

(D)

40 V

Q.No. 99

Consider the following amines:



The basic strength of these amines in increasing order is:

(A)

C<D<A<B

(B)

D<B<C<A

(C)

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C<D<B<A

(D)

D<C<B<A

Q.No. 100

In the given reaction (equation is not balanced), 'X' is:

$$\mathrm{FeS_2(\ s) + O_2(\ g) \longrightarrow X(s) + SO_2(\ g)}$$

(A)

FeO

(B)

Fe_2O_3

(C)

Fe_3O_4

(D)

Fe

Q.No. 101

Two vectors

$$\vec{A}$$

and

$$\vec{B}$$

are inclined such a way that the magnitude of their cross product is equal to $\sqrt{3}$ times their dot product. The angle between them is

(A)

30 degree

(B)

45 degree

(C)

60 degree

(D)

Zero

Q.No. 102

Given f(x)=sin4x+cos4x: $0 \leq x \leq \pi/2$, which of the following statements are true?

A: Local minimum value of f(x) is 1/2

B: f(x) is increasing on$[\pi/4, \pi/2]$

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C.

$$\int_0^{\pi/2} f'(x)dx = 1$$

D. Period of f(x) is $\pi/4$

Choose the correct answer from the options given below:

(A)

A and B only

(B)

A and D only

(C)

B and D only

(D)

A. B and D only

Q.No. 103

Given below are two statements:

Statement I: Dissociation is the process of separation of ions in water already existing as such in the solid state of the solute like NaCl.

Statement II: Ionization corresponds to a process in which a neutral molecules splits into charged ions in the solution.

Choose the correct answer from the options given below:

(A)

Both Statement I and Statement II are true

(B)

Both Statement I and Statement II are false

(C)

Statement I is true but Statement II is false

(D)

Statement I is false but Statement II is true

Q.No. 104

An alternating current having peak value of 14 A used to heat a metal wire. To produce heating effect, a constant current i can be used where i is

(A)

14 A

(B)

about 20 A

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(C)

7 A

(D)

about 10 A

Q.No. 105

In which of the following decays, the element does not change?

(A)

α - decay

(B)

β^+ - decay

(C)

β^- - decay

(D)

γ - decay

Q.No. 106

Two charges +10μC and +20μC are placed at a distance of 2 cm. The electric potential due to the charges at the mid point of the line joining the two charges will be,

$$\left(1/4\pi E_0 = 9310^9 \text{ N m}^2/\text{c}\right)$$

(A)

0

(B)

9MV

(C)

18MV

(D)

27MV

Q.No. 107

For the function f(x)=Inx/x, which of the following statement are true?

A: f(x) has horizontal tangent at x=e

B: f(x) cuts the x-axis only at one point

C: f(x) is many one function

D: f(x) has one vertical tangent

Choose the correct answer from the options given below:

(A)

A, B and C only

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(B)

A and B only

(C)

B and C only

(D)

A, C and D only

Q.No. 108

Choose the correct order of the packing efficiency for the simple cubic lattice, bcc, ccp and hcp.

(A)

hcp>ccp>bcc>Simple cubic lattice

(B)

hcp<ccp<bcc<Simple cubic lattice

(C)

hcp=ccp<bcc<Simple cubic lattice

(D)

hcp=ccp>bcc>Simple cubic lattice

Q.No. 109

Which of the following expressions is correct for the molar conductivity of strong electrolytes?

(A)

$$\Lambda_{\mathrm{m}}^{0}=\Lambda_{\mathrm{m}}-\mathrm{A}(\mathrm{c})^{1/2}$$

(B)

$$\Lambda_{\mathrm{m}}=\Lambda_{\mathrm{m}}^{0}-\mathrm{A}(\mathrm{c})^{1/2}$$

(C)

$$\Lambda_{\mathrm{m}}=\Lambda_{\mathrm{m}}^{0}-\mathrm{A}(\mathrm{c})^{1/2}$$

(D)

$$\Lambda_{m}^{0}=\Lambda_{m}-A(c)^{1/2}$$

Q.No. 110

Which of the following compounds dose not react with sodium metal?

