FBD-12-1-23

Roll No. : _____

Objective
Paper Code
8475

Intermediate Part Second - 136
PHYSICS (Objective) **GROUP - I**
Time: 20 Minutes   Marks: 17

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Q.No.1 You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.acf

S.#	Questions	A	B	C	D
1	If $V = 630\cos(100\pi t + 60°)V$; the frequency of rotation of generator coil is:	100Hz	314Hz	50Hz	200Hz
2	Unit of self induction is not equivalent to:	VsA^{-1}	WbA^{-1}	JA^{-2}	$Vs^{-1}A$
3	When flux through a coil remains unchanged, induced emf is:	Positive	Negative	Zero	Infinite
4	In a galvanometer, radial magnetic field ensures that iron cylinder and field lines are always:	Parallel	Perpendicular	Anti-parallel	Oblique
5	Magnetic field due to a long conductor carrying current I at distance r is proportional to:	$\frac{r}{I}$	$\frac{I}{r}$	$\frac{I}{r^2}$	$\frac{I^2}{r}$
6	Which is a unipolar medium?	Extrinsic semi-conductor	Ionized gases	Electrolyte	Metals
7	When plates of an isolated charged capacitor are moved apart, energy stored:	Increases	Decreases	Remains same	Reduces to zero
8	If a +ve point charge q is moved away from a point, the absolute potential at that point:	Increases	Remains same	Decreases	Becomes infinite
9	The ratio of decayed fraction to undecayed fraction after 3 half-lives is:	$\frac{1}{8}$	$\frac{7}{8}$	$\frac{7}{1}$	$\frac{1}{1}$
10	One twelfth of mass of $_6C^{12}$ isotope is equal to:	0.0055u	1u	1.008665u	3.016u
11	The energy of _____ electrons is specific.	Free	Orbital	Oscillating	Accelerated
12	Positron was first discovered in _____.	Cosmic rays	Magnetosphere	Gamma ray bursts	Earth's crust
13	A black body is a perfect absorber and _____.	Reflector	Radiator	Anti-reflector	Transmitter
14	Due to high open loop gain, a small potential difference at input _____ output voltage of operational amplifier.	Diminishes	Fluctuates	Saturates	Oscillates
15	Pulsating DC generated by rectifier can be made smooth by using:	Generator	Motor	Filter	Transistor
16	A moving hole is equivalent to a moving:	Proton	Positive ion	Positron	Electron
17	In a series RC circuit; if $R = \frac{1}{\omega c}$, the power factor is:	$\frac{\sqrt{3}}{2}$	1	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$

1209-XII112336-38000

Intermediate Part Second   Roll No. ____

PHYSICS   (Subjective)   **GROUP - I**

FBD -12-1-23   Time: 02:40 Hours   Marks: 68

SECTION – I

2. Write short answers to any EIGHT parts.   16

  (i)   How can you identify that which plate of a capacitor is positively charged?
  (ii) Electric lines of forces never cross. Why?
  (iii) Do electrons tend to go to region of high potential or low potential?
  (iv) If the absolute potential at a point is zero, what can you say about the electric intensity there?
  (v)   Why is B non-zero outside a solenoid?
  (vi) Two charged particles are projected into a region where there is a magnetic field perpendicular to their velocities, if the charges are deflected in opposite directions. What can you say about them?
  (vii) Why the resistance of an ammeter should be very low?
  (viii) Can a charged particle move through a magnetic field without deflecting? Explain.
  (ix) Why are heavy nuclei unstable?
  (x)   What factors make a fusion reaction difficult to achieve?
  (xi) After 2 half-lives, what percentage of radioactive sample remains?
  (xii) Write any two uses of nuclear reactor.

3. Write short answers to any EIGHT parts.   16

  (i)   What are difficulties in testing whether the filament of a lighted bulb obeys Ohm's law?
  (ii) Is the filament resistance lower or higher in a 500W, 220V light bulb than in a 100W, 220V bulb?
  (iii) How many times per second will an incandescent lamp reach maximum brilliance when connected to 50Hz source?
  (iv) How the reception of a particular radio station is selected on your radio set?
  (v)   What is diamagnetic substance? Give example.
  (vi) What are polymeric solids? Give example.
  (vii) What is net charge on a n-type or a p-type substance?
  (viii) Why charge carriers are not present in the depletion region?
  (ix) What is thermistor? Give two examples.
  (x)   What advantage of three phase A.C supply over single phase A.C?
  (xi) What is difference between elasticity and plasticity?
  (xii) Express by diagram how current flows in n-p-n transistor?

