Roll No. | | | | | | | Answer Sheet No. 13

Sig. of Candidate. _____ Sig. of Invigilator. _____

PHYSICS HSSC–II

SECTION – A (Marks 17)

Time allowed: 25 Minutes **Version Number** 1 7 1 6

Note: **Section – A is compulsory. All parts of this section are to be answered on the OMR Answer Sheet provided separately. It should be completed in the first 25 minutes and handed over to the Centre Superintendent along with the Question Paper. Deleting/overwriting is not allowed. Do not use lead pencil.**

Q. 1 **Choose the correct answer A / B / C / D by filling the relevant bubble for each question on the OMR Answer Sheet according to the instructions given there.**

1) The Young's Modulus Y = ?

A. $\frac{F/A}{\Delta l/l}$ B. $\frac{F/A}{\Delta A/A}$ C. $\frac{F/A}{\Delta V/V}$ D. $\frac{F/A}{\tan\theta}$

2) The proportionality constant between current and potential difference is:

A. C B. R C. K D. $\frac{1}{R}$

3) The output of NAND gate is ZERO when the two inputs are:

A. 0 & 0 B. 0 & 1 C. 1 & 0 D. 1 & 1

4) The resistance of an iron wire having $0.75A$ current when connected across a battery of $1.5V$ is:

A. 1Ω B. 2Ω C. 3Ω D. 4Ω

5) By connecting high resistance in series with the galvanometer, the galvanometer becomes:

A. Ohm meter B. Ammeter C. Voltmeter D. Aerometer

6) Which of the following options is NOT the definition of electric flux?

A. The dot product of electric intensity and vector area
B. The cross product of electric intensity and vector area
C. The scalar product of electric intensity and vector area
D. The number of electric field lines passing through a certain area

7) The cross (x) symbols drawn on the page indicates that magnetic field is:

A. Out of page B. Into page
C. Parallel to page D. Zero (no magnetic field)

8) The relation of Lenz's law is:

A. $\epsilon = -N\frac{\Delta\phi}{\Delta t}$ B. $\epsilon = N\frac{\Delta\phi}{\Delta t}$ C. $\epsilon_p = -M\frac{\Delta I_p}{\Delta t}$ D. $\epsilon_L = -L\frac{\Delta I}{\Delta t}$

9) _____ is a device, which converts electrical energy into mechanical energy.

A. A.C Generator B. D.C Generator C. Transformer D. Motor

10) Root mean square (rms) value of voltage is:

A. $\sqrt{\frac{V_o^2}{2}}$ B. $\sqrt{\frac{V_o}{2}}$ C. $\frac{V_o^2}{2}$ D. $\frac{V_o^2}{\sqrt{2}}$

11) The unit of charge is:

A. Coulomb B. Ampere C. Ohm D. Volt

12) _____ is heat sensitive resistor.

A. Capacitor B. Inductor C. Thermistor D. Rheostat

13) The current gain of transistor, β = ?

A. $\frac{I_B}{I_C}$ B. $\frac{I_E}{I_C}$ C. $\frac{I_E}{I_B}$ D. $\frac{I_C}{I_B}$

14) Converting of alternating current into direct current is called:

A. Amplification B. Modulation C. Rectification D. Quantization

15) _____ is the equation of Boolean algebra for NOR gate.

A. $\overline{A.B}$ B. $\overline{A+B}$ C. $X=A\bar{B}+\bar{A}B$ D. $\overline{A\bar{B}+\bar{A}B}$

16) The first Bohr orbit radius of the hydrogen atom is:

A. $0.53\ nm$ B. $0.053\ nm$ C. $0.0053\ nm$ D. $0.00053\ nm$

17) Electron, muons and nutrinos are:

A. Photons B. Hadrons C. Leptons D. Quarks

For Examiner's use only:

Total Marks: 17

Marks Obtained:

PHYSICS HSSC–II

Time allowed: 2:35 Hours **Total Marks Sections B and C: 68**

NOTE: Answer any fourteen parts from Section 'B' and any two questions from Section 'C' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet–B if required. Write your answers neatly and legibly.

SECTION – B (Marks 42)

Q. 2 Answer any FOURTEEN parts. The answer to each part should not exceed 3 to 4 lines. (14 x 3 = 42)

(i) Show that the unit of time constant of series RC circuit is second.

(ii) Distinguish between electric and magnetic field.

(iii) Define Shunt.

(iv) Can a Step down transformer decrease the power level?

(v) Why the voltmeter should have very high resistance?

(vi) Name the main parts of Cathode Ray Oscilloscope (CRO).

(vii) Does the induced emf always act to decrease the magnetic flux through a circuit?

(viii) Draw impedance diagram of RLC series circuit.

(ix) What are super conductors?

(x) Define operational amplifier.

(xi) Why is the base current in a transistor very small?

(xii) Can pair production take place in vacuum? Explain briefly.

(xiii) Why ordinary silicon diodes do not emit light?

(xiv) Why don't we observe a Compton effect with visible light?

(xv) What are the characteristics by which LASER light is distinguished by ordinary light?

(xvi) What do we mean by relative motion?

(xvii) What factors make a fusion reaction difficult to achieve?

(xviii) Define Radioactivity?

(xix) What are the fundamental conditions for Coulomb's law.

SECTION – C (Marks 26)

Note: Attempt any TWO questions. (2 x 13 = 26)

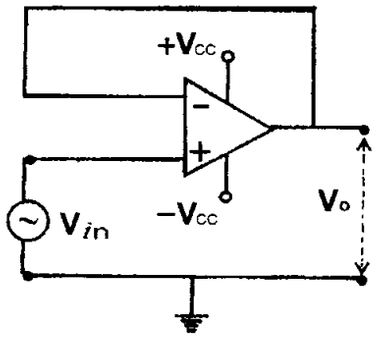
Q. 3 **a.** State and explain Gauss's law. Calculate the electric intensity due to an infinite sheet of charges. **(07)**

b. A particle carrying a charge 2e falls through a potential difference of 3.0 V. Calculate the energy acquired by it. **(04)**

c. Why electric lines of force never cross each other? **(02)**

Q. 4 **a.** Derive the energy density relation for inductor. **(06)**

b. Find the gain of the circuit shown in the following figure: **(05)**



c. Define super conductors. **(02)**

Q. 5 **a.** State and explain Einstein's Postulates of special theory of relativity. **(07)**

b. Find speed of the electron in the first Bohr orbit of hydrogen atom. **(04)**

c. Define LASER. **(02)**