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Roll No._____ to be filled in by the candidate.

Paper Code	4	4	7	5

Sessions: 2015-2017 & 2016-2018

Physics (Objective Type)

Rwp-12-18

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. Maximum compton shift is observed at:
(A) 0° (B) 90° (C) 180° (D) 45°

2. Bremsstrahlung radiations are example of:
(A) Atomic spectra (B) Molecular spectra (C) Continuous spectra (D) Discrete spectra

3. What is different in isotopes?
(A) number of protons (B) number of neutrons (C) number of electrons (D) Charge number

4. Circulation of blood is studied by radio isotope:
(A) carbon-14 (B) carbon-12 (C) cobalt-60 (D) sodium-24

5. if electric lines of force are equally spaced the electric field is:
(A) uniform (B) non-uniform (C) weak (D) strong

6. Drum of Photocopier is made of:
(A) Copper (B) Toner (C) Selenium (D) Aluminium

7. Magnetic effect of current is used in:
(A) Toaster (B) Electric motor (C) Electric iron (D) D.C battery

8. Two current carrying parallel conductors are lying in same direction, they.
(A) form magnetic dipole (B) attract each other (C) repel each other (D) have no effect

9. If current flowing through a solenoid becomes four times, then magnetic field inside it becomes:
(A) two times (B) three times (C) four times (D) half

10. In A.C,inductor behaves as:
(A) Capacitor (B) Resistor (C) Commutators (D) Transistor

11. In A.C generator when plane of coil is perpendicular to the magnetic field, then output of generator is:
(A) NWAB (B) $2\pi f$ (C) maximum (D) zero

12. In metal detectors, we use:
(A) RL circuit (B) RC circuit (C) LC circuit (D) any of these

13. In frequency modulation, which factor is changed?
(A) Amplitude of carrier waves (B) Frequency of carrier wave
(C) Amplitude of signal (D) Frequency of signal

14. A material which is insulator at OK and conduct at room temperature is:
(A) Silver (B) Lead (C) Germanium (D) Polythene

15. Doping is made compartively larger in:
(A) emitter (B) base (C) collector (D) P-type semi-conductors

16. In put resistance of op-amplifier is of the order of:
(A) Few ohms (B) Mega ohms (C) Milli ohms (D) Micro ohms

17. Light of 4.5ev is incident on a cesium surface and stoping potential is 0.25V, maximum K.E of emitted electrons is:
(A) 4.5 ev (B) 4.25 ev (C) 4.75 ev (D) 0.25 ev

Roll No._____ (To be filled in by the candidate)

Sessions: 2015-2017 & 2016-2018

Physics (Essay Type)

Pwp-12-18

Time: 2:40 Hours **Marks: 68**

Section - I

2- Write short answers of any eight parts from the following. 2 x 8 =16

i. What is capaciter? Define the capacitance.
ii. Write in detail about electron Volt.
iii. How can you identify that which plate of a capacitor is positively charged?
iv. 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 rectlinear motion?
v. Define magnetic flux and mention the factors upon which it depends.
vi. Write down the uses of C.R.O.
vii. Why the voltmeter should have a very high resistance?
viii. Is it possible to orient a current loop in uniform magnetic field such that the loop will not tend to rotate?
ix. State Faraday's law of electromagnetic induction and write its mathematical expression.
x. What is D.C motor? Write down the parts of D.C motor.
xi. Can a D.C motor be turned into D.C generator? What changes are required to be done?
xii. Does the induced emf always act to decrease the magetic flux through a circuit?

3- Write short answers of any eight parts from the following. 2 x 8 =16

i. Define ohm's law. Also define ohmic and non-ohmic devices.
ii. What is wheat stone bridge? Sketch its circuit diagram.
iii. Why does the resistance of a conductor rise with temperature?
iv. Write two properties of parallel resonance circuit.
v. How does doubling the frequency affect the reactance of: (a) an inductor. (b) a capacitor.
vi. A sinusoidal current has rms value of 10 A. What is the maximum or peak value?
vii. Define retantivity and coercivity.
viii. Distinguish between crystalline and amorphous solids.
ix. Distinguish between instrinsic and extrinsic semi-conductor.
x. What is photodiode? Write down its any two applications.
xi Why charge carrier are not present in the depletion region?
xii What is the effect of forward and reverse biasing of a diode on the width of depletion region?

4- Write short answers of any six parts from the following. 2 x 6 =12

i. Define pair production and annihilation of matter.
ii. Which has the lower energy quanta? Radio wave or X-rays.
iii. Is it possible to create a single electron from energy? Explain.
iv. Is energy conserved when an electron emits a photon of light.
v. Define normal population and population inversion.
vi. How can radioactivity help in the treatment of cancer?
vii. A particle which produces more ionisation is less penetrating. Why?
viii. Why are heavy nuclei unstable?
ix. What are the basic forces in nature?

Section - II

NOTE: **Answer any three questions from the following.** 8x3=24

5. (a) State Gauss's Law.Derive a relation for electric intensity at a point near an infinite sheet of charge. 05
   (b) A rectangular bar of iron is 2.0cm by 2.0cm in cross-section and 40cm long. Calculate its resistance if the resistivity of iron is $11x10^{-8}\Omega m$. 03
6. (a) What is mutual induction? Derive a relation for induced emf in secondary coil. What is unit of mutual inductance? Define it. 05
   (b) A 20cm wire carrying a current of 10.0A is placed in a uniform magnetic field of 0.30T. If wire makes an angle of 40° with the direction of magnetic field, find the magnitude of the force acting on the wire. 03
7. (a) What is transistor? Describe the use of transistor as an amplifier and calculate its voltage gain. 05
   (b) What is the resonant frequency of a circuit which includes a coil of inductance 2.5H and a capacitance of $40\mu F$? 03
8. (a) What is meant by doping? Give the names of doped materials. How would you obtain n-type and p-type material from pure silicon? Illustrate it by Schematic diagram. 05
   (b) A 90 KeV x-ray photon is fired at a carbon target and compton scattering occurs. Find the wavelength of incident photon and scattered photon for scattering angle of 60°. 03
9. (a) Write down the postulates of Bohr atom model for hydrogen atom. Also derive the formula for nth orbit radius of Bohr atom model and prove that the Bohr radii are quantized. 05
   (b) A sheet of lead 5.0mm thick reduces the intensity of beam of $\gamma-rays$ by a factor 0.4. Find half value thickness of lead sheet which will reduce the intensity to half of its initial value. 03