4. Write short answers to any SIX parts.   12

  (i)   Does the induced current depend on the resistance of the circuit?
  (ii) Show that ε and $\frac{\Delta\phi}{\Delta t}$ have the same units.
  (iii) Can a D.C motor be turned into a D.C generator? What changes are required to be done?
  (iv) Can pair production take place in vacuum? Explain.
  (v)   Which has lower energy quanta? Radio waves or x-rays.
  (vi) What is the rest mass of photon? What you can say about its momentum?
  (vii) Why can red light be used in a photographic dark room when developing film, but a blue or white light cannot?
  (viii) What are advantages of lasers over ordinary light?
  (ix) What is meant by cat-scanner?

| SECTION – II   Attempt any THREE questions. Each question carries 08 marks. |

5. (a) Define resistivity and describe its dependence upon temperature.   05
   (b) Two point charges $q_1 = -1.0 \times 10^{-6}$ C and $q_2 = +4.0 \times 10^{-6}$ C are separated by a distance of 3.0m.
   Find and justify the zero field location.   03

6. (a) State Ampere's law and derive relation for magnetic field due to current carrying solenoid.   05
   (b) A square coil of side 16cm has 200 turns and rotates in a uniform magnetic field of magnitude 0.05T. If the peak emf is 12V, what is the angular velocity of the coil?   03

7. (a) How can a transistor be used as an amplifier?   05
    (b) Find the value of current flowing through a capacitance 0.5μF when connected to a source of 150V   03
    at 50Hz.

8. (a) Does particle possess wave like properties? Describe experiment giving evidence of the wave nature   05
    of electron.
    (b) A 1.0m long copper wire is subjected to stretching force and its length increases by 20cm. Calculate   03
    the tensile strain and the percent elongation which the wire undergoes.

9. (a) Describe mass spectrograph and how it can be used for the detection of isotopes?   05
    (b) Find the wavelength of spectral line corresponding to the transition in hydrogen from n = 6 state to   03
    n = 3 state.

FBD - 12 - 2 - 23

Roll No. : _____

Objective
Paper Code
8476

Intermediate Part Second - 136
PHYSICS (Objective) **GROUP - II**
Time: 20 Minutes   Marks: 17

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Q.No.1
You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.acf

S.#	Questions	A	B	C	D
1	The reactance of an inductor at 50Hz is 10Ω its reactance at 100Hz becomes:	20Ω	5Ω	2.5Ω	3Ω
2	The winding of the electromagnetic in motor are usually called:	Magnetic coils	Field coils	Electric coils	All of these
3	Transformer is a device which step up or step down the input:	Current	Voltage	Energy	Power
4	The unit of $\vec{E}$ is NC^{-1} and that of $\vec{B}$ is $NA^{-1}m^{-1}$ then the unit of $\frac{E}{B}$ is:	ms^{-2}	$m^{-1}s^{-1}$	ms	ms^{-1}
5	The value of high resistance which can be used to convert galvanometer in voltmeter:	$R_h = \frac{I_g}{V} - R_g$	$R_h = R_g - \frac{V}{I_g}$	$R_h = \frac{V}{I_g} - R_g$	None
6	Energy consumed by 60 watts bulb in 2 minutes is equal to:	720 Joule	7.2 kilo Joule	120 Joule	7600 Joule
7	Unit of relative permittivity is:	No unit	NC^2m^{-2}	Nm^2C^{-2}	$N^{-1}C^{-2}m^{-2}$
8	Force experienced per unit positive test charge at a point in an electric field is:	Electric potential	Electric potential energy	Electric field strength	Electric field
9	The dead time for Geiger-Muller counter is:	10^{-4} s	10 s	10^{-2} s	10^{-3} s
10	Cobalt-60 is the source for:	α-rays	γ-rays	β-rays	Neutron
11	Helium-Neon laser discharge tube contains Helium:	10%	15%	25%	85%
12	Using relativistic effects, the location of an air craft after an hour flight can be predicted about:	20m	760m	50m	780m
13	Mathematical form of Stephen-Boltzmann law is:	$E = \sigma T^2$	$E = \sigma T^3$	$E = \sigma T^4$	$E = \sigma T^6$
14	In photo voltaic cell current is directly proportional to:	Wavelength of light	Energy	Frequency of light	Intensity of light
15	A diode can be used as:	Amplifier	Rectifier	Oscillator	Transistor
16	When silicon crystal doped with a pentavalent impurity, the doped semi-conductor is:	n-type	p-type	Both A & B	None of these
17	Ohm is not a unit for:	Reactance	Resistance	Inductance	Impedance

1210-XII112336-15000

1210-XII123

FBD-12-2-23

Intermediate Part Second

Roll No. _____

PHYSICS   (Subjective)   **GROUP - II**

Time: 02:40 Hours   Marks: 68

SECTION – I

2. Write short answers to any EIGHT parts.   16

(i) If a point charge 'q' of mass 'm' is released in a non-uniform electric field with field lines pointing in the same direction, will it make a rectilinear motion?

