

**INTERMEDIATE PART-II (12<sup>th</sup> CLASS)**  
**PHYSICS PAPER-II (NEW SCHEME) (SESSION 2015-2017) GROUP-I**

TIME ALLOWED: 2.40 Hours

**SUBJECTIVE**

MAXIMUM MARKS: 68

**NOTE: - Write same question number and its part number on answer book,  
as given in the question paper.**

**SECTION-I**2. **Attempt any eight parts.****8 × 2 = 16**

- (i) Give similarity and difference between the Coulomb's and Gravitational Forces.
- (ii) What is Photoconductor?
- (iii) Why does Capacitance of a Capacitor increase when some dielectric material is inserted between the plates?
- (iv) How can you identify that which plate of a charged capacitor is negatively charged?
- (v) How can you use a magnetic field to separate isotopes of chemical element?
- (vi) At a given instant, a proton moves in the positive X-direction in a region where there is magnetic field in the negative Z-direction. What is the direction of the Magnetic Force?
- (vii) What is Dead Beat Galvanometer?
- (viii) Write the formula used to convert a Galvanometer into Voltmeter, Why the resistance of Voltmeter should high?
- (ix) A light metallic ring is released from above into a vertical bar magnet with N – pole upside. Does the current flow clockwise or anticlockwise in the ring?



- (x) A suspended magnet is oscillating freely, in a horizontal plane. The oscillations are strongly damped when a metal plate is placed under the magnet. Explain why this occurs?
- (xi) What are the main causes of power loss in a transformer?
- (xii) Where the capacitor and the inductor store their energies?

3. **Attempt any eight parts.****8 × 2 = 16**

- (i) What is the difference between Conventional Current and Electronic Current?
- (ii) What is Wheatstone Bridge? Write its Principle.
- (iii) A potential difference is applied across the ends of a Copper wire. What is the effect on the drift velocity of free electrons by increasing the potential difference and decreasing the temperature of the wire?
- (iv) What is Frequency Modulation?
- (v) How does doubling the frequency affect the reactance of an inductor and a capacitor?
- (vi) F.M. radio waves provide a higher quality transmission of sound than A.M radio waves. Discuss briefly.
- (vii) Define Valence Band and Conduction Band.
- (viii) Define Semiconductors in terms of Energy Bands.
- (ix) Define Hysteresis Loop.
- (x) Define Rectification and write names of its types.
- (xi) Why Ordinary Silicon Diodes do not emit light?
- (xii) Why is the base current in a transistor very small?

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## 4. Attempt any six parts.

 $6 \times 2 = 12$ 

- (i) When ultraviolet light falls on certain dyes, visible light is emitted. Why does this not happen when infrared light falls on these dyes?
- (ii) Why don't we observe a Compton's effect with visible light?
- (iii) If an electron and a proton have the same de Broglie wavelength, which particle has greater speed?
- (iv) What are the advantages of lasers over ordinary light?
- (v) What is CAT – Scanner?
- (vi) What is a radioactive tracer? Describe one application in medicine.
- (vii) Which radiation dose would deposit more energy to the body?  
(a) 10 mGy dose to the hand or (b) 1 mGy dose to the entire body
- (viii) For what purpose Alcohol or Bromine is mixed with principal gas in Geiger tube?
- (ix) Is it possible that fusion of two small nuclei may occur without collision of extremely high energy?

SECTION-II

NOTE: - Attempt any three questions.

- 5.(a) State Gauss's Law. How can you apply the Gauss's Law to calculate Electric Intensity due to an infinite sheet of charge? 5
- (b)  $1.0 \times 10^7$  electrons pass through a conductor in  $1.0 \mu s$ . Find the current in ampere flowing through the conductor. Electronic charge is  $1.6 \times 10^{-19} C$ . 3
- 6.(a) Calculate torque on a current carrying coil placed in a uniform magnetic field. 5
- (b) A permanent magnetic D.C motor is run by a battery of 24 V. The coil of the motor has a resistance of  $2 \Omega$ . It develops a back emf of 22.5 V when driving the load at normal speed. What is the current when motor just starts up? Also find the current when motor is running at normal speed. 3
- 7.(a) Define phase of A.C. Also discuss the behaviour of R – C and R – L series circuits for the A.C. 5
- (b) The current flowing into the base of a transistor is  $100 \mu A$ . Find its collector current  $I_C$ , its emitter current  $I_E$  and the ratio  $\frac{I_C}{I_E}$ , if the value of current gain  $\beta$  is 100. 3
- 8.(a) What is Compton Effect? Calculate Compton Wavelength. 5
- (b) A 1.0 metre long Copper wire is subjected to stretching force and its length increases by 20 cm. Calculate the tensile strain and the percent elongation which the wire undergoes. 3
- 9.(a) What is Solid State Detector? Describe its principle, construction and working.  $1 + 1 + 1 + 2 = 5$
- (b) Calculate the longest wavelength of radiation for the Paschen Series. 3



