छत्तीसगढ़ माध्यमिक शिक्षा मण्डल, रायपुर

Hkkfrd 'kkL=

d{kk XII

lEiw.kZ ikB~;&i=

¼fo|kfpr bdkbZ½

NÙkhlx< ek/;fed f'k{kk e.My] jk;iqj

i'u & i= dh ;ktuk

Scheme of Question Paper

fo"k;%& Hkkfrdh

i.kkd % 75

le; % 3 ?kV

ijh{kk % gk;j ld.Mjh

¼v½ 'k{kf.kd mnn';ksa dk vuqikr eku

(A) Weightage as per Educational objective:

lq Ø0	mnn';		vad	izfr'kr
1-	Kku (Knowledge)		30	40%
2-	vocks/k (Understanding)		26	35%
3-	vuqi;ksx ,oa dk'ky (Application & Skill)		19	25%
		;ksx	75	100%

¼c½ bdkbZokj vadksa dk eku

lq Ø0	bdkbZ dk uke	bdkbZ ij vkcafVr vad	i'u&i= dk ik:i vuqikr vkcafVr vad
1-	fdj.k idkf'kdh	09	09
2-	rjax idkf'kdh	06	06
3-	pEcdRo	08	08
4-	fLFkj fo|qr	07	07
5-	/kkjk fo|qr	04	04
6-	fo|qr /kkjk dk iHkko	10	10
7-	fo|qr pEcdh; ij.k ,oa iR;korh /kkjk	10	10
8-	byDVku o QkVku	04	04
9-	Bkl ,oa v)pkyd ;fDr;k	08	08
10-	lpkj byDVkfudh	09	09
11-			
12-			

¼l½ dfBukbZ Lrj (Difficulty Level)

lO ØO	mnn';	vd	ifr'kr
1-	ljy (Easy)	26	35%
2-	vkSlr (Average)	38	50%
3-	dfBu (Difficult)	11	15%
	;kx	75	100%

¼n½ i'ui= fn'kk fun'k ,oa fodYi ;kstuk %&

(Instruction's & Scheme of Option for Question Paper)

- oLrfu"B i'u e ¼05½ cgfodYih; i'u rFkk ¼05½ fjDr LFkkuksa dh ifr@mfpr tkMh cuk, dk i'u fn;k tkoxk vkj ;g iR;d lVe i'u Øekd 1 gkxk A
- iR;d lVe 1] 2 ,oa 3 vdk d i'uksa e fHkUurk jgxh A leLr 04 vd ;k bll vf/kd vdk d y?kmÙkjh; rFkk nh?kmÙkjh; i'uksa e fodYi fn;k tkuk g A fodYi i'u mlh bdkbZ l rFkk leku mnn';k d jgx A 04 vd ;k bll vf/kd vdk d i'u iR;d lVe ,d leku jgx A
- vf/kdre mÙkj lhek vfry?kmÙkjh; ½2 vd@30 'kCn½ ¼3 vd@50 'kCn½
  y?kmÙkjh; ¼4 vd@75 'kCn½ ¼5 vd@150 'kCn½
  nh?kmÙkjh; ¼6 vd ;k vf/kd@250 'kCn½

i'u & i= dk CyfiUV

Blue Print of Question Paper

fo"k;%& Hkkfrdh i.kkd % 75

le; % 3 ?kV

ijh{kk % gk;j ld.Mjh

bdkb l-Ø-	bdkb	bdkb ij vkcfVr vd	vdokj i'u							dy i'u
			1 vd	2 vd	3 vd	4 vd	5 vd	6 vd	6 vd ;k bl l vf/kd	
1	fdj.k idkf'kdh	9	1			2				2$1
2	rjx idkf'kdh	6		1		1				2$0
3	pEcdRo	8			1		1			2$0
4	fLFkj fo|r	7	2				1			1$2
5	/kkjk fo|r	4	2	1						1$2
6	/kkjk dk pEcdh; iHkko	10	1		1			1		2$1
7	fo|r pEcdh; ij.k ,o i- /kkjk	10		2				1		3$0
8	byDVku ,o QkVku	4	1		1					1$1
9	Bkl ,o v)pkyd ;fDr;k	8	1	1			1			2$1
10	lpkj byDVkfudh	9	2		1	1				2$2
11										
12										
	;kx	75	1	5	4	4	3	2	&	18$1

Set - A

gk;j ld.Mjh Ldy lVhfQdV ijh{kk

Higher Secondary School Certificate Examination

lEiy&i'u i=

SAMPLE PAPER

fo"k; %& (Subject) - Hkkfrd 'kkL= **le; 3 ?k.Vk (Time- 3 Hrs)**

d{kk %& (Class) - ckjgoh **i.kkd 75 (M.M.)**

(Instruction) & ¼fun'k½

1- lHkh i'u gy djuk vfuok;z g A

Attempt all the Question

2- i'u Øekd 01 e 10 vd fu/kkfjr g A nk dky[k.M g A [k.M ^^v** e 05 cgfodYih; i'u rFkk [k.M ^^c** e 05 fjDr LFkkuk dh ifr vFkok mfpr lc/k tkfM, A iR;d i'u d fy, 1 vd vkcfVr g A

Q. No. 01 Carries 10 Marks. There are two sub-section, Section A is Multiple choice carries 05 marks and section B is fill in the blanks or match the column carries 05 marks.

3- i'u Øekd 02 l i'u Øekd 06 rd vfr y?kqRrjh; i'u g A iR;d i'u ij 02 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 30 'kCn A

Q. No. 2 to 06 are very short answer type question & it carries 02 marks each. Word limit is maximum 30.

4- i'u Øekd 07 l i'u Øekd 10 rd y?kqRrjh; i'u g A iR;d i'u ij 03 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 50 'kCn A

Q. No. 07 to 10 are short answer type question & it carries 03 marks each. Word limit is maximum 50.

5- i'u Øekd 11 l i'u Øekd 14 rd y?kqRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 04 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 75 'kCn A

Q. No. 11 to 14 are short answer type question & it carries 04 marks each. Each question has internal choice. Word limit is maximum 75.

6- i'u Øekd 15 l i'u Øekd 17 rd nh?kmRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 05 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 100 'kCn A

Q. No. 15 to 17 are long answer type question & it carries 05 marks each. Each question has internal choice. Word limit is maximum 100.

7- i'u Øekd 17 l i'u Øekd 19 rd nh?kmRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 06 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 150 'kCn A

Q. No. 17 to 19 are long answer type question & it carries 06 marks each. Each question has internal choice. Word limit is maximum 150.

Ik'Uk 1¼v½ Lkgh f0kdYIk PkUkdj fYkf[k, –

1- f0k|Rk f}/k0k dh fUkj{kh¸k fLFkfRk Ek f0k|Rk f0kHk0k gkRkk g&

¼v½ $\frac{1}{4\pi\in_0}\frac{p}{r^3}$ 0kkYV ¼c½ $\frac{1}{4\pi\in_0}\frac{2p}{r^3}$ 0kkYV

¼l½ 0 0kkYV ¼n½ bUkEk Lk dkb Ukgh

2- Pkkj vkEk d Pkkj IkfRkjk/k LkEkkUkkRkj ØEk Ek TkM g mUkdk Ikfj.kkEkh IkfRkjk/k gkXkk A

¼v½ 16 vkEk ¼c½ 2 vkEk

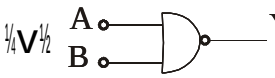
¼l½ 10 vkEk ¼n½ bUkEk Lk dkb Ukgh

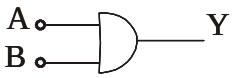
3- fdLkh IknkFk d ,d XkkEk RkY¸kkd dk mLkd f0kYk;Uk Lk EkDRk djUk gRk vk0k'k dh vk0k'¸kdRkk gkXkh–

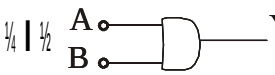
¼v½ 96500 dYkkEk ¼c½ 96000 dYkkEk

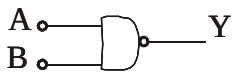
¼l½ 96500 dYkkEk ¼n½ bUkEk Lk dkb Ukgh A

4- NAND gate dk LkdRk g–

¼v½ 

¼c½ 

¼l½ 

¼n½ 

5- Ikdkf'kd RkRk fdLk fLk)kRk Ikj dk¸k djRkk g

¼v½ Ikjk0kRkUk ¼c½ Ik.k vkRkfjd Ikjk0kRkUk

¼l½ vIk0kRkUk ¼n½ bUkEk Lk dkb Ukgh

Que 1 (A) Write correct alternative -

(i) The electric potential of electric dipole in broad side postion is -

(a) $\frac{1}{4\pi\in_0}\frac{p}{r^3}$ volt (b) $\frac{1}{4\pi\in_0}\frac{2p}{r^3}$ volt

(c) 0 volt (d) None of these.

(ii) The resultant resistance of parallel combination of four resistances each of 4 ohm is

(a) 16 ohms (b) 2 ohm

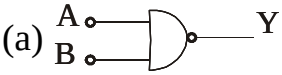
(c) 1 ohm (d) None of these.

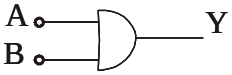
(iii) The charge of necessary for removing 1 gm equivalent from its solution-

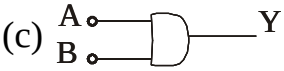
(a) 96500 coulombs (b) 96000 coulomb

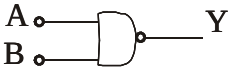
(c) 9650 coulombs (d) none of these.

(iv) Symbol of NAND gate is -

(a) 

(b) 

(c) 

(d) 

(v) On which principle optical fibre works -

(a) Reflection (b) Total internal Reflection

(c) Refraction (d) None of these.

¼c½ fjDRk LFkkUkk dh IkfRk dhfTk, –

1- IkfRkjk/k dk f0kHkh¸k Lk«k ———— gA

2- J0¸k vk0kfÙUk dk Ikjk LLk 20 Hz Lk ——— gA

3- 10 cm. f«kT¸kk d XkkYkkdkj PkkYkd dh /kkfjRkk ———— gkXkh A

4- IkkFkfEkd bUæ/kUk"k Ek Ikdk'k dk Ik.k vkRkfjd Ikjk0kRkUk ———— Ckkj gkRkk gA

5- Ikdk'k f0k|Rk IkHkk0k Ek mRLkfTkRk bYkDVkUkk dh XkfRkTk ÅTkk ——— d LkEkkUkIkkRkh gkRkh gA

(B) Fill in the blanks -

(i) Dimensional formulae of resistance is .....

(ii) The range of audio frequency is from 20 Hz to ..... Hz.

(iii) The capacity of spherical conductor of radius 10cm. is .....

(iv) In primary rainbow total internal reflection of light happens ..... time.

(v) In photo electric effect the kinetic energy of ejectied electron is proportional to .....

Ik'Uk 2- Ikdk'k dk f0k0kRkUk D¸kk g\ bLkd nk Ikdkj fYkf[k, ¼2½

What is diffraction of light? Write its two kinds.

Ik'Uk 3- L0kIkj.k D¸kk g\ mLkdk ,d mnkgj.k fYkf[k,A ¼2½

Waht is self induction? Write its one example.

Ik'Uk 4- IkfRkjk/k 0k f0kf'k"V IkfRkjk/k Ek nk vRkj fYkf[k,A ¼2½

Write two differences between resistance and specific resistance.

Ik'Uk 5- ,d IkR;kkOkRkh /kkjk L«kkRk d f0k|Rk 0kkgd CkYk dk LkEkhdj.k v = 300 sin¾t mLkdk 0kx Ekk/;k EkYk EkkUk 0k vk0kfÙUk KkRk dhfTk,A ¼2½

The equation of electro motive force of alternating current source is v = 300 sin ¾t. Find its roots mean square value and frequency of source.

Ik'Uk 6- OR gate dh LkR;kRkk Lkkj.kh fYkf[k,A ¼2½

Write truth table of OR gate.

Ik'Uk 7- ,d nM PkCkd dk fTkLkdh /k0k IkkCY;k *m*, PkECkdh;k vk?k.k *m*, 0k nkYkUkdkYk T g bLk YkCkkb d YkCk0kRk nk Ckjk Ckj HkkXkk Ek CkkVk Xk;kk gk Rkk mLkd IkR;kd Hkkx dk /k0k IkkCkY;k] PkCkdh;k vk?k.k 0k nkYkUk dkYk D;kk gkXkk A ¼3½

A bar magnet having pole strength *m*, magnetic moment *m* and time period T is divided into two equal parts perpendiculary to length then find its pole strength, magnetic moment and Time period of each part.

Ik'Uk 8- LkhCkd J.kh D;kk g\ mLkdh nk f0k'k"kRkk, fYkf[k,A ¼3½

What is Seeback series? Write its four characteristics.

Ik'Uk 9- 1 eV mTkk d QkVkUk dh Rkjxk YkCkkb KkRk dhfTk,A ¼3½

Find the wavelength of photon of 1 eV energy.

Ik'Uk 10- f0k|Rk PkCkdh;k rjx D;kk g\ mLkdh Pkkj f0k'k"kRkk, fYkf[k,A ¼3½

What is electro magnetic wave? writes its four characteristics.

Ik'Uk 11- f0kPkYkUk jfgRk f0k{kIk.k vkj f0k{kIk.k jfgRk f0kPkYkUk Ek Pkkj vRkj fYkf[k, A ¼4½

Write four differences between dispersion without deviation and Deviation without dipersion.

¼vFkOkk½

[kXkkYkh; njn'kh 0k XkYkhfYk;kk njn'kh Ek Pkkj vRkj fYkf[k,

Write four differences between telescope and Galilean telescope.

Ik'Uk 12- f0kLFkkIkUk f0kf/k Lk mRRkYk YkLk dh QkdLk njh KkRk djUk dk Ik;kkXk dk 0k.kUk

fUkEUkfYkf[kRk fCknvk lkj dhfTk, – ¼4½

1- UkkEkkfdRk j[kkfPk«k

2- lk¸kDRk Lk«k dk fUkXkEkUkA

Describe displacement method of focal length of convex lens on following points -

1. Labelled diagram
2. Derivation of formulae used.

¼vFkOkk½

lkRkYk YkLk d fYk, YkLk fUkEkkRkk Lk«k dk fUkXkEkUk ¼fPk«k CkUkkdj½ dhfTk, ¼3½

Deduce an expression for lens maker's formula for thin lens with diagram.

lk'Uk 13- nk lkdk'k L«kkRkk dh RkhOkRkkvk dk vUklkkRk 9%16 g Rkk mLkdh vf/kdRkEk Ok U¸kUkRkEk RkhOkRkkvk dk vUklkkRk KkRk dhfTk, \

If the ratio of intensities of two light sources are 9 : 16. Then find its ratio of maximum and minimum intensties.

¼vFkOkk½

nk fLYkVk d CkhPk dh njh 1 mm g RkFkk L«kkRk Lk lkjn dh njh 1 m g Rkk fÝTk dh PkkMkb KkRk dhfTk, TkCkfd lk¸kDRk lkdk'k dh RkjXk YkCkkb 500 nm ¼UkUkkEkhVj½ gA

The distance between two slit is 1 mm and its distance from screen is 1 metre, then find out fringe width if the wave length of incident light is 500 nano metre.

lk'Uk 14- LkEkk{kh¸k Rkkj D¸kk g\ bLkd RkhUk YkkHk Ok RkhUk LkhEkk, fYkf[k, \ ¼4½

What is co-axial cable? Write its 3 advantages and three limitations.

¼vFkOkk½

lkdkf'kd RkRk D¸kk g\ mLkdh dk¸kf0kf/k Ok nk mlk¸kkXk fYkf[k,A

What is optical fibre? Write its working and two application.

lk'Uk 15- nkYkUk PkCkdROkEkkIkh dh ¸kkXkkURkj f0kf/k Lk nk PkCkdk d PkCkdh¸k vk?k.kk dh

RkYkUkk fUkEUkfYkf[kRk fCknvk lkj fYkf[k, \

1- fLk)kRk 0k Lk«k

2- f0kf/k dh f0k'k"kRkk

3- f0kf/k dk nk"k

4- nk Lkk0k/kkfUk,kk

Write sum and difference method of comparison of magnetic moments of two magnets with vibrational magneto metre on following points -

1. Principle and formulae
2. Characteristics
3. Demerits
4. Two precautions.

¼vFk0kk½

f0k{kIk PkCkdR0kEkkIkh dh TanA f0k{kIk f0kf/k Lk nk PkCkdk d PkCkdh,k vk?k.kk dh RkYkUkk fUkEUkfYkf[kRk fCknvk lkj fYkf[k,A

1- LkEkTkUk mIkdj.k dk

2- UkkEkkfdRk fPk«k

3- Lk«k

4- nk Lkk0k/kkfUk,kk

Write TanA deflection method of comparison of magnetic moment of two magnets by deflection magneto metre on following points.

1. Adjustment of apparatus
2. Labelled diagram
3. Formula
4. Two precautions.

lk'Uk 16- XkkmLk lkEk,k Lk ,d LkEkkUk vk0kf'kRk XkkYkh,k d0kPk d dkj.k f0k|Rk {k«k dh Rkh0kRkk dk 0,kTkd fUkXkfEkRk dhfTk,A ¼4½

1- XkkYkh,k d0kPk d Ckkgj

2- XkkYkh,k d0kPk d HkhRkj

3- XkkYkh¸k dOkPk d LkRkg Ikj

Deduce an expression for electric field intensity of uniformly charged spherical conductor by Gauss theorem.

1. Outside spherical conductor
2. Inside spherical conductor
3. On surface of spherical conductor

¼vFkOkk½

LkEkkUkkRkj IYkV Lk?kkfj«k dh /kkfjRkk dk O¸kTkd fUkXkfEkRk dhfTk, TkCk nkUkk IYkVk d Ek/¸k K Ikjk0k|Rkk d OkkYkk Ekk/¸kEk gkA bLk Lk?kkfj«k dh /kkfjRkk dk IkHkkf0kRk djUk OkkYk dkjd fYkf[k,A

Deduce an expression for capacity of parallel plate condensor when medium between both plate is of dielectric constant 'K'. Write factor's effecting its capacity.

Ik'Uk 17- PN Lkf/k Mk¸kkM Lk fUkfEkRk Ik.k RkjXk fn"Vdkjh dk fUkEUkfYkf[kRk fCknvk Ikj fYkf[k,A ¼5½

1- f0k|Rk Ikfjlkfk
2- dk¸kf0kf/k
3- fUk0k'kh 0k fUkXkRk fLkXUkYk

Write full wave rectifive made from Pn junction diode on following points

1. Electric circuit diagram
2. Working procedure
3. INput and output signal

¼vFkOkk½

CE NPN Ik0k/kd dk f0k|Rk Ikfjlkfk CkUkkdj dk¸kf0kf/k fYkf[k, A

Write working of CE NPN amplifier with electric circuit diagram.

Ik'Uk 18 /kkjkokgh 0kÙkkdkj dMYkh d dkj.k PkCkdh¸k {k«k dh Rkh0kRkk O¸kTkd fUkXkfEkRk dhfTk,&

1- TkCk fCkn mLkd v{k Ikj gk

2- TkCk fCkn mLkd dæ Ikj gk

Deduce an expression for magnetic field intensity of current carring circular coil.

1. When point is at its axis
2. When point is its centre

¼vFkOkk½

dhYkfdRk dMYk /kkjkEkkIkh dk fUkEUkfYkf[kRk fCknvk Ikj 0k.kUk dhfTk,&

1- UkkEkkfdRk j[kkfPk«k
2- fLk)kRk
3- vEkhVj Lk CknYkUk dk Rkjhdk
4- OkkYVEkhVj Ek CknYkUk dk Rkjhdk

Describe pivoted type galvanometre on following points-

1. Labelled diagram
2. Principle
3. Changing method it into ammetre
4. Changing method it into volt metre.

Ik'Uk 19- LC Ikfjlkfk dk 0k.kUk fUkEUkkfdRk fCknvk Ikj dhfTk,&

1- Ikfj.kkEkh fOkHkOkkRkj
2- IkfRkCkk/kk
3- vkLkRkR,kIk 'kfDRk
4- vUkUkknh vkOkfÙk dk O,kTkd

Describe LC circuit on following points -

1. Resultant potential difference
2. Impedance
3. Average power accumulation
4. Expression for resonant freuency.

¼vFkOkk½

Mk,kUkEkk Lk vkIk D,kk LkEkÖkRk g mLkdk 0k.kUk fUkEUk fCknvk Ikj dhfTk,&

1- UkkEkkfdRk j[kkfPk«k

2- dk,kf0kf/k

3- mlk,kkXk

What do you mean by Dynemo? Describe it on following points -

1. Labelled diagram
2. Working
3. Application.

lk'Uk 1¼v½ Ckgf0kdYlkh,k i'u

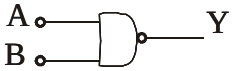
lEiy mRRkj & lV ,

mRrj 1¼v½

1- (c) 0 0kkYV 1×10=10

2- (c) 1 ohm

3- (a) 96500 dYkkEk A

4- (d) 

5 (b) lk.k vkRkfjd lkjk0kRkUk A

¼Ck½ 1- $M^1L^2T^{-3}A^{-2}$

2 2000 Hz

3 10cm ;k $\frac{1}{9}\times10^{-10}$F

4- ,d Ckkj

5- vk0kfÙk A

mÙkj 2 TkCk lkdk'k d EkkXk Ek dkb v0kjk/k vk TkkRkk g Rkk v0kjk/k d fdUkkj Lk EkMdj lkdk'k dk T¸kkfEkfRk Nk¸kk d {k«k Ek lkgPkUkk lkdk'k dk f0k0kRkUk dgYkkRkk gA bLkd nk lkdkj gkr g&1- ÝUkYk 2- ÝkUkgkQj A ½2½

mRRkj 3 tCk fdLkh dMYkh Ek Ckgk 0kkYkh /kkjk d EkkUk Ek lkjk0kRkUk fd¸kk TkkRkk g Rkk mLk dMYkh Lk Ck) PkCkdh¸k ¶YkDLk d EkkUk Ek lkfj0kRkUk gkRkk g QYkL0k:lk mLkh dMYkh Ek lkfjRk /kkjk mRlkUUk gkRkh g bLk L0klkj.k dgRk g mnkgj.k &lkfRkjk/k CkkDLk Ek Rkkj dk nkgjk YklkVUkk A ½2½

mRRkj 4-

lkfRkjk/k		f0kf'k"V lkfRkjk/k	
1-	lkfRkjk/k PkkYkd dh YkCkkb lkj fUkHkj gA	1-	f0kf'k"V lkfRkjk/k PkkYkd dh YkCkkb lkj fUkHkj Ukgh gA
2-	bLkdk Ekk«kd vkEk g	2-	bLkdk Ekk«kd vkEkh EkhVj gA

bLkd vYkk0kk vU¸k dkb Hkh Lkgh vRkj fYk[kUk lkj lkR¸kd Lkgh lkj 1 vd A ¼1$1½

mRRkj 5 $v = 300 \sin wt$

$v = v_0 \sin wt$ Lk RkYkUkk dju ij

$v_0 = 300$

$$v_{rms} = \frac{V_0}{V_l} = \frac{300}{V_l} = \frac{300V_l}{2} = 150V_l \quad \text{0kkYV A}$$ ¼1½

$$w = 2\pi v$$

$$314 = 2 \times 3.14\, v$$

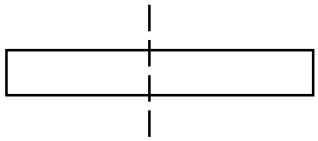
$$v = \frac{314}{2\times 3014} = \frac{100}{2} = 50 \text{ Hz.}$$ ¼1½

mRRkj 6

A	B	y = A + B
0	0	0
0	1	1
1	0	1
1	1	1

¼1½

mRRkj 7



¼1$1$1½

Uk¸kk /k0k Ikk0kYk¸k ¾ m,

Uk¸kk PkCkd vk?k.k = M/L

vk0kRkdkYk = T/L

mRRkj 8 f0kfHkUUk /kkRkvk dk ,Lkh J.kh Ek 0¸k0kfLFkRk fd¸kk Tkk¸k fd ¸kfn mUkEk Lk fdUgh Hkh nk /kkRkvk dk LkkFk RkkIk 0k|Rk QkEk CkUkk¸kk Tkk¸k Rkk BMh Lkf/k Ikj RkkIk f0k|Rk /kkjk J.kh Ek Ikgyk vkUk 0kkYkh /kkRk Lk Ckkn vkUk 0kkYkh /kkRk dh vkj Ik0kkfgRk gkRkh gA ¼1½

