JEE EXPERT

STAYHOME#STAYSAFE

CORONA KO STOP KARNA HAI
AT LOCKDOWN, UNLOCK YOUR POTENTIAL
PRACTICE TEST – 07

Time : 3 hours ***Maximum Marks : 240***

- ***Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.***
- ***You are not allowed to leave the examination hall before end of the test.***

Instructions

Note:

1. The question paper contains 3 sections (Sec-I, Chemistry, Sec-II, Physics & Sec-III, Mathematics).

2. Each section is divided into three parts, **Part – A**, **Part – B** & **Part – C**.

3. **Part – A** contains **12** questions which are further divided as follows:

- **Q. 1 – 8** are multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which **only one is correct**.
- **Q. 9 – 12** are multiple correct answer type questions. Each question has four choices (A), (B), (C) and (D) out of which one or more answer(s) is/are correct.

4. **Part – B** contains two questions **(Q. 1 – 2)**. Each question has four statements (A, B, C and D) given in **Column – I** and five statements (P,Q,R,S and T) given in **Column – II**. Any given statement in **column – I** can have correct matching with one or more statement(s) given in **column – II**. For example, if for a given question, statement B matches with the statements given in Q and R then for that particular question, against statement B, darken the bubbles corresponding to Q and R in the ORS.

5. **Part – C** contains **6** questions **(Q. 1 – 6)**. The answer to each of the questions is a single – digit integer, ranging from 0 to 9. The appropriate bubbles against the respective question numbers in the ORS have to be darkened.

6. **Use OMR ICR400410SS**

Marking Scheme

1. For each question in the group **Q. 1 – 8** of **Part – A** you will be awarded **3 marks** if you have darkened only the bubble corresponding to the correct answer and **zero marks** if no bubble is darkened in all other cases, **minus two (–1) mark** will be awarded.

2. For each question in the group **Q. 9 – 12** of **Part – A** you will be awarded **4 marks** if you have darkened **ALL** the bubble(s) corresponding to the correct answer(s) **ONLY** and zero marks otherwise. There are **no negative marks** in this section.

3. For each question in **Part – B**, you will be **awarded two marks** for **each row** in which you have darkened the bubble(s) corresponding to the correct answer. Thus, each question in this part carries a maximum of **8 marks**. There is **no negative marking** for incorrect answer(s) in this section.

4. For each question in **Part – C,** you will be awarded **4 marks** if you have darkened the bubble corresponding to the correct answer and **zero mark** if no bubble is darkened. No negative marks will be awarded for incorrect answer.

Name of the Candidate **:** ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Enrolment Number **:** ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Useful Data Chemistry :

Gas Constant	R	=	$8.314\ J\ K^{-1}\ mol^{-1}$
		=	$0.0821\ Lit\ atm\ K^{-1}\ mol^{-1}$
		=	$1.987 \approx 2\ Cal\ K^{-1}\ mol^{-1}$
Avogadro's Number	N_a	=	6.023×10^{23}
Planck's Constant	h	=	6.626×10^{-34} Js
		=	6.25×10^{-27} erg.s
1 Faraday		=	96500 Coulomb
1 calorie		=	4.2 Joule
1 amu		=	1.66×10^{-27} kg
1 eV		=	1.6×10^{-19} J

Atomic No : H=1, D=1, Li=3, Na=11, K=19, Rb=37, Cs=55, F=9, Ca=20, He=2, O=8, Au=79.

Atomic Masses: He=4, Mg=24, C=12, O=16, N=14, P=31, Br=80, Cu=63.5, Fe=56, Mn=55, Pb=207,
Au=197, Ag=108, F=19, H=2, Cl=35.5, Sn=118.6

Useful Data Physics :

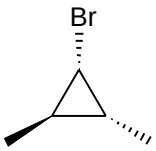
Acceleration due to gravity g = 10 m/s^2

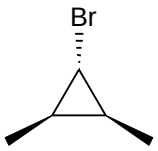
Section – I (Chemistry)

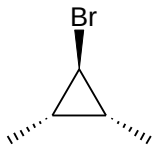
PART – A

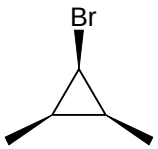
Single Correct Choice Type

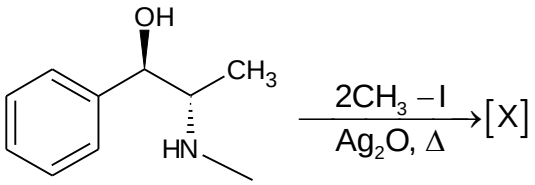
1. Which isomer of 1-bromo-2, 3-dimethylcyclopropane is most reactive towards nuclephile in an SN_2 reaction

(A) 

(B) 

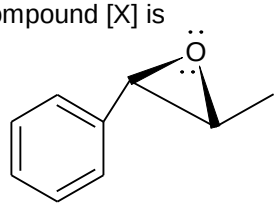
(C) 

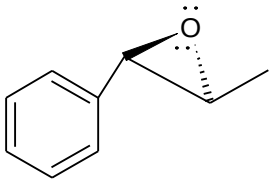
(D) 

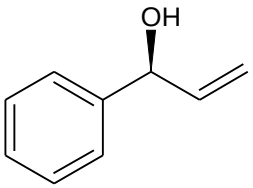
2. 

