



BWP-12-G2-18

Note : Four possible choices A, B, C, D to each question are given. Which choice is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

Q.No.1	Electric Flux is expressed as :
(1)	(A) $\Phi_e = \vec{E} \times \vec{A}$ (B) $\Phi_e = \vec{E} \cdot \vec{Q}$ (C) $\Phi_e = \vec{E} \cdot \vec{A}$ (D) $\Phi_e = EA^2$
(2)	The force between two charges is 28 N. If Paraffin Wax of relative permittivity 2.8 is introduced between the charges as medium, then the force reduces to : (A) 25 N (B) 20 N (C) 15 N (D) 10 N
(3)	What is the colour code for $52 M\Omega \pm 5\%$ resistance : (A) Red Green Blue Gold (B) Green Red Blue Gold (C) Yellow Red Blue Gold (D) Green Red Violet Gold
(4)	If length of Solenoid is doubled but N same, $\vec{B}$ inside the Solenoid becomes : (A) Half (B) Double (C) One Fourth (D) Four Times
(5)	Which one has the Least Resistance : (A) Galvanometer (B) Ammeter (C) Voltmeter (D) Ohm Meter
(6)	A 50 mH coil carries a current of 2 Amp. The energy stored in its magnetic field is : (A) 0.05 J (B) 0.1 J (C) 10 J (D) 50 J
(7)	The Practical Illustration of the Phenomenon of mutual induction is in the device of : (A) Transformer (B) A.C. Generator (C) D.C. Generator (D) Ammeter
(8)	The device which allows only the flow of D.C. is : (A) Capacitor (B) Transformer (C) Inductor (D) Generator
(9)	The inductive reactance of a coil is directly proportional to : (A) Inductance (B) Resistance (C) Frequency of A.C. (D) Both Frequency of A.C. and Inductance
(10)	Glass and High Carbon Steel are examples of : (A) Ductile Substances (B) Brittle Substances (C) Soft Substances (D) Hard Substances
(11)	The Resistance between the Inverting (-) and Non-Inverting (+) inputs is called Input Resistance and is of the order of : (A) Ohms (B) Kilo Ohms (C) Thousands Ohms (D) Mega Ohms
(12)	For Automatic Switching of Street Light, the Op - Amplifier is used as : (A) Inverter (B) Convertor (C) Comparator (D) Rectifier
(13)	The maximum K.E. of Photoelectron depends upon : (A) Intensity of Incident Light (B) Frequency of Incident Light (C) Metal (D) Temp. of Metal
(14)	The materialization of energy takes place in the process of : (A) Photoelectric Effect (B) Compton Effect (C) Pair Production (D) Annihilation of Matter
(15)	The Rest Mass of X-ray photon is : (A) $9.1 \times 10^{-31}$ Kg (B) $1.67 \times 10^{-27}$ Kg (C) $1.6 \times 10^{-19}$ Kg (D) Zero
(16)	In Liquid Metal Fast Breeder reactor, the type of Uranium used is : (A) ${}_{92}^{235}\text{U}$ (B) ${}_{92}^{238}\text{U}$ (C) ${}_{92}^{234}\text{U}$ (D) ${}_{92}^{239}\text{U}$
(17)	If we have $N_0$ number of atoms of any Radioactive Element, then after four half lives, the number of atoms left behind is : (A) $\frac{1}{4} N_0$ (B) $\frac{1}{8} N_0$ (C) $\frac{1}{16} N_0$ (D) $\frac{1}{2} N_0$



Roll No.	912 - 9000	New Pattern / Group 2nd	Session (2015 - 17) to (2016 - 18)
Physics (Subjective)	Inter-A-2018	Inter (Part - II)	Time : 2:40 Hours Marks : 68

Note: It is compulsory to attempt any (8-8) parts each from Q.No.2 and Q.No.3 and attempt any (6) parts from Q.No.4. Attempt any (03) questions from Part II. Write same Question No. and its Part No. as given in the question paper.

Make diagram where necessary.