1- J.kh Ek fdUgh Hkh nk /kkRkvk dk RkkIk 0k}kRk ¸kXEk CkUkk¸kk Tkk¸k Rkk /kkjk BMh Lkf/k Lk XkEk Lkf/k dh vkj Ikgyk vkUk 0kkYkh /kkRk Lk Ckkn Ek vkUk 0kkYkh /kkRk dh vkj CkgRkh gA ¼1½

2- J.kh Ek /kkRk fTkRkUk vf/kd vRkj Ikj gkRkh g RkkIk f0k|Rk 0kkgd CkYk dk EkkUk mRkUkk gh vf/kd gkRkk gA ¼1½

mRRkj 9 $\phi = h\nu_0 = \frac{hc}{\lambda_0} or \lambda_0 = \frac{hc}{\phi}$ ¼1½

$\lambda_0 = \frac{6.6\times10^{-34}\times3\times10^{8}}{1eV}$ ¼1½

$\lambda_0 = \frac{6.6\times10^{-34}\times3\times10^{8}}{1.6\times10^{-19}}$

$= 12.375 \times 10^{-7} = 12375 \times 10^{-10} = 12375A^{o}$ ¼1½

mRRkj 10 f0k|Rk PkCkdh¸k Rkjxk 0k gkRkh g Tkk ,d nLkj d YkCk0kRk RkYkk Ek f0k|Rk {k«k vkj PkCkdh¸k {k«k d T¸kk0kdh¸k nkYkUkk Lk CkUkRkh g A RkFkk ¸k nkYkUk PkCkdh¸k Rkjxk d LkPkj.k dh fn'kk d YkCk0kRk gkRkh gA ¼1½½

f0k'k"kRkk & ¼1½½

1- ¸k Rkjxk nkYkk¸kEkkUk R0kfjRk vk0k'kk Lk mRIkUUk gkRkh gA

2- ¸k fUk0kkRk Ek Ikdk'k d 0kXk Lk PkYkRkh gA

3- bUk Rkjxkk Ek dkb vk0k'k Ukgh gkRkk A

4- bUk Rkjxkk Ek mTkk 0k Lk0kXk Hkh gkRkk gA

bLkd vYkk0kk mfPkRk vU¸k f0k'k"kRkkvk Ikj Hkh vd fn¸kk Tkk¸kA

mÙkj 11

f0kPkYkUk jfgRk f0k{kIk.k

1- bLk fØ¸kk Ek Ikdk'k dk 0k.k f0k{kIk.k gkRkk g f0kYk¸kUk UkghA

2- bLkEk Ik¸kDRk Økmuk ,0k f¶YkV dkPk d fIkTEkk d dk.kk dk vUkIkkRk&

$\frac{A}{A'} = -\frac{\mu_{y'}-1}{\mu_y-1}$

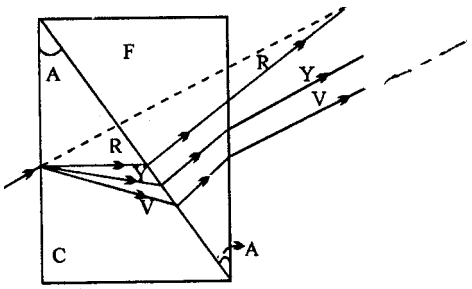
f0k{kIk.k jfgRk f0kPkYkUk

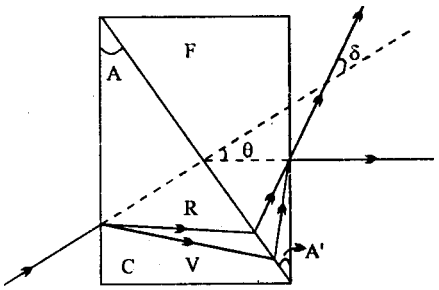
1- bLk fØ¸kk Ek Ikdk'k dk f0kPkYkUk gkRkk g f0k{kIk.k Ukgh

$\frac{A}{A'} = -\frac{\mu_{v'}-\mu_{R'}}{\mu_v-\mu_R}$

3- bLk fØ¸kk dk mIk¸kkXk LkEk{k nf"V Ldk Ik Ek fd¸kk TkkRkk gA

2- fIkTEkk d vIk.kd Lk¸kkXk Ek fd¸kk TkkRkk gA

4- 

4- 

1$1$1$1¾4

¼vFkOkk½

XkYkfYk,kk njn'kh [kXkkYkh,k njn'kh 1$1$1$1¾4

1- bLk njn'kh dh YkCkkb dEk gkRkh gA

1- bLk njn'kh dh YkCkkb vf/kd gkRkh gA

2- vOkRkYk YkLk Ukf«kdk

2- mÙkYk YkLk Ukf«kdk

3- vkOk/kUk {kEkRkk dEk

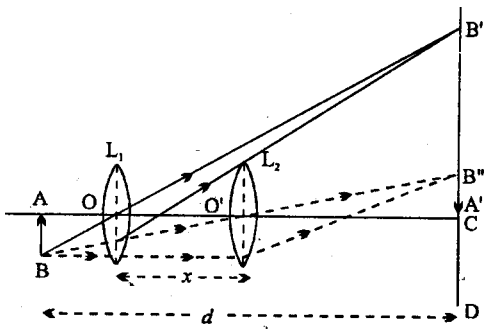
3- vkOk/kUk {kEkRkk vf/kd

4- vfRkEk lkfRkfCkECk Lkh/kk CkUkRkk gA

4- vfRkEk lkfRkfOkECk mYVk CkUkRkk gA

mRRkj 12- f0kLFkklkUk f0kf/k }kjk mRry yl dh Qkdl njh &

UkkEkkfdRk fPk«k



¼1½

AB = 0kLRk dh YkCkkb

A'B' = I_1

A''B' = I_2

L = mRRkYk YkLk

x = YkLk dk f0kLFkklkUk A

Lk«k 0,kRlkfÙk&

EkkUkk fd nkUkk flkUk d CkhPk dh njh = d

lkFkEk fLFkfRk e] v + u = d .....(1)

II fLFkfRk Ek] $v - u = x$ .....(2) ¼1½

lehdj.k (1) o (2) l

u = $\frac{d-x}{2}$ rFkk v = $\frac{d+x}{2}$

yl d lkeku; l= $\frac{1}{f}=\frac{1}{v}-\frac{1}{u}$ l

mfpr fpUgk dk i;kx dju ij $\frac{1}{+f}=\frac{1}{+v}-\frac{1}{-u}$ ¼1½

$\frac{1}{f}=\frac{1}{v}+\frac{1}{u}$;k $f=\frac{uv}{u+v}$ .....(3)

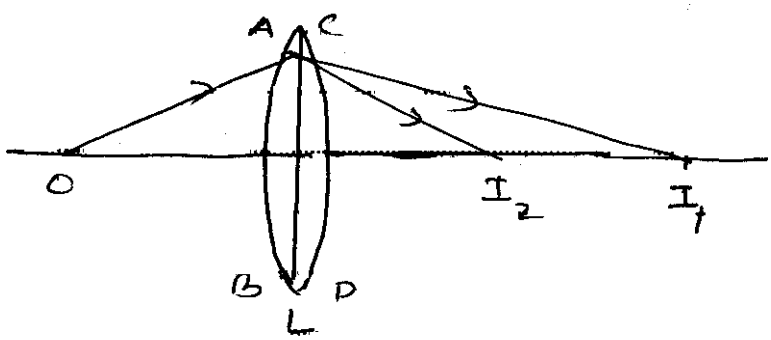
lehdj.k (3) e eku j[ku ij

$$f = \frac{\left(\frac{d-x}{2}\right)\left(\frac{d+x}{2}\right)}{\left(\frac{d-x}{2}\right)+\left(\frac{d+x}{2}\right)}$$

$$f = \frac{\left(d^2-x^2\right)}{4d}$$ ¼1½

¼vFkOkk½

fPk«k



¼1½

EkkUkk fd L d ,d mHk;kkÙkYk gA ¼1½

AB lk"B d fYk,

OkLRk (O) dh njh = u]

lkfRkfCkEck I] dh nwjh $= v_1$

oØrk f=T;k $= R_1$

$$\frac{\mu-1}{R_1}=\frac{\mu}{v_1}-\frac{1}{u} \qquad \text{.....(i)}$$ ¼1½

CD lk"B d fYk,]

0kLRk I_1 dh nwjh $= v_1$

lkfRkfCkEck I] dh nwjh $= v$

oØrk f=T;k $= R_2$

vioruukd $= \frac{1}{\mu}$ ¼lw?ku l fojy e tku d dkj.k½

$$\frac{\frac{1}{\mu}-1}{R_2}=\frac{\frac{1}{\mu}}{v}-\frac{1}{v_1} \qquad \text{.....(ii)}$$ ¼1½

$$\left(\frac{\frac{1}{\mu}-1}{R_2}\right)\mu=\left(\frac{\frac{1}{\mu}}{v}-\frac{1}{v_1}\right)\mu$$

$$\frac{1-\mu}{R_2}=\frac{1}{v}-\frac{\mu}{v_1} \qquad \text{.....(iii)}$$

leh dj.k (i) vkj (iii) l

$$\frac{\mu-1}{R_1}+\frac{1-\mu}{R_2}=\frac{\mu}{v_1}-\frac{1}{u}+\frac{1}{v}-\frac{\mu}{v_1}$$

$$\frac{\mu-1}{R_1}+\frac{1-\mu}{R_2}=\frac{1}{v}-\frac{1}{u}$$

$$\mu-1\left(\frac{1}{R_1}-\frac{1}{R_2}\right)=\frac{1}{v}-\frac{1}{u}$$

$u=\infty, v=f$

$$\mu-1\left(\frac{1}{R_1}-\frac{1}{R_2}\right)=\frac{1}{f}-\frac{1}{\infty}$$

$$\frac{1}{f}=(\mu-1)\left(\frac{1}{R_1}-\frac{1}{R_2}\right)$$ ¼1½

mÙkj 13-

$$\frac{I_1}{I_2}=\frac{a_1^{\,2}}{a_2^{\,2}}$$

$$\frac{a_1^{\,2}}{a_2^{\,2}}=\frac{9}{16}$$ ¼1$1½

$$\frac{a_1}{a_2}=\frac{3}{4}\Rightarrow a_1=3k, a_2=4k$$

$$\frac{I_{\max}}{I_{\min}}=\frac{(a_1+a_2)^2}{(a_1-a_2)^2}$$

$$\frac{I_{\max}}{I_{\min}}=\frac{(3k+4k)^2}{(3k-4k)^2}$$ ¼1$1½

$$\frac{I_{\max}}{I_{\min}}=\frac{49}{1}$$

¼vFkok½

$$\beta=\frac{\lambda D}{d}$$ ¼1½

$d = 1$ fe Ekh- $= \frac{1}{1000} = 10^{-3}$ Ekh Vj ¼1½

$D = 1$ eh Vj

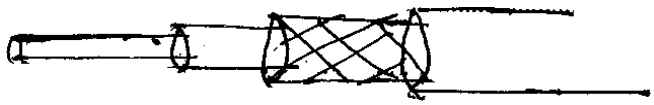
$\lambda = 500$ uuk eh Vj $= 50\times10^{-9}$ Ekh Vj ¼1½

$$\beta=\frac{500\times10^{-9}\times1}{10^{-3}}$$

$$\beta=5\times10^{-4}\ \text{Ekh Vj}$$ ¼1½

mRRkj 14- LkEkk{kh;k Rkkj Ykkb Uk& LkEkk{kh;k dOkYk Ek ,d Rkkj gkRkk g Tkk LkEkk{kh;k [kk[kYk CkYkUkk dkj PkkYk d Lk f?kjk gkRkk gA nkUkk PkkYk dk d CkhPk Ikjk Ok|Rk Iknk Fk TkLk

V¶YkkUk IkkYkhfFkYkhUk vkfn Hkjk gkRkk g fTkLkEk vkRkfjd PkkYkd Ckkâ¸k [kk[kYk CkYkUkkdkj PkkYkd d vnj dæ Ikj CkUkk gkRkk gA Ikjk0k|Rk IknkFk dh IkÑfRk IkLkkfjRk gkUk 0kkYkh vk0kfÙk vkj 'kfDRk Ikj fUkHkj djRkk gA ¼2½



YkkHk

1- Ckn vk0kj.k gkUk d dkj.k RkkCk d Rkkj Lk f0kfdj.k }kjk mTkk ¸kk 'kfDRk dk {k¸k Ukgh gk IkkRkkA

2- bLkd }kjk U¸kUkRkEk 'kfDRk d {k¸k d LkkFk mPPk vk0kfÙk¸kk dk IkLkkfjRk fd¸kk Tkk Lkd Rkk gA D¸kkfd bLkEk f0k|Rk PkECkdh¸k Rkjxk gh vf/kdk'k ÅTkk ¸kk 'kfDRk dk 0kkgd gkRkh gA

LkhEkk, &

1- Ikjk0k|Rk âkkLk gkRkk gA

2- LkEkk{kh¸k d0kYk d }kjk ,d fUkf'PkRk vk0kfÙk Lk dEk vk0kfÙk d fLkXUkYkk dk gh IkHkk0kh <Xk Lk IkLkkfjRk fd¸kk Tkk LkdRkk gA ¼2½

¼vFk0kk½

Ikdkf'kRk RkRk] Ik.k vkRkfjd Ikjk0kRkUk Ikj vk/kkfjRk ,d ,Lkh ¸kfDRk g fTkLkdh Lkgk¸kRkk Lk Ikdk'k fLkXUkYk dk mLkh Rkh0kRkk d LkkFk V<&Ek< EkkXk Lk vYIk njh ¸kk YkCkh njh Rkd Yk Tkk¸kk Tkk LkdRkk gA ¼1½

dk¸kf0kf/k & TkCk Ikdk'k RkRk d ,d fLkj Ikj NkVk dk.k Ikj vkIkfRkRk gkRkk g Rkk 0kg RkRk d vnj XkTkjUk YkXkRkk gA bLkdk RkRk vkj DYkfMXk d vURkjk n"V Lk Ckkj&Ckkj Ik.k vkRkfjd Ikjk0kRkUk gkRkk g D¸kkfd vkIkRkUk dk.k dk EkkUk DYkfMXk d LkkIk{k RkRk d ØkfRkd dk.k Lk vf/kd gkRkk gA bLk Ikdkj db Ckkj Ik.k vkRkfjd Ikjk0kRkUk d Ik'PkkRk Ikdk'k vRk Ek nLkj fLkj Lk bRkUkh gh Rkh0kRkk d LkkFk Ckkgj fUkdYk TkkRkk gA ¼2½

mIk¸kkXk& ¼1½

1- Ikdk'kh¸k fLkXkUYkk d Ik"k.k d fYk,

2- fPkfdRLkk mí'¸k d fYk, A

mRRkj 15- nkYkUk PkECkdROk EkkIkh ¼2½

fLk)kRk Lk«k &

f0k'k"kRkk,& TkMR0k vk?k.k KkRk djUk dh vk0k'¸kdRkk UkghA ¼1½

nk"k & LkEkkUk PkECkdh¸k vk?k.k 0kkYk PkECkdk dk PkECkdh¸k vk?k.k Ukgh KkRk fd¸kk Tkk Lkd Rkk gA bUkd fYk, nkYkUk dkYk d djhCk gkXkk A ¼1½

Lkk0k/kkfUk¸kk&

1- Ik¸kkXk d vRk mIkdj.k Ukgh fgYkkUkk Pkkfg,A

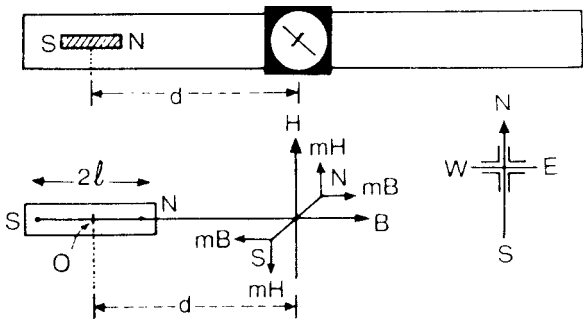
2- mIkdj.k d djhCk vU¸k PkECkdh¸k {k«k Ukgh gkUkk Pkkfg, A ¼1½

¼vFk0kk½

f0k{kIk PkECkdROk EkkIkh &

LkEkTkUk dk Rkjhdk & Lk0kIkFkEk f0k{kIk PkECkdROk EkkIkh dh HkTkkvk dk Ik0k Ikf'PkEk fn'kk Ek LkHkfTkRk djRk gA nLkj d fYk, f0k{kIk PkECkdROk EkkIkh d Lkd Rkd d LkEkkU«k nLkj HkTkkvk dk LkHkfTkRk djRk gA ¼1½

fPk«k &



¼1½

l= & $$\frac{M_1}{M_2}=\frac{(d^2-l_1^2)^2}{(d^2-l_2^2)^2}\frac{\tan\theta_1}{\tan\theta_1}$$

$$l_1=l_2=l$$

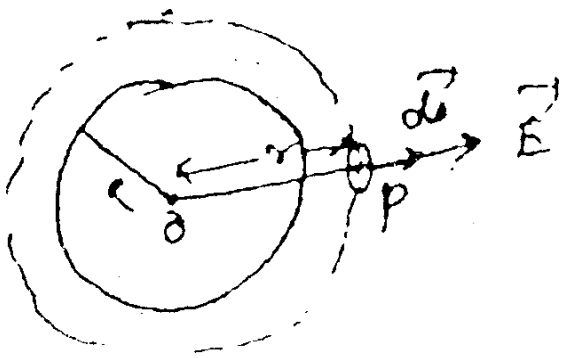
$$\frac{M_1}{M_2}=\frac{\tan\theta_1}{\tan\theta_2}$$ ¼1½

Lkk0k/kkfUk¸kk&

1- f0k{kIk PkECkdROkEkkIkh dk LkHkfTkRk djUk d Ckkn Ik¸kkXk d vRk Rkd Ukgh fgYkkUkk Pkkfg, A

2- Ikk¸kkfXkd PkECkd d vYkk0kk vU¸k PkECkd ¸kk PkECkdh¸k IknkFk Uk gkA ¼1½

mRRkj 16 ,d LkEkkUk vk0kf'kRk XkkYkh;k d0kPk d dkj.k f0k{kIk {k«k dh Rkh0kRkk & XkkYkh;k d0kPk d Ckkgj & EkkUkk fd R f«kT;kk dk ,d LkEkkUk vk0kf'kRk XkkYkh;k d0kPk g fTkLk +Q vk0k'k fn;kk Xk;kk gA ¼1½



¼1½

nLkj dæ O Lk *r* njh Ikj ,d fCkn P g Tkgk Rkh0kRkk dh Xk.kUkk djUkh g bLkd fYk, *r* f«kT;kk dk XkkMLkh;k Ik"B XkkYk dh jPkUkk djRk gA

bLk XkkmLkh;k Ik"B XkTkjUk 0kkYkk f0k|Rk ¶YkDLk&

$$\phi_{\in} = E.\ 4\pi r^2 \cos\theta$$

$$\phi_{\in} = E.\ 4\pi r^2 \quad .....(1)$$ ¼1½

XkkmLk IkEk;kk l

bLkh XkkmLkh;k Ik"B Lk XkTkjUk 0kkYkk f0k|Rk ¶YkDLk $\phi_{\in} = \frac{q}{\in_0}$ .....(ii)

$$E.\ 4\pi r^2 = \frac{q}{\in_0}$$ ¼1½

$$E = \frac{1}{4\pi \in_0}\frac{q}{r^2}$$

2- XkkYkh;k d0kPk d vnj Rkh0kRkk

$\because\ q = 0$

$E = 0$

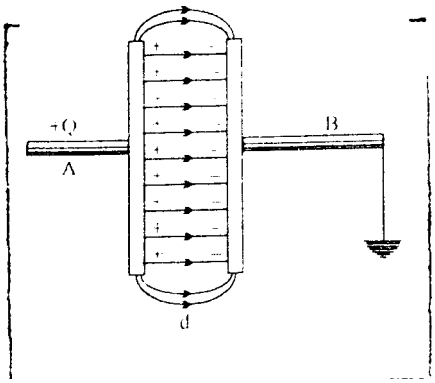
3- XkkYkh;k d0kPk d Ik"B Ikj ¼1½

$\because\ r = R$

$$E = \frac{1}{4\pi \in_0}\frac{q}{R^2}$$

¼vFkokk½

lekarj iV~V ladqfpr= dh /kkfjrk&

fPk«k & 

¼1½

jPkukk & bLkEk LkEkkUk {k«kQYk d nk vk,kRkk dkj ,kk 0kRRkk dkj lYkV gkRkh g Tkk fd ,d nLkj d LkEkkURkj gkRk gA nLkj dk LkCk/k lkF0kh Lk gkRkk gA lkjk0k|Rk dk Ekk/,kEk Hkjk gkRkk gA ¼1½

dk,kf0kf/k& lkFkEk lYkV dk +Q vk0k'k nUk lkj nLkj lYkV d vRkk LkRkg –Q RkFkk Ckkâ,k LkRkg lkj +Q vk0k'k mRlkUUk gkRkk gA bLkd lYkV dk LkECk) lkF0kh Lk gkUk d dkj.k Ckkg,k LkRkg +Q vk0k'k lkF0khÑRk gk TkkRkk gA