(A)

Ethyne

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(B)

1-Pentyne

(C)

2-Pentyne

(D) 1-Propyne

Q.No. 111

Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: The circle

$$x^2 + y^2 = 4$$

is an auxiliary circle of ellipse

$$\frac{x^2}{4} + \frac{y^2}{b^2} = 1$$

where b<2

Reason R: A given circle is an auxiliary circle of exactly one ellipse.

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

(A)

Both A and R are correct and R is the correct explanation of A

(B)

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

(C)

A is correct but R is not correct

(D)

A is not correct but R is correct

Q.No. 112

A person is moving upward in a balloon with a constant velocity 20 m/s. When the balloon is at a height of 25 m from the ground, the person drops a stone. The stone will hit the ground after the time

(A)

2 s

(B)

3 s

(C)

5 s

(D)

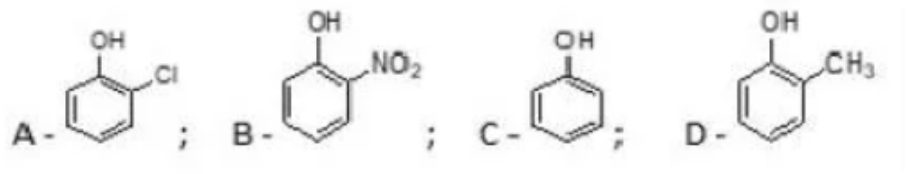
7 s

Q.No. 113

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Arrange the following compounds in increasing order of acidity:



(A)

D<C<A<B

(B)

C<D<A<B

(C)

D<A<B<C

(D)

A<D<B<C

Q.No. 114

The integral

$$\int_0^{\pi/2} |\operatorname{Sin} x - \operatorname{Cos} x| dx$$

is equal to

(A)

2√2

(B)

2(√2-1)

(C)

2(√2+1)

(D)

√2+1

Q.No. 115

For the general reaction, A + 2B -----> C + D

Which is the following statement is correct?

(A)

Rate of disappearance of A=Rate of disappearance of B

(B)

Rate of disappearance of A=1/2Rate of disappearance of C

(C)

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Rate of disappearance of A=1/2Rate of disappearance of B

(D)

Rate of disappearance of A=1/2Rate of disappearance of D

Q.No. 116

4p and 5d orbitals have X and Y angular nods, respectively. X and Y are respectively,

(A)

0 and 1

(B)

1 and 2

(C)

2 and 3

(D)

3 and 4

Q.No. 117

When two equal forces are inclined at an angle of 2α, their resultant is twice as greater as when they act at an angle 2β, the ratio |cosα/cosβ| is equal to

(A)

2

(B)

$\sqrt{3}$

(C)

1/2

(D)

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

Q.No. 118

Two cars having masses m_1 and m_2 move in circles of radii r_1 and r_2 respectively. If they complete the circles in equal time, the ratio of their angular speed w_1/w_2 will be:

(A)

m_1/m_2

(B)

r_1/r_2

(C)

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m_1r_1/m_2r_2

(D)

1

Q.No. 119

Match List I with List II:

List I	List II
Law	**Formula**
A. Charle's Law	I. P/T = Constant
B. Gay Lussac's Law	II. PV = Constant
C. Boyle's Law	III. V/n = Constant
D. Avagadro's Law	IV. V/T = Constant

Choose the correct answer from the options given below:

(A)

A-II, B-I, C-IV, D-III

(B)

A-II, B-IV, C-III, D-I

(C)

A-IV, B-I, C-II, D-III

(D)

A-Iv, B-III, C-II, D-I

Q.No. 120

If $y = (1+x)(1+x2(1+x^4).....(1+x^{2n})$; then the value of dy/dx at x=0 is

(A)

0

(B)

-1

(C)

1

(D)

2

Q.No. 121

The least velocity with which a cricket ball may be thrown 80m horizontally is

(A)

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28 m/s

(B)

35 m/s

(C)

9.8 m/s

(D)

71 m/s

Q.No. 122

As the mass number A increases, which of the following quantities related to the nucleus do not change?