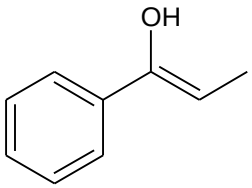
ephedrine

The compound [X] is

(A) 

(B) 

(C) 

(D) 

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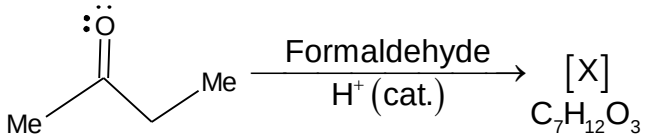
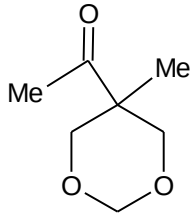
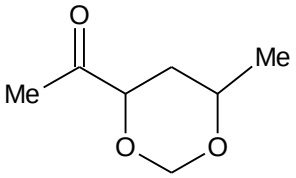
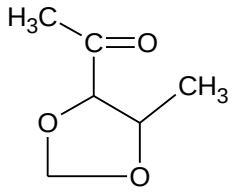
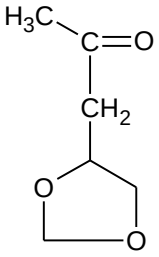
3. 

The major compound [X] is

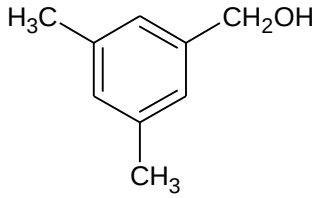
(A) 

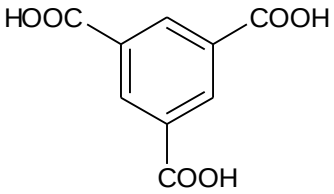
(B) 

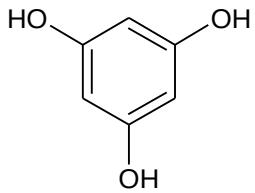
(C) 

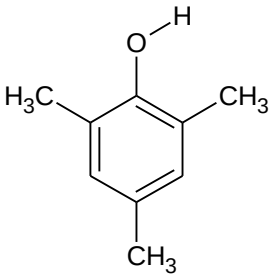
(D) 

4. 1, 3, 5-Trimethylbenzene + $F_3C-CO_3H \xrightarrow{BF_3} [X]$. The compound [X] is

(A) 

(B) 

(C) 

(D) 

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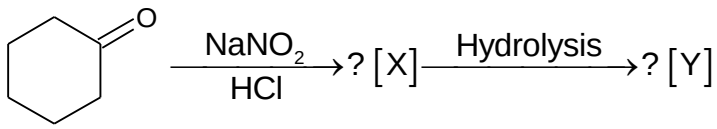
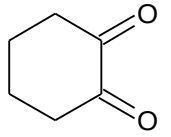
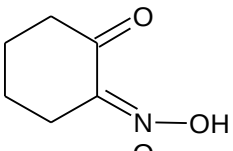
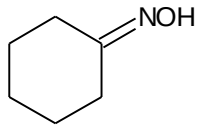
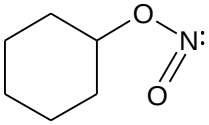
5. 

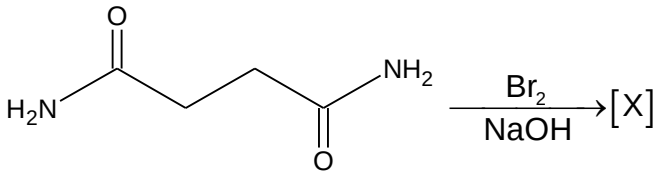
The end product [Y] is

(A) 

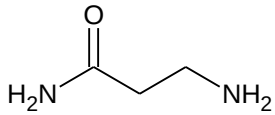
(B) 

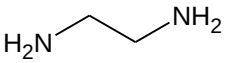
(C) 

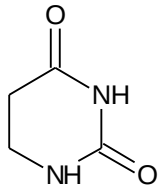
(D) 

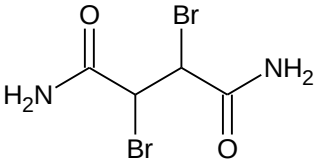
6. 