**PHYSICS PAPER-II (NEW SCHEME) (SESSION 2015-2017) GROUP-I**  
**TIME ALLOWED: 20 Minutes OBJECTIVE MAXIMUM MARKS: 17**

**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. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

## Q.No.1

- (1) If both the magnitude of charges and distance between them is doubled, then coulomb's force will be:-  
 (A) Doubled (B) Half (C) Remains same (D) One fourth
- (2) Coulomb/volt is called:-  
 (A) Farad (B) Ampere (C) Joule (D) Henry
- (3) If  $1 \times 10^7$  electrons pass through a conductor in  $1.0 \mu s$ , then the current is:-  
 (A)  $2 A$  (B)  $1.6 A$  (C)  $2.6 \times 10^{-6} A$  (D)  $1.6 \times 10^{-6} A$
- (4) The value of shunt resistance is given by ( $R_g$ ):-  
 (A)  $\frac{I - I_g}{I_g}$  (B)  $\frac{I - V_g}{I_g}$  (C)  $\frac{I}{I - I_g}$  (D)  $\frac{V_g}{I - I_g}$
- (5) A sensitive galvanometer is:-  
 (A) Unstable (B) Stable (C) Moderate (D) Both B & C
- (6) Mutual induction has practical role in the performance of:-  
 (A) Rectifier (B) A.C Generator (C) Capacitor (D) Transformer
- (7) When back emf in motor is zero, it draws:-  
 (A) Zero current (B) Minimum current (C) Maximum current (D) Steady current
- (8) In three phase A.C generator, phase difference between each pair of coil is:-  
 (A)  $90^\circ$  (B)  $270^\circ$  (C)  $120^\circ$  (D)  $180^\circ$
- (9) In modulation, low frequency signal is known as:-  
 (A) Carrier Wave (B) Fluctuated signal (C) Modulated carrier signal (D) Modulation signal
- (10) Above the curie temperature, Iron is:-  
 (A) Paramagnetic (B) Diamagnetic (C) Ferromagnetic (D) Not effected
- (11) An expression for current gain of a Transistor is given by:-  
 (A)  $\beta = \frac{I_B}{I_C}$  (B)  $\beta = \frac{I_C}{I_B}$  (C)  $\beta = I_B + I_C$  (D)  $\beta = I_B - I_C$
- (12) A photodiode can turn its current ON and OFF in:-  
 (A) Micro seconds (B) Mega seconds (C) Nano seconds (D) Milli seconds
- (13) Platinum wire becomes white at a temperature of:-  
 (A)  $1600^\circ C$  (B)  $1300^\circ C$  (C)  $1100^\circ C$  (D)  $900^\circ C$
- (14) Stefan – Boltzmann law is given by:-  
 (A)  $E = hf$  (B)  $E = mc^2$  (C)  $E = \sigma T^4$  (D)  $\lambda \times T = \text{constant}$
- (15) Radius of first Bohr's orbit is:-  
 (A) 0.053 nm (B) 0.053 mm (C)  $0.053 \mu m$  (D) 0.053 m
- (16) Number of isotopes of Neon gas are:-  
 (A) 2 (B) 3 (C) 4 (D) 1
- (17) Binding energy per nucleon is maximum for:-  
 (A) Platinum (B) Iron (C) Uranium (D) Lead

**INTERMEDIATE PART-II (12<sup>th</sup> CLASS)****PHYSICS PAPER-II (NEW SCHEME) (SESSION 2015-2017) GROUP-II**TIME ALLOWED: 2.40 Hours **SUBJECTIVE** MAXIMUM MARKS: 68**NOTE: - Write same question number and its part number on answer book, as given in the question paper.****SECTION-I**