(A)

mass

(B)

volume

(C)

density

(D)

binding energy

Q.No. 123

Arrange the following in the descending order of covalent bond length:

C-C, C-N, C-H, O-H

(A)

C-C > C-N > C-H > O-H

(B)

C-C > C-H > C-N > O-H

(C)

O-H > C-H > C-C > C-N

(D)

C-N > C-C > O-H > C-H

Q.No. 124

The solution of $dy/dx+2ytanx=sinx$, is

(A)

$y\ sec^3x=sec^2x+c$

(B)

$y\ sec^2x=secx+c$

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(C)

y sinx=tanx+c

(D)

y sinx=sec^3x+c

Q.No. 125

If

$$p \rightarrow (\sim pv \sim q)$$

is false, then the truth value of p and q are respectively,

(A)

T ,F

(B)

F,F

(C)

F,T

(D)

T,T

Q.No. 126

Given

$$f(x) = \begin{cases} x-1; x \leq 1 \\ x^3-1; x > 1 \end{cases}$$

, then at x=1, f is

(A)

Continuous and differentiable

(B)

Continuous and not differentiable

(C)

Differentiable but not continuous

(D)

Neither continuous nor differentiable

Q.No. 127

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

Assertion A: α-D-glucose is a dextrorotatory compound.

Reason R: The notation 'D' in α-D-Glucose represents its dextrorotatory nature.

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

(A)

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Both A and R are correct but R is the correct explanation of A

(B)

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

(C)

A is correct but R is not correct

(D)

A is not correct but R is correct

Q.No. 128

If

$$\Delta(x)=\begin{vmatrix} 1 & 1+\sin x & \sin x \\ \cos x & \cos x & \sin x \\ 1-\cos x & 1+\sin x-\cos x & 1 \end{vmatrix}$$

, then

$$\int_0^{\frac{\pi}{4}} \Delta(x)\cdot dx$$

is equal to

(A)

1/4

(B)

1/2

(C)

0

(D)

-1/4

Q.No. 129

A wire can sustain the weight of 20 kg before breaking. If the wire is cut into two equal pieces, each part can sustain a weight of-

(A)

10 kg

(B)

20 kg

(C)

40 kg

(D)

80 kg

Q.No. 130

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Which of the following statements are correct?

A. If

$$\vec{a}$$

and

$$\vec{b}$$

are two vectors such that

$$|\vec{a}+\vec{b}|=|\vec{a}|$$

, then

$$2\vec{a}+\vec{b}_{\text{is perpendicular to}}$$

$$\vec{b}$$

B. For any three vectors

$$\vec{a},\vec{b}$$

and

$$\vec{c}$$

if

$$|\vec{a}|=1,|\vec{b}|=4,|\vec{c}|=2$$

and

$$\vec{a}+\vec{b}+\vec{c}=\overrightarrow{0}$$

, then

$$\vec{a}\cdot\vec{b}+\vec{b}\cdot\vec{c}+\vec{c}\cdot\vec{a}=-\frac{7}{2}$$

C. The area of a parallelogram having diagonals

$$\hat{\imath}-3\hat{\jmath}+4\hat{k}$$

and

$$3\hat{\imath}-\hat{\jmath}+2\hat{k}_{\text{is}}\ \frac{5\sqrt{3}}{2}$$

square units D. If

$$\vec{a},\vec{b},\vec{c}$$

are three vectors such that then

$$\vec{a}\cdot\vec{b}=\vec{a}\cdot\vec{c},\vec{a}\times\vec{b}=\vec{a}\times\vec{c},\vec{a}\neq\overrightarrow{0}$$

then

$$\vec{b}=\vec{c}$$

Choose the correct answer from the options given below:

(A)

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A, B and D only

(B)

A and D only

(C)

B and D only

(D)