The compound [X] is

(A) 

(B) 

(C) 

(D) 

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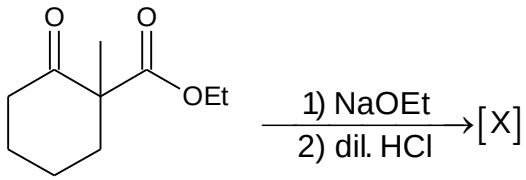
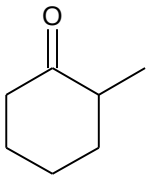
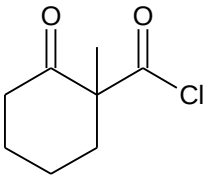
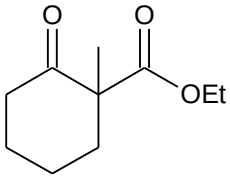
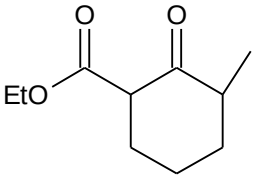
7. 

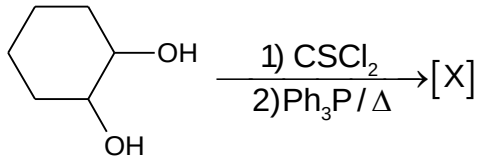
The compound [X] is

(A) 

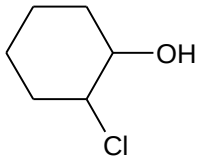
(B) 

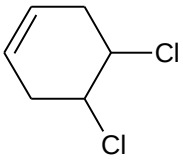
(C) 

(D) 

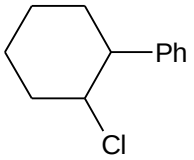
8. 

The compound [X] is

(A) 

(B) 

(C) 

(D) 

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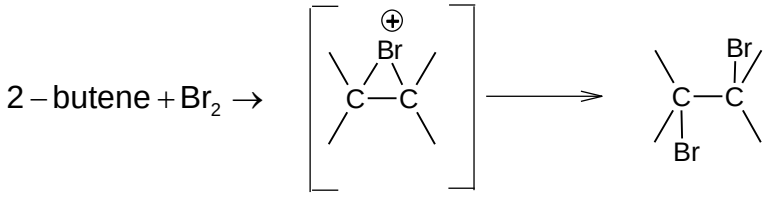
Multiple Correct Choice Type

9. The typical example of electrophilic addition in bromination of alkane to give vic.dibromide via cyclic bromonium ion intermediate

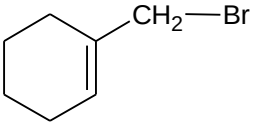


Intermediate

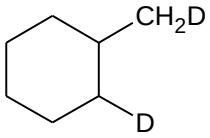
Which of the following statement(s) is/are correct?

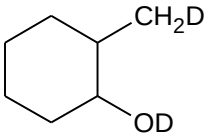
(A) Cis-2-butene gives racemic intermediate as well as racemic products.
(B) Trans-2-butene gives meso intermediate as well as meso products
(C) Cis-2-butene gives meso intermediate and racemic products.
(D) Trans-2-butene gives racemic intermediate and meso products.

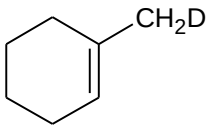
10. What product(s) is/are formed, when a Grignard reagent prepared from the alkyl halide

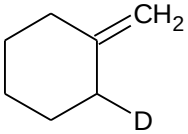


is treated with D_2O.

(A) 

(B) 

(C) 

(D) 

11. Which of the following gases is/are evolved when urea (H_2NCONH_2) is treated with nitrous acid?

(A) N_2 (B) CO
(C) CO_2 (D) N_2O

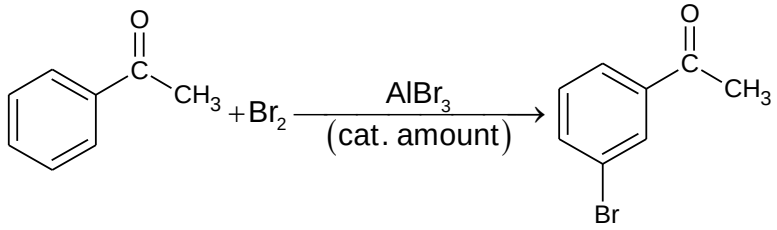
space for rough work

12. In the reactions given below, select all the possible fauty synthetic procedures.

(A) $H_3CCH_2CO_2Et \xrightarrow[EtOH]{NaOEt} \xrightarrow{CH_3I} (CH_3)_2CHCO_2Et$

(B) $H_3CCHCO_2Et \xrightarrow[\Delta]{H_3O^+} H_2C=CH-CO_2Et$ (OH)

(C) $H_3CCH_2COOH \xrightarrow[Br_2]{PBr_3\ (cat)} \xrightarrow[ether]{Mg} \xrightarrow[2)\ H_3O^+]{1)\ H_3C-CH=O} H_3C-HC(OH)-CH(CH_3)-CO_2H$

(D) 