- 2. Attempt any eight parts. 8 × 2 = 16**
- (i) Define Capacitance. Also define its unit.
  - (ii) Write down any two properties of Electric Field Lines.
  - (iii) Describe the force or forces on a positive point charge when placed between parallel plates
    - (a) With similar and equal charge
    - (b) With opposite and equal charges
  - (iv) Show that  $1\text{ eV} = 1.6 \times 10^{-19}\text{ J}$
  - (v) Define right hand rule for determining the direction of the magnetic field.
  - (vi) Define AVO meter and Ohmmeter.
  - (vii) Why does the picture on 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) Write down two methods to improve the efficiency of a transformer.
  - (x) Show that  $\mathcal{E}$  and  $\frac{\Delta\phi}{\Delta t}$  have the same units.
  - (xi) Can an electric motor be used to drive an electric generator with the output from generator being used to operate the motor?
  - (xii) When an electric motor, such as an electric drill, is being used, does it also act as a generator? If so, what is the consequence of this?
- 3. Attempt any eight parts. 8 × 2 = 16**
- (i) What is Wheatstone bridge? Draw its circuit diagram.
  - (ii) Why does the resistance of a conductor rise with temperature?
  - (iii) What is meant by the tolerance? Find the resistance of the resistor with colours Red – Violet – Orange – Silver.
  - (iv) What is Choke Coil?
  - (v) What is meant by A.M and F.M?
  - (vi) How does doubling the frequency affect the reactance of (a) an inductor (b) a capacitor?
  - (vii) Distinguish between Crystalline and Polymeric Solids.
  - (viii) What is meant by Para and Ferromagnetic substances? Give examples for each.
  - (ix) Define Modulus of elasticity. Show that the units of Modulus of elasticity and stress are the same.
  - (x) The inputs of a gate are 1 and 0. Identify the gate if its out put is (a) 0 (b) 1.
  - (xi) How does the motion of an electron in a n – type substance differ from the motion of holes in a p – type substance?
  - (xii) Why a photo diode is operated in reverse biased state?
- 4. Attempt any six parts. 6 × 2 = 12**
- (i) What is NAVSTAR navigation system?
  - (ii) What are the measurements on which two observers in a relative motion will always agree upon?
  - (iii) What are the advantages of electron microscope over an optical microscope?
  - (iv) Define Ionization Energy and Ionization Potential.



- (v) What are the reasons of instability of heavy nuclei?
- (vi) Hydrogen atom contains one electron but its spectrum contains so many lines, explain.
- (vii) Define mass deficit and binding energy.
- (viii) What are Background Radiations? Write the name of its two sources.
- (ix) What do we mean by the term Critical Mass?

### SECTION-II

**NOTE: - Attempt any three questions.**

- 5.(a) Define Absolute Electric Potential. Derive its relation due to a point charge. 5
- (b) A Platinum wire has resistance of  $10\ \Omega$  at  $0^\circ\text{C}$  and  $20\ \Omega$  at  $273^\circ\text{C}$ . Find value of temperature coefficient of resistance of Platinum. 3
- 6.(a) Derive an expression for the energy stored in an inductor. 5
- (b) What current should pass through a solenoid that is 0.5 m long with 10,000 turns of Copper wire so that it will have a magnetic field of 0.4 T? 3
- 7.(a) What is RLC – parallel circuit? Find the value of the resonance frequency and also write its four properties. 1 + 2 + 2 = 5
- (b) The current flowing into the base of a transistor is  $100\ \mu\text{A}$ . Find its emitter current  $I_E$ , if the value of current gain  $\beta$  is 100. 3
- 8.(a) What is Doping? Explain formation of n – type and p – type semiconductors. 5
- (b) A Sodium surface is illuminated with light of wavelength 300 nm. The work function of Sodium metal is  $2.46\ \text{eV}$ . Determine the cut off wavelength for Sodium. 3
- 9.(a) What are Isotopes and how Isotopes are detected by Mass spectrograph? 1 + 4 = 5
- (b) Calculate the longest wavelength of radiation for the Paschen Series. 3