A only

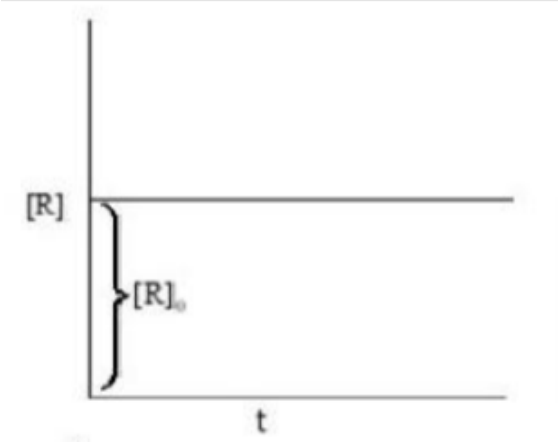
Q.No. 131

For a zero order reaction, the rate constant is

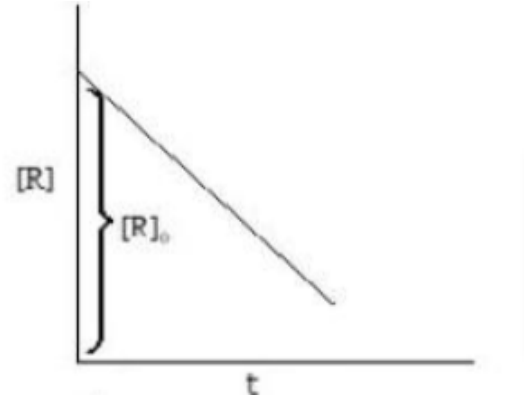
$$K = \frac{[R]_0 - [R]}{t}$$

Which of the following is correct graph for it?

(A)



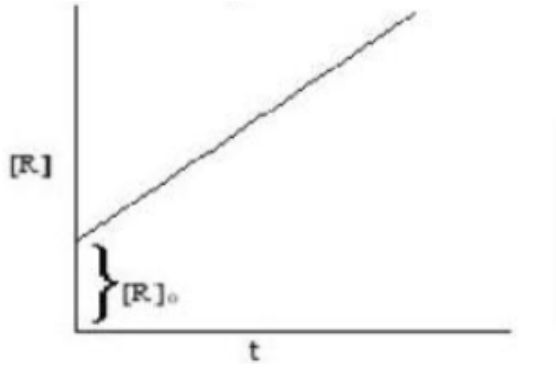
(B)



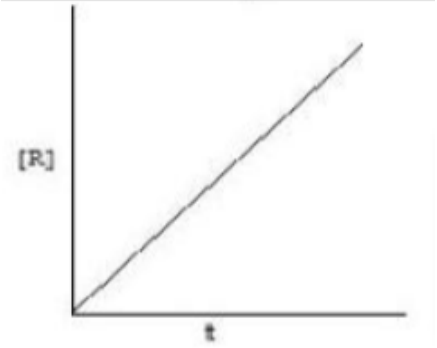
(C)

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(D)



Q.No. 132

The ac voltage across the resistance can be measured using-

(A)

A potentiometer

(B)

Moving coil galvanometer

(C)

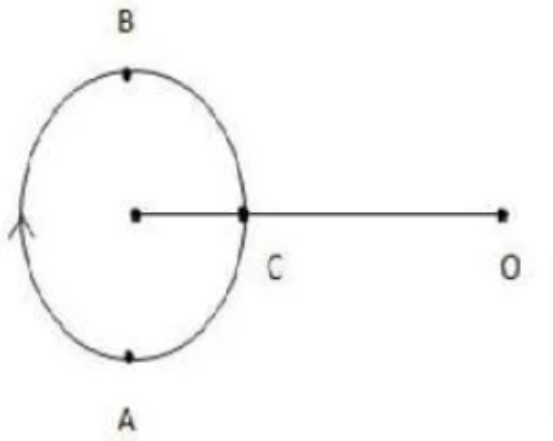
A hot wire voltmeter

(D)

A moving magnet galvanometer

Q.No. 133

A small source of sound moves on a circle as shown in figure and observer is setting at O. Let v_A, v_B and v_C be the frequencies heard when the source is at A, B and C respectively. We can then say:



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(A)

$v_A > v_B > v_C$

(B)

$v_A = v_B > v_C$

(C) $v_B > v_C > v_A$

(D)

$v_A > v_C > v_B$

Q.No. 134

The molar conductance of acidic acid is 40 S cm2mol-1. If the dissolution constant is 1 *10-5molL-1, then the concentration of acidic acid is

$$\left(\Lambda_{\mathrm{Na^0c}} = 90\ \mathrm{S\ cm^2/mol^1}, \Lambda_{\mathrm{Nacl}}{}^2 = 120\ \mathrm{S\ cm/mol^2}\right.$$