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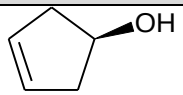
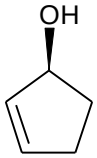
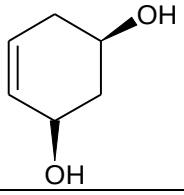
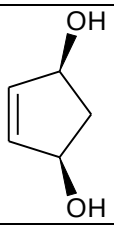
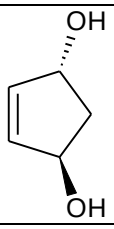
PART – B

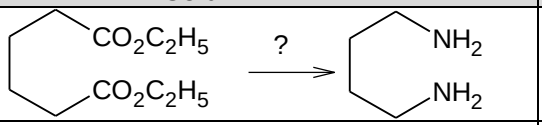
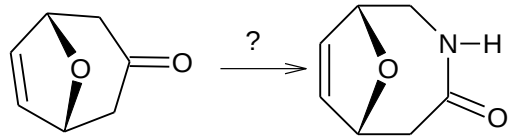
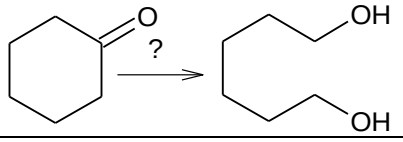
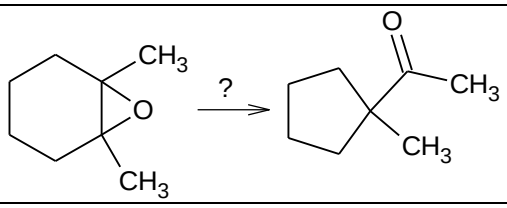
Matrix – Match Type

1. In column – I, statements are given and in Column II, structures are provided. Match the statement given in Column I with corresponding structures shown in Column – II

Column – I		Column – II	
(A)	An optically active compound that is oxidized by MnO_2 to an optically inactive compound.	(P)	
(B)	An optically active compound that is oxidized by MnO_2 to an optically active compound	(Q)	
(C)	An optically inactive compound that is oxidized by MnO_2 to an optically inactive compound	(R)	
(D)	A compound that is not oxidized by MnO_2	(S)	
		(T)	

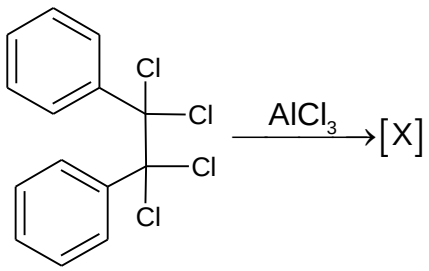
space for rough work

2. Synthetic transformation A to D are shown here. Each of these has been carried out by a sequence of reactions, one of which involves a molecular rearrangement. A list of five possible procedures is given to the right of equations. Your job is to pick the sequence (or single reaction) that best achieves the selected synthesis.

Column – I		Column – II	
(A)		(P)	$(i)C_6H_5CO_3H$ in CH_2Cl_2; $(ii)LiAlH_4$ in ether; (iii) H_2O
(B)		(Q)	$(i)LiAlH_4$ in ether; $(ii)H_2O$; $(iii)C_6H_5CO_3H$ in CH_2Cl_2
(C)		(R)	H_2SO_4 (catalyst) in CH_3CN solvent
(D)		(S)	(i) NH_2OH (oxime formation) (ii) strong acid or PCl_5 (Beckmann rearrangement)
		(T)	N_2H_4 (excess) (ii) HNO_2; $H_3O^{(+)}$; 5^oC

PART – C

Numerical Based

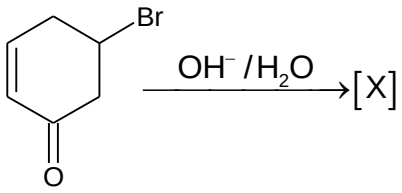
1. 

In the compound [X], the algebric sum of the π bonds and number of chlorine atoms is?

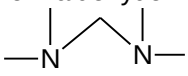
space for rough work

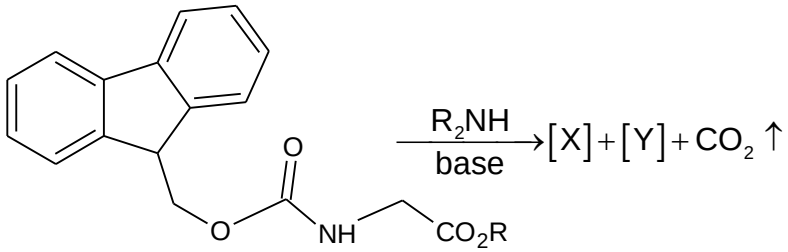
2. $\text{Trans}-2-\text{butene} \xrightarrow[2)\,Ph_3P,\ \Delta]{1)\ RCO_3H} [X] + \text{other product}$

How many π-bonds is in the compound [X]

3. 

How many delocalized π electrons are in compound [X]

4. Usually, aldehydes and ketones react with ammonia to give aldimine and Ketimine respectively. But formaldehyde reacts with ammonia in a different manner to give Urotropine. How many bonds are  bonds in Urotropine?