Lk«k dh 0,kRlkfÙk&

EkkUkk fd lkR,kd lkR,kd lYkV dk {k«kQYk ¾ A ¼2½

lk"Bh,k vk0k'k ?kUkR0k $\sigma = \frac{Q}{A}$

nkUkk lYkVk d CkhPk d njh = d

nkUkk lYkVk d Ek/,k f0k|Rk {k«k dh Rkh0kRkk = $E = \frac{\sigma}{K \in_0}$

nkUkk lYkVk d Ek/,k f0kHkk0kkURkj ¾ nLkj lYkV Lk lkFkEk lYkV Rkd ,dk, /kUkk'k dk YkkUk Ek dk,k

$$V = E \times d$$

$$E = \frac{Qd}{K \in_0 A}$$

Lk-lkê Lk?kfj«k dh /kkfjRkk $C = \frac{Q}{V}$

$$C = \frac{Q}{V} = \frac{Q}{Qd / K \in_0 A}$$

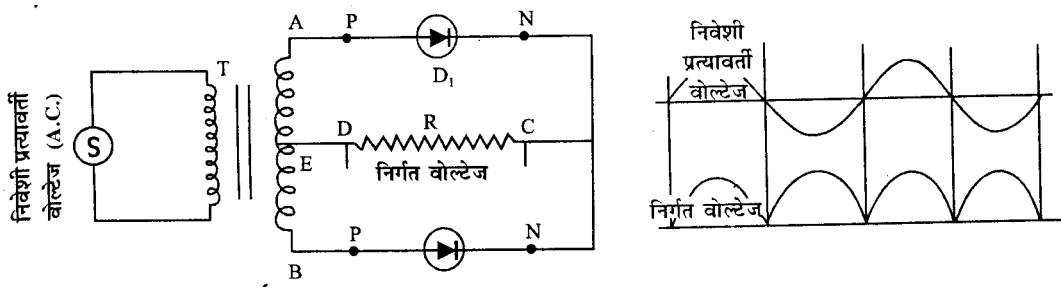
$$= \frac{K \in_0 A}{d}$$

$$C = \frac{K \in_0 A}{d}$$

$$C = \frac{K \in_0 A}{d}$$

fUkHkjRkk (i) $C \propto A$ (ii) $C \propto \frac{1}{d}$ (iii) $C \propto K$

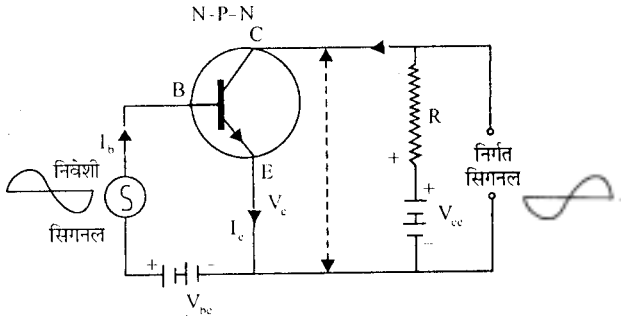
mRRkj 17- fo|r ifjiFk dk ukekfdr fp=& ¼1½



dk,kf0kf/k &EkkUkk fd lkR,kk0kRkh /kkjk d lkFkEk v)PkØ Ek fLkjk /kUkkREkd RkFkk B fLkjk _.kkREkd bLk fLFkfRk E fLkjk A d RkYkUkk Ek _.kkREkd RkFkk B d RkYkUkk Ek /kUkkREkd gkXkk fTkLkd dkj.k Mk,kkM D_1 vXk vfHkUkfRk Ek RkFkk D_2 lk'p vfHkUkfRk Ek gkXkk A vRkh lkFkEk Mk,kkM Lk /kkjk C Lk D dh vkj Ckg XkhA lkR,kk0kRkh /kkjk d f}Rkh,k v)PkØ Ek A fLkjk _.kkREkd RkFkk B fLkjk /kUkkREkd gkUk lkj E fLkjk A d Lkklk{k /kUkkREkd RkFkk B d Lkklk{k _.kkREkd gkXkk A fTkLkd dkj.k Mk,kkM D_1 lk'Pk vfHkUkfRk Ek RkFkk D_2 vXk vfHkUkfRk Ek gkXkk A fTkLkLk /kkjk C Lk D dh vkj Ck<Xkh ¼3½

¼vFk0kk½

NPN VkfTkLVj dk Ik0k) d d :Ik Ek vUkIk¸kkXk Ikfj IkFk dk fPk«k



½2½

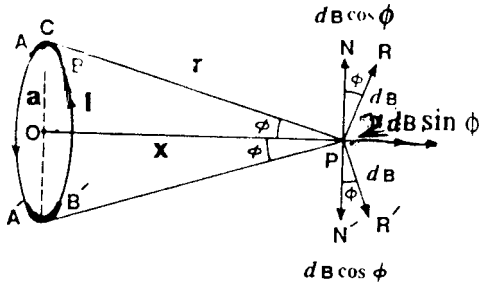
dk¸k f0kf/k & Vc = Vce – IcR ½3½

fUk0k'kh fLkXkUkYk d /kUkkREkd v)PkØ Ek vk/kkj mRLkUkd d LkkIk{k vf/kd /kUkkREkd gk TkkRkk gA fTkLkLk Ic /kkjk Ck< TkkRkh g fTkLkd dkj.k Vc dEk /kUkkREkd gk TkkRkk gA fTkLkd fUkXkRk fLkXkUkYk _.kkREkd IkkIRk gkRkk gA

fUk0k'kh fLkXkUkYk d _.kkREkd v)PkØ Ek vk/kkj mRLkTkd d LkkIk{k dEk /kUkkREkd gk Tkk¸kXkk fTkLkd dkj.k Ic EkkUk dEk gk Tkk¸kXkk fTkLkd QYkL0k :Ik Vc T¸kknk /kUkkREkd gkXkk vRkh fUkXkRk fLkXkUkYk /kUkkREkd gk Tkk¸kXkk A

mRRkj 18- **/kkjkokgh oRrkdkj d.Myh&**

fPk«k



½2½

EkkUkk fd *a* f«kT¸kk dk ,d /kkjk0kkgh Ikfj UkfYkdk fTkLkEk I /kkjk fPk«kkUkLkkj Ckg jgh g

dMYkh dkXkTk d RkYk Ikj YkCk0kRk bLk Ikdkj j[kk g fd d.MYkh dk v{k dkXkTk d RkR0k Ikj fLFkRk gkA

dMYkh d dæ O Lk *x* njh Ikj ,d fCkn P g Tkgk PkECkdhLk {k«k dh Rkh0kRkk KkRk djUkh gA

bLkd fYk, dMYkh d Åkj *dl* YkCk0kRk dk ,d AB YkRk g A vYIkk'k RkFkk p dh njh *r* g

Ckk,kk lkoV d fUk,kEk l

$$dB = \frac{\mu_0}{4\pi}\frac{I.dl.\sin\theta}{r^2} \qquad \text{½2½}$$

nLkjh fn'kk CP d YkCkOkRk mlkj dh vkj 0kØ dk nk LkEkdkf.kd ?kVdk Ek f0k,kkfTkRk djUk lkj

dB $\sin\phi$ OP d YkCkOkRk mlkj dh vkj

dB $\cos\phi$ OP d vUkfn'kA

AB d LkEEk[k AB d Ckjk Ckj ,d vU,k vYlkk'k YkRk g A bLk vYlkk'k d dkj.k Hkh RkhOkRkk dB gkXkhA lkjRk bLkdh fn'kk DP d YkCkOkRk UkhPk dh vkj gkXkhA bLk nk LkEkdkf.kd ?kVdk Ek f0k,kkfTkRk dj

dB $\cos\phi$ OP d YkCkOkRk UkhPk dh vkj

dB $\sin\phi$ OP d vUkfn'k

m/Okk/kj ?kVd lkfj.kkEk Ek Ckjk Ckj 0k f0klkfjRk g fTkLkd dkj.k ,d nLkj d lkHkkOk dk fUkjLRk dj nRk gA

lkj dMYkh d dkj.k p RkhOkRkk

$$dB = \sum dB\sin\phi$$

$$dB = \sum \frac{\mu_0}{4\pi}\frac{Idl}{r^2}.\frac{a}{r}$$

$$dB = \frac{\mu_0}{4\pi}\frac{Ia}{r^3}\sum dl$$

$$dB = \frac{\mu_0}{4\pi}\frac{Ia2\pi a}{r^3} \qquad \left[\because \sum dl = 2\pi a\right]$$

n Qj d fYk, $B = \frac{\mu_0}{4\pi}\frac{nIa^2 2\pi}{r^3}$

ΔOBP e $r^2 = a^2 + x^2$

$$r^3 = \left(a^2 + x^2\right)^{3/2}$$

v{k lkj $B = \frac{\mu_0}{4\pi}\frac{n2\pi Ia^2}{\left(a^2 + x^2\right)^{3/2}}$ ½2½

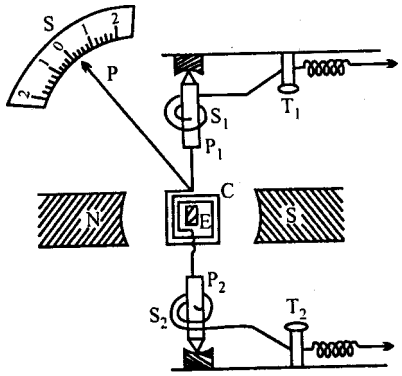
dæ lkj $x = 0$

$$B = \frac{\mu_0}{4\pi}\frac{2\pi nI}{a}$$

¼vFkOkk½

dhyfdr d.My /kkjkekih &

ukekfdr j[kkfp=&



¼1½

/kkjk α fOk{kIk

fLk)kRk & PkECkd d Ek/;k dMYkh Ek /kkjk IkOkkfgRk djUk Ikj dMYkh Ek CkYk ;kXEk vk?k.k mRIkUUk gk TkkRkk gA dhYkd Ek YkXk fLIkXk d }kjk ,BUk CkYk ;kXEk vk?k.k mRIkUUk gkRkk A LkURkYkUk dh fLFkfRk Ek nkUkk Ckjk Ckj ,Ok fOkIkfjRk gk TkkRk gA EkkUkk fd dMYkh d RkYk dk {k««kQYk $= A$ ¼1½

Qjk dh Lk[;kk $= n$

PkECk dh;k {k««k dh RkhOkRkk $= B$

I /kkjk IkOkkfgRk djUk Ikj mRIkUUk CkYk ;kXEk vk?k.k $\tau_1 = nIAB$

PkECk dh;k {k««kQYk RkYk d vfHkYkCk d YkCkOkRk gkRkk gA

,d fMXkh d fYk, ,BUk CkYk ;kXEk vk?k.k x gk Rkk fOk{kIk θ d gkUk Ikj ,BUk CkYk;kXEk vk?k.k $= c\theta$

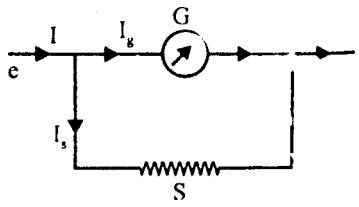
LkRkYkUk dh fLFkfRk Ek

$$nIAB = c\theta$$

$$I = \frac{c\theta}{nAB} \qquad \left[\because \frac{c\theta}{nAB} = \text{fu; rkd}\right]$$ ¼1½

$$I \propto \theta$$

vEkhVj Ek /kkjkEkkIkh dk CknYkUkk & vEkhVj CknYkUk d fYk, dEk vkEk dk IkfRkjk/k dk /kkjkEkkIkh d LkEkkURkj YkXkkRk gA ¼1½

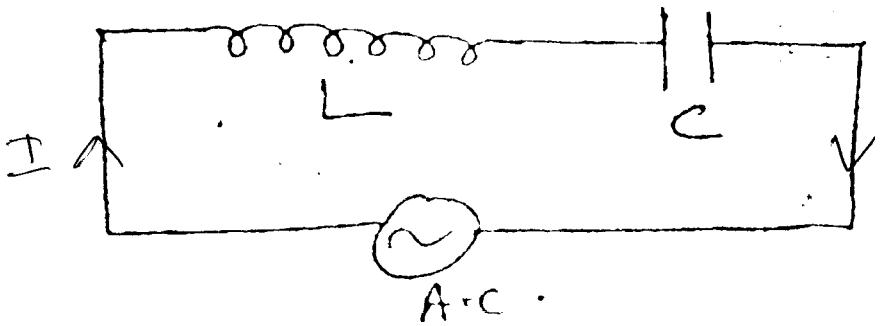


¼1½

OkkYVEkhVj Ek CknYkUkk &mPPk lkfRkjk/k dk /kkjkEkk lkh d LkkFk J.kh ØEk Ek TkkMdj CkUkk¸kk TkkRkk gA

¼1½

mÙkj 19- ekuk L lkjdROk dh dMYkh RkFkk C /kkfjRkk dk l/kkfj«k lkR¸kkOkRkh OkkYkVTk d LkkFk J.kh ØEk Ek TkMk gk Rkk fdLkh {k.k lkR¸kkOkRkh fOk-Okk- CkYk LkEkhdj.k gkXkkA



¼1½

$$V = V_o \sin \omega t \quad \text{.....(i)}$$

Ø¸kfn fdLkh {k.k lkfjkFk Ek CkgUk OkkYkh /kkjk I gk Rkk lkjdROk d fLkjk dk fOkHkOkkURkj

$$V_L = I.X_L \quad \text{.....(ii)}$$ ¼1½

RkFkk l/kkfj«k d fLkjk dk fOkHkOkkRkj

$$V_C = I.X_C \quad \text{.....(iii)}$$

V_L vkj V_c dk lkfj.kkEkh fOkHkOkkRkj V gk Rkk

$$V = V_L - V_c$$

vRkh $V = I.x_L - I.x_c$

;k $V = I(x_L - x_c)$

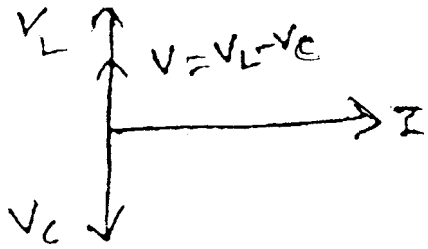
;k $V/I = x_L - x_c$

vkEk d fUk¸kEk Lk $(x_L - x_c)$ lkfjkFk vlHkkOkh lkfRkjk/k ¼1½

vFkkRk lkfjkFk dh lkfRkCkk/kk Z gkXkk

vRk% $Z = x_L - x_c$ .....(iv)

;k IkfRkCkk/kk $Z = \omega L - \frac{1}{\omega C}$



vkLkRk 0,k,k 'kfDRk& ¼1½

$$P_{av} = V_{rms}\, I_{rms} \cos\phi$$

LC ifjiFk gr $\phi = 90^\circ$

$$P_{av} = V_{rms}\, I_{rms} \cos 90^\circ$$

$$P_{av} = 0$$

vUkqukn vkoÙk & vUkUkkn dh fLFkfRk Ek $x_L = x_c$ ¼1½

$$\omega L = \frac{1}{\omega C}$$

$$\omega^2 = \frac{1}{LC}$$

$$\omega = \frac{1}{\sqrt{LC}}$$

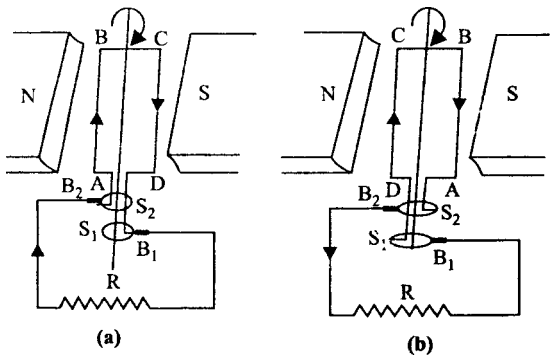
$$\therefore 2\pi\upsilon = \frac{1}{\sqrt{LC}} \qquad [\because \omega = 2p\nu]$$

$$\therefore \upsilon = \frac{1}{2\pi\sqrt{LC}}$$

,kgh vUkUkkn vkoÙk gA

¼vFkok½

Mk¸kUkEkk& Mk¸kUkEkk ,d ,Lkh ¸kfDRk g] Tkk ¸kkf«kd ÅTkk dk f0k|Rk ÅTkk Ek lkfj0kfRkRk djRkh g mLk Mk¸kUkEkk dgRk gA



¼2½

S_1S_2 = lfiyoy; NS = pcdh; {k=

ABCD = vkepj C = ØkM

B_1B_2 = c'k ¼dkcu½ R = ckáifrjk/k ¼3½

dk¸kf0kf/k & TkCk vkEkPkj ABCD dk /k0k [kM NS d Ek/¸k nf{k.kk0kRkh fn'kk Ek ?kEkk¸kk TkkRkk g Rkk dMYkh Lk Ck) PkECkdh¸k ¶YkLd Ek lkfj0kfRkRk gkRkk gA vRkh dMYkh Ek lkfjRk /kkjk mRIkUUk gk TkkRkh gA lkFkEk v)PkØ Ek /kkjk dh fn'kk ABCD gkRkh gA vRkh Ckkâ¸k lkfRkjk/k R e f0k|Rk /kkjk Ck'k B_1Lk B_2 dh vkj lk0kkfgRk gkRkh gA f}Rkh¸k v)PkØ Ek dMYkh Ek /kkjk dh fn'kk DCBA gkRkh g vRkh Ckká lkfRkjk/k R Ek f0k|Rk /kkjk Ck'k B_2 Lk B_1 dh vkj lk0kkfgRk gkRkh gA TkCk dMYkh dk RkYk 0kØ j[kkvk d YkCk0kRk gkRkk g Rkk lkfjRk /kkjk dk EkkUk 'kU¸k vkj TkCk mLkdk 0kØ j[kkvk d LkEkkURkj gkRkk g Rkk lkfjRk /kkjk dk EkkUk vf/kdRkEk gkRkk gA bLk lkdkj Ckkâ¸k lkfRkjk/k R Ek CkgUk 0kkYkh /kkjk dk EkkUk lkFkEk v)PkØ Ek 'kU¸k Lk Ck<dj vf/kdRkEk RkFkk lkUkh 'kU¸k gk TkkRkk gA RkRIk'PkkRk /kkjk dh fn'kk CknYk TkkRkh gA RkFkk f}Rkh¸k v)PkØ Ek bLkdk EkkUk 'kU¸k Lk Ck<dj vf/kdRkEk ,0k fQj 'kU¸k gk TkkRkk gA LIk"V g fd Ckkâ¸k lkfRkjk/k R Ek CkgUk 0kkYkh /kkjk lkR¸kk0kRkh /kkjk gkRkh gA fTkLkdh vk0kfÙk vkEkPkj dh vk0kfÙk d Ckjk Ckj gkRkh gA

mlk¸kkXk& fCkTkYkh d mRIkknUk ¼1½

¸kfn dkb Nk«k Mk¸kUkEkk dk 0k.kUk dj mLk lkj Hkh lkjk vd fn¸kk Tkk¸kA

Set - B

gk;j ld.Mjh Ldy lVhfQdV ijh{kk

Higher Secondary School Certificate Examination

lEiy&i'u i=

SAMPLE PAPER

fo"k; %& (Subject) - Hkkfrd 'kkL= **le; 3 ?k.Vk (Time- 3 Hrs)**

d{kk %& (Class) - ckjgoh **i.kkd 75 (M.M.)**

(Instruction) & ¼fun'k½

1- lHkh i'u gy djuk vfuok;z g A

Attempt all the Question

2- i'u Øekd 01 e 10 vd fu/kkfjr g A nk dky[k.M g A [k.M ^^v** e 05 cgfodYih; i'u rFkk [k.M ^^c** e 05 fjDr LFkkuk dh ifr vFkok mfpr lc/k tkfM, A iR;d i'u d fy, 1 vd vkcfVr g A

Q. No. 01 Carries 10 Marks. There are two sub-section, Section A is Multiple choice carries 05 marks and section B is fill in the blanks or match the column carries 05 marks.

3- i'u Øekd 02 l i'u Øekd 06 rd vfr y?kqRrjh; i'u g A iR;d i'u ij 02 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 30 'kCn A

Q. No. 2 to 06 are very short answer type question & it carries 02 marks each. Word limit is maximum 30.

4- i'u Øekd 07 l i'u Øekd 10 rd y?kqRrjh; i'u g A iR;d i'u ij 03 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 50 'kCn A

Q. No. 07 to 10 are short answer type question & it carries 03 marks each. Word limit is maximum 50.

5- i'u Øekd 11 l i'u Øekd 14 rd y?kqRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 04 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 75 'kCn A

Q. No. 11 to 14 are short answer type question & it carries 04 marks each. Each question has internal choice. Word limit is maximum 75.

6- i'u Øekd 15 l i'u Øekd 17 rd nh?kmRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 05 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 100 'kCn A

Q. No. 15 to 17 are long answer type question & it carries 05 marks each. Each question has internal choice. Word limit is maximum 100.

7- i'u Øekd 17 l i'u Øekd 19 rd nh?kmRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 06 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 150 'kCn A

Q. No. 17 to 19 are long answer type question & it carries 06 marks each. Each question has internal choice. Word limit is maximum 150.

1- lkdk'k dk /k0k.k fLk) djRkk g–

¼v½ lkdk'k dk df.kdk fLk)kRk ¼c½ lkdk'k dh vUkIkLFk RkjXk lkÑfRk

¼l½ lkdk'k dh d0kk.VEk lkÑfRk ¼n½ lkdk'k dh vUkn/;k RkjXk lkÑfRk]

2- XkkYkh;k dk'k] fTkLk lkj vk0k'k dk Ik"V ?kUkR0k ,d LkEkkUk g] d vnj f0k|Rk {k«k dh Rkh0kRkk gkXkh–

¼v½ $E = \frac{1}{4}\frac{1}{4\pi \in_0}\frac{q}{r^2}$ ¼c½ $E = 0$

¼l½ $E > 0$ ¼n½ mlk;kDRk Ek Lk dkb Ukgh A

3- ,d bYkDVkUk vkj ,d lkkVkUk ,d LkEkkUk f0k|Rk Ek j[k TkkRk gA mUkd R0kj.kk dk vUkIkkRk gkXkk–

¼v½ 'kU;k ¼c½ ,d

¼l½ lkkVkUk vkj bYkDVkUk d æ0;kEkkUkk d vUkIkkRk Ek

¼n½ bYkDVkUk vkj lkkVkUkk d æ0;kEkkUk d vUkIkkRk Ek

4- f0kHk0kEkkIkh dh LkXkkfgRkk Ck< TkkRkh g–

¼v½ LkYk d f0k|Rk 0kkgd CkYk dk Ck<kUk Lk

¼c½ f0kHk0kEkkIkh d Rkkj dh YkCkkb dk Ck<kUk Lk]

¼l½ f0kHk0kEkkIkh d Rkkj dh YkCkkb dk dEk djUk Lk

¼n½ Rkkj dk RkkIk Ck<kUk Lk

5- vUkvkEkh;k IkfRkjk/k dk mnkgj.k g –

¼v½ RkkCk dk Rkkj ¼c½ dkCkUk IkfRkjk/k

¼l½ Mk;kkM ¼n½ VXkLVUk dk Rkkj

Que 1 (A) Choose the correct alternative -

(i) Polar nature of light proves -

(a) Corpuscular theory (b) Transverse wave nature of light

(c) Quantum theory (d) Longitudinal wave nature of light.

(ii) Spherical shell having uniform charge on its surface density, the inner intensity of electric field would be -

(a) $E = \frac{1}{4} \frac{1}{4\pi \in_0} \frac{q}{r^2}$ (b) $E = 0$

(c) $E > 0$ (d) none of the above

(iii) An electrone and a proton are kept similar electric field. The ratio of the ir acceleration would be -

(a) zero (b) one

(c) ratio of mass of protion and electron

(d) ratio of mass of electron and proton.

(iv) Super conductivity of potentiometer increases by -

(a) increasing emf of cell (b) incresing the length of its wire

(c) decreasing the length of its wire (d) increasing the temp. of wire

(v) Example of non-ohmic resistance is -

(a) copper wire (b) carbon resistance

(c) Diode (d) Tungston wire

¼Ck½ fjDRk LFkkUk dh IkfRk dhfTk;k %&

1- ¶YkfEkXk d 0kk;k gkFk d fUk;kEk —— KkRk djRk gA

2- f0k|Rk PkECkdh;k Rkj Xkk d vfLRkR0k dh Ikk;kkfXkd Ikf"V Lk0kIkFkEk ——— Uk dh FkhA

3- v0kjDRk fdj.kk d v/;k;kUk d fYk,—— fIkTEk Ik;kDRk djRk gA

4- ,d d.k] fTkLkdk æ0;kEkkUk *a* RkFkk ox *v* g] d LkkFk Mh ckXYkh dk Rkj Xkn/;k –— gkXkkA

5- VkfTkLVj dk Ik0k/kd dh HkkfRk mIk;kkXk djUk d mRLkTkd vk/kkj Lkf/k ——— vfHkUkRk Ek gkRkh gA

(B) Fill in the blanks -

(i) Fleming's left hand rule reveal .....

(ii) The existence of electro magnetic waves was practically proved by .....

(iii) To study the infra red rays ..... prism is used.

(iv) The De-Broglie's wave length of a particle of mass '*m*' and velocity '*v*'

would be .....

(v) The emitter base junction should be in biasing to used a transister as an amplifier.

vfRkYk?kmÙkjh¸k Ik'u

Ik'Uk 2 LkEIkk"kh 0¸kfDRkdj.k dk Ikfjdkf"kRk dhfTk¸kA

Define Emission spectrum.

Ik'Uk 3 f0k-0kk-CkYk ,0k f0kHk0kkURkj Ek nk vRkj fYkf[k¸kA

Mention 2 differences between emf and potential difference.

Ik'Uk 4 PkECkdh¸k ¶YkDLk D¸kk g\ bLkdk SI Ekk«kd fYkf[k¸kA

What is magnetic flux? Write its SI unit.