Part - I

BWP-12-G12-18

22 x 2 = 44

- Q.No.2** (i) Write four characteristics of Electric Field Lines.  
(ii) Differentiate between Electric Potential Energy and Electric Potential Difference.  
(iii) How can you identify that which plate of a capacitor is positively charged?  
(iv) Show that  $1 \text{ Vm}^{-1} = 1 \text{ NC}^{-1}$ .  
(v) What do you know about Sensitivity of Galvanometer?  
(vi) What is the function of Grid in CRO?  
(vii) How can you use a Magnetic Field to separate Isotopes of Chemical Element?  
(viii) Why the Resistance of an Ammeter should be very low?  
(ix) What is the Back Motor Effect in Generators?  
(x) Distinguish between A.C. Generator and Transformer.  
(xi) Show that  $\mathcal{E}$  and  $\frac{\Delta\phi}{\Delta t}$  have the same units.  
(xii) Can a D.C. Motor be turned into D.C. Generator? What changes are required to be done?
- Q.No.3** (i) Is the filament resistance lower or higher in a 500 W, 220 V light bulb than in a 100 W, 220 V bulb?  
(ii) Why does the Resistance of a Conductor rise with temperature?  
(iii) State Ohm's Law and Basic Principle of Electroplating.  
(iv) How does doubling the frequency affect the reactance of : (a) An Inductor (b) A capacitor  
(v) What is meant by A.M. and F.M.?  
(vi) Define Choke and Impedance.  
(vii) What is meant by Para and Ferromagnetic Substances? Give examples for each.  
(viii) Define Stress and Strain.  
(ix) What is meant by Super Conductor?  
(x) What is OR Gate?  
(xi) Why is Base Current in a Transistor is very small?  
(xii) Define Digital System and Logic Gates.
- Q.No.4** (i) If the speed of light were infinite, what would the equations of special theory of Relativity reduce to?  
(ii) Photon A has twice the energy of Photon B. What is the ratio of the Momentum of A to that of B?  
(iii) When does light behave as a Wave? When does it behave as a particle?  
(iv) Is energy conserved when an atom emits a photon of light?  
(v) What are the advantages of Laser over Ordinary Light?  
(vi) Why are Heavy Nuclei unstable?  
(vii) How can Radioactivity help in the treatment of Cancer?  
(viii) What are Leptons? Give examples of Leptons?  
(ix) What do we mean by the term "Critical Mass"?
- Part - II**
- Q.No.5** (a) What is Wheatstone Bridge? Give its principle, construction and working. How it is used to find the unknown low resistance? (5)  
(b) A proton placed in a uniform electric field of  $5000 \text{ NC}^{-1}$  directed to right is allowed to go through a distance of  $10.0 \text{ cm}$ . Calculate Potential difference between two points work done and velocity. (3)
- Q.No.6** (a) Derive an expression for Force acting on moving charge particle in uniform magnetic field. Hence define Tesla. (5)  
(b) The back emf in a motor is  $120 \text{ V}$  when the motor is turning at  $1680 \text{ rev per min}$ . What is the back emf when the motor turns  $3360 \text{ rev per min}$ ? (3)
- Q.No.7** (a) Explain the working of Series Resonance Circuit. Write down its any four properties. (5)  
(b) A  $10 \text{ mH}$ ,  $20 \Omega$  coil is connected across  $240 \text{ V}$  and  $180/\pi \text{ Hz}$  source. How much power does it dissipate? (3)
- Q.No.8** (a) What are Intrinsic and Extrinsic Semi Conductors? Describe the formation of N-type and P-type Semi Conductors. (5)  
(b) A Sodium Surface is illuminated with a light of Wavelength  $300 \text{ nm}$ . The work function of Sodium Metal is  $2.46 \text{ eV}$ . (a) Find the maximum K.E. of Ejected Electron.  
(b) Determine the Cut Off Wavelength for Sodium. (3)
- Q.No.9** (a) Describe the Principle, Construction and Working of a Wilson Cloud Chamber. (5)  
(b) A tungsten target is struck by electrons that have been accelerated from rest through  $40 \text{ kV}$  potential difference. Find the shortest Wavelength of the Bremsstrahlung Radiation emitted. (3)