Physics (New Scheme)   (INTER: PART - II - CLASS 12th)(III)   Time : 20 Minutes
Paper : II   Marks : 17

Objective   Code : 8475

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct fill that circle in front of that question number with marker or pen. Cutting or filling two or more circles will result in zero mark in that question.

1. 1. Frequency range in FM is:

   (A) 540 KHz to 1600 KHz   (B) 1000 KHz to 1600 KHz   (C) 540 MHz to 1600 MHz   (D) 88 MHz to 108 MHz

2. Yttrium barium copper oxide ($YBa_2Cu_3O_7$) is superconductor at temperature:

   (A) 163 K   (B) 77 K   (C) 4.2 K   (D) 125 K

3. If $R_1 = 10k\Omega$ and $R_2 = 100k\Omega$, then gain of inverting amplifier is :

   (A) -11   (B) -10   (C) 10   (D) 11

4. A p-n junction cannot be used as:

   (A) amplifier   (B) rectifier   (C) diode   (D) LED

5. The angle of scattering for which the Compton shift is maximum is :

   (A) 180°   (B) 90°   (C) 45°   (D) 0°

6. If temperature is doubled for a black body, then energy radiated per second per unit area becomes:

   (A) $\frac{1}{2}$ times   (B) $\frac{1}{4}$ times   (C) $\frac{1}{16}$ times   (D) 16 times

7. In spectrum of hydrogen, bracket series lies in :

   (A) ultraviolet region   (B) visible region   (C) infrared region   (D) X-rays region

8. Half life of radium-226 is:

   (A) 1620 years   (B) 3.8 days   (C) 2.5 days   (D) 23.5 minutes

9. Binding energy per nucleus is maximum for:

   (A) Helium   (B) Iron   (C) Radium   (D) Polonium

10. The number of electrons in one coulomb charge are equal to:

   (A) 1.6×10^{-19} (B) 6.02×10^{-18} (C) 6.25×10^{20} (D) 6.25×10^{18}

11. What is the force on a proton placed between two parallel plates containing equal positive charges:

   (A) zero   (B) $2.6 \times 10^{-19} N$ (C) $9 \times 10^{-19} N$ (D) $5 \times 10^{-19} N$

12. A resistor of resistance 'R' is cut into two equal parts of resistance R/2, its resistivity becomes:

   (A) half   (B) remains same   (C) double   (D) four times

13. Magnetic field of 0.5 T is parallel to vector area of $1m^2$ of a coil, flux through the coil is :

   (A) zero   (B) 5 web   (C) 0.2 web   (D) 0.5 web

14. The brightness of spot in CRO is controlled by:

   (A) cathode   (B) anode   (C) grid   (D) deflecting plates

15. The principle of an electric generator is based upon:

   (A) Ampere's law   (B) Faraday's law   (C) Coulomb's law   (D) Kirchhoff's law

16. Energy stored in the inductor is in the form of :

   (A) electrical energy   (B) magnetic energy   (C) kinetic energy   (D) chemical energy

17. In a three phase A.C generator, if the phase of first coil is 0°, then the phase of other two coils will be:

   (A) 120° and 120°   (B) 120° and 160°   (C) 120° and 240°   (D) 120° and 360°

Roll No. _____ Annual 2019

Physics (New Scheme) (INTER PART - II – CLASS 12th) Time : 2 . 40 Hours
Paper : II SUBJECTIVE Marks : 68
Note:- Section I is compulsory. Attempt any 3 questions from Section II.

(Section – I)

2. Write short answers to any Eight parts. (8 x 2 = 16)

i. A particle carrying a charge of 2 e falls through a potential difference of 3.0 V. Calculate the energy acquired by it.
ii. Write four properties of electric field lines.
iii. How can you identify that which plate of a capacitor is positively charged?
iv. Do electrons tend to go to region of high potential or of low potential?
v. State Ampere's Law and write its formula.
vi. Define Lorentz force and write its equation.
vii. Why does the picture on a T.V screen become distorted when a magnet is brought near the screen?
viii. Why the resistance of an ammeter should be very low?
ix. State Faraday Law of electromagnetic induction.
x. Define the term Henry.
xi. Does the induced e.m.f always act to decrease the magnetic flux through a circuit?
xii. Show that ε and $\dfrac{\Delta\phi}{\Delta t}$ have the same units.

3. Write short answers to any Eight parts. (8 x 2 = 16)

i. How many electrons pass through an electric bulb in one minute if the 300 mA current is passing through it?
ii. Define drift velocity and also write its value at room temperature.
iii. What are the difficulties in testing whether the filament of a lighted bulb obeys Ohm's Law?
iv. What is the principle of generation of electromagnetic waves?
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. A choke coil placed in series with an electric lamp in an A.C circuit causes the lamp to become dim. Why is it so? A variable capacitor added in series, in this circuit may be adjusted until the lamp glows with normal brilliance. Explain how this is possible.
vii. What do you mean by hysteresis and hysteresis loss?
viii. How would you obtain N-type and P-type material from pure silicon? Illustrate it by schematic diagram.
ix. What do you mean by curie temperature? Write the curie temperature of iron.
x. The anode of a diode is 0.2 v positive with respect to its cathode. Is it forward biased?
xi. Why a photo diode is operated in reverse biased state?
xii. What do you mean by the terms, rectifier and rectification?

4. Write short answers to any Six parts: (6 x 2 = 12)

i. Why don't we observe a Compton effect with visible light?
ii. As a solid is heated and begins to glow. Why does it first appear red?
iii. What is the condition of pair production? Briefly explain.
iv. What are the advantages of lasers over ordinary light:
v. What is meant by CAT – Scanner?
vi. What do we mean by critical mass?
vii. What fraction of a radioactive sample decays after two half – lives have elapsed?
viii. What is the use of nuclear reactor and draw its diagram.
ix. Define decay constant and write its unit.

(Section - II)

Note **Attempt any three (3) questions:** (3 × 8=24)

5. (a What is Wheatstone Bridge? How it is used to determine the unknown resistance? (5)
   (b A particle having a charge of 20 electrons on it falls through a potential difference of 100 volt. Calculate the energy acquired. (3)
6. (a Derive the expression for torque on the current carrying coil in uniform magnetic field. (5)
   (b A square coil of side 16 cm has 200 turns and rotates in uniform magnetic field of magnitude 0.05 T , If the peak e.m.f is 12 v, what is the angular velocity of the coil? (3)
7. (a What is operational amplifier? Derive the relation for the gain of an inverting amplifier. (5)
   (b A 10 mH, 20Ω coil is connected across 240 v and 180/π Hz source. How much power does it dissipate? (3)
8. (a State the special theory of relativity with two postulates and explain any two results. (5)
   (b A steel wire 12 mm in diameter is fastened to a log and is then pulled by tractor. The length of steel wire between the log and tractor is 11m. A force of 10000 N is required to pull the log. Calculate (a) the stress in the wire and (b) the strain in the wire ($E = 200 \times 10^9 Nm^{-2}$) (c) How much does the wire stretch when the log is pulled. (3)
9. (a State postulates of Bohr's model of the hydrogen atom and then show that hydrogen atom has quantized radii. (5)
   (b A sheet of lead 5.0 mm thick reduces the intensity of a beam of γ – rays by a factor 0.4. Find half value thickness of lead sheet which will reduce the intensity to half of its initial value. (3)

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