5. 

The total number of π bonds in the organic compound [X] and [Y] are …..

6. How many types of β-ketoester is/are formed if ethyl acetate is treated with $MeO^- / MeOH$?

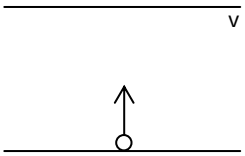
space for rough work

Section – II (Physics)

PART – A

Single Correct Choice Type

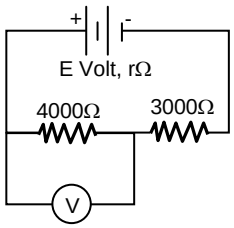
1. An electron having charge e and mass m starts from lower plate of two metallic plates separated by a distance d. If potential difference between the plates is V, the time taken by the electron to reach the upper plate is given by



(A) $\sqrt{\frac{2md^2}{eV}}$ (B) $\sqrt{\frac{md^2}{eV}}$

(C) $\sqrt{\frac{md^2}{2eV}}$ (D) $\frac{2md^2}{eV}$

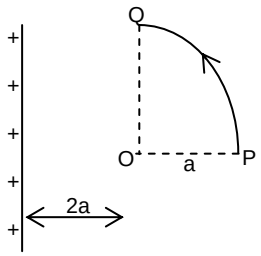
2. In the figure, when an ideal voltmeter is connected across 4000 Ω resistance it reads 30V. If the voltmeter is connected across 3000 Ω resistance, it will read



(A) 20V (B) 22.5V

(C) 35V (D) 40V

3. A arc PQ with centre at O and an infinitely long wire having linear charge density λ are lying in the same plane. The minimum amount of work to be done by an external agent to move a point charge q_0 from point P to Q through circular arc PQ of radius a is equal to:

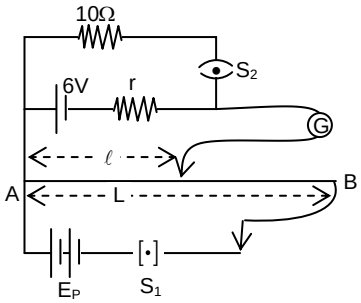


(A) $\frac{q_0^2}{2\pi\varepsilon_0}\ln\left(\frac{2}{3}\right)$ (B) $\frac{q_0\lambda}{2\pi\varepsilon_0}\ln\left(\frac{2}{3}\right)$

(C) $\frac{q_0\lambda}{2\pi\varepsilon_0}\ln\left(\frac{3}{2}\right)$ (D) $\frac{q_0^2}{2\pi\varepsilon_0}\ln\left(\frac{3}{2}\right)$

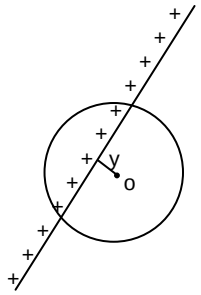
space for rough work

4. In the arrangement shown in the figure when the switch S_2 is open, the galvanometer shows no deflection for ℓ = L/2. When the switch S_2 is closed, the galvanometer shows no deflection for $\ell = \frac{5}{12}L$. The internal resistance (r) of 6 V cell,



(A) 3Ω (B) 2Ω
(C) 4Ω (D) 5Ω

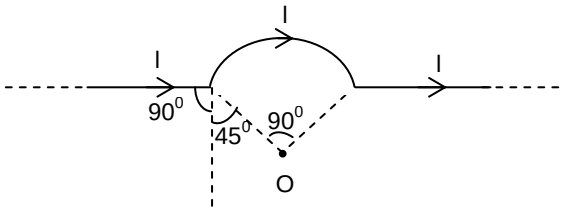
5. A uniformly charged and infinitely long line having a linear charge density 'λ' is paced at a normal distance y from a point O. Consider a sphere of radius R with O as centre and R > y. Electric flux through the surface of the sphere is



(A) zero (B) $\frac{2\lambda R}{\varepsilon_0}$

(C) $\frac{2\lambda\sqrt{R^2-y^2}}{\varepsilon_0}$ (D) $\frac{\lambda\sqrt{R^2+y^2}}{\varepsilon_0}$

6. The magnetic field at the centre O of the arc in figure is (r is the radius of circular arc)



(A) $\frac{\mu_0 I}{4\pi\times r}\left[\sqrt{2}+\pi\right]$

(B) $\frac{\mu_0 I}{2\pi r}\left[\frac{\pi}{4}+1\left(\sqrt{2}-1\right)\right]$

(C) $\frac{\mu_0}{4\pi}\times\frac{I}{r}\left[\sqrt{2}+r\right]$

(D) $\frac{\mu_0}{4\pi}\times\frac{I}{r}\left[\sqrt{2}+\frac{\pi}{4}\right]$

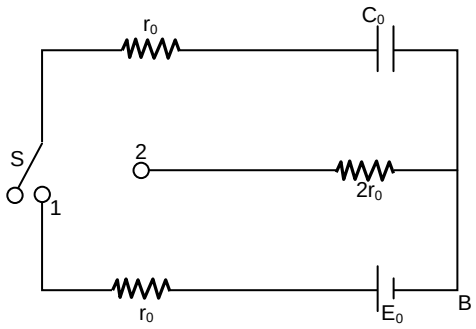
space for rough work

7. A metallic wire is folded to form a square loop of side a. It carries a current i and is kept perpendicular to a uniform magnetic field B. If the shape of the loop is changed from square to an equilateral triangle without changing the length of the wire and current, the amount of work done in doing so is