Ik'Uk 5 f0k|Rk EkkVj Ek f0kjk/kh f0k-0kk-CkYk mRIkUUk gkUkk YkkHkIkn g ¸kk UkdLkkUk IknA D¸kk\

Negative emf in a electric motor is advantages or disadvantageous. Explain?

Ik'Uk 6 PNP VkfTkLVj d fYk, mHk¸kfUk"V mRLkTkd f0k/kk d fYk, /kkjk YkkHk dk Ikfjdkf"kRk dj Lk«k fYkf[k¸kA

Explain the current advantage for PNP Transistor by common emitter configuration and write its formula.

Yk?kmÙkjh¸k Ik'u

Ik'Uk 7 ,d PkECkdh¸k IkF0kh d {k«k Ek IkfRk fEkUkV 30 nkYkUk djRkk gA ¸kfn {k«k nXkUkk dj fn¸kk Tkk¸k Rkk PkECkd dk nkYkUk dkYk KkRk dhfTk,A

A magnet oscillates 30 times per minutes in earths magnetic field. If the field is doubled then find the change in time period.

Ik'Uk 8 TkYk dk m"Ekk mRIkknUk LkCk/kh RkhUkk fUk¸kEk fYkf[k¸kA

Write the three laws of Heat production as explained by joule.

Ik'Uk 9 vkbLVhUk dk Ikdk'k f0k|Rk LkEkhdj.k dh LFkkIkUkk dj Ikdk'k f0k|Rk IkHkk0k dh 0¸kk[¸kk dhfTk,A

Explain light-electric effect by stating the light electric equation as proved by Eiensteine.

lk'Uk 10 EkkMYk'kUk dk lkfjHkkf"kRk dj EkkMYk'kUk d lkdkj fYkf[k,kA

Define modulation and mention its types.

lk'Uk 11- f0kPkYkUk jfgRk f0k{klk.k vkj f0k{klk.k jfgRk f0kPkYkUk Ek Pkkj vRkj fYkf[k, A ¼4½

Write four differences between dispersion without deviation and Deviation without dipersion.

¼vFkOkk½

[kXkkYkh; njn'kh 0k XkYkhfYk,kk njn'kh Ek Pkkj vRkj fYkf[k,

Write four differences between telescope and Galilean telescope.

lk'Uk 12- f0kLFkklkUk f0kf/k Lk mRRkYk YkLk dh Qkd Lk njh KkRk djUk dk lk,kkXk dk 0k.kUk fUkEUkfYkf[kRk fCknvk lkj dhfTk, – ¼4½

1- UkkEkkfdRk j[kkfPk«k

2- lk,kDRk Lk«k dk fUkXkEkUkA

Describe displacement method of focal length of convex lens on following points -

1. Labelled diagram
2. Derivation of formulae used.

¼vFkOkk½

lkRkYk YkLk d fYk, YkLk fUkEkkRkk Lk«k dk fUkXkEkUk ¼fPk«k CkUkkdj½ dhfTk, ¼3½

Deduce an expression for lens maker's formula for thin lens with diagram.

lk'Uk 13- nk lkdk'k L«kkRkk dh RkhOkRkkvk dk vUklkkRk 9%16 g Rkk mLkdh vf/kdRkEk 0k U,kUkRkEk RkhOkRkkvk dk vUklkkRk KkRk dhfTk, \

If the ratio of intensities of two light sources are 9 : 16. Then find its ratio of maximum and minimum intensties.

¼vFkOkk½

nk fLYkVk d CkhPk dh njh 1 mm g RkFkk L«kkRk Lk lkjn dh njh 1 m g Rkk fÝTk dh PkkMkb KkRk dhfTk, TkCkfd lk,kDRk lkdk'k dh RkjXk YkCkkb 500 nm ¼UkUkkEkhVj½ gA

The distance between two slit is 1 mm and its distance from screen is 1 metre, then find out fringe width if the wave length of incident light is 500 nano metre.

Ik'Uk 14- LkEkk{kh¸k Rkkj D¸kk g\ bLkd RkhUk YkkHk 0k RkhUk LkhEkk¸ fYkf[k, \ ¼4½

What is co-axial cable? Write its 3 advantages and three limitations.

¼vFkOkk½

Ikdkf'kd RkRk D¸kk g\ mLkdh dk¸kf0kf/k 0k nk mIk¸kkXk fYkf[k,A

What is optical fibre? Write its working and two application.

Ik'Uk 15- nkYkUk PkCkdROkEkkIkh dh ¸kkXkkURkj f0kf/k Lk nk PkCkdk d PkCkdh¸k vk?k.kk dh RkYkUkk fUkEUkfYkf[kRk fCknvk Ikj fYkf[k, \

1- fLk)kRk 0k Lk«k
2- f0kf/k dh f0k'k"kRkk
3- f0kf/k dk nk"k
4- nk LkkOk/kkfUk¸kk

Write sum and difference method of comparison of magnetic moments of two magnets with vibrational magneto metre on following points -

1. Principle and formulae
2. Characteristics
3. Demerits
4. Two precautions.

¼vFkOkk½

f0k{kIk PkCkdROkEkkIkh dh TanA f0k{kIk f0kf/k Lk nk PkCkdk d PkCkdh¸k vk?k.kk dh RkYkUkk fUkEUkfYkf[kRk fCknvk Ikj fYkf[k,A

1- LkEkTkUk mIkdj.k dk
2- UkkEkkfdRk fPk«k
3- Lk«k
4- nk LkkOk/kkfUk¸kk

Write TanA deflection method of comparison of magnetic moment of two magnets by deflection magneto metre on following points.

1. Adjustment of apparatus
2. Labelled diagram
3. Formula
4. Two precautions.

lk'Uk 16- XkkmLk lkEk¸k Lk ,d LkEkkUk vk0kf'kRk XkkYkh¸k d0kPk d dkj.k f0k|Rk {k«k dh Rkh0kRkk dk 0¸kTkd fUkXkfEkRk dhfTk,A ¼4½

1- XkkYkh¸k d0kPk d Ckkgj
2- XkkYkh¸k d0kPk d HkhRkj
3- XkkYkh¸k d0kPk d LkRkg lkj

Deduce an expression for electric field intensity of uniformly charged spherical conductor by Gauss theorem.

1. Outside spherical conductor
2. Inside spherical conductor
3. On surface of spherical conductor

¼vFk0kk½

LkEkkUkkRkj lYkV Lk?kkfj«k dh /kkfjRkk dk 0¸kTkd fUkXkfEkRk dhfTk, TkCk nkUkk lYkVk d Ek/¸k K lkjk0k|Rkkd 0kkYkk Ekk/¸kEk gkA bLk Lk?kkfj«k dh /kkfjRkk dk lkHkkf0kRk djUk 0kkYk dkjd fYkf[k,A

Deduce an expression for capacity of parallel plate condensor when medium between both plate is of dielectric constant 'K'. Write factor's effecting its capacity.

lk'Uk 17- PN Lkf/k Mk¸kkM Lk fUkfEkRk lk.k Rkjk Xk fn"Vdkjh dk fUkEUkfYkf[kRk fCknvk lkj fYkf[k,A ¼5½

1- f0k|Rk lkfjlkFk
2- dk¸kf0kf/k
3- fUk0k'kh 0k fUkXkRk fLkXUkYk

Write full wave rectifive made from PN junction diode on following points

1. Electric circuit diagram
2. Working procedure
3. INput and output signal

¼vFkok½

CE NPN lk0k/kd dk f0k|Rk lkfjlkFk CkUkkdj dk,kf0kf/k fYkf[k, A

Write working of CE NPN amplifier with electric circuit diagram.

lk'Uk 18 /kkjkokgh 0kÙkkdkj dMYkh d dkj.k PkCkdh,k {k«k dh Rkh0kRkk 0,kTkd fUkXkfEkRk dhfTk,&

1- TkCk fCkn mLkd v{k lkj gk
2- TkCk fCkn mLkd dæ lkj gk

Deduce an expression for magnetic field intensity of current carring circular coil.

1. When point is at its axis
2. When point is its centre

¼vFkok½

dhYkfdRk dMYk /kkjkEkklkh dk fUkEUkfYkf[kRk fCknvk lkj 0k.kUk dhfTk,&

1- UkkEkkfdRk j[kkfPk«k
2- fLk)kRk
3- vEkhVj Lk CknYkUk dk Rkjhdk
4- 0kkYVEkhVj Ek CknYkUk dk Rkjhdk

Describe pivoted type galvanometre on following points-

1. Labelled diagram
2. Principle
3. Changing method it into ammetre
4. Changing method it into volt metre.

lk'Uk 19- LC lkfjlkFk dk 0k.kUk fUkEUkkfdRk fCknvk lkj dhfTk,&

1- lkfj.kkEkh f0kHk0kkRkj
2- lkfRkCkk/kk

3- vkLkRkR¸kIk 'kfDRk

4- vUkUkknh vk0kfÙk dk 0¸kTkd

Describe LC circuit on following points -

1. Resultant potential difference
2. Impedance
3. Average power accumulation
4. Expression for resonant freuency.

¼vFk0kk½

Mk¸kUkEkk Lk vkIk D¸kk LkEkÖkRk g mLkdk 0k.kUk fUkEUk fCknvk Ikj dhfTk,&

1- UkkEkkfdRk j[kkfPk«k

2- dk¸kf0kf/k

3- mIk¸kkXk

What do you mean by Dynemo? Describe it on following points -

1. Labelled diagram
2. Working
3. Application.

LkEIkYk mRrj&Ik«k LkV&Ckh

mRrj 1¼v½

1- (c) Ikdk'k dh vUkIkLFk Rkj Xk IkÑfRk

2- (b) E = 0

3- (c) IkkVkUk vkj bYkDVkUk d æC¸kEkkUkk d vUkIkkRk Ek

4- (c) fOkHkOkEkkIkh d Rkkj dh YkCkkb dk Ck<kUk Lk

5 (c) Mk¸kkM A

¼Ck½ 1- Ykkj Tk CkYk

2 gVTk l

3 jkd LkkYV ¼Lkk/kkj.k UkEkd½

4- $\frac{h}{mv}$

5- vXkvfHkUkRk

mÙkj 2 LkEkkUk vkOkfRk ,Ok YkXkHkXk LkEkkUk vk¸kkEk d nk Rkj Xk ,d gh fn'kk XkEkUk djRk g, LkEkkUk dYkk ¼'kh"k&'kh"k Lk] Xkr&Xkr½ Lk fEkYkRk gA ,Lk O¸kfRkdj.k dk LkEik"kh O¸kfRkdj.k dgRk gA

mÙkj 3 fo- okgd cy ,o foHkokU rj e vUrj&

	fo- Okkgd CkYk		fOkHkkOkkURkj
1-	LkYk d nkUkk bYkDVkMk d Ek/¸k dk vf/kdRkEk fOkHkkOkkURkj gkRkk g TkCk LkYk [kYk Ikfj IkFk Ek gk	1-	Ikfj IkFk d fdUgh nk fCkUnvk d Ek/¸k dk fOkHkkOkkURkj gkRkk gA
2-	¸kg Ikfj IkFk d IkfRkjk/k Ikj fUkHkj Ukgh djRkkA	2-	¸kg IkfRkjk/k Ikj fUkHk djRkk gA
3-	Ikfj IkFk HkXk gkUk Ikj Hkh bLkdk vfLRkROk gkRkk gA	3-	Ikfj IkFk HkXk gkUk Ikj vfLRkROk LkEkkIRk gk TkkRkk gA

mÙkj 4 fdLkh Ik"V d vfHkYkEOkOkRk XkTkjUk OkkYkh PkECkdh CkYk j[kkvk dh Lk[¸kk dk PkECkdh¸k ¶YkDLk dgRk gA

$$\phi = B.A\cos\theta$$

Ekk«kd $\phi = B.A$ ¾ VLkYkk EkhVj^2

,kk $\phi = \frac{F}{m}.A$ $\frac{U;\ Vu}{,fEi;j}$ Ekh-

,kk $\phi = \frac{MLT^{-2} \times L^2}{A^1}$ = $ML^2T^{-2}A^{-1}$ fdXkk Ekh^2 Lk$^{&2}$ 1 Lk$^{&1}$

mRRkj 5 f0k|Rk EkkVj Ek f0kjk/kh f0k-0kk-CkYk mRIkUUk gkUkk YkkHkIkn gkRkk gA

D,kkfd $I = \frac{E - Kw}{R}$ $e \propto w$

$e = Kw$ ¼f0kjk/kh fn-0kk-CkYk½

EkkVj Ek /kkjk d EkkUk dk vf/kdRkEk gkUk Lk jkdRkk gA

mÙkj 6 LkXkkgd mRLkTkd 0kkYVTk dk fUk,kRk j[kdj LkXkkgd /kkjk Ek Ikfj0kRkUk ,0k vk/kkj /kkjk d vUkIkkRk dk bLk f0k/kk d fYk, Ikfj0kRkUk /kkjk YkkHk dgRk gA

/kkjk YkkHk ¾ Vce = fUk,kRk

/kkjk YkkHk ¾ & $\left(\frac{\text{LkXkkgd / kkjk Ek Ikfj0kRkUk}}{\text{vk / kkj / kkjk Ek Ikfj0kRkUk}}\right)$ Vce = fUk,kRk

mÙkj 7% $\frac{H_1}{H_2} = \frac{T_1^2}{T_2^2}$ .....(i)

$T_1 = \frac{60}{30} = 2$ ld.M

T_2 = ?

$H_1 = H$

$H_2 = 2H$

$\frac{H}{2H} = \frac{T_2^2}{2^2}$

T_2^2 = 2

T_2 = $\sqrt{2}$ = 1.414 Lkd.M

mRrj & 1-414 Lkd.MA

mÙkj 8 **TkYk dk m"Ekk mRIkknUk LkECk/kh fUk¸kEk&**

IkFkEk fUk¸kEk & ,d fUk¸kRk PkkYkd Ek ,d fUkfÜPkRk LkEk¸k Rkd f0kfHké IkCkYkRkk dh /kkjk Ik0kkfgRk dh Tkk¸k Rkk mRIké m"Ekk /kkjk d IkCkYkRkk d 0kXk d vUkØEkkUkIkkRk gkRkk gA

$$H \propto I^2 \qquad R \text{ o } t$$ fUk¸kRk

f}Rkh¸k fUk¸kEk& ,d gh IkCkYkRkk dh /kkjk ,d fUkfÜPkRk LkEk¸k d fYk, f0kfHké PkkYkdk Ek Ik0kkfgRk dh Tkk¸k Rkk mRIké m"Ekk IkfRkjk/k d vUkØEkkUkIkkRkh gkRkk gA

$$H \propto R \qquad I \text{ o } t$$ fUk¸kRk

RkRkh¸k fUk¸kEk& ,d gh IkCkYkRkk dh /kkjk ,d fUkf'PkRk PkkYkd Ek fHké&fHké LkEk¸k d fYk, Ik0kkfgRk dh Tkk¸k Rkk mRIké m"Ekk LkEk¸k d vUkØEkkUkIkkRkh gkRkk gA

$$H \propto T \qquad I \text{ o } R$$ fUk¸kRk

$$H \propto I^2 Rt$$

mÙkj 9 Ikdk'k f0k|Rk IkHkk0k dk LIk"V djUk d fYk, vkbULkVhUk Uk ,d LkEkhdj.k fn¸kk fTkLk Ikdk'k LkEkhdj.k dgRk gA mUgkUk IYkkd d D0kk.VEk fLk)kRk dk vk/kkj EkkUkdj bLk LkEkhdj.k dk 0¸kRié fd¸kk gA

IYkkd d vUkLkkj & Ikdk'k ÅTkk d NkV & NkV d.Mdk d :Ik Ek PkYkRkk g fTkLk QkVkUk dgRk gA

,d QkVkUk dh mTkk $E = h\nu$

,d QkVkUk dh mTkk nk :Ikk Ek [kPk gkRkh gA

$$E = \phi + \frac{1}{2}mv^2$$

$$h\nu = \phi + \frac{1}{2}mv^2$$

$E =$ dk¸kIkkYkUk$XkfRkTk mTkk]

¸kfn ,d QkVkUk dh mTkk fLkQ dk¸k IkkYkUk bYkDVkUk mRLkTkUk Ek [kPk gk Tkk¸k d :Ik Ek [kPk gk Tkk¸k XkfRkTkmTkk Uk n Ikk¸k RkCk dh fLFkfRk

$$h\nu_0 = \phi$$

$$h\nu = h\nu_0 + \frac{1}{2}mv^2$$

$$\frac{1}{2}mv^2 = h\nu - h\nu_0$$

$$E_k = h(\nu - \nu_0)$$

lkdk'k f0k|Rk lkHkkoh dh 0,kk[,kk

(i) $E_k \propto \nu$ vkoÙkfÙk lkj fUkHkj djRkk gA Rkh0kRkk lkj Ukgh

(ii) $\nu \propto \nu_0$] E_k ¾ _.kkREkd gkXkh

vRkh ngYkh vkoÙkfÙk Lk dEk gkUk lkj bYkDVkUk mRLkTkUk Ukgh gkXkkkA

mÙkj 10 EkkMYkd Rkjxk /0kfUkRkjxk ,kk n',k Rkjxk dk 0kkgd Rkjxk jfM,kk Rkjxk d LkkFk v/,kkjkfIkRk djUk dh fØ,kk dk EkkMYk'kUk dgRk gA

EkkMYk'kUk d RkhUk lkdkj gA

(i) vk,kkEk EkkMYk'kUk

(ii) vkoÙkfÙk EkkMYk'kUk

(iii) dYkk EkkMYk'kUk A

vk,kkEk EkkMYk'kUk& EkkMYkd Rkjxk dk 0kkgd Rkjxk Ek bLk lkdkj v/,kkjkfIkRk fd,kk Tkk,k fd EkkMfYkRk Rkjxk dk vk,kkEk EkkMYkd Rkjxk d vk,kkEk jf[kd QYkUk gkA RkFkk vkoÙkfÙk ,0k dYkk 0kkgd Rkjxk d LkEkkUk gkA

vkoÙkfÙk EkkMYk'ku& EkkMYkd Rkjxk dk 0kkgd Rkjxk d LkkFk bLk lkdkj v/,kkjkfIkRk fd,kk Tkk,k dh EkkMfYkRk Rkjxk dh vkoÙkfÙk EkkMYkd Rkjx dh vkoÙkfÙk dk jf[kd QYkUk gkA vk,kkEk RkFkk dYkk 0kkgd Rkjxk d LkEkkUk gkA

dYkk EkkMYk'kUk& EkkMYkd Rkjxk dk 0kkgd Rkjxk d LkkFk bLk lkdkj v/,kkjkfIkRk fd,kk Tkk,k fd EkkMfYkRk Rkjxk dk dYkk EkkMYkd Rkjxk d dYkk dk jf[kd QYkUk gkA vkoÙkfÙk RkFkk vk,kkEk 0kkgd Rkjxk d LkEkkUk gkA

mÙkj 11

f0kPkYkUk jfgRk f0k{kIk.k	f0k{kIk.k jfgRk f0kPkYkUk
1- bLk fØ,kk Ek lkdk'k dk 0k.k f0k{kIk.k gkRkk g f0kYk,kUk UkghA	1- bLk fØ,kk Ek lkdk'k dk f0kPkYkUk gkRkk g f0k{kIk.k Ukgh
2- bLkEk Ik,kDRk ØkmUk ,0k f¶YkV dkPk d flkTEkk d dk.kk dk vUkIkkRk&	

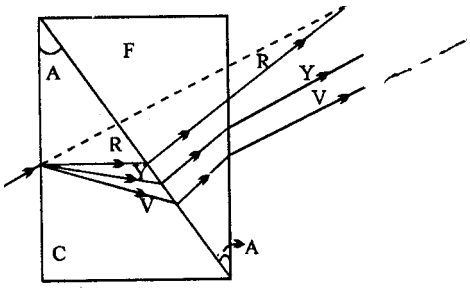
$$\frac{A}{A'} = -\frac{\mu_{y'} - 1}{\mu_y - 1}$$

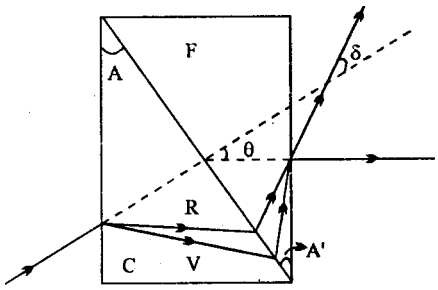
3- bLk fØ;kk dk mlk;kkXk LkEk{k nf"V Ldklk Ek fd;kk TkkRkk gA

$$\frac{A}{A'} = -\frac{\mu_{v'} - \mu_{R'}}{\mu_v - \mu_R}$$

2- flkTEkk d vlk.kd Lk;kkXk Ek fd;kk TkkRkk gA

4-





¼vFkOkk½

XkYkfYk;kk njn'kh

1- bLk njn'kh dh YkCkkb dEk gkRkh gA

2- vOkRkYk YkLk Ukf«kdk

3- vkOk/kUk {kEkRkk dEk

4- vfRkEk lkfRkfCkECk Lkh/kk CkUkRkk gA

[kXkkYkh;k njn'kh

1- bLk njn'kh dh YkCkkb vf/kd gkRkh gA

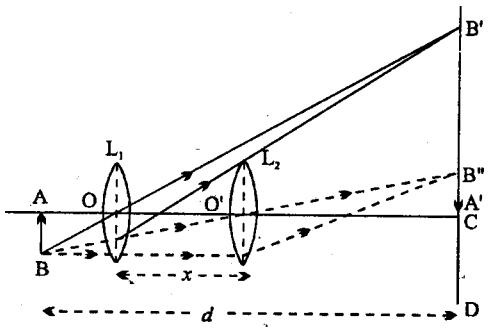
2- mÙkYk YkLk Ukf«kdk

3- vkOk/kUk {kEkRkk vf/kd

4- vfRkEk lkfRkf0kECk mYVk CkUkRkk gA

mRRkj 12- f0kLFkklkUk f0kf/k }kjk mRry yl dh Qkdl njh &

UkkEkkfdRk fPk«k



AB = 0kLRk dh YkCkkb

A'B' = I_1

A''B' = I_2

L = mRRkYk YkLk

x = YkLk dk f0kLFkkIkUk A

Lk«k 0,kRIkfÙk&

EkkUkk fd nkUkk flkUk d CkhPk dh njh = d

IkFkEk fLFkfRk e] v + u = d .....(1)

II fLFkfRk Ek] v – u = x .....(2)

leh dj.k (1) o (2) l

u = $\frac{d-x}{2}$ rFkk v = $\frac{d+x}{2}$

yl d lkekU; l= $\frac{1}{f}=\frac{1}{v}-\frac{1}{u}$ l

mfpr fpUgk dk i;kx dju ij $\frac{1}{+f}=\frac{1}{+v}-\frac{1}{-u}$

$\frac{1}{f}=\frac{1}{v}+\frac{1}{u}$;k $\frac{uv}{u+v}$ .....(3)

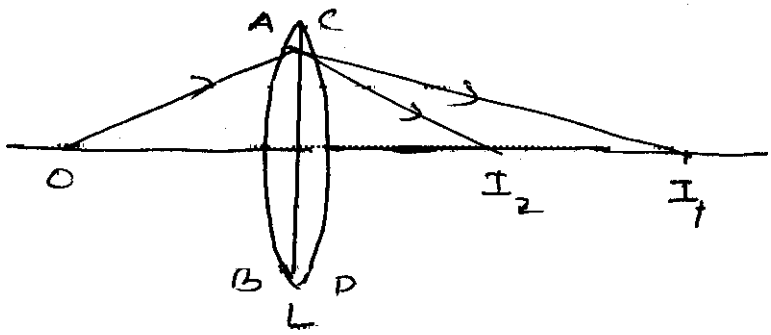
leh dj.k (3) e eku j[ku ij

$$\frac{\left(\frac{d-x}{2}\right)\left(\frac{d+x}{2}\right)}{\left(\frac{d-x}{2}\right)+\left(\frac{d+x}{2}\right)}$$

$$f = \frac{\left(d^2-x^2\right)}{4d}$$

¼vFkokk½

fPk«k



EkkUkk fd L d ,d mHk;kkÙkYk gA

AB lk"B d fYk,

0kLRk (O) dh njh = u]