## PHYSICS PAPER-II (NEW SCHEME) (SESSION 2015-2017) GROUP-II

TIME ALLOWED: 20 Minutes

**OBJECTIVE**

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## Q.No.1

- (1) The drum in a photocopier is coated with a layer of:-  
 (A) Aluminium (B) Silver (C) Gold (D) Selenium
- (2) If a charged body is moved against the electric field it will gain:- (A) Elastic Potential Energy  
 (B) Kinetic Energy (C) Gravitational Energy (D) Electric Potential Energy
- (3) For Ohmic device the graph between  $V$  and  $I$  is:-  
 (A) A straight line (B) Curve (C) Hyperbola (D) Parabola
- (4) A device used for detection of current is called:-  
 (A) Inductor (B) Voltmeter (C) Capacitor (D) Galvanometer
- (5) Two parallel straight wires carrying current in opposite direction:-  
 (A) Repel each other (B) Attract each other (C) Have no effect upon each other  
 (D) They cancel out their individual magnetic effect
- (6) \_\_\_\_\_ is not present in A.C generator. (A) Armature (B) Magnet (C) Slip-rings (D) Commutator
- (7) \_\_\_\_\_ expressions for mutual inductance is correct.  
 (A)  $M = \frac{N_S \phi_S}{I_P}$  (B)  $M = \frac{\phi_S}{N_S I_P}$  (C)  $M = \frac{I_P}{N_S \phi_S}$  (D)  $M = \frac{N_S}{I_P \phi_S}$
- (8) The output voltage of an A.C generator at time  $t = \frac{T}{4}$  is given by:-  
 (A)  $V = -V_o$  (B)  $V = V_o$  (C)  $V = 0$  (D)  $V = \frac{V_o}{4}$
- (9) The expression  $P = VI$  holds only when current and voltage are:-  
 (A) In phase (B) Out of phase (C) At right angle to each other (D) At angle of 120°
- (10) The substance in which atom cooperate with each other in such a way so as to exhibit a strong magnetic field is called:-  
 (A) Ferromagnetic (B) Paramagnetic (C) Diamagnetic (D) Non-magnetic
- (11) Logic gates can control some physical parameters like:- (A) Temperature, Pressure  
 (B) Resistance, Inductance (C) Capacitance, Impedance (D) Current, Voltage
- (12) The term inverter is used for:- (A) NOR gate (B) NAND gate (C) XNOR gate (D) NOT gate
- (13) The velocity at which relativistic length of a body reduces to half of its original length is:-  
 (A)  $\frac{1}{2}C$  (B)  $\frac{3}{2}C$  (C)  $\frac{1}{\sqrt{2}}C$  (D)  $\frac{\sqrt{3}}{2}C$
- (14) When the K.E max of photoelectron is zero, the frequency of incident photon is \_\_\_\_\_ that of threshold frequency:- (A) Less than (B) Greater than (C) Much greater (D) Equal to
- (15) The radiations emitted from hydrogen filled discharge tube can be analyzed into:-  
 (A) Band Spectrum (B) Line Spectrum (C) Continuous Spectrum (D) Absorption Spectrum
- (16) In Beta – decay, \_\_\_\_\_ reaction takes place.  
 (A)  ${}^1_0n \rightarrow {}^1_1H + {}^0_{-1}e$  (B)  ${}^3_1H \rightarrow {}^1_0n + {}^0_{-1}e$  (C)  ${}^1_0n \rightarrow {}^2_1H + {}^0_{-1}e$  (D)  ${}^1_0n \rightarrow {}^1_1H + {}^0_{-1}e$
- (17) The particles equal or greater in mass than that of protons is called:-  
 (A) Baryons (B) Leptons (C) Mesons (D) Quarks



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**OBJECTIVE KEY FOR INTER (PART I/ II) Annual Examination, 2017.**

Name of Subject Physics

Session 2015-2017

Group: 1st (New)

Group: 2nd (New)

Q. Nos.	Paper Code	Paper Code	Paper Code	Paper Code
	4471	4473	4475	4477
1.	C	A	C	D
2.	A	B	C	A
3.	D	B	D	D
4.	D	C	A	C
5.	A	A	B	C
6.	D	D	C	D
7.	C	D	A	A
8.	C	A	C	B
9.	D	D	A	C
10.	A	C	B	A
11.	B	C	B	C
12.	C	D	C	A
13.	A	A	A	B
14.	C	B	D	B
15.	A	C	D	C
16.	B	A	A	A
17.	B	C	D	D
18.	/	/	/	/
19.	/	/	/	/
20.	/	/	/	/

Q. Nos.	Paper Code	Paper Code	Paper Code	Paper Code
	4472	4474	4476	4478
1.	D	D	A	A
2.	D	D	B	D
3.	A	B	A	A
4.	D	D	A	B
5.	A	A	A	A
6.	D	D	D	A
7.	A	D	D	A
8.	B	A	D	D
9.	A	D	B	D
10.	A	A	D	D
11.	A	D	A	B
12.	D	A	D	D
13.	D	B	D	A
14.	D	A	A	D
15.	B	A	D	D
16.	D	A	A	A
17.	A	D	D	D
18.	/	/	/	/
19.	/	/	/	/
20.	/	/	/	/