(A) $Bia^2\left(1-\frac{4\sqrt{3}}{9}\right)$ (B) $Bia^2\left(1-\frac{\sqrt{3}}{9}\right)$

(C) $\frac{2}{3}Bia^2$ (D) zero

8. In the circuit given below, switch S is at position 1 for long time. Find the total heat generated in resistor of resistance $(2r_0)$, when the switch S is shifted from position 1 to position 2



(A) $\frac{C_0E_0^2}{2}$

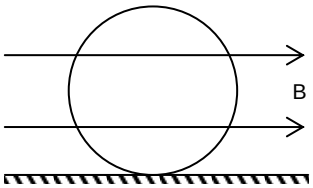
(B) $\frac{3}{4}C_0E_0^2$

(C) $\frac{C_0E_0^2}{3}$

(D) $\frac{2}{3}C_0E_0^2$

Multiple Correct Choice Type

9. A conducting ring of mass 2 kg and radius 0.5 m is placed on a smooth horizontal plane. The ring carries a current of I = 4A. A horizontal magnetic field B = 10T,coplanar with ring, is switched on at time t = 0 as shown in figure. Then at t=0

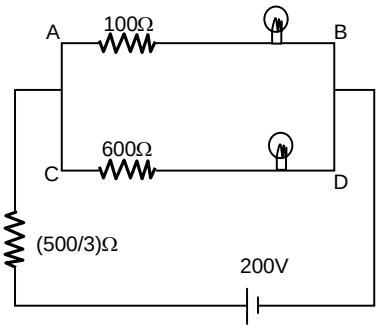


(A) angular acceleration of the ring is $40\ \pi rad\ s^{-2}$ (B) torque on the ring is $20\ \pi Nm$

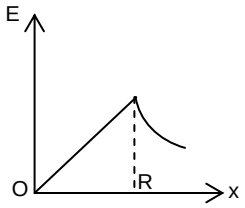
(C) angular acceleration of the ring is $20\ \pi rad\ s^{-2}$ (D) torque on the ring is $10\ \pi Nm$

space for rough work

10. Two bulbs 25W, 100V (upper bulb in figure) and 100W, 200V (lower bulb in figure) are connected in the circuit as shown in figure. Choose the correct answer (s)
(A) Heat lost per second in the circuit will be 80J
(B) Ratio of heat produced per second in bulbs will be 1: 1
(C) Ratio of heat produced in branch AB to branch CD will be 1:2
(D) Current drawn from the cell is 0.4 A



11. A sphere has a positive charge. Figure shows variation of electric field (E) with distance x from its centre. From this figure, we conclude that
(A) Sphere is made of a non conducting materials
(B) Diameter of sphere is equal to R/2
(C) Electric potential, due to sphere, is maximum at its centre
(D) Density of charge is uniform throughout the volume of sphere



12. Electric charge +q is uniformly distributed over the entire length of a ring of radius r rotating with constant angular velocity ω about its own axis. Assuming mass of ring to be m,its magnetic moment to be M and angular momentum to be L.

(A) $M = \frac{q\omega r^2}{2}$ (B) $M = \frac{2q\omega r^2}{5}$

(C) $\frac{M}{L} = \frac{q}{2m}$ (D) $\frac{M}{L} = \frac{2q}{m}$

space for rough work

PART – B

Matrix – Match Type

1. Column I specifies a point P at distance r from the center/axis of a symmetrical distribution of charge. Column II gives the variation of electric intensity at P as a function of r(>0). Match the entries of Column I with possible entries of Column II.

Column I		Column II	
(A)	P lies outside a long cylinder having uniform volume charge density	(P)	$E \propto \frac{1}{r^2}$
(B)	P lies inside a spherical charged conductor	(Q)	$E \propto \frac{1}{r}$
(C)	P lies inside a spherical body having uniform volume charge density	(R)	$E \propto r$
(D)	P lies outside of a nonconducting solid sphere of radius R and its volume charge density varies as $\rho = \frac{\rho_0 x^2}{R^2}$,where x is distance from centre of the sphere	(S)	$E \propto r^0$
		(T)	$E \propto \frac{1}{r^3}$

2. A charged particle with some initial velocity is projected in a region where non zero electric and / or magnetic fields are present. In column I, information about the existence of electric and /or magnetic field and direction of initial velocity of charged particle are given, while in Column II probable path of the charged particle is mentioned. Match the entries of Column I with possible entries of Column II.