IkfRkfCkECk I] dh njh = v_1

oØrk f=T;k = R_1

$$\frac{\mu-1}{R_1}=\frac{\mu}{v_1}-\frac{1}{u} \qquad \text{.....(i)}$$

CD lk"B d fYk,]

0kLRk I_1 dh njh = v_1

IkfRkfCkECk I] dh njh = v

oØrk f=T;k = R_2

viorukd = $\frac{1}{\mu}$ ¼lw=k l fojy e tkus d dkj.k½

$$\frac{\frac{1}{\mu}-1}{R_2}=\frac{\frac{1}{\mu}}{v}-\frac{1}{v_1} \qquad \text{.....(ii)}$$

$$\left(\frac{\frac{1}{\mu}-1}{R_2}\right)\mu=\left(\frac{\frac{1}{\mu}}{v}-\frac{1}{v_1}\right)\mu$$

$$\frac{1-\mu}{R_2}=\frac{1}{v}-\frac{\mu}{v_1} \qquad \text{.....(iii)}$$

lehdj.k (i) vkj (iii) l

$$\frac{\mu-1}{R_1}+\frac{1-\mu}{R_2}=\frac{\mu}{v_1}-\frac{1}{u}+\frac{1}{v}-\frac{\mu}{v_1}$$

$$\frac{\mu-1}{R_1}+\frac{1-\mu}{R_2}=\frac{1}{v}-\frac{1}{u}$$

$$\mu-1\left(\frac{1}{R_1}+\frac{1}{R_2}\right)=\frac{1}{v}-\frac{1}{u}$$

$$u=\infty, v=f$$

$$\mu-1\left(\frac{1}{R_1}+\frac{1}{R_2}\right)=\frac{1}{f}-\frac{1}{\infty}$$

$$\frac{1}{f}=\mu-1\left(\frac{1}{R_1}+\frac{1}{R_2}\right)$$

mÙkj 13-

$$\frac{I_1}{I_2}=\frac{a_1^{\,2}}{a_2^{\,2}}$$

$$\frac{a_1^{\,2}}{a_2^{\,2}}=\frac{9}{16}$$

$$\frac{a_1}{a_2}=\frac{3}{4}\Rightarrow a_1=3k, a_2=4k$$

$$\frac{I_{\max}}{I_{\min}}=\frac{\left(a_1+a_2\right)^2}{\left(a_1-a_2\right)^2}$$

$$\frac{I_{\max}}{I_{\min}}=\frac{\left(3k+4k\right)^2}{\left(3k-4k\right)^2}$$

$$\frac{I_{\max}}{I_{\min}}=\frac{49}{1}$$

¼vFkok½

$$\beta=\frac{\lambda D}{d}$$

d = 1 feEkh- $=\frac{1}{1000}$ $=10^{-3}$ EkhVj

D = 1 ehVj

λ = 500 uuk eh Vj $=50\times10^{-9}$ EkhVj

$$\beta=\frac{500\times10^{-9}\times1}{10^{-3}}$$

$$\beta = 5\times10^{-4}\ \text{EkhVj}$$

mRRkj 14- LkEkk{kh¸k Rkkj Ykkb Uk& LkEkk{kh¸k dOkYk Ek ,d Rkkj gkRkk g Tkk LkEkk{kh¸k [kk[kYk CkYkUkk dkj PkkYkd Lk f?kjk gkRkk gA nkUkk PkkYkdk d CkhPk Ikjk Ok|Rk IknkFk TkLk V¶YkkUk IkkYkhfFkYkhUk vkfn Hkjk gkRkk g fTkLkEk vkRkfjd PkkYkd Ckkâ¸k [kk[kYk CkYkUkk dkj PkkYkd d vnj dæ Ikj CkUkk gkRkk gA Ikjk0k|Rk IknkFk dh IkÑfRk IkLkkfjRk gkUk 0kkYkh vk0kfÙk vkj 'kfDRk Ikj fUkHkj djRkk gA

YkkHk

1- Ckn vk0kj.k gkUk d dkj.k RkkCk d Rkkj Lk f0kfdj.k }kjk mTkk ¸kk 'kfDRk dk {k¸k Ukgh gk IkkRkkA

2- bLkd }kjk U¸kUkRkEk 'kfDRk d {k¸k d LkkFk mPPk vk0kfÙk¸kk dk IkLkkfjRk fd¸kk Tkk Lkd Rkk gA D¸kkfd bLkEk f0k|Rk PkECkdh¸k Rkjk Xk gh vf/kdk'k ÅTkk ¸kk 'kfDRk dk 0kkgd gkRkh gA

LkhEkk, &

1- Ikjk0k|Rk âkkLk gkRkk gA

2- LkEkk{kh¸k dOkYk d }kjk ,d fUkf'PkRk vk0kfÙk Lk dEk vk0kfÙk d fLkXUkYkk dk gh IkHkk0kh <Xk Lk IkLkkfjRk fd¸kk Tkk Lkd Rkk gA

¼vFk0kk½

Ikdkf'kRk RkRk] Ik.k vkRkfjd Ikjk0kRkUk Ikj vk/kkfjRk ,d ,Lkh ¸kfDRk g fTkLkdh Lkgk¸kRkk Lk Ikdk'k fLkXUkYk dk mLkh Rkh0kRkk d LkkFk V<&Ek< EkkXk Lk vYIk njh ¸kk YkCkh njh Rkd Yk Tkk¸kk Tkk Lkd Rkk gA

dk¸kf0kf/k & TkCk Ikdk'k RkRk d ,d fLkj Ikj NkVk dk.k Ikj vkIkfRkRk gkRkk g Rkk 0kg RkRk d vnj XkTkjUk YkXkRkk gA bLkdk RkRk vkj DYkfMXk d vURkjk n"V Lk Ckkj&Ckkj Ik.k vkRkfjd Ikjk0kRkUk gkRkk g D¸kkfd vkIkRkUk dk.k dk EkkUk DYkfMXk d LkkIk{k RkRk d ØkfRkd dk.k Lk vf/kd gkRkk gA bLk Ikdkj db Ckkj Ik.k vkRkfjd Ikjk0kRkUk d Ik'PkkRk Ikdk'k vRk Ek nLkj fLkj Lk bRkUkh gh Rkh0kRkk d LkkFk Ckkgj fUkdYk TkkRkk gA

mIk¸kkXk&

1- lkdk'kh¸k fLkXkkUYkk d lk"k.k d fYk,

2- fPkfdRLkk mí'¸k d fYk, A

mRRkj 15- nkYkUk PkECkdROk EkkIkh

fLk)kRk Lk«k &

f0k'k"kRkk,& TkMR0k vk?k.k KkRk djUk dh vk0k'¸kdRkk UkghA

nk"k & LkEkkUk PkECkdh¸k vk?k.k 0kkYk PkECkdk dk PkECkdh¸k vk?k.k Ukgh KkRk fd¸kk Tkk Lkdkk gA bUkd fYk, nkYkUk dkYk d djhCk gkXkk A

Lkk0k/kkfUk¸kk&

1- Ik¸kkXk d vRk mIkdj.k Ukgh fgYkkUkk Pkkfg,A

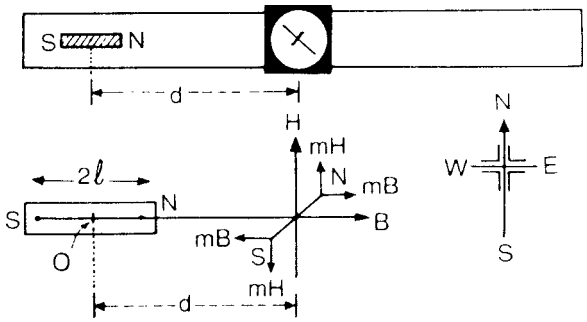
2- mIkdj.k d djhCk vU¸k PkECkdh¸k {k«k Ukgh gkUkk Pkkfg, A

¼vFk0kk½

f0k{kIk PkECkdROk EkkIkh &

LkEkTkUk dk Rkjhdk & Lk0kIkFkEk f0k{kIk PkECkdROk EkkIkh dh HkTkkvk dk Ik0k Ikf'PkEk fn'kk Ek LkHkfTkRk djRk gA nLkj d fYk, f0k{kIk PkECkdROk EkkIkh d Lkdkd d LkEkkU«k nLkj HkTkkvk dk LkHkfTkRk djRk gA

fPk«k &



I = &
$$\frac{M_1}{M_2} = \frac{(d^2 - l_1^2)^2}{(d^2 - l_2^2)^2} \frac{\tan\theta_1}{\tan\theta_1}$$

$$l_1 = l_2 = l$$

$$\frac{M_1}{M_2} = \frac{\tan\theta_1}{\tan\theta_2}$$

Lkk0k/kkfUk¸kk&

1- f0k{kIk PkECkdROkEkkIkh dk LkHkfTkRk djUk d Ckkn Ik¸kkXk d vRk Rkd Ukgh fgYkkUkk

Pkkfg, A

2- Ikk,kkfXkd PkECkd d vYkk0kk vU,k PkECkd ,kk PkECkdh,k Iknkfk Uk gkA

mRRkj & ,d LkEkkUk vk0kf'kRk XkkYkh,k d0kPk d dkj.k f0k{kIk {k«k dh Rkh0kRkk & XkkYkh,k d0kPk d Ckkgj & EkkUkk fd R f«kT,kk dk ,d LkEkkUk vk0kf'kRk XkkYkh,k d0kPk g fTkLk +Q vk0k'k fn,kk Xk,kk gA

nLkj dæ O Lk *r* njh Ikj ,d f©kn P g Tkgk Rkh0kRkk dh Xk.kUkk djUkh g

bLkd fYk, *r* f«kT,kk dk XkkMLkh,k Ik"B XkkYk dh jPkUkk djRk gA

bLk XkkmLkh,k Ik"B XkTkjUk 0kkYkk f0k|Rk ¶YkDLk&

$$\phi_{\in} = E.\ 4\pi r^2 \cos\theta$$

$$\phi_{\in} = E.\ 4\pi r^2 \quad .....(1)$$ XkkmLk

IkEk,k I

bLkh XkkmLkh,k Ik"B Lk XkTkjUk 0kkYkk f0k|Rk ¶YkDLk $\phi_{\in} = \frac{q}{\in_0}$ .....(ii)

$$E.\ 4\pi r^2 = \frac{q}{\in_0}$$

$$E = \frac{1}{4\pi \in_0}\frac{q}{r^2}$$

2- XkkYkh,k d0kPk d vnj Rkh0kRkk

$\because\ q = 0$

$E = 0$

3- XkkYkh,k d0kPk d Ik"B Ikj

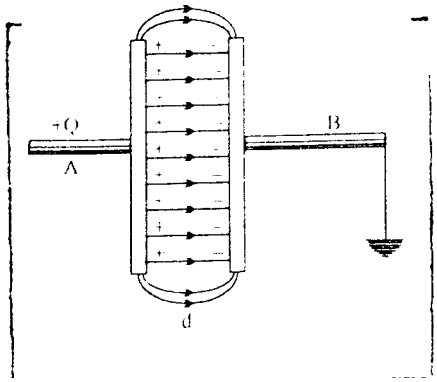
$\because\ r = R$

$$E = \frac{1}{4\pi \in_0}\frac{q}{R^2}$$

¼vFk0kk½

lekarj iV~ I;/kkfj= dh /kkfjrk&

fPk«k &



jPkUkk & bLkEk LkEkkUk {k«kQYk d nk vk,kRkk dkj ,kk 0kRRkk dkj lYkV gkRkh g Tkk fd ,d nLkj d LkEkkURkj gkRk gA nLkj dk LkCk/k lkF0kh Lk gkRkk gA lkjk0k|Rk dk Ekk/,kEk Hkjk gkRkk gA

dk,kf0kf/k& lkFkEk lYkV dk +Q vk0k'k nUk lkj nLkj lYkV d vRkh LkRkg –Q RkFkk Ckkâ,k LkRkg lkj +Q vk0k'k mRlkUUk gkRkk gA bLkd lYkV dk LkECk) lkF0kh Lk gkUk d dkj.k Ckkg,k LkRkg +Q vk0k'k lkF0khÑRk gk TkkRkk gA

Lk«k dh 0,kRlkfÙk&

EkkUkk fd lkR,kd lkR,kd lYkV dk {k«kQYk ¾ A

lk"Bh,k vk0k'k ?kUkR0k $\sigma = \frac{Q}{A}$

nkUkk lYkVk d CkhPk d njh = d

nkUkk lYkVk d Ek/,k f0k|Rk {k«k dh Rkh0kRkk = $E = \frac{\sigma}{K \in_0}$

nkUkk lYkVk d Ek/,k f0kHkk0kkURkj ¾ nLkj lYkV Lk lkFkEk lYkV Rkd ,dk, /kUkk'k dk YkkUk Ek dk,k

$$V = E \times d$$

$$E = \frac{Qd}{K \in_0 A}$$

Lk-lkê Lk?kfj«k dh /kkfjRkk $C = \frac{Q}{V}$

$$C = \frac{Q}{V} = \frac{Q}{Qd / K \in_0 A}$$

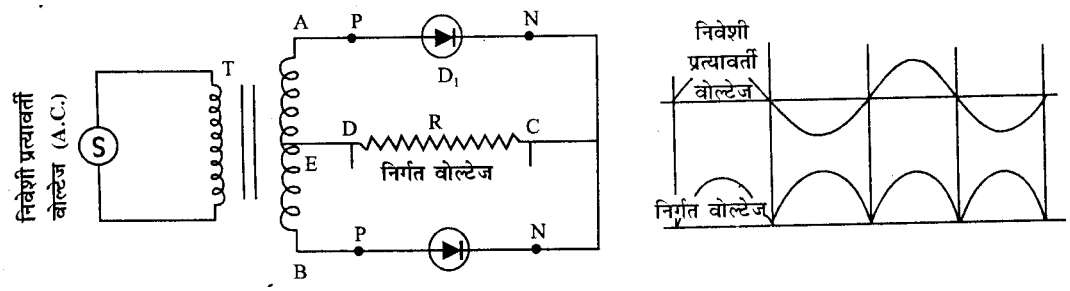
$$= \frac{K \in_0 A}{d}$$

$$C = \frac{K \in_0 A}{d}$$

$$C = \frac{K \in_0 A}{d}$$

fUkHkjRkk (i) $C \propto A$ (ii) $C \propto \frac{1}{d}$ (iii) $C \propto K$

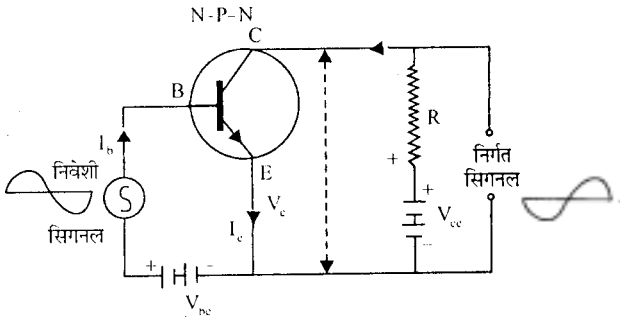
mRRkj 17- fo|r ifjiFk dk ukekfdr fp=&



dk,kf0kf/k &EkkUkk fd IkR,kk0kRkh /kkjk d IkFkEk v)PkØ Ek fLkjk /kUkkREkd RkFkk B fLkjk _.kkREkd bLk fLFkfRk E fLkjk A d RkYkUkk Ek _.kkREkd RkFkk B d RkYkUkk Ek /kUkkREkd gkXkk fTkLkd dkj.k Mk,kkM D_1 vXk vfHkUkfRk Ek RkFkk D_2 Ik'p vfHkUkfRk Ek gkXkk A vRkh IkFkEk Mk,kkM Lk /kkjk C Lk D dh vkj CkgXkhA IkR,kk0kRkh /kkjk d f}Rkh,k v)PkØ Ek A fLkjk _.kkREkd RkFkk B fLkjk /kUkkREkd gkUk Ikj E fLkjk A d LkkIk{k /kUkkREkd RkFkk B d LkkIk{k _.kkREkd gkXkk A fTkLkd dkj.k Mk,kkM D_1 Ik'Pk vfHkUkfRk Ek RkFkk D_2 vXk vfHkUkfRk Ek gkXkk A fTkLkLk /kkjk C Lk D dh vkj Ck<Xkh

¼vFk0kk½

NPN VkfTkLVj dk Ik0)d d :Ik Ek vUkIk,kkXk IkfjIkFk dk fPk«k



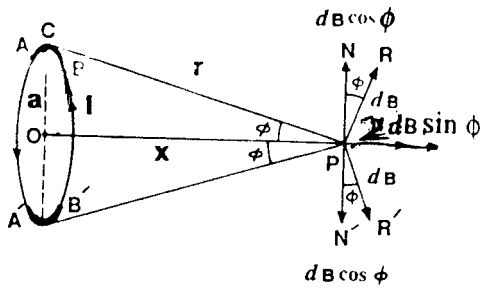
dk¸k f0kf/k & $V_c = V_{ce} - I_cR$

fUk0k'kh fLkXkUkYk d /kUkkREkd v)PkØ Ek vk/kkj mRLkUkd d LkkIk{k vf/kd /kUkkREkd gk TkkRkk gA fTkLkLk Ic /kkjk Ck< TkkRkh g fTkLkd dkj.k Vc dEk /kUkkREkd gk TkkRkk gA fTkLkd fUkXkRk fLkXkUkYk _.kkREkd IkkIRk gkRkk gA

fUk0k'kh fLkXkUkYk d _.kkREkd v)PkØ Ek vk/kkj mRLkTkd d LkkIk{k dEk /kUkkREkd gk Tkk¸kXkk fTkLkd dkj.k Ic EkkUk dEk gk Tkk¸kXkk fTkLkd QYkL0k:Ik Vc T¸kknk /kUkkREkd gkXkk vRkh fUkXkRk fLkXkUkYk /kUkkREkd gk Tkk¸kXkk A

mRRkj 18- **/kkjkokgh oRrkdkj d.Myh&**

fPk«k



EkkUkk fd *a* f«kT¸kk dk ,d /kkjkOkkgh IkfjUkfYkdk fTkLkEk I /kkjk fPk«kkUkLkkj Ckg jgh g

dMYkh dkXkTk d RkYk Ikj YkCk0kRk bLk Ikdkj j[kk g fd d.MYkh dk v{k dkXkTk d RkR0k Ikj fLFkRk gkA

dMYkh d dæ O Lk *x* njh Ikj ,d fCkn P g Tkgk PkECkdhLk {k«k dh RkhOkRkk KkRk djUkh gA

bLkd fYk, dMYkh d Åkj *dl* YkCk0kRk dk ,d AB YkRk g A vYIkk'k RkFkk p dh njh *r* g

Ckk¸kk IkoV d fUk¸kEk I

$$dB = \frac{\mu_0}{4\pi}\frac{I.dl.\sin\theta}{r^2}$$

nLkjh fn'kk CP d YkCk0kRk mIkj dh vkj 0kØ dk nk LkEkdkf.kd ?kVdk Ek f0k¸kkfTkRk djUk Ikj &&&&&

$dB\sin\phi$ OP d YkCk0kRk mIkj dh vkj

$dB\cos\phi$ OP d vUkfn'kA

AB d LkEEk[k AB d Ckjk Ckj ,d vU;k vYIkk'k YkRk g A bLk vYIkk'k d dkj.k Hkh RkhOkRkk dB gkXkhA Ikj Rk bLk dh fn'kk DP d YkCkOkRk UkhPk dh vkj gkXkhA bLk nk LkEk dkf.k d ?kVd k Ek f0k;kkfTkRk dj

dB $\cos\phi$ OP d YkCkOkRk UkhPk dh vkj

dB $\sin\phi$ OP d vUkfn'k

m/Okk/kj ?kVd Ikfj.kkEk Ek Ckjk Ckj Ok f0kIkfjRk g fTkLk d dkj.k ,d nLkj d IkHkk0k dk fUkjLRk dj nRk gA

Ikj dMYkh d dkj.k p RkhOkRkk

$$dB = \sum dB\sin\phi$$

$$dB = \sum \frac{\mu_0}{4\pi}\frac{Idl}{r^2}\cdot\frac{a}{r}$$

$$dB = \frac{\mu_0}{4\pi}\frac{Ia}{r^3}\sum dl$$

$$dB = \frac{\mu_0}{4\pi}\frac{Ia2\pi a}{r^3} \qquad \left[\because \sum dl = 2\pi a\right]$$

n Qj d fYk, $B = \frac{\mu_0}{4\pi}\frac{nIa^2 2\pi}{r^3}$

ΔOBP e $r^2 = a^2 + x^2$

$$r^3 = \left(a^2 + x^2\right)^{3/2}$$

v{k Ikj $B = \frac{\mu_0}{4\pi}\frac{n2\pi Ia^2}{\left(a^2 + x^2\right)^{3/2}}$

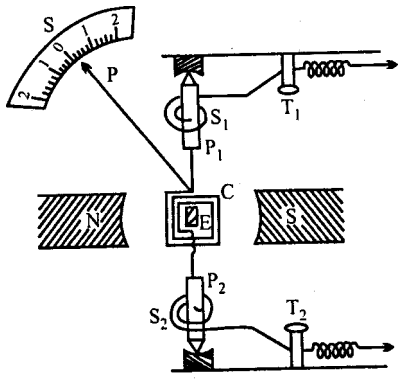
dæ Ikj $x = 0$

$$B = \frac{\mu_0}{4\pi}\frac{2\pi nI}{a}$$

¼vFkOkk½

dhyfdr d|.My /kkjkekih &

ukekfdr j[kkfp=&



/kkjk α f0k{kIk

fLk)kRk & PkECkd d Ek/,k dMYkh Ek /kkjk Ik0kkfgRk djUk Ikj dMYkh Ek CkYk ,kXEk vk?k.k mRIkUUk gk TkkRkk gA dhYkd Ek YkXk fLIkXk d }kjk ,BUk CkYk ,kXEk vk?k.k mRIkUUk gkRkk A LkURkYkUk dh fLFkfRk Ek nkUkk Ckjk Ckj ,0k f0kIkfjRk gk TkkRk gA EkkUkk fd dMYkh d RkYk dk {k««kQYk $= A$

Qjk dh Lk[,kk $= n$

PkECkdh,k {k««k dh Rkh0kRkk $= B$

I /kkjk Ik0kkfgRk djUk Ikj mRIkUUk CkYk ,kXEk vk?k.k $\tau_1 = nIAB$

PkECkdh,k {k««kQYk RkYk d vfHkYkCk d YkCk0kRk gkRkk gA

,d fMXkh d fYk, ,BUk CkYk ,kXEk vk?k.k x gk Rkk f0k{kIk θ d gkUk Ikj ,BUk CkYk,kXEk vk?k.k $= c\theta$

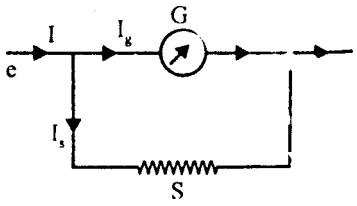
LkRkYkUk dh fLFkfRk Ek

$$nIAB = c\theta$$

$$I = \frac{c\theta}{nAB} \qquad \left[\because \frac{c\theta}{nAB} = \text{fu; rkd}\right]$$