, and

$$\left.\Lambda^0_{\mathrm{HCl}} = 430 \mathrm{Scm^2} mol\right)$$

(A)

$$9 \times 10^{-4}\ \mathrm{mol\ L^{-1}}$$

(B)

$$9 \times 10^{-3}\ \mathrm{mol\ L^{-1}}$$

(C)

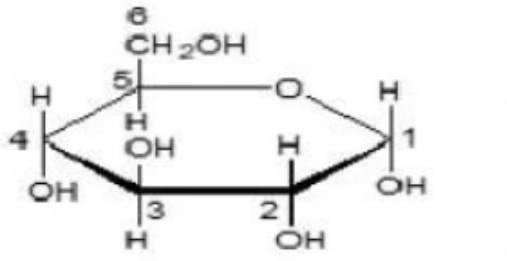
$$400 \mathrm{Scm^2\ mol^{-1}}$$

(D)

$$40 \mathrm{Scm^2\ mol^{-1}}$$

Q.No. 135

Identify the anomeric carbon in the given structure of α-D-glucopyranose.



(A)

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C1

(B)

C2 and C3

(C)

C4 and C5

(D)

C6

Q.No. 136

We have a holly cylindrical conductor of length 3.0 m and inner and outer radii 1.0 cm and 2.0 cm respectively. Its resistance is, (resistivity of the material is $\pi*10^{-8}\Omega m$)

(A)

$10^{-2}\Omega$

(B)

$10^{-3}\Omega$

(C)

$10^{-4}\Omega$

(D)

$10^{-5}\Omega$

Q.No. 137

A function

$$f : R \to R$$

satisfies the equation f(x+y)=f(x). for all

$$x, y \in R : f(x) \neq 0$$

. Suppose that the function f(x) is differentiable at x=0 and

$$f'(0) = 2$$

. If

$$f'(x) = \lambda$$

. f(x), then the value of

$$\lambda$$

is

(A)

1

(B)

2

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(C)

1/2

(D)

Any real number

Q.No. 138

The expansion of the magnetic energy stored in a solenoid in terms of magnetic field B, Area A and length l of solenoid.

(A)

$$BAl/2\mu_0^2$$

(B)

$$B^2Ai/2\mu_0$$

(C)

$$BAl/\mu_0^2$$

(D)

$$\mathrm{BAl/H_0}$$

Q.No. 139

A mass m is rotated in a vertical circle by connecting it to a light string of length l and keeping the other end of the string fixed. The minimum speed of the particle when the string is horizontal for which the mass will complete the circle is-

(A)

√gl

(B)

√2gl

(C)

√3gl

(D)

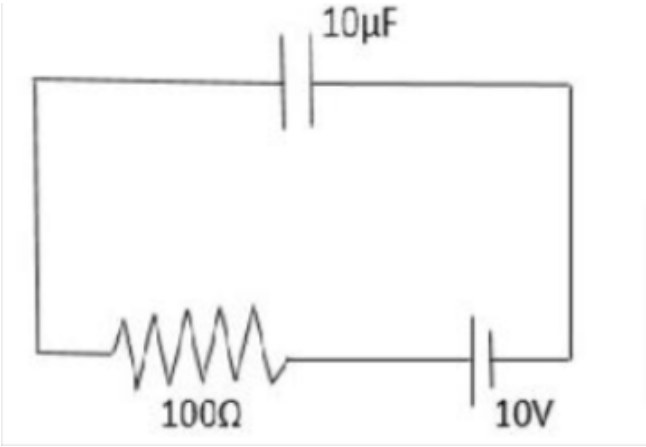
√5gl

Q.No. 140

A $10\mu F$ capacitor is connected to the battery of 10 V through a 100Ω resistor as shown in figure. The charge accumulated in the capacitor will be

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(A)

100μC

(B)

50μC

(C)

25μC

(D)

0

Q.No. 141

Gemstones, Ruby and Sapphire contain 'A' and 'B' respectively as impurities, 'A' and 'B' are

