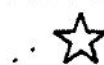


RBD-12-18

Roll No. : _____

Objective
Paper Code
8471

Intermediate Part Second (New Scheme)
PHYSICS (Objective)
Time: 20 Minutes Marks: 17



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.

| S.# | Questions | A | B | C | D |
|-----|--|-------------------------|-------------------------|-------------------------|---------------------------|
| 1 | The capacitance of capacitor depends upon: | Thickness of plates | Charges on the plates | Voltage applied | Geometry of the capacitor |
| 2 | A billion electrons are added to pith ball. Its charge is: | $-1.6 \times 10^{-10}C$ | $-1.6 \times 10^{-12}C$ | $-1.6 \times 10^{-14}C$ | $-1.6 \times 10^{-7}C$ |
| 3 | The current through a resistance of 100Ω when connected across a source of 220V is: | 22000A | 22A | 2.2A | 0.45A |
| 4 | A current carrying conductor is placed in uniform magnetic field parallel to it. The magnetic force experienced by the conductor is: | $F = ILB$ | $F = ILB \sin\theta$ | $F = ILB \cos\theta$ | F is zero |
| 5 | Cathode ray oscilloscope works by deflecting a beam of: | Electrons | Protons | Neutrons | Positrons |
| 6 | The only difference between the construction of DC and AC generator is: | Carbon brushes | coil | Commutator | Magnetic field |
| 7 | If the coil is wound on iron core, the flux through it: | Decreases | Becomes zero | Increases | Remains constant |
| 8 | During each cycle, alternating voltage reaches to peak value: | Once | Twice | Thrice | Four times |
| 9 | The device which allows only the continuous flow of AC through it is: | Capacitor | Inductor | Battery | Thermistor |
| 10 | A vacant or partially filled band is called: | Fermi band | Valence band | Forbidden band | Conduction band |
| 11 | A device which is used for the conversion of AC into DC is called: | Oscillator | Detector | Amplifier | Rectifier |
| 12 | Which one is not fundamental logic gate? | OR gate | AND gate | NOT gate | NAND gate |
| 13 | The unit of Plank's constant is: | Joule | Joule-S | Watt | Candela |
| 14 | Which one is low energy photon? | Visible light | Infrared light | Ultra violet light | X-rays |
| 15 | Radiation produced from TV picture tube is: | Gamma rays | X-rays | Infrared light | Ultra violet light |
| 16 | The bombardment of nitrogen with α -particle will produce: | Neutron | Proton | Electron | Positron |
| 17 | The quantity called the absorbed dose "D" is: | E/m | E/C | m/C | C/E |

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FEB-12-18

SECTION – I

2. Write short answers to any EIGHT parts. 16
- (i) Do electrons tend to go to region of high potential or of low potential?
 - (ii) Electric lines of force never cross. Why?
 - (iii) Define capacitance and electric polarization.
 - (iv) Show $1\text{eV} = 1.6 \times 10^{-19}\text{J}$
 - (v) A plane conducted loop is located in a uniform magnetic field that is directed along the x-axis. For what orientation of the loop is the flux a maximum? For what orientation is the flux a minimum?
 - (vi) Why the voltmeter should have a very high resistance?
 - (vii) What is digital multimeter?
 - (viii) Define ammeter and voltmeter.
 - (ix) When the primary circuit of a transformer is connected to a.c. mains the current in it (a) is very small if the secondary circuit is open but (b) increases when the secondary circuit is closed. Explain these factors.
 - (x) Show that ϵ and $\frac{\Delta\phi}{\Delta t}$ have the same units.
 - (xi) Define induced current and induced emf.
 - (xii) Define self-induction and mutual induction.
3. Write short answers to any EIGHT parts. 16
- (i) Write the names of sources of current.
 - (ii) Is the filament resistance lower or higher in a 500W, 220V light bulb than in a 100W, 220V bulb?
 - (iii) A voltmeter cannot read the exact emf of a cell. Why?
 - (iv) What do you mean by phase lag and phase lead?
 - (v) Show that potential difference across LC is zero at resonating frequency in series LRC series circuit.
 - (vi) Name the device that will (a) permit the flow of direct current but oppose the flow of alternating current (b) permit the flow of alternating current but not direct current.
 - (vii) Show that units of modulus of elasticity and stress are the same.
 - (viii) Define ductile and brittle substances. Give example of each.
 - (ix) What are superconductors? Where are they used?
 - (x) What do LED and LASER stand for?
 - (xi) Why ordinary silicon diodes do not emit light?
 - (xii) The anode of a diode is 0.2 positive with respect to its cathode. Is it forward biased?
4. Write short answers to any SIX parts. 12
- (i) Can pair production take place in vacuum? Explain.
 - (ii) We do not notice the de-Broglie wavelength for a pitched cricket ball. Explain why?
 - (iii) Write the relations of length contraction and time dilation in case of special theory of relativity.
 - (iv) What are advantages of LASER over ordinary light?
 - (v) Can electron reside inside the nucleus? Explain.
 - (vi) How can radioactivity help in treatment of Cancer?
 - (vii) Why heavy nuclei are unstable? Explain.
 - (viii) Define half-life and discuss its dependence.
 - (ix) Write names of hydrogen isotopes with their formulas (symbols).

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

5. (a) What is potentiometer? How it can be used as (i) potential divider (ii) measuring of unknown emf of a cell? 1,2,2
- (b) Determine the electric field at the position $\vec{r} = (4\hat{i} + 3\hat{j})\text{m}$. Caused by a point charge $q = 5.0 \times 10^{-6}\text{C}$ placed at the origin. 03
6. (a) What is solenoid? Draw the pattern of magnetic field produced by the current carrying solenoid and derive the relation to calculate the value of its magnetic field inside it by using Ampere's law. 1,1,3
- (b) When current through a coil changes from 100mA to 200mA in 0.005s an induced emf of 40mV is produced in the coil. (i) What is the self-inductance of the coil? (ii) Increase in the energy stored in the coil. 03
7. (a) How operational amplifier can be used as inverting and non-inverting amplifier? Derive their gain. 2,2,1
- (b) Find the value of the current and inductive reactance when AC voltage of 220V at 50Hz is passed through an inductor of 10H. 03
8. (a) What is de-Broglie's hypothesis about wave nature of particle? How it was confirmed by Davisson and Germer? 02,03
- (b) A 1.25cm diameter cylinder is subjected to a load of 2500kg. Calculate the stress on the bar in megapascals. 03
9. (a) What is a nuclear reactor? Describe its four important parts. 01,04
- (b) Compute the shortest wavelength radiation in the Balmer series? What value of n must be used? 03