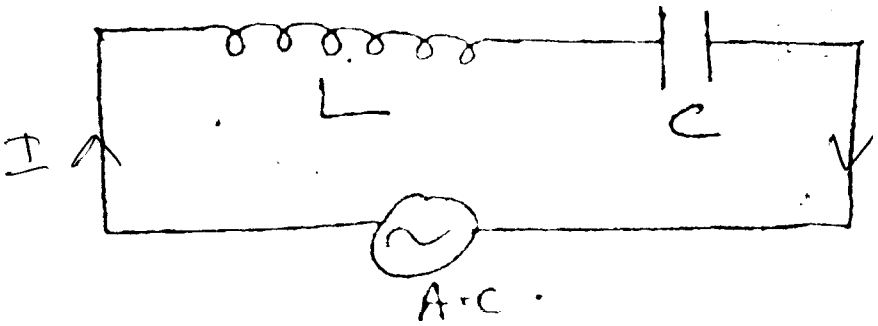
$$I \propto \theta$$

vEkhVj Ek /kkjkEkkIkh dk CknYkUkk & vEkhVj CknYkUk d fYk, dEk vkEk dk IkfRkjk/k dk /kkjkEkkIkh d LkEkkURkj YkXkkRk gA



OkkYVEkhVj Ek CknYkUkk &mPPk IkfRkjk/k dk /kkjkEkkIkh d LkkFk J.kh ØEk Ek TkkMdj CkUkk,kk TkkRkk gA

mÙkj 19- ekuk L Ikjdrok dh dMYkh RkFkk C /kkfjRkk dk l/kkfj«k IkR,kkOkRkh OkkYkVTk d LkkFk J.kh ØEk Ek TkkMk gk Rkk fdLkh {k.k IkR,kkOkRkh fOk-Okk- CkYk LkEkhdj.k gkXkkA



$$V = V_o \sin \omega t \qquad \text{.....(i)}$$

Ø,kfn fdLkh {k.k Ikfjkkfk Ek Ckgk Okkykh /kkjk I gk Rkk Ikjdrok d fLkjk dk fOkHkOkkURkj

$$V_L = I.X_L \qquad \text{.....(ii)}$$

RkFkk l/kkfj«k d fLkjk dk fOkHkOkkRkj

$$V_C = I.X_C \qquad \text{.....(iii)}$$

V_L vkj V_c dk Ikfj.kkEkh fOkHkOkkRkj V gk Rkk

$$V = V_L - V_c$$

vRkk% $V = I.x_L - I.x_c$

;k $V = I\,(x_L - x_c)$

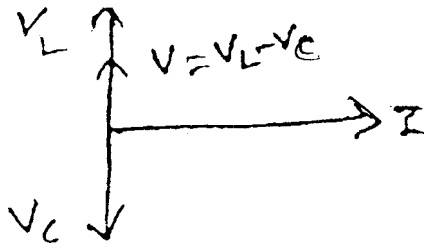
;k $V/I = x_L - x_c$

vkEk d fUk,kEk Lk $(x_L - x_c)$ Ikfjkkfk vIkHkkOkh IkfRkjk/k

vFkkRk Ikfjkkfk dh IkfRkCkk/kk Z gkXkk

vRkk% $Z = x_L - x_c \qquad \text{.....(iv)}$

;k IkfRkCkk/kk $Z = \omega L - \dfrac{1}{\omega C}$



vkLkRk 0,k,k 'kfDRk&

$$P_{av} = V_{rms}\, I_{rms} \cos\phi$$

LC ifjiFk gr $\phi = 90^\circ$

$$P_{av} = V_{rms}\, I_{rms} \cos 90^\circ$$

$$P_{av} = 0$$

vUk0kknh vk0kfÙk & vUkUkkn dh fLFkfRk Ek $x_L = x_c$

$$\omega L = \frac{1}{\omega C}$$

$$\omega^2 = \frac{1}{LC}$$

$$\omega = \frac{1}{\sqrt{LC}}$$

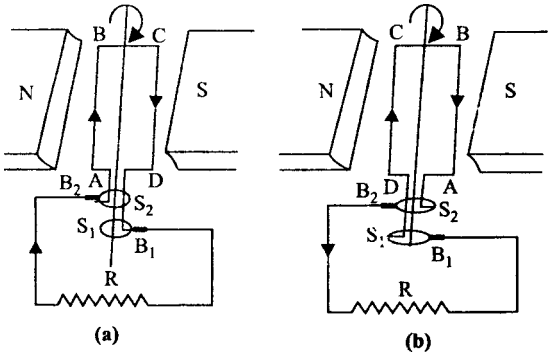
$$\therefore 2\pi\upsilon = \frac{1}{\sqrt{LC}} \qquad [\because \omega = 2p\nu]$$

$$\therefore \upsilon = \frac{1}{2\pi\sqrt{LC}}$$

,kgh vUkUkknh vk0kfÙk gA

¼vFk0kk½

Mk,kUkEkk& Mk,kUkEkk ,d ,Lkh ,kfDRk g] Tkk ,kkf«kd ÅTkk dk f0k|Rk ÅTkk Ek Ikfj0kfRkRk djRkh g mLk Mk,kUkEkk dgRk gA



S_1S_2 = lfiy oy; NS = pcdh; {k=

ABCD = vkepj C = ØkM

B_1B_2 = c'k ¼dkcu½ R = cká ifrjk/k

dk¸kf0kf/k & TkCk vkEkPkj ABCD dk /k0k [kM NS d Ek/¸k nf{k.kk0kRkh fn'kk Ek ?kEkk¸kk TkkRkk g Rkk dMYkh Lk Ck) PkECkdh¸k ¶YkLd Ek Ikfj0kfRkRk gkRkk gA vRkh dMYkh Ek Ikfjk /kkjk mRIkUUk gk TkkRkh gA IkFkEk v)Pk Ø Ek /kkjk dh fn'kk ABCD gkRkh gA vRkh Ckkâ¸k IkfRkjk/k R e f0k|Rk /kkjk Ck'k B_1Lk B_2 dh vkj Ik0kkfgRk gkRkh gA f}Rkh¸k v)Pk Ø Ek dMYkh Ek /kkjk dh fn'kk DCBA gkRkh g vRkh Ckká IkfRkjk/k R Ek f0k|Rk /kkjk Ck'k B_2 Lk B_1 dh vkj Ik0kkfgRk gkRkh gA TkCk dMYkh dk RkYk 0k Ø j[kkvk d YkCk0kRk gkRkk g Rkk Ikfjk /kkjk dk EkkUk 'kU¸k vkj TkCk mLkdk 0k Ø j[kkvk d LkEkkURkj gkRkk g Rkk Ikfjk /kkjk dk EkkUk vf/kdRkEk gkRkk gA bLk Ikdkj Ckkâ¸k IkfRkjk/k R Ek Ckgk 0kkYkh /kkjk dk EkkUk IkFkEk v)Pk Ø Ek 'kU¸k Lk Ck<dj vf/kdRkEk RkFkk IkUkh 'kU¸k gk TkkRkk gA RkRIk'PkkRk /kkjk dh fn'kk CknYk TkkRkh gA RkFkk f}Rkh¸k v)Pk Ø Ek bLkdk EkkUk 'kU¸k Lk Ck<dj vf/kdRkEk ,0k fQj 'kU¸k gk TkkRkk gA LIk"V g fd Ckkâ¸k IkfRkjk/k R Ek Ckgk 0kkYkh /kkjk IkR¸kk0kRkh /kkjk gkRkh gA fTkLkdh vk0kfÙk vkEkPkj dh vk0kfÙk d Ckjk Ckj gkRkh gA

mIk¸kkXk& fCkTkYkh d mRIkknUk

¸kfn dkb Nk«k Mk¸kUkEkk dk 0k.kUk dj mLk Ikj Hkh Ikjk vd fn¸kk Tkk¸kA

Set - C

gk;j ld.Mjh Ldy lVhfQdV ijh{kk

Higher Secondary School Certificate Examination

lEiy&i'u i=

SAMPLE PAPER

fo"k; ¼& (Subject) - Hkkfrd 'kkL= **le; 3 ?k.Vk (Time- 3 Hrs)**

d{kk ¼& (Class) - ckjgoh **i.kkd 75 (M.M.)**

(Instruction) & ¼fun'k½

1- lHkh i'u gy djuk vfuok;g A

Attempt all the Question

2- i'u Øekd 01 e 10 vd fu/kkfjr g A nk dky[k.M g A [k.M ^^v** e 05 cgfodYih; i'u rFkk [k.M ^^c** e 05 fjDr LFkkuk dh ifr vFkok mfpr lc/k tkfM, A iR;d i'u d fy, 1 vd vkcfVr g A

Q. No. 01 Carries 10 Marks. There are two sub-section, Section A is Multiple choice carries 05 marks and section B is fill in the blanks or match the column carries 05 marks.

3- i'u Øekd 02 l i'u Øekd 06 rd vfr y?kmRrjh; i'u g A iR;d i'u ij 02 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 30 'kCn A

Q. No. 2 to 06 are very short answer type question & it carries 02 marks each. Word limit is maximum 30.

4- i'u Øekd 07 l i'u Øekd 10 rd y?kmRrjh; i'u g A iR;d i'u ij 03 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 50 'kCn A

Q. No. 07 to 10 are short answer type question & it carries 03 marks each. Word limit is maximum 50.

5- i'u Øekd 11 l i'u Øekd 14 rd y?kmRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 04 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 75 'kCn A

Q. No. 11 to 14 are short answer type question & it carries 04 marks each. Each question has internal choice. Word limit is maximum 75.

6- i'u Øekd 15 l i'u Øekd 17 rd nh?kmRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 05 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 100 'kCn A

Q. No. 15 to 17 are long answer type question & it carries 05 marks each. Each question has internal choice. Word limit is maximum 100.

7- i'u Øekd 17 l i'u Øekd 19 rd nh?kmRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 06 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 150 'kCn A

Q. No. 17 to 19 are long answer type question & it carries 06 marks each. Each question has internal choice. Word limit is maximum 150.

Set - C

gkb Ldy lfVfQdV ijh{kk

High School Certificate Examination

lEiy&i'u i=

SAMPLE PAPER

fo"k; %& (Subject) - Hkkfrd 'kkL= **le; 3 ?k.Vk (Time- 3 Hrs)**

d{kk %& (Class) - ckjgoh **i.kkd 100 (M.M.)**

(Instruction) & ¼fun'k½

1- lHkh i'u gy djuk vfuok;Z g A

Attempt all the Question

2- i'u Øekd 01 e 10 vd fu/kkfjr g A nk dky[k.M g A [k.M ^^v** e 05 cgfodYih; i'u rFkk [k.M ^^c** e 05 fjDr LFkkuk dh ifr vfkok mfpr lc/k tkfM, A iR;d i'u d fy, 1 vd vkcfVr g A

Q. No. 01 Carries 10 Marks. There are two sub-section, Section A is Multiple choice carries 05 marks and section B is fill in the blanks or match the column carries 05 marks.

3- i'u Øekd 02 l i'u Øekd 09 rd vfr y?kqRrjh; i'u g A iR;d i'u ij 02 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 30 'kCn A

Q. No. 2 to 09 are very short answer type question & it carries 02 marks each. Word limit is maximum 30.

4- i'u Øekd 10 l i'u Øekd 15 rd y?kqRrjh; i'u g A iR;d i'u ij 03 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 50 'kCn A

Q. No. 10 to 15 are short answer type question & it carries 03 marks each. Word limit is maximum 50.

5- i'u Øekd 16 l i'u Øekd 21 rd y?kqRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 04 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 75 'kCn A

Q. No. 16 to 21 are short answer type question & it carries 04 marks each. Each question has internal choice. Word limit is maximum 75.

6- i'u Øekd 22 l i'u Øekd 25 rd nh?kmRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 05 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 100 'kCn A

Q. No. 22 to 25 are long answer type question & it carries 05 marks each. Each question has internal choice. Word limit is maximum 100.

7- i'u Øekd 26 l i'u Øekd 27 rd nh?kmRrjh; i'u g A iR;d i'u e vkrfjd fodYi g vkj iR;d i'u ij 06 vd vkcfVr g A mRrj dh vf/kdre 'kCn lhek 150 'kCn A

Q. No. 26 to 27 are long answer type question & it carries 06 marks each. Each question has internal choice. Word limit is maximum 150.

lk'Uk 1- ¼v½ Lkgh fodYlk PkUkdj fYkf[k, &

1- fUkEUk jXk dh fdj.k d fYk, dkPk dk vlkOkRkUkkd U;kUkRkEk gkRkk g–

¼v½ YkkYk lkdk'k ¼c½ lkhYkk lkdk'k

¼l½ CkXkUkh lkdk'k ¼n½ gjk lkdk'k A

2- fdLkh f}/kOk d v{k Lk *r* njh lkj f0k|Rk {k«k –

¼v½ r^3 d vUkØEkkUkIkkRkh ¼c½ r^3 0;kRØEkkUkIkkRkh

¼l½ r^2 d vUkØEkkUkIkkRkh ¼n½ r^2 0;kRØEkkUkIkkRkh A

3- f0k|Rk /kkfjRkk dk C.G.S. Ekk«kd g–

¼v½ QjM ¼c½ LFkRk QjM

¼l½ EkkbØk QjM ¼n½ flkdk QjM A

4- *l* YkCkkb] *I* /kkjk RkFkk *N* Qjk 0kkYkh lkfjUkkfYkdk d Ek/;k PkECkdh;k {k«k dk 0;kTkd gkRkk g–

¼v½ $\frac{\mu_0 NI}{4\pi l}$ ¼c½ $\mu_0 NlI$

¼l½ $\frac{\mu_0}{4\pi} NlI$ ¼n½ $\mu_0 \frac{NI}{l}$

5- ghfYk;kEk–fUk;kkUk YkLkj Ek ghfYk;kEk ,0k fUk;kkd dk vUkIkkRk gkRkk g–

¼v½ 1%10 ¼c½ 10%1

¼l½ 4%1 ¼n½ 1%4 A

Que 1 (A) Choose the correct alternative -

(i) The refrative index is minimum for the ray of light of colour -

(a) Red light (b) Yellow light

(c) Violet light (d) Green light

(ii) The magnetic field at 'r' distance from the axis of a dipole is -

(a) directely proportional to r^3 (b) inversely proportional to r^3

(c) directely proportional to r^2 (d) inversely proportional to r^2

(iii) C.G.S. unit of electric capacity is -

(a) farad (b) Static Farad

(c) micro farad (d) pico farad

(iv) If l be the lingth of the solenoid having N turns adn current I, then magnetic field of a solenoid is -

(a) $\frac{\mu_0 NI}{4\pi l}$ (b) $\mu_0 NlI$

(c) $\frac{\mu_0}{4\pi} NlI$ (d) $\mu_0 \frac{NI}{l}$

(v) The ratio of Helium and Neon in Helium-Neon leser is -

(a) 1 : 10 (b) 10 : 1

(c) 4 : 1 (d) 1 : 4

¼Ck½ fjDRk LFkkUkk dh lkfRk dhfTk, –

1- f0kf'k"V lkfRkjk/k dk Ekk«kd ———————— gA

2- fdLkh Rkkj dk [khPkdj mLkdh YkCkkb nXkUkh dj nh TkkRkh g Rkk mLkdk lkfRkjk/k ——— gk Tkk¸kXkk A

3- ,d /kkRk dk dk¸k QYkUk 2-51eV g Rkk bLkdh ngYkh vk0kfRRk dk EkkUk ——— gkXkh

4- RkklIk Ek lk¸kkIRk 0kf) djUk lkj ————dh PkkYkdRkk Ck<Rkh gA

5- LkPkkj mlkXkg dk lkF0kh dh LkRkg Lk YkXkHkXk ———ÅPkkb lkj LFkkflkRk fd¸kk TkkRkk gA

(B) Fill in the blanks -

(i) The unit of specific resistance is .....

(ii) If a wire is stretched to twice of its length then its resistance will be .....

(iii) The resistance of metal is 2.51 eV, then the magnitude of its external frequency will be .....

(iv) The conductivity of increases on increasing he temperature.

(v) The communication setellites are set at a ..... height form the earth surface.

lk'Uk 2- LkEkRkYk /kf0kRk lkdk'k fdLk dgRk g\

What is plane-polarized light?

lk'Uk 3- Hk0kj /kkjk fdLk dgRk g\ bLkdh [kkTk djUk 0kkYk 0kKkfUkd dk UkkEk fYkf[k,A

What is flux? Who discovered it name the scientist.

lk'Uk 4- LkYk d vkRkfjd lkfRkjk/k dk lkHkkf0kRk djUk 0kkYk nk dkjd fYkf[k,A

Write two factor's affecting the internal resistanced of a cell.

lk'Uk 5- ¸kfn V_R = 80 0kkYV] V_C = 100 0kkYV vkj V_L = 40 0kkYV Rkk lkR¸kk0kRkh /kkjk d 0kkYVTk dh Xk.kUkk dhfTk, \

Calculate the voltage of an alternating current if V_R = 80 volt, V_C = 100 volt and V_L= 40 volt.

lk'Uk 6- v)pkyd midj.k d nk nk"k fyf[k,A

Write two defects of semi-conductors.

lk'Uk 7- Llk'kT¸kk fUk¸kEk fYkf[k, ,0k fLk) dhfTk,A

State and prove that tangent law.

lk'Uk 8- 'k.V D¸kk g\ 'k.V dk fLk)kRk fYkf[k,A

What is shunt? Write its principle.

lk'Uk 9- æ0¸k Rkjxk D¸kk g\ fdLkh æ0¸k Rkjxk Lk LkCkf/kRk Mh—CkkXYkh Rkjxkn/¸k dk 0¸kTkd KkRk dhfTk,A

What is wave matter? Find a constant related to any wave matter according to De-Broglie's wave length.

lk'Uk 10- MhfTkVYk LkPkkj dh dkb RkhUk f0k'k"kRkk, fYkf[k,A

Write any three characteristics of digital signal.

lk'Uk 11- f0kPkYkUk jfgRk f0k{kIk.k vkj f0k{kIk.k jfgRk f0kPkYkUk Ek Pkkj vRkj fYkf[k, A ¼4½

Write four differences between dispersion without deviation and Deviation without dipersion.

¼vFkok½

[kXkkYkh; njn'kh 0k XkYkhfYk¸kk njn'kh Ek Pkkj vRkj fYkf[k,

Write four differences between telescope and Galilean telescope.

lk'Uk 12- f0kLFkkIkUk f0kf/k Lk mRRkYk YkLk dh Qkdlk njh KkRk djUk dk lk¸kkXk dk 0k.kUk fUkEUkfYkf[kRk fCknvk lkj dhfTk, – ¼4½

1- UkkEkkfdRk j[kkfPk«k

2- lk¸kDRk Lk«k dk fUkXkEkUkA

Describe displacement method of focal length of convex lens on following points -

1. Labelled diagram
2. Derivation of formulae used.

¼vFkOkk½

lkRkYk YkLk d fYk, YkLk fUkEkkRkk Lk«k dk fUkXkEkUk ¼fPk«k CkUkk dj½ dhfTk, ¼3½

Deduce an expression for lens maker's formula for thin lens with diagram.

lk'Uk 13- nk lkdk'k L«kkRkk dh RkhOkRkk vk dk vUkIkkRk 9%16 g Rkk mLkdh vf/kdRkEk Ok U¸kUkRkEk RkhOkRkk vk dk vUkIkkRk KkRk dhfTk, \

If the ratio of intensities of two light sources are 9 : 16. Then find its ratio of maximum and minimum intensties.

¼vFkOkk½

nk fLYkVk d CkhPk dh njh 1 mm g RkFkk L«kkRk Lk lkjn dh njh 1 m g Rkk fÝTk dh PkkMkb KkRk dhfTk, TkCkfd lk¸kDRk lkdk'k dh Rkj Xk YkCkkb 500 nm ¼UkUkkEkh Vj½ gA

The distance between two slit is 1 mm and its distance from screen is 1 metre, then find out fringe width if the wave length of incident light is 500 nano metre.

lk'Uk 14- LkEkk{kh¸k Rkkj D¸kk g\ bLkd RkhUk YkkHk Ok RkhUk LkhEkk, fYkf[k, \ ¼4½

What is co-axial cable? Write its 3 advantages and three limitations.

¼vFkOkk½

lkdkf'kd RkRk D¸kk g\ mLkdh dk¸kfOkf/k Ok nk mlk¸kkXk fYkf[k,A

What is optical fibre? Write its working and two application.

lk'Uk 15- nkYkUk PkCkdROkEkkIkh dh ¸kkXkkURkj fOkf/k Lk nk PkCkdk d PkCkdh¸k vk?k.kk dh RkYkUkk fUkEUkfYkf[kRk fCknvk lkj fYkf[k, \

1- fLk)kRk Ok Lk«k

2- f0kf/k dh f0k'k"kRkk

3- f0kf/k dk nk"k

4- nk LkkOk/kkfUk,kk

Write sum and difference method of comparison of magnetic moments of two magnets with vibrational magneto metre on following points -

1. Principle and formulae
2. Characteristics
3. Demerits
4. Two precautions.

¼vFkOkk½

f0k{kIk PkCkdROkEkkIkh dh TanA f0k{kIk f0kf/k Lk nk PkCkdk d PkCkdh,k vk?k.kk dh RkYkUkk fUkEUkfYkf[kRk fCknvk Ikj fYkf[k,A

1- LkEkTkUk mIkdj.k dk

2- UkkEkkfdRk fPk«k

3- Lk«k

4- nk LkkOk/kkfUk,kk

Write TanA deflection method of comparison of magnetic moment of two magnets by deflection magneto metre on following points.

1. Adjustment of apparatus
2. Labelled diagram
3. Formula
4. Two precautions.

Ik'Uk 16- XkkmLk IkEk,k Lk ,d LkEkkUk vkOkf'kRk XkkYkh,k dOkPk d dkj.k f0k|Rk {k«k dh RkhOkRkk dk O,kTkd fUkXkfEkRk dhfTk,A ¼4½

1- XkkYkh,k dOkPk d Ckkgj

2- XkkYkh,k dOkPk d HkhRkj

3- XkkYkh,k dOkPk d LkRkg Ikj

Deduce an expression for electric field intensity of uniformly charged

spherical conductor by Gauss theorem.

1. Outside spherical conductor
2. Inside spherical conductor
3. On surface of spherical conductor

¼vFkZkk½

LkEkkUkkRkj lYkV Lk?kkfj«k dh /kkfjRkk dk 0,kTkd fUkXkfEkRk dhfTk, TkCk nkUkk lYkVk d Ek/,k K lkjk0k|Rkkd 0kkYkk Ekk/,kEk gkA bLk Lk?kkfj«k dh /kkfjRkk dk lkHkkf0kRk djUk 0kkYk dkjd fYkf[k,A

Deduce an expression for capacity of parallel plae condensor when medium between both plate is of dielectric constant 'K'. Write factor's effecting its capacity.

lk'Uk 17- PN Lkf/k Mk,kkM Lk fUkfEkRk lk.k Rkjk Xk fn"Vdkjh dk fUkEUkfYkf[kRk fCknvk lkj fYkf[k,A ¼5½

1- f0k|Rk lkfjlkFk
2- dk,kf0kf/k
3- fUk0k'kh 0k fUkXkRk fLkXUkYk

Write full wave rectifive made from PN junction diode on following points

1. Electric circuit diagram
2. Working procedure
3. INput and output signal

¼vFkZkk½

CE NPN lk0k/kd dk f0k|Rk lkfjlkFk CkUkk dj dk,kf0kf/k fYkf[k, A

Write working of CE NPN amplifier with electric circuit diagram.

lk'Uk 18 /kkjkokgh 0kÙkk dkj dMYkh d dkj.k PkCk dh,k {k«k dh Rkh0kRkk 0,kTkd fUkXkfEkRk dhfTk,&

1- TkCk fCkn mLkd v{k lkj gk
2- TkCk fCkn mLkd dæ lkj gk

Deduce an expression for magnetic field intensity of current carring circular coid.

