HCM-003-001502 Seat No. _____

B. Sc. (Sem. V) (CBCS) Examination

October – 2017

Physics : P - 502

(Electricity, Magnetism & Solid State Electronics)

(New Course)

Faculty Code : 003

Subject Code : 001502

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) All questions are compulsory.

(2) Symbols have their usual meaning.

(3) Figures on right side indicate marks.

1 Answer the questions. **20**

(1) Write the differential form of Gauss's law.

(2) Which term in Biot-Savart's law reminiscent the Coulomb's law?

(3) Mass, charge and current densities are scalar quantities. True or False? Give reason.

(4) Flux through any closed surface is _____ .

(5) Flux through any enclosed surface depends on its shape and size. True or False? Give reason.

(6) In electrodynamics $\nabla x \overline{B} =$ _____ .

(7) Write Faradey's law.

(8) What is the function of alternator?

(9) Write equation of continuity.

(10) If any charge q is moving in magnetic field parallel to field, the magnetic force exerted on charge is _____ .

(11) Which device is used as coupling device in RC coupled amplifier.

(12) Where load is small, which kind of coupling is used generally?

(13) For amplification of very low frequency, which kind of coupling scheme is employed?

(14) In terms of voltage and current, write the expression for electrical power.

(15) Which power supply is best in terms of voltage regulation?

(16) Why the size of the power transistor is considerably large?

(17) Normally last stage of multistage amplifier is _____.

(18) For power amplification, which coupling device is employed?

(19) For amplification of audio frequencies, which kind of multistage amplifier is used?

(20) Inside the CRT, a graphite coat is also known as _____ .

2 (A) Answer the questions : (any **three**) **6**

(1) Explain Gauss's law.

(2) Explain divergence of vector E.

(3) Draw diagram which shows electric and magnetic field.

(4) Write the continuity equation for volume current density.

(5) Define : Magnetostatic.

(6) Define : Laplace equation.

(B) Answer the question : (any **three**) **9**

(1) Explain divergence of $\overline{B}$.

(2) Deduce continuity equation.

(3) Explain scalar potential.

(4) Derive Poission's equation.

(5) Explain : The work done to move a charge in electric field.

(6) Write a short note on Ampere's law.

(C) Answer the questions : (any **two**) **10**

(1) Compare electrostatic and magnetostatic.

(2) Write a note on magnetic vector potential.

(3) Give brief idea of force on a current in a magnetic field.

(4) Write a note on sources of energy.

(5) Explain Hydro electric power station with schematic diagram.

3 (A) Answer any **three :** **6**

(1) What is the role of capacitor in transistor amplifiers?

(2) What is the work of bypass capacitor in amplifier?

(3) Write advantages and disadvantages of direct coupled amplifier.

(4) Define class - B power amplifier.

(5) Give the definition of power dissipation capability of power amplifier.

(6) Define regulated power supply.

(B) Answer any **three** **9**

(1) Write advantages and disadvantages of transformer coupled amplifier.

(2) Explain multistage amplifier with block diagram.

(3) Discuss frequency response of RC coupled amplifier.

(4) Explain how impedance matching is achieved by transformer coupling.

(5) Explain : heat sink

(6) Explain voltage regulation.

(C) Answer any **two** : **10**

(1) Explain arrangement, operation and frequency response of transformer coupled amplifier.

(2) Show that the maximum collector efficiency of class A transformer coupled power amplifier is 50%.

(3) Explain the classification of power amplifiers.

(4) Write a note on regulated power supply and also justify the needs of regulated power supply.

(5) Write a note on Digital volt meter with proper circuit diagram.