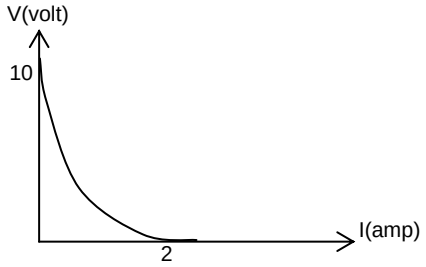
Column I		Column II	
(A)	$\vec{E} = 0, \vec{B} \neq 0$ and initial velocity is at any angle with $\vec{B}$	(P)	Straight line
(B)	$\vec{E} \neq 0, \vec{B} = 0$ and initial velocity is at any angle with E	(Q)	Parabola
(C)	$\vec{E} \neq 0, \vec{B} \neq 0, E \parallel \vec{B}$ and initial velocity is $\perp$ to both	(R)	Circular
(D)	$\vec{E} \neq 0, \vec{B} \neq 0, \vec{E}$ perpendicular to $\vec{B}$ and velocity is perpendicular to both $\vec{E}$ and $\vec{B}$	(S)	Helical Path

space for rough work

PART – C

Numerical Based

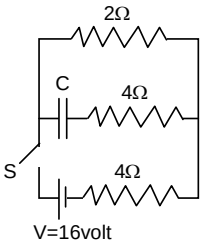
1. A battery of emf E and internal resistance r is connected with external resistance R. Resistance R can be adjusted to any value greater than or equal to zero. Graph is plotted between the current passing through the resistance (I) and potential difference (V) across it. Internal resistance of the battery (in Ω) is



2 A battery is made by joining m rows of identical cells in parallel. Each row consists of n cells joined in series. This battery is connected to an external resistance R. Each cell has an internal resistance r and e.m.f. E . If $\frac{n}{m} = 2$ and the battery sends a maximum current in R, then R/r =

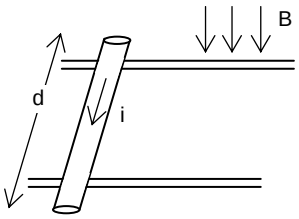
3. A drop of water of mass 135 x 10^{-3} gm having charge 10^{-9}C falls away from the bottom of a charged conducting sphere of radius 20 cm,having uniformly distributed charge of 2.5×10^{-6}C . What is the speed(m/s) of the drop, after it has fallen 30 cm?

4 In the circuit shown the capacitor is initially uncharged. The switch S is closed at time t = 0. The internal resistance of the battery is negligible and the capacitance of the capacitor C is 2μF. Calculate Initial current(in Ampere) through 2Ω resistance.



5. A particle having a mass of 0.5 g carries a charge 2.5×10^{-8}C. The particle is given an initial horizontal velocity of $4 \times 10^{4} ms^{-1}$. To keep the particle moving in a horizontal direction, the minimum value of magnetic field(in Tesla) should be

6. A cylindrical uniform rod of mass 0.72 kg and radius 6 cm rests on two parallel rails, that are d = 50 cm apart. The rod caries a current I = 48A (In the direction shown) and rolls along the rails without slipping. If it starts from rest due to applications of uniform magnetic field of magnitudes 0.25 T (directed perpendicular to the rod and the rail), then the friction force(In N) between rod and rails is



space for rough work

Section – III (Mathematics)

PART – A

Single Correct Choice Type

1. Let $S_n = \frac{5}{9}.\frac{14}{20}.\frac{27}{35}.....\frac{2n^2-n-1}{2n^2+n-1}$ then $\lim_{n\to\infty} nS_n =$

(A) 0 (B) $\frac{4}{3}$

(C) $\frac{3}{4}$ (D) 1

2. Let f be a function satisfying $f(xy) = \frac{f(x)}{y}$ for all positive real numbers x and y if $f(30) = 20$, then the value of $f(40)$ is

(A) 15 (B) 20

(C) 40 (D) 60

3. If $f(x) = x^3$ sgnx, then

(A) f is derivable at x=0 (B) f is continuous but not derivable at x=0

(C) L.H.D. at x=0 is 1 (D) R.H.D. at x=0 is 1

4. $\int_{1/2}^{2} \frac{\tan^{-1}x}{x^2-x+1}dx =$

(A) $\frac{\pi^2}{\sqrt{3}}$ (B) $\frac{\pi^2}{3\sqrt{3}}$

(C) $\frac{\pi^2}{12\sqrt{3}}$ (D) $\frac{\pi^2}{6\sqrt{3}}$

5. If $f(x)$ is continuous function and satisfying $f(x)+f(1+x) = |2^x-1|+|x-1|$ in $0 \le x \le 2$, then the value of $\int_0^2 f(x)dx$ is equal to