1. When point is at its axis
2. When point is its centre

¼vFkOkk½

dhYkfdRk dMYk /kkjkEkkIkh dk fUkEUkfYkf[kRk fCknvk Ikj Ok.kUk dhfTk,&

1- UkkEkkfdRk j[kkfPk«k
2- fLk)kRk
3- vEkhVj Lk CknYkUk dk Rkjhdk
4- OkkYVEkhVj Ek CknYkUk dk Rkjhdk

Describe pivoted type galvanometre on following points-

1. Labelled diagram
2. Principle
3. Changing method it into ammetre
4. Changing method it into volt metre.

Ik'Uk 19- LC Ikfjlkfk dk Ok.kUk fUkEUkkfdRk fCknvk Ikj dhfTk,&

1- Ikfj.kkEkh fOkHkOkkRkj
2- IkfRkCkk/kk
3- vkLkRkR;kIk 'kfDRk
4- vUkUkknh vkOkfÙk dk O;kTkd

Describe LC circuit on following points -

1. Resultant potential difference
2. Impedance
3. Average power accumulation
4. Expression for resonant freuency.

¼vFkOkk½

Mk;kUkEkk Lk vkIk D;kk LkEkÖkRk g mLkdk Ok.kUk fUkEUk fCknvk Ikj dhfTk,&

1- UkkEkkfdRk j[kkfPk«k

2- dk¸kf0kf/k

3- mlk¸kkXk

What do you mean by Dynemo? Describe it on following points -

1. Labelled diagram
2. Working
3. Application.

LkEIkYk mRrj&Ik«k LkV& I h

mRrj 1¼v½

1- (a) YkkYk Ikdk'k

2- (a) r^3 d 0¸kRØEkkUkIkkRkh

3- (b) LFkRk QjM

4- (d) $\mu_0 \frac{NI}{l}$

5 (b) 10 ⁄ 1

¼Ck½ 1- vkEk EkhVj

2 Pkkj XkUkk

3 6.08×10^{-14} pØ@Lkd.M

4- v) PkkYkd

5- 360000 fdeh-

mRRkj 2- ¸kfn Ikdk'k Rkj Xk d vUkIkLFk dEIkUk Ikdk'k LkPkj.k dh fn'kk d YkCk0kRk RkYk Ek ,d gh fn'kk Ek gM IkR¸kd fn'kk Ek LkEkfUkRk Uk gk Rkk bLk Ikdk'k dk LkEkRkYk /kf0kRk dgRk gA

mRRkj 3 TkCk fdLkh Hkh vkÑfRk ¸kk vkdkj d PkkYkd dk fdLkh PkCkdh¸k {k«k Ek PkYkk¸kk TkkRkk g ¸kk mLk Ikfj0kRkUk'khYk PkCkdh¸k {k«k Ek j[kk TkkRkk g Rkk mLkLk Ck) PkCkdh¸k ¶YkDLk Ek Ikfj0kRkUk gkRkk gA fTkLkLk PkkYkd Ek TkYk Ek mRIkUUk Hk0kj d LkEkkUk PkDdj nkj IkfjRk /kkjk, mRIkUUk gk TkkRkh g fTkLk Hk0kj /kkjk, dgRk gA bLkdh [kkTk Qkdk 0kKkfUkd Uk dh FkhA

mRRkj 4 1- nkUkk bYkDVkUkk d CkhPk dh njh Ck<kUk Ikj vkRkfjd IkfRkjk/k Ck< TkkRkk gA

2- f0k|Rk vIk?kV¸k dh LkkUæRkk Ck<kUk Ikj vkRkfjd IkfRkjk/k Ck< TkkRkk gA

bLkd vYkk0kk vU¸k mfPkRk dkjd CkRkkUk Ikj Hkh IkR¸kd Lkgh dkjd Ikj 1 vd A

mRRkj 5- $V = \sqrt{V_R{}^2 + (V_L - V_C)^2}$

$V = \sqrt{(80)^2 + (100-40)^2}$

$V = \sqrt{6400 + 3600}$

$V = \sqrt{10000}$

$V = 100$ 0kkYV A

mRRkj 6-

1- ; RkkIk LkOknh gkRk gA RkkIk Ck<kUk Ikj bUkdh n{kRkk dEk gk TkkRkh gA

2- mPPk vkOkfÙk Ikj bUkdh fØ¸kk Ekn gk TkkRkh gA

mRRkj 7 ¸kfn LOkRk«kRkkIkOkd ?kEkUk OkkYk PkCkd Ikj nk ,d LkEkkUk vkj IkjLIkj YkCkOkRk PkCkdh¸k {k«k fØ¸kk'khYk gk vkj LkRkYkUk dh fLFkfRk Ek PkCkd IkgYk {k«k Ek H Lk θ dk.k CkUkkRkk g Rkk nLkjk {k«k B IkgYk {k«k H dk $\tan\theta$ XkUkk gkRkk gA

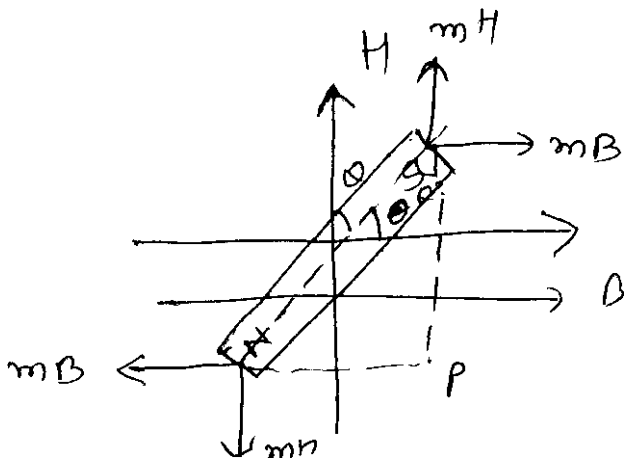
$$B = H \tan\theta$$

O¸kRIkfÙk & EkkUkk PkCkd NS dh IkHkkOkdkjh YkCkkb 2*l* /kOk LkkEkF¸k m RkFkk PkCkdh¸k vk?k.k M g ¸kg nk ,d LkEkkUk Ok IkjLIkj YkCkOkRk PkCkdh¸k {k= B RkFkk H Ek LOkRk«kRkkIkOkd ?kEk Lkd Rkk gA LkRkYkUk dh vOkLFkk Ek {k«k H d LkkFk θ dk.k CkUkkRkk gA

{k«k H d dkj.k PkCkd Ikj CkYk¸kXEk (mH, mH) PkCkd dk H d LkEkkURkj ,Ok {k«k B d dkj.k CkYk¸kXEk (mB, mB) mLk B d LkEkkURkj YkkUk dk Ik¸kkLk djRkk g LkRkYkUk vOkLFkk Ek

(mH, mH) CkYk ¸kXEk dh vk?k.k = (mB, mB) CkYk¸kXEk dk vk?k.k

$$mH_1 \times NP = mB \times SP \quad ¸kk \quad B = H\frac{NP}{SP}$$



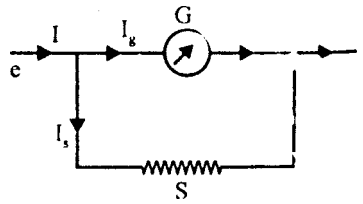
Ied k.k ΔNSP e

$$\tan\theta = \frac{NP}{SP}$$

$$\therefore \quad B = H\tan\theta$$

mRRkj 8- /kkjkEkkIkh dk LkHkkf0kRk {kfr;k Lk Lkj{kk d fYk, dMYkh d LkkFk LkEkkURkj ØEk Ek dEk IkfRkjk/k dk Rkkj TkkMk TkkRkk g fTkLk 'k.V ,kk IkkÜ0k0kkgh dgRk gA fLk)kRk & EkkUkk fd /kkjkEkkIkh dk IkfRkjk/k G 0k RkFkk 'k.V dk IkfRkjk/k S g A Ikfj IkFk Ek Ik0kkfgRk Ek[,k /kkjk I g fTkLk dk I_g HkkXk /kkjk EkkIkh I_s HkkXk 'k.V Lk gkdj Ik0kkfgRk gkRkk gA Rkk fdjPkkQ d IkFkEk fUk,kEk Lk &

$$i = i_g + i_s \qquad \text{.....(i)}$$



vkEk fUk,kEk Lk

/kkjkEkkIkh d fLkjk Ikj f0kHk0kkRkj $= I_g G$

'k.V d fLkjk dk f0kHk0kkRkj $= I_s S$

vr% $I_g G = I_s S$

$$\frac{I_s}{I_g} = \frac{G}{S}$$

;k $\frac{I_s}{I_g} + 1 = \frac{G}{S} + 1 = \frac{I_s + I_g}{I_g} = \frac{G+S}{S}$

;k $\frac{I}{I_g} = \frac{G+S}{S}$ = leh- (i) l

$$\frac{I_g}{I} = \frac{S}{G+S} \qquad \text{.....(ii)}$$

,kfn Ek[,k /kkjk dk n0kk HkkXk /kkjkEkkIkh Lk Ik0kkfgRk gk Rkk

$$\frac{I_g}{I} = \frac{1}{n} \qquad \text{.....(iii)}$$

leh- (ii) vkj (iii) l

$$\frac{S}{G+S} = \frac{1}{n}$$

$nS = G + S$

$(n-1)S = G$

$$S = \frac{G}{(n-1)}$$

vFkkRk Ek[,k/kkjk dk *n*0kk HkkXk /kkjkEkkIkh Ek Lk Ik0kkfgRk djUkk Pkkg Rk gA Rkk 'k.V d IkfRkjk/k dk /kkjkEkkIkh d IkfRkjk/k dk $(n-1)$ 0kk HkkXk gkUkk Pkkfg, A

mRRkj 9 TkCk dkb gYdk d.k mPPk vk0kXk Lk XkfRk djRkk g Rkk mLkd LkkFk Rkj Xk LkCk) gkRkh g fTkLk æ0,k Rkj Xk dg Rk gA

0,kTkd & ,kfn QkVku dh vk0kfÙk ν ,0k Rkj Xk n/,k λ gk Rkk

QkVkUk dh ÅTkk $E = h\nu$ .....(i)

Ikj Rk vkbUVhUk d mTkk RkY,kRkk LkEkh dj.k Lk

$E = mc^2$ .....(ii)

LkEkh dj.k (i) ,0k LkEkh dj.k (ii) Lk

$$mc^2 = h\nu$$

$$m = \frac{h\nu}{c^2} \quad \text{.....(iii)}$$

Ikj Rk $c = \nu\lambda$

$$m = \frac{h\,c/\lambda}{c^2}$$

$$m = \frac{h}{c\lambda}$$

ijUr QkVkUk dh Lk0kXk

$$p = mc$$

$$p = \frac{h}{c\lambda}c$$

$$p = \frac{h}{\lambda}$$

,kk $\lambda = \frac{h}{p}$,kg MhCkkxyh Rkj Xk LkEkh dj.k gA

,kfn fdLkh ØEk dk Lk0kXk $p = m\nu$ gk Rkk

$$\lambda = \frac{h}{mv}$$ bLk Mh CkkXkkYkh LkCk/k dgRk gA

mRRkj 10

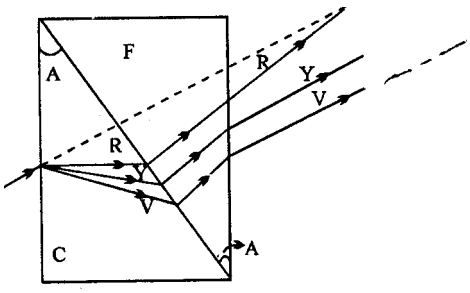
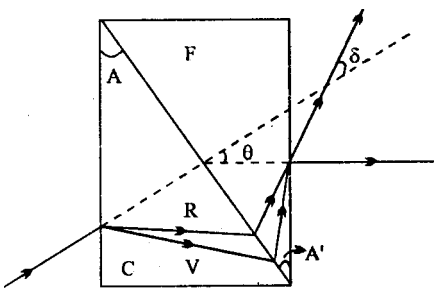
1- fMTkhVYk fLkXUkYk LIkn d : Ik Ek gkRk gA YkkfTkd XkVk dk mIk¸kkXk djd bUg vkLkkUkh Lk mRIkUUk fd¸kk Tkk Lkd Rkk gA

2- bLkdh Xk.kOkRRkk Ckg Rk vPNh gkRkh gA

3- bLkEk PkUkYk vkOkfÙk Ikj kLk Ek Ckg Rk Lkh LkPkUkkvk dk IkLkkj.k fd¸kk Tkk Lkd Rkk gA

bLkd vYkkOkk Hkh vU¸k RkhUk mfPkRk f0k'k"kRkk, fYk[kUk Ikj Hkh IkR¸kd Ikj 2 vd n nA

mÙkj 11

f0kPkYkUk jfg Rk f0k{kIk.k	f0k{kIk.k jfg Rk f0kPkYkUk
1- bLk fØ¸kk Ek Ikdk'k dk Ok.k f0k{kIk.k gkRkk g f0kYk¸kUk UkghA	1- bLk fØ¸kk Ek Ikdk'k dk f0kPkYkUk gkRkk g f0k{kIk.k Ukgh
2- bLkEk Ik¸kDRk ØkmUk ,Ok f¶YkV dkPk d fIkTEkk d dk.kk dk vUkIkkRk& $\frac{A}{A'} = -\frac{\mu_{y'} - 1}{\mu_y - 1}$	$\frac{A}{A'} = -\frac{\mu_{v'} - \mu_{R'}}{\mu_v - \mu_R}$
3- bLk fØ¸kk dk mIk¸kkXk LkEk{k nf"V LdkIk Ek fd¸kk TkkRkk gA	2- fIkTEkk d vIk.kd Lk¸kkXk Ek fd¸kk TkkRkk gA
4- 	

¼vFkOkk½

XkYkfYk¸kk njn'kh	[kXkkYkh¸k njn'kh
1- bLk njn'kh dh YkCkkb dEk gkRkh gA	1- bLk njn'kh dh YkCkkb vf/kd gkRkh gA

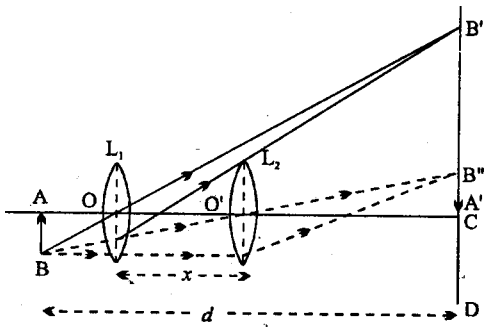
2- vOkRkYk YkLk Ukf«kdk 2- mÙkYk YkLk Ukf«kdk

3- vkOk/kUk {kEkRkk dEk 3- vkOk/kUk {kEkRkk vf/kd

4- vfRkEk lkfRkfCkECk Lkh/kk CkUkRkk gA 4- vfRkEk lkfRkfOkECk mYVk CkUkRkk gA

mRRkj 12- f0kLFkklkUk f0kf/k }kjk mRry yl dh Qkdl njh &

UkkEkkfdRk fPk«k



AB = 0kLRk dh YkCkkb

A'B' = I_1

A''B' = I_2

L = mRRkYk YkLk

x = YkLk dk f0kLFkklkUk A

Lk«k 0;kRlkfÙk&

EkkUkk fd nkUkk flkUk d CkhPk dh njh = d

lkFkEk fLFkfRk e] v + u = d .....(1)

II fLFkfRk Ek] v – u = x .....(2)

lehdj.k (1) o (2) l

$u = \frac{d-x}{2}$ rFkk $v = \frac{d+x}{2}$

yl d lkeku; l= $\frac{1}{f}=\frac{1}{v}-\frac{1}{u}$ l

mfpr fpUgk dk i;kx dju ij $\frac{1}{+f}=\frac{1}{+v}-\frac{1}{-u}$

$\frac{1}{f}=\frac{1}{v}+\frac{1}{u}$;k $\frac{uv}{u+v}$ .....(3)

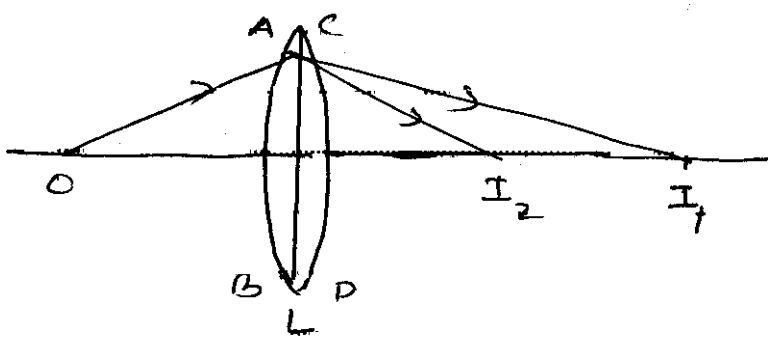
lehdj.k (3) e eku j[ku ij

$$\frac{\left(\frac{d-x}{2}\right)\left(\frac{d+x}{2}\right)}{\left(\frac{d-x}{2}\right)+\left(\frac{d+x}{2}\right)}$$

$$f = \frac{\left(d^2 - x^2\right)}{4d}$$

¼vFkokk½

fPk«k



EkkUkk fd L d ,d mHk;kkÙkYk gA

AB lk"B d fYk,

0kLRk (O) dh njh = u]

IkfRkfCkECk I] dh njh = v_1

oØrk f=T;k = R_1

$$\frac{\mu-1}{R_1} = \frac{\mu}{v_1} - \frac{1}{u} \qquad \text{.....(i)}$$

CD lk"B d fYk,]

0kLRk I_1 dh njh = v_1

IkfRkfCkECk I] dh njh = v

oØrk f=T;k = R_2

vioruukd = $\frac{1}{\mu}$ ¼lw?ku l fojy e tku d dkj.k½

$$\frac{\frac{1}{\mu}-1}{R_2} = \frac{\frac{1}{\mu}}{v} - \frac{1}{v_1} \qquad \text{.....(ii)}$$

$$\left(\frac{\frac{1}{\mu}-1}{R_2}\right)\mu=\left(\frac{\frac{1}{\mu}}{v}-\frac{1}{v_1}\right)\mu$$

$$\frac{1-\mu}{R_2}=\frac{1}{v}-\frac{\mu}{v_1} \qquad \text{.....(iii)}$$

lehdj.k (i) vkj (iii) l

$$\frac{\mu-1}{R_1}+\frac{1-\mu}{R_2}=\frac{\mu}{v_1}-\frac{1}{u}+\frac{1}{v}-\frac{\mu}{v_1}$$

$$\frac{\mu-1}{R_1}+\frac{1-\mu}{R_2}=\frac{1}{v}-\frac{1}{u}$$

$$\mu-1\left(\frac{1}{R_1}+\frac{1}{R_2}\right)=\frac{1}{v}-\frac{1}{u}$$

$u=\infty, v=f$

$$\mu-1\left(\frac{1}{R_1}+\frac{1}{R_2}\right)=\frac{1}{f}-\frac{1}{\infty}$$

$$\frac{1}{f}=\mu-1\left(\frac{1}{R_1}+\frac{1}{R_2}\right)$$

mÙkj 13-

$$\frac{I_1}{I_2}=\frac{a_1^{\,2}}{a_2^{\,2}}\Rightarrow\frac{a_1^{\,2}}{a_2^{\,2}}=\frac{9}{16}$$

$$\frac{a_1}{a_2}=\frac{3}{4}\Rightarrow a_1=3k, a_2=4k$$

$$\frac{I_{\max}}{I_{\min}}=\frac{\left(a_1+a_2\right)^2}{\left(a_1-a_2\right)^2}$$

$$\frac{I_{\max}}{I_{\min}}=\frac{\left(3k+4k\right)^2}{\left(3k-4k\right)^2}$$

$$\frac{I_{\max}}{I_{\min}}=\frac{49}{1}$$

¼vFkok½

$$\beta = \frac{\lambda D}{d}$$

$d = 1$ feEkh- $= \frac{1}{1000} = 10^{-3}$ EkhVj

$D = 1$ ehVj

$\lambda = 500$ uukehVj $= 50\times10^{-9}$ EkhVj

$$\beta = \frac{500\times10^{-9}\times1}{10^{-3}}$$

$$\beta = 5\times10^{-4} \text{ EkhVj}$$

mRRkj 14- LkEkk{kh¸k Rkkj Ykkb Uk& LkEkk{kh¸k dOkYk Ek ,d Rkkj gkRkk g Tkk LkEkk{kh¸k [kk[kYk CkYkUkk dkj PkkYkd Lk f?kjk gkRkk gA nkUkk PkkYkdk d CkhPk Ikjk Ok|Rk IknkFk TkLk V¶YkkUk IkkYkhfFkYkhUk vkfn Hkjk gkRkk g fTkLkEk vkRkfjd PkkYkd Ckkâ¸k [kk[kYk CkYkUkk dkj PkkYkd d vnj dæ Ikj CkUkk gkRkk gA Ikjk0k|Rk IknkFk dh IkÑfRk IkLkkfjRk gkUk 0kkYkh vk0kfÙk vkj 'kfDRk Ikj fUkHkj djRkk gA

YkkHk

1- Ckn vk0kj.k gkUk d dkj.k RkkCk d Rkkj Lk f0kfdj.k }kjk mTkk ¸kk 'kfDRk dk {k¸k Ukgh gk IkkRkkA

2- bLkd }kjk U¸kUkRkEk 'kfDRk d {k¸k d LkkFk mPPk vk0kfÙk¸kk dk IkLkkfjRk fd¸kk Tkk Lkd Rkk gA D¸kkfd bLkEk f0k|Rk PkECkdh¸k RkjXk gh vf/kdk'k ÅTkk ¸kk 'kfDRk dk 0kkgd gkRkh gA

LkhEkk, &

1- Ikjk0k|Rk âkkLk gkRkk gA

2- LkEkk{kh¸k dOkYk d }kjk ,d fUkf'PkRk vk0kfÙk Lk dEk vk0kfÙk d fLkXUkYkk dk gh IkHkk0kh <Xk Lk IkLkkfjRk fd¸kk Tkk Lkd Rkk gA

¼vFk0kk½

Ikdkf'kRk RkRk] Ik.k vkRkfjd Ikjk0kRkUk Ikj vk/kkfjRk ,d ,Lkh ¸kfDRk g fTkLkdh

Lkgk¸kRkk Lk Ikdk'k fLkXUkYk dk mLkh RkhOkRkk d LkkFk V<&Ek< EkkXk Lk vYIk njh ¸kk YkCkh njh Rkd Yk Tkk¸kk Tkk Lkdkk gA

dk¸kf0kf/k & TkCk Ikdk'k RkRk d ,d fLkj Ikj NkVk dk.k Ikj vkIkfRkRk gkRkk g Rkk 0kg RkRk d vnj XkTkjUk YkXkRkk gA bLkdk RkRk vkj DYkfMXk d vURkjk n"V Lk Ckkj&Ckkj Ik.k vkRkfjd Ikjk0kRkUk gkRkk g D¸kkfd vkIkRkUk dk.k dk EkkUk DYkfMXk d LkkIk{k RkRk d ØkfRkd dk.k Lk vf/kd gkRkk gA bLk Ikdkj db Ckkj Ik.k vkRkfjd Ikjk0kRkUk d Ik'PkkRk Ikdk'k vRk Ek nLkj fLkj Lk bRkUkh gh RkhOkRkk d LkkFk Ckkgj fUkdYk TkkRkk gA

mIk¸kkXk&

1- Ikdk'kh¸k fLkXkUYkk d Ik"k.k d fYk,

2- fPkfdRLkk mí'¸k d fYk, A

mRRkj 15- nkYkUk PkECkdROk EkkIkh

fLk)kRk Lk«k &

f0k'k"kRkk,& TkMROk vk?k.k KkRk djUk dh vk0k'¸kdRkk UkghA

nk"k & LkEkkUk PkECkdh¸k vk?k.k 0kkYk PkECkdk dk PkECkdh¸k vk?k.k Ukgh KkRk fd¸kk Tkk Lkdkk gA bUkd fYk, nkYkUk dkYk d djhCk gkXkk A