(A)

A=Co;B=Cr

(B)

A=Cr;B=Co

(C)

A=Co;B=Co

(D)

A=Cr;B=Cr

Q.No. 142

Match List I with List II :

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List I	List II
A. $\int_0^{\pi} \frac{1}{5+4\cos x} dx$	I. $\frac{\pi}{4}$
B. $\int_0^{\pi/4} \frac{\sin 2x}{\cos^4 x + \sin^4 x} dx$	II. $\frac{\pi}{2}$
C. $\int_0^{\pi} \frac{e^{\cos x}}{e^{\cos x} + e^{-\cos x}} dx$	III. $\frac{\pi}{3}$
D. $\int_0^{\pi} \frac{x}{1+\sin x} dx$	IV. π

Choose the correct answer from the options given below:

(A) A-II, B-I, C-IV, D-III

(B)

A-IV, B-I, C-II, D-III

(C)

A-III, B-I, C-II, D-IV

(D)

A-II, B-IV, C-III, D-I

Q.No. 143

The inverse of the function

$$f(x) = \frac{10^x - 10^{-x}}{10^x + 10^{-x}}$$

is

(A)

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$$\log_{10}\left(\frac{1+x}{1-x}\right)$$

(B)

$$\frac{1}{2}\log_{10}\left(\frac{1+x}{1-x}\right)$$

(C)

$$\log_{10}(1+x)$$

(D)

$$-\log_{10}\left(\frac{1+x}{1-x}\right)$$

Q.No. 144

Out of 7 consonants and 4 vowels, the number of words(with or without meaning)that can be made, each consisting of 3 consonants and 2 vowels is

(A)

24800

(B)

25100

(C)

25200

(D)

25400

Q.No. 145

A proton and an electron are placed in an electric field. Then we can say-

(A)

The electric force acting on them are equal

(B)

The magnitude of the forces are equal

(C)

Their acceleration are equal

(D)

The magnitude of their acceleration are equal

Q.No. 146

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In the given reaction,

$$\underset{}{\overset{A}{2Cu_2O(s)}} + \underset{}{Cu_2\,S(\,s)} \longrightarrow \quad \underset{}{\overset{B}{6Cu(s)}} + \underset{}{\overset{C}{SO_2(\,g)}}$$

The oxidation number of Cu are A, B and C. A, B and C are respectively

(A)

+1,+2,0

(B)

+1,+1,0

(C)

+2,+1,0

(D)

+1,+2,+1

Q.No. 147

The dimensional formula for the coefficient of viscosity is:

(A)

$[M^{-1}LT^{0}]$

(B)

$[M^{-1}L^{-1}T^{-1}]$

(C)

$[ML^{0}T^{1}]$

(D)

$[ML^{-1}T^{-1}]$

Q.No. 148

Two resistors R and 2R are connected in parallel in an electric circuit. The thermal energy developed in R and 2R are in the ratio :

(A)

1:4

(B)

4:1

(C)

2:1

(D)

1:1

Q.No. 149

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Which of the following hydrides does not passes during property?

(A)

H_2O

(B)

H_2S

(C)

H_2Se

(D)

H_2Te

Q.No. 150

Which of the following statements are correct?

A: Hydrides of group 13 acts as Lewis acids.

B: On addition of gypsum to cement, the setting time decreases.

C: Diamond is thermodynamically most stable allotrope of carbon.

D: Beryllium exhibits coordination number of more than four.

E: Beryllium is not readily attached by acids because the presence of an oxide film of the surface of the metal.