(ii) Is it true that Gauss's law states that the total number of lines of forces crossing any closed surface in the outward direction is proportional to the net positive charge enclosed with in surface?

(iii) Define Gauss's law for n-point charges.

(iv) What is effect of relative permittivity of different dielectrics on electric force?

(v) How can you use a magnetic field to separate isotopes of chemical element?

(vi) What should be the orientation of a current carrying coil in a magnetic field so that torque acting upon the coil is (a) maximum   (b) minimum?

(vii) How radial magnetic field is produced in a galvanometer?

(viii) Find the radius of orbit of an electron moving at a rate of 2×10^7 ms^{-1} in a uniform magnetic field of 1.20×10^{-3} T.

(ix) What information is revealed by the length and shape of the tracks of an incident particle in Wilson cloud chamber?

(x) What do we mean by the term 'critical mass'?

(xi) What is meant by nuclear fission reaction? Give its uses.

(xii) What are types of nuclear reactors?

3. Write short answers to any EIGHT parts.   16

(i) What are sources of current?

(ii) State Kirchhoff's rules.

(iii) Is the filament resistance lower or higher in a 500W, 220V light bulb than in a 100W, 220V bulb?

(iv) What is meant by phase lag and phase lead?

(v) Name the device that will (a) permit flow of direct current but oppose the flow of alternating current (b) permit flow of alternating current but not the direct current.

(vi) How many times per second will an incandescent lamp reach maximum brilliance when connected to a 50Hz source?

(vii) Write any two properties of semi-conductors.

(viii) Differentiate between retentivity and coercivity.

(ix) Write a brief note on superconductors.

(x) What are applications of photodiode?

(xi) What is meant by closed loop gain and open loop gain of an operational amplifier?

(xii) Why a photodiode is operated in reverse biased state?

4. Write short answers to any SIX parts.   12

(i) What is step up and step down transformer?

(ii) Why is the transformer used to transmit the A.C current over long distance?

(iii) A square loop of wire is moving through a uniform magnetic field. The normal to the loop is oriented parallel to the magnetic field. Is a emf induced in loop? Give a reason for your answer.

(iv) Will higher frequency light eject more electrons from a metal surface than low frequency light?

(v) If an electron and a proton have the same de-Broglie wavelength, which particle has greater speed?

(vi) What is dual wave-particle nature?

(vii) What is Compton shift? At what angle, Compton shift will be maximum?

(viii) What is meant by quantized radii of hydrogen atom?

(ix) Is energy conserved when an atom emits a photon of light?

| SECTION – II   Attempt any THREE questions. Each question carries 08 marks. |

5. (a) State Gauss's law and apply it to find electric field intensity due to an infinite sheet of charge by pointing out the importance of Gaussian surface.   05

(b) How many electrons pass through an electric bulb in one minute if the 300mA current is passing through it?   03

6. (a) Determine e/m ratio of electron in terms of B and V (accelerating voltage).   05
   (b) A D.C. motor operates at 240V and has a resistance of 0.5Ω. When the motor is running at normal speed, the armature current is 15A. Find the back emf in the armature.   03

7. (a) How capacitor behave in A.C circuit? Write expression for capacitive reactance.   05
   (b) Calculate the gain of non-inverting amplifier shown in figure given below: 03
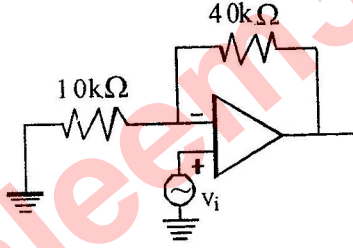
8. (a) Explain energy band theory of solids. How does it help to distinguish between conductor, insulator and semi-conductor.   05
   (b) What is the energy of photon in a beam of infrared radiation of wavelength 1240nm?   03

9. (a) What is radioactivity and explain nuclear transmutation?   05
   (b) What are the energies in eV of quanta of wavelength $\lambda = 400nm$, 500nm and 700nm?   03

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