LkkOk/kkfUk¸kk&

1- Ik¸kkXk d vRk mIkdj.k Ukgh fgYkkUkk Pkkfg,A

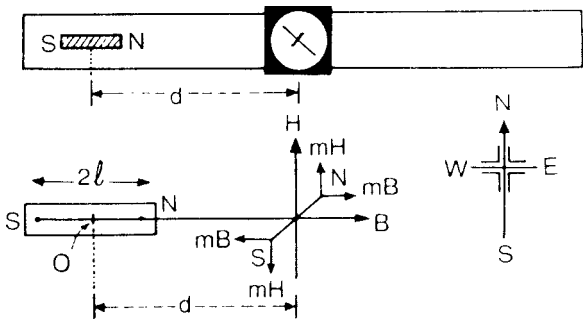
2- mIkdj.k d djhCk vU¸k PkECkdh¸k {k«k Ukgh gkUkk Pkkfg, A

¼vFk0kk½

f0k{kIk PkECkdROk EkkIkh &

LkEkTkUk dk Rkjhdk & Lk0kIkFkEk f0k{kIk PkECkdROk EkkIkh dh HkTkkvk dk Ik0k Ikf'PkEk fn'kk Ek LkHkfTkRk djRk gA nLkj d fYk, f0k{kIk PkECkdROk EkkIkh d Lkdkd d LkEkkU«k nLkj HkTkkvk dk LkHkfTkRk djRk gA

fPk«k &



l = & $\frac{M_1}{M_2} = \frac{(d^2 - l_1^2)^2}{(d^2 - l_2^2)^2} \frac{\tan\theta_1}{\tan\theta_1}$

$l_1 = l_2 = l$

$\frac{M_1}{M_2} = \frac{\tan\theta_1}{\tan\theta_2}$

Lkk0k/kkfUk¸kk&

1- f0k{kIk PkECkdR0kEkkIkh dk LkHkfTkRk djUk d Ckkn Ik¸kkXk d vRk Rkd Ukgh fgYkkUkk Pkkfg, A

2- Ikk¸kkfXkd PkECkd d vYkk0kk vU¸k PkECkd ¸kk PkECkdh¸k IknkFk Uk gkA

mRRkj 16 ,d LkEkkUk vk0kf'kRk XkkYkh¸k d0kPk d dkj.k f0k{kIk {k««k dh Rkh0kRkk & XkkYkh¸k d0kPk d Ckkgj & EkkUkk fd R f«kT¸kk dk ,d LkEkkUk vk0kf'kRk XkkYkh¸k d0kPk g fTkLk +Q vk0k'k fn¸kk Xk¸kk gA

nLkj dæ O Lk *r* njh Ikj ,d fCkn P g Tkgk Rkh0kRkk dh Xk.kUkk djUkh g bLkd fYk, *r* f«kT¸kk dk XkkMLkh¸k Ik"B XkkYk dh jPkUkk djRk gA

bLk XkkmLkh¸k Ik"B XkTkjUk 0kkYkk f0k|Rk ¶YkDLk&

$\phi_\in = E.\ 4\pi r^2 \cos\theta$

$\phi_\in = E.\ 4\pi r^2$ .....(1) XkkmLk IkEk¸k l

bLkh XkkmLkh¸k Ik"B Lk XkTkjUk 0kkYkk f0k|Rk ¶YkDLk $\phi_\in = \frac{q}{\in_0}$ .....(ii)

$E.\ 4\pi r^2 = \frac{q}{\in_0}$

$E = \frac{1}{4\pi \in_0} \frac{q}{r^2}$

2- XkkYkh¸k d0kPk d vnj Rkh0kRkk

$\because\ q = 0$

$E = 0$

3- XkkYkh¸k dOkPk d Ik"B Ikj

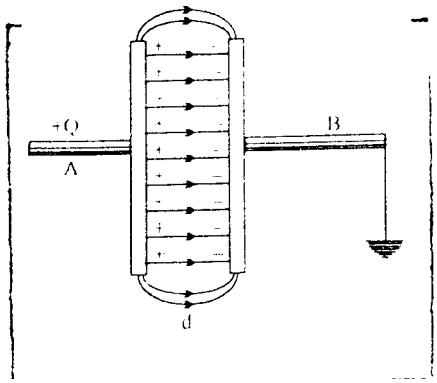
$\because \; r = R$

$$E = \frac{1}{4\pi \in_0} \frac{q}{R^2}$$

¼vFkOkk½

lekrj iV~ I;/kkfj= dh /kkfjrk&

fPk«k &



jPkUkk & bLkEk LkEkkUk {k«kQYk d nk vk¸kRkk dkj ¸kk OkRRkk dkj IYkV gkRkh g Tkk fd ,d nLkj d LkEkkURkj gkRk gA nLkj dk LkCk/k IkF0kh Lk gkRkk gA Ikjk0k|Rk dk Ekk/¸kEk Hkjk gkRkk gA

dk¸kf0kf/k& IkFkEk IYkV dk +Q vk0k'k nUk Ikj nLkj IYkV d vRk% LkRkg –Q RkFkk Ckkâ¸k LkRkg Ikj +Q vk0k'k mRIkUUk gkRkk gA bLkd IYkV dk LkECk) IkF0kh Lk gkUk d dkj.k Ckkg¸k LkRkg +Q vk0k'k IkF0khÑRk gk TkkRkk gA

Lk«k dh 0¸kRIkfÙk&

EkkUkk fd IkR¸kd IkR¸kd IYkV dk {k«kQYk ¾ A

Ik"Bh¸k vk0k'k ?kUkR0k $\sigma = \frac{Q}{A}$

nkUkk IYkVk d CkhPk d njh = d

nkUkk IYkVk d Ek/¸k f0k|Rk {k«k dh Rkh0kRkk = $E = \frac{\sigma}{K \in_0}$

nkUkk IYkVk d Ek/¸k f0kHkk0kkURkj ¾ nLkj IYkV Lk IkFkEk IYkV Rkd ,dk, /kUkk'k dk YkkUk Ek dk¸k

$V = E \times d$

$$E = \frac{Qd}{K \in_0 A}$$

Lk-Ikê Lk?kfj«k dh /kkfjRkk $C = \frac{Q}{V}$

$$C = \frac{Q}{V} = \frac{Q}{Qd / K \in_0 A}$$

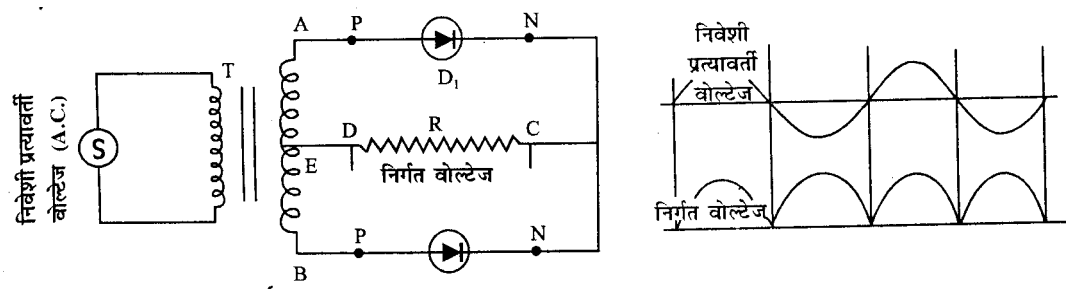
$$= \frac{K \in_0 A}{d}$$

$$C = \frac{K \in_0 A}{d}$$

$$C = \frac{K \in_0 A}{d}$$

fUkHkjRkk (i) $C \propto A$ (ii) $C \propto \frac{1}{d}$ (iii) $C \propto K$

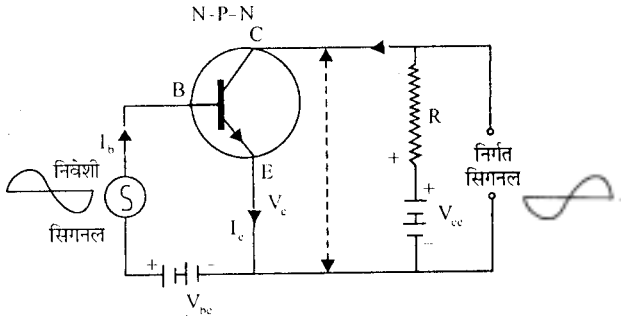
mRRkj 17- fo|r ifjiFk dk ukekfdr fp=&



dk,kf0kf/k &EkkUkk fd IkR,kk0kRkh /kkjk d IkFkEk v)PkØ Ek fLkjk /kUkkREkd RkFkk B fLkjk _.kkREkd bLk fLFkfRk E fLkjk A d RkYkUkk Ek _.kkREkd RkFkk B d RkYkUkk Ek /kUkkREkd gkXkk fTkLkd dkj.k Mk,kkM D_1 vXk vfHkUkfRk Ek RkFkk D_2 Ik'p vfHkUkfRk Ek gkXkk A vRkh IkFkEk Mk,kkM Lk /kkjk C Lk D dh vkj Ckg XkhA IkR,kk0kRkh /kkjk d f}Rkh,k v)PkØ Ek A fLkjk _.kkREkd RkFkk B fLkjk /kUkkREkd gkUk Ikj E fLkjk A d LkkIk{k /kUkkREkd RkFkk B d LkkIk{k _.kkREkd gkXkk A fTkLkd dkj.k Mk,kkM D_1 Ik'Pk vfHkUkfRk Ek RkFkk D_2 vXk vfHkUkfRk Ek gkXkk A fTkLkLk /kkjk C Lk D dh vkj Ck<Xkh

¼vFk0kk½

NPN VkfTkLVj dk Ik0k)d d :Ik Ek vUkIk¸kkXk Ikfj Ikfk dk fPk«k



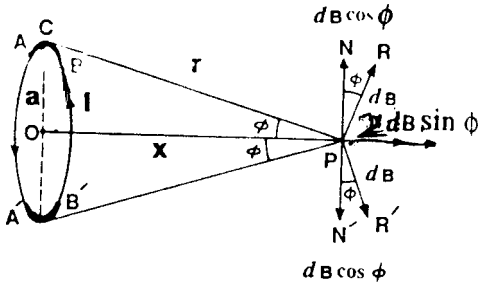
dk¸k f0kf/k & Vc = Vce – IcR

fUk0k'kh fLkXkUkYk d /kUkkREkd v)PkØ Ek vk/kkj mRLkUkd d LkkIk{k vf/kd /kUkkREkd gk TkkRkk gA fTkLkLk Ic /kkjk Ck< TkkRkh g fTkLkd dkj.k Vc dEk /kUkkREkd gk TkkRkk gA fTkLkd fUkXkRk fLkXkUkYk _.kkREkd IkkIRk gkRkk gA

fUk0k'kh fLkXkUkYk d _.kkREkd v)PkØ Ek vk/kkj mRLkTkd d LkkIk{k dEk /kUkkREkd gk Tkk¸kXkk fTkLkd dkj.k Ic EkkUk dEk gk Tkk¸kXkk fTkLkd QYkL0k :Ik Vc T¸kknk /kUkkREkd gkXkk vRkh fUkXkRk fLkXkUkYk /kUkkREkd gk Tkk¸kXkk A

mRRkj 18- **/kkjkokgh oRrkdkj d.Myh&**

fPk«k



EkkUkk fd *a* f«kT¸kk dk ,d /kkjk0kkgh Ikfj UkfYkdk fTkLkEk I /kkjk fPk«kkUkLkkj Ckg jgh g

dMYkh dkXkTk d RkYk Ikj YkCk0kRk bLk Ikdkj j[kk g fd d.MYkh dk v{k dkXkTk d RkR0k Ikj fLFkRk gkA

dMYkh d dæ O Lk *x* njh Ikj ,d fCkn P g Tkgk PkECkdhLk {k«k dh Rkh0kRkk KkRk djUkh gA

bLkd fYk, dMYkh d Åkj *dl* YkCk0kRk dk ,d AB YkRk g A vYIkk'k RkFkk p dh njh *r* g

Ckk,kk lkoV d fUk,kEk l

$$dB = \frac{\mu_0}{4\pi}\frac{I.dl.\sin\theta}{r^2}$$

nLkjh fn'kk CP d YkCkOkRk mlkj dh vkj 0kØ dk nk LkEkdkf.kd ?kVdk Ek f0k,kkfTkRk djUk lkj &&&&&

dB $\sin\phi$ OP d YkCkOkRk mlkj dh vkj

dB $\cos\phi$ OP d vUkfn'kA

AB d LkEEk[k AB d Ckj kCkj ,d vU,k vYlkk'k YkRk g A bLk vYlkk'k d dkj.k Hkh RkhOkRkk dB gkXkhA lkjRk bLkdh fn'kk DP d YkCkOkRk UkhPk dh vkj gkXkhA bLk nk LkEkdkf.kd ?kVdk Ek f0k,kkfTkRk dj

dB $\cos\phi$ OP d YkCkOkRk UkhPk dh vkj

dB $\sin\phi$ OP d vUkfn'k

m/Okk/kj ?kVd lkfj.kkEk Ek Ckj kCkj 0k f0klkfjRk g fTkLkd dkj.k ,d nLkj d lkHkkOk dk fUkjLRk dj nRk gA

lkj dMYkh d dkj.k p RkhOkRkk

$$dB = \sum dB\sin\phi$$

$$dB = \sum \frac{\mu_0}{4\pi}\frac{Idl}{r^2}\cdot\frac{a}{r}$$

$$dB = \frac{\mu_0}{4\pi}\frac{Ia}{r^3}\sum dl$$

$$dB = \frac{\mu_0}{4\pi}\frac{Ia2\pi a}{r^3} \qquad \left[\because \sum dl = 2\pi a\right]$$

n Qj d fYk, $B = \frac{\mu_0}{4\pi}\frac{nIa^2 2\pi}{r^3}$

Δ OBP e $r^2 = a^2 + x^2$

$$r^3 = \left(a^2 + x^2\right)^{3/2}$$

v{k lkj $B = \frac{\mu_0}{4\pi}\frac{n2\pi Ia^2}{\left(a^2 + x^2\right)^{3/2}}$

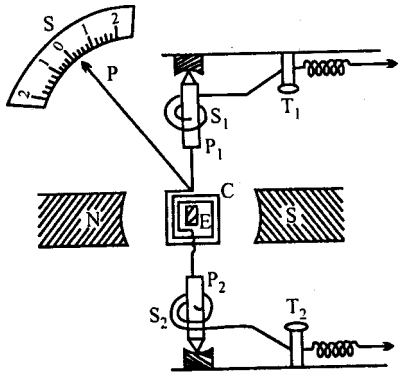
dæ lkj $x = 0$

$$B = \frac{\mu_0}{4\pi}\frac{2\pi nI}{a}$$

¼vFkOkk½

dhyfdr d|.My /kkjkeki h &

ukekfdr j[kfp=&



/kkjk α f0k{kIk

fLk)kRk & PkECkd d Ek/;k dMYkh Ek /kkjk Ik0kkfgRk djUk Ikj dMYkh Ek CkYk ;kXEk vk?k.k mRIkUUk gk TkkRkk gA dhYkd Ek YkXk fLIkXk d }kjk ,BUk CkYk ;kXEk vk?k.k mRIkUUk gkRkk A LkURkYkUk dh fLFkfRk Ek nkUkk Ckjk Ck j ,Ok f0kIkfjRk gk TkkRk gA EkkUkk fd dMYkh d RkYk dk {k««kQYk $= A$

Qjk dh Lk[;kk $= n$

PkECkdh;k {k««k dh Rkh0kRkk $= B$

I /kkjk Ik0kkfgRk djUk Ikj mRIkUUk CkYk ;kXEk vk?k.k $\tau_1 = nIAB$

PkECkdh;k {k««kQYk RkYk d vfHkYkCk d YkCk0kRk gkRkk gA

,d fMXkh d fYk, ,BUk CkYk ;kXEk vk?k.k x gk Rkk f0k{kIk θ d gkUk Ikj ,BUk CkYk;kXEk vk?k.k $= c\theta$

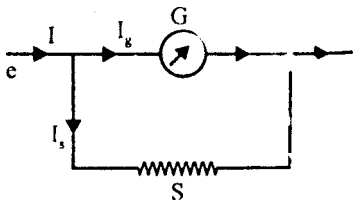
LkRkYkUk dh fLFkfRk Ek

$$nIAB = c\theta$$

$$I = \frac{c\theta}{nAB} \qquad \left[\because \frac{c\theta}{nAB} = \text{fu; rkd}\right]$$

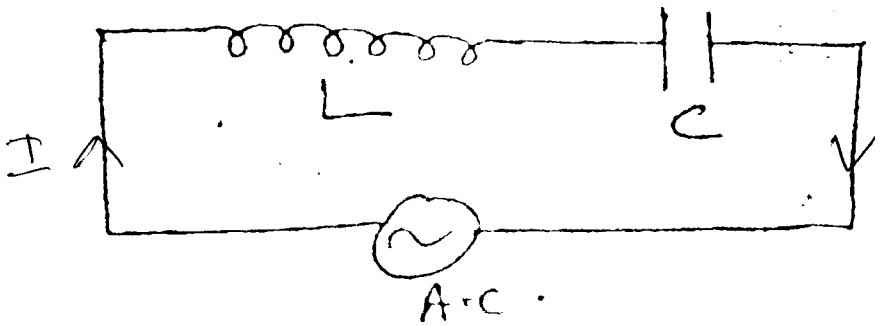
$$I \propto \theta$$

vEkhVj Ek /kkjkEkkIkh dk CknYkUkk & vEkhVj CknYkUk d fYk, dEk vkEk dk IkfRkjk/k dk /kkjkEkkIkh d LkEkkURkj YkXkkRk gA



OkkYVEkhVj Ek CknYkUkk &mPPk IkfRkjk/k dk /kkjkEkkIkh d LkkFk J.kh ØEk Ek TkkMdj CkUkk,kk TkkRkk gA

mÙkj 19- ekuk L Ikjdrok dh dMYkh RkFkk C /kkfjrkk dk l/kkfj«k IkR,kkOkRkh OkkYkVTk d LkkFk J.kh ØEk Ek TkkMk gk Rkk fdLkh {k.k IkR,kkOkRkh fOk-Okk- CkYk LkEkhdj.k gkXkkA



$$V = V_o \sin \omega t \qquad \text{.....(i)}$$

Ø,kfn fdLkh {k.k Ikfjkk Ek CkgUk OkkYkh /kkjk I gk Rkk Ikjdrok d fLkjk dk fOkHkOkkURkj

$$V_L = I.X_L \qquad \text{.....(ii)}$$

RkFkk l/kkfj«k d fLkjk dk fOkHkOkkRkj

$$V_C = I.X_C \qquad \text{.....(iii)}$$

V_L vkj V_c dk Ikfj.kkEkh fOkHkOkkRkj V gk Rkk

$$V = V_L - V_c$$

vRkh% $V = I.x_L - I.x_c$

;k $V = I\,(x_L - x_c)$

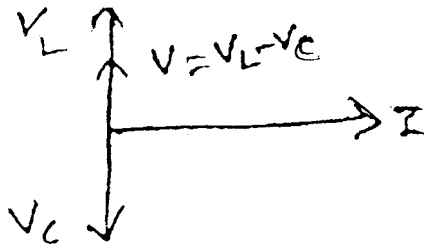
;k $V/I = x_L - x_c$

vkEk d fUk,kEk Lk $(x_L - x_c)$ Ikfjkk vIkHkkOkh IkfRkjk/k

vFkkRk Ikfjkk dh IkfRkCkk/kk Z gkXkk

vRk% $Z = x_L - x_c$ .....(iv)

;k IkfRkCkk/kk $Z = \omega L - \frac{1}{\omega C}$



vkLkRk 0,k,k 'kfDRk&

$$P_{av} = V_{rms}\, I_{rms} \cos\phi$$

LC ifjiFk gr $\phi = 90^\circ$

$$P_{av} = V_{rms}\, I_{rms} \cos 90^\circ$$

$$P_{av} = 0$$

vUk0kknh vk0kfÙk & vUkUkkn dh fLFkfRk Ek $x_L = x_c$

$$\omega L = \frac{1}{\omega C}$$

$$\omega^2 = \frac{1}{LC}$$

$$\omega = \frac{1}{\sqrt{LC}}$$

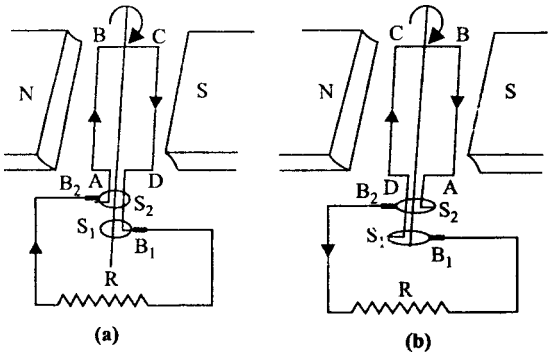
$$\therefore 2\pi\upsilon = \frac{1}{\sqrt{LC}} \qquad [\because \omega = 2p\nu]$$

$$\therefore \upsilon = \frac{1}{2\pi\sqrt{LC}}$$

,kgh vUkUkknh vk0kfÙk gA

¼vFk0kk½

Mk,kUkEkk& Mk,kUkEkk ,d ,Lkh ,kfDRk g] Tkk ,kkf«kd ÅTkk dk f0k|Rk ÅTkk Ek Ikfj0kfRkRk djRkh g mLk Mk,kUkEkk dgRk gA



S_1S_2 = lfiy oy; NS = pcdh; {k=

ABCD = vkepj C = ØkM

B_1B_2 = c'k ¼dkcu½ R = ckáifrjk/k

dk¸kf0kf/k & TkCk vkEkPkj ABCD dk /k0k [kM NS d Ek/¸k nf{k.kk0kRkh fn'kk Ek ?kEkk¸kk TkkRkk g Rkk dMYkh Lk Ck) PkECkdh¸k ¶YkLd Ek Ikfj0kfRkRk gkRkk gA vRkh dMYkh Ek Ikfj Rk /kkjk mRIkUUk gk TkkRkh gA IkFkEk v)Pk Ø Ek /kkjk dh fn'kk ABCD gkRkh gA vRkh Ckkâ¸k IkfRkjk/k R e f0k|Rk /kkjk Ck'k B_1Lk B_2 dh vkj Ik0kkfgRk gkRkh gA f}Rkh¸k v)Pk Ø Ek dMYkh Ek /kkjk dh fn'kk DCBA gkRkh g vRkh Ckká IkfRkjk/k R Ek f0k|Rk /kkjk Ck'k B_2 Lk B_1 dh vkj Ik0kkfgRk gkRkh gA TkCk dMYkh dk RkYk 0kØ j[kkvk d YkCk0kRk gkRkk g Rkk Ikfj Rk /kkjk dk EkkUk 'kU¸k vkj TkCk mLkdk 0kØ j[kkvk d LkEkkURkj gkRkk g Rkk Ikfj Rk /kkjk dk EkkUk vf/kdRkEk gkRkk gA bLk Ikdkj Ckkâ¸k IkfRkjk/k R Ek Ckgk 0kkYkh /kkjk dk EkkUk IkFkEk v)Pk Ø Ek 'kU¸k Lk Ck<dj vf/kdRkEk RkFkk IkUkh 'kU¸k gk TkkRkk gA RkRIk'PkkRk /kkjk dh fn'kk CknYk TkkRkh gA RkFkk f}Rkh¸k v)Pk Ø Ek bLkdk EkkUk 'kU¸k Lk Ck<dj vf/kdRkEk ,0k fQj 'kU¸k gk TkkRkk gA LIk"V g fd Ckkâ¸k IkfRkjk/k R Ek Ckgk 0kkYkh /kkjk IkR¸kk0kRkh /kkjk gkRkh gA fTkLkdh vk0kfÙk vkEkPkj dh vk0kfÙk d Ckjk Ckj gkRkh gA

mIk¸kkXk& fCkTkYkh d mRIkknUk

¸kfn dkb Nk«k Mk¸kUkEkk dk 0k.kUk dj mLk Ikj Hkh Ikjk vd fn¸kk Tkk¸kA