Choose the correct answer from the options given below:

(A)

A and C only

(B)

B and C only

(C)

A and E only

(D)

A and B only

Answer Sheet

Q.No	Answer
Q.No. 1	(C)
Q.No. 2	(A)
Q.No. 3	(C)
Q.No. 4	(B)
Q.No. 5	(C)
Q.No. 6	(A)
Q.No. 7	(A)

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Q.No. 8	(B)
Q.No. 9	(A)
Q.No. 10	(D)
Q.No. 11	(B)
Q.No. 12	(C)
Q.No. 13	(B)
Q.No. 14	(B)
Q.No. 15	(B)
Q.No. 16	(A)
Q.No. 17	(B)
Q.No. 18	(A)
Q.No. 19	(C)
Q.No. 20	(D)
Q.No. 21	(B)
Q.No. 22	(D)
Q.No. 23	(B)
Q.No. 24	(A)
Q.No. 25	(A)
Q.No. 26	(A)
Q.No. 27	(A)
Q.No. 28	(A)
Q.No. 29	(D)
Q.No. 30	(B)
Q.No. 31	(B)
Q.No. 32	(B)
Q.No. 33	(B)
Q.No. 34	(A)
Q.No. 35	(C)
Q.No. 36	(C)
Q.No. 37	(C)
Q.No. 38	(C)
Q.No. 39	(A)
Q.No. 40	(B)
Q.No. 41	(A)
Q.No. 42	(A)
Q.No. 43	(A)
Q.No. 44	(D)
Q.No. 45	(D)
Q.No. 46	(A)
Q.No. 47	(D)
Q.No. 48	(B)
Q.No. 49	(C)
Q.No. 50	(A)

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Q.No. 51	(D)
Q.No. 52	(A)
Q.No. 53	(A)
Q.No. 54	(B)
Q.No. 55	(D)
Q.No. 56	(A)
Q.No. 57	(D)
Q.No. 58	(B)
Q.No. 59	(D)
Q.No. 60	(A)
Q.No. 61	(A)
Q.No. 62	(B)
Q.No. 63	(B)
Q.No. 64	(A)
Q.No. 65	(B)
Q.No. 66	(B)
Q.No. 67	(C)
Q.No. 68	(B)
Q.No. 69	(A)
Q.No. 70	(C)
Q.No. 71	(C)
Q.No. 72	(A)
Q.No. 73	(C)
Q.No. 74	(A)
Q.No. 75	(B)
Q.No. 76	(D)
Q.No. 77	(A)
Q.No. 78	(C)
Q.No. 79	(D)
Q.No. 80	(C)
Q.No. 81	(C)
Q.No. 82	(A)
Q.No. 83	(D)
Q.No. 84	(C)
Q.No. 85	(D)
Q.No. 86	(D)
Q.No. 87	(B)
Q.No. 88	(B)
Q.No. 89	(D)
Q.No. 90	(D)
Q.No. 91	(B)
Q.No. 92	(C)
Q.No. 93	(A)

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Q.No. 94	(C)
Q.No. 95	(C)
Q.No. 96	(B)
Q.No. 97	(B)
Q.No. 98	(C)
Q.No. 99	(D)
Q.No. 100	(B)
Q.No. 101	(C)
Q.No. 102	(A)
Q.No. 103	(A)
Q.No. 104	(D)
Q.No. 105	(D)
Q.No. 106	(D)
Q.No. 107	(A)
Q.No. 108	(D)
Q.No. 109	(B)
Q.No. 110	(C)
Q.No. 111	(C)
Q.No. 112	(C)
Q.No. 113	(A)
Q.No. 114	(B)
Q.No. 115	(C)
Q.No. 116	(B)
Q.No. 117	(A)
Q.No. 118	(D)
Q.No. 119	(C)
Q.No. 120	(C)
Q.No. 121	(A)
Q.No. 122	(C)
Q.No. 123	(A)
Q.No. 124	(B)
Q.No. 125	(D)
Q.No. 126	(B)
Q.No. 127	(C)
Q.No. 128	(D)
Q.No. 129	(B)
Q.No. 130	(B)
Q.No. 131	(B)
Q.No. 132	(C)
Q.No. 133	(C)
Q.No. 134	(A)
Q.No. 135	(A)
Q.No. 136	(C)

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Q.No. 137	(B)
Q.No. 138	(B)
Q.No. 139	(C)
Q.No. 140	(A)
Q.No. 141	(B)
Q.No. 142	(C)
Q.No. 143	(B)
Q.No. 144	(C)
Q.No. 145	(B)
Q.No. 146	(B)
Q.No. 147	(D)
Q.No. 148	(D)
Q.No. 149	(A)
Q.No. 150	(C)

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