(A) $\frac{1}{\ln 2}-\frac{1}{2}$ (B) $\frac{1}{\ln 2}-1$

(C) $\frac{2}{\ln 2}-1$ (D) none of these

space for rough work

6. If $f(x)=\begin{cases} x^2+3+\log_{0.5}\log_2[k+3], & -1\le x<0 \\ x^2+3x+2, & 0\le x\le 1 \end{cases}$, (where [.] denotes the greatest integer function) has minimum value at x=0, then

(A) $k\in[2,5)$ (B) $k\in[-2,1)$

(C) $k\in[-1,2]$ (D) $k\in[-1,2)$

7. $\int\sqrt{\dfrac{\cos x-\cos^3 x}{1-\cos^3 x}}\,dx$ is equal to

(A) $\dfrac{2}{3}\sin^{-1}\left(\cos^{3/2}x\right)+C$ (B) $\dfrac{3}{2}\sin^{-1}\left(\cos^{3/2}x\right)+C$

(C) $\dfrac{2}{3}\cos^{-1}\left(\cos^{3/2}x\right)+C$ (D) none of these

8. If $\int_0^1 e^{x^2}(x-\alpha)dx=0$, then

(A) $1<\alpha<2$ (B) $\alpha<0$

(C) $0<\alpha<1$ (D) $\alpha=0$

Multiple Correct Choice Type

9. If $f(x)$ is a polynomial and g(x) is a function non differentiable but continuous at x=0 then $h(x)=f(x)\times g(x)$ will be differentiable at x=0 if

(A) $y=f(|x|)$ is differentiable at x=0 (B) f(0)=0

(C) $\dfrac{d}{dx}(\cos f(x))=0$ (D) none of these

10. If $f(2-x)=f(2+x)$ and $f(4-x)=f(4+x)$ for all x and f(x) is a function for which $\int_0^2 f(x)dx=5$, then $\int_0^{50} f(x)\,dx$ is equal to

(A) 125 (B) $\int_{-4}^{46} f(x)dx$

(C) $\int_1^{51} f(x)dx$ (D) $\int_2^{52} f(x)dx$

space for rough work

11. A function f is defined on an interval [a,b]. Which of the following statement(s) is/are incorrect?
(A) If f(a) and f(b) have opposite signs, then there must be a point $c \in (a,b)$ such that $f(c)=0$
(B) if f is continuous on [a,b], $f(a)<0$ and f(b)>0, then there must be a point $c \in (a,b)$ such that $f(c)=0$
(C) If f is continuous on [a,b] and there is a point c in (a,b) such that f(c)=0, then f(a) and f(b) have opposite signs.
(D) if f has no zeros on [a,b], then $f(a)$ and $f(b)$ have the same sign

12. If $f(x)=x^3-x^2+100x+2002$, then

(A) $f(1000)>f(1001)$ (B) $f\left(\frac{1}{2000}\right)>f\left(\frac{1}{2001}\right)$

(C) $f(x-1)>f(x-2)$ (D) $f(2x-3)>f(2x)$

PART – B

Matrix – Match Type

1. Let $f(x)=x^4-14x^2+24x-3$

Column A $f(x)+p=0$ has		**Column B** Then range of p	
(A)	Exactly two negative real roots	(P)	p>120
(B)	Exactly two real roots of opposite sign	(Q)	$-8<p<-5$
(C)	Four distinct real roots	(R)	$3<p<120$
(D)	No real roots	(S)	$p<-8$ or $-5<p<3$

2. Let $f(x)=x^2+bx+c$ such that $b^2-4c>0$ (where b&c are real numbers)

Column A (Condition on b and c)		**Column B** (Number of points of non-differentiability of $g(x)=\lvert f(\lvert x\rvert)\rvert$	
(A)	$b<0,c>0$	(P)	1
(B)	$c=0,b<0$	(Q)	2
(C)	$c=0,b>0$	(R)	3
(D)	$b=0,c<0$	(S)	5

space for rough work

PART – C

Numerical Based

1. If $L=\lim_{x\to 0}\frac{\sin x^4 - x^4\cos x^4 + x^{20}}{x^4\left(e^{2x^4}-1-2x^4\right)}$, then the value of $\frac{1}{L}$ is _____

2. A function f(x) satisfies the relation $f(x+y)=f(x)+f(y)+xy(x+y)\forall x,y\in R$. If $f'(0)=-1$, then $f'(3)$=?

3. The least value of a for which $f(x)=\sqrt{3}$ sinx-cosx-2ax+b decreases for all real values of x is _____

4. The number of integral values of k for which $x^3-3x+a=0$ has three real distinct roots is

5. Let $I=\int_0^\infty \frac{x^{2008}}{1+x^2}dx$ and $J=\int_0^\infty \frac{x^{2008}+x^{-2008}}{1+x^2}dx$, then $\frac{J}{I}$ is _____

6. The function f is continuous and has the property $f(f(x))=1-x$ for all $x\in[0,1]$ and $J=\int_0^1 f(x)dx$, then the value of $\frac{1}{J}$ is _____

space for rough work