Roll No. _____

END SEMESTER EXAMINATION
SEMESTER- III

COURSE CODE : G 207 **DURATION : 3 (THREE)HRS**
COURSE TITLE : FUNDAMENTALS OF ELECTRICAL AND ELECTRONICS ENGINEERING **MAXIMUM MARKS : 75**
PASS MARKS : 35 %
SESSION : JULY-DEC' 21

NOTE: *1. Attempt any 5 (five) question of 15 marks each.*
2. Mark for each question is shown against it.
3. Assume suitable logical data wherever necessary.

1. **(a)** What is series and parallel circuit? Write its characteristics. **(2+2)**
(b) State Faraday's laws of electromagnetic induction. Differentiate self induction and mutual induction. **(2+3)**
(c) What is forbidden energy gap and how does it occur? Write its magnitude for Germanium and Silicon. **(2+1)**
(d) A coil consist of 2000 turns of copper wire having a cross sectional area of $0.8mm^2$.The mean length per turn is 80cm and the resistivity of copper is 0.2 micro ohm-meter .Find the resistance of the coil. **(3)**

2. **(a)** Define AC circuit. Describe purely capacitive circuit and draw its phasor diagram. **(1+4)**
(b) Define Rectifier. Write limitations of half wave rectifier. Explain bridge full wave rectifier with its circuit diagram and write its advantages. **(1+1+5)**
(c) Explain terminals of BJT. **(3)**

3. **(a)** Define Electrical power and energy. **(3)**
(b) An electric installation consist of 15 light points of 60 watt each,8 light points of 40 watt lamp, and 3 fan of 60 watt capacity. Assuming the light and fan are used for 4 hours per day, find out monthly consumption and cost of electricity bill, based on tariff of 20 paise per kwh. **(4)**
(c) Define (i)MMF (ii)Permeability (iii)Magnetic Hysteresis (iv) Reluctance (v) Magnetic field strength **(5)**
(d) Explain properties of semiconductor material. **(3)**

4. **(a)** Define resonance .Explain resonance in parallel circuit consisting of an inductive coil in parallel with a capacitor. **(2+5)**
(b) Define transistor. Explain construction and working of NPN transistor. **(1+4)**
(c) Calculate the equivalent resistance of the given circuit in fig.1. **(3)**

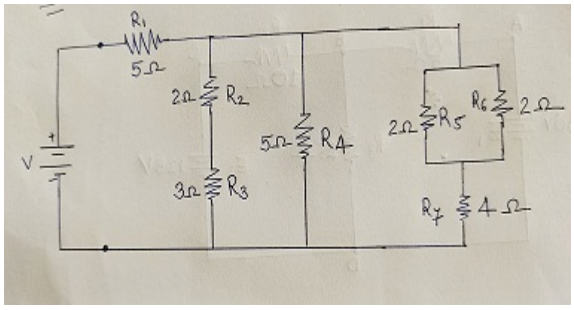

Fig.1

5. **(a)** What is P N Junction diode? Describe its formation and working. **(1+4)**
(b) Derive expression for ripple factor for half wave and full wave rectifier. **(3)**
(c) Define energy band. Differentiate conductor, semiconductor and insulator with the help of energy band diagram. **(7)**

6. **(a)** State Kirchhoff's laws. Write its application. **(2+1)**
(b) Calculate the current supplied by two batteries in the circuit given below. **(5)**

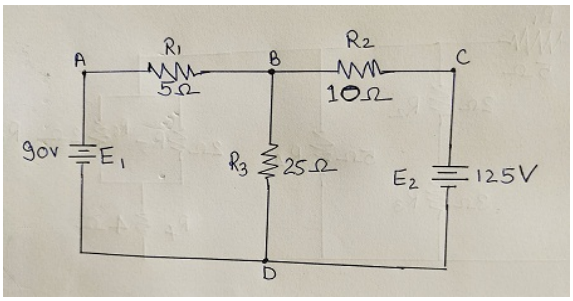

Fig.2

(c) State Fleming's Left hand rule. Derive force between two parallel linear conductors. **(1+4)**
(d) What is Zener diode? Explain its V-I characteristics diagram. **(2)**

7. **(a)** What is the advantage of transformer in rectifier circuit? **(2+1)**
The applied a.c power to half wave rectifier is 100 watt and the d.c output power obtained is 40 watt. Find its rectification efficiency.
(b) Draw circuit diagram of common collector connection of npn and pnp transistor. Write its application and derive expression for collector current. **(7)**
(c) What is intrinsic and extrinsic semiconductor? Explain current conduction in P-type semiconductor. **(5)**

8. **(a)** Differentiate series and parallel magnetic circuit. **(5)**
(b) Define (i) Depletion layer (ii)Reverse saturation current (iii)Peak inverse voltage (iv)Avalanche breakdown (v) Phase difference **(5)**
(d) Explain transistor as an amplifier. **(5)**

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