PVP 12

Code: **EE1T3**

I B.Tech - I Semester – Regular Examinations February - 2014

BASIC ELECTRICAL ENGINEERING

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Duration: 3 hours Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Define Electric current, Electric potential, Resistance, EMF, Conductance. 7 M

b) A 60 W, 240 V incandescent filament lamp is switched on at 20^0 C. The operating temperature of the filament is 2000^0 C. Determine the current taken by the lamp at the instant of switching on. The temperature coefficient of resistance of the filament material is 0.0045 /K . 7 M

2. a) Explain Ohms law and Kirchoff 's laws with an example. 7 M

b) A battery consists of five cells, each having an emf of 1.2V and internal resistance of 0.4 ohm joined in series. If the battery supplies current to a 6 ohm resistor, calculate the current supplied by the battery and the potential difference across the battery terminals . 7 M

3. a) Obtain the relationship between power, torque and speed of a rotating machine. 7 M

b) A 240 V dc motor drives a pump lifting 1.2 m^3 of water per minute to a height of 15m . If the efficiency of the motor and the pump is 61%, determine the electrical power input and the current taken from the supply. Assume that 1m^3 of water has a mass of 1000 kg. 7 M

4. Define and explain 14 M

a) Absolute permittivity
b) Electric field
c) Field strength
d) Flux density
e) Potential gradient
f) Electric flux

5. a) Derive the expression for the energy stored in a parallel plate capacitor. 7 M

b) Two capacitors 8μf and 2μf are connected in series across a 400 V dc supply. Calculate the resultant capacitance, charge on each capacitor, the potential difference across each capacitor. 7 M

6. a) Compare magnetic circuit with electric circuit. 7 M

b) A magnetic core, in the form of a closed ring, has a mean length of 20 cm and a cross section of 1 sq.cm. The relative permeability of iron is 2400. Calculate the magnitude of current needed in a coil of 2000 turns uniformly wound round the ring to create a flux of 0.2 mwb in the iron. 7 M

7. a) Explain the Faraday's laws of electromagnetic induction. 7 M

b) Derive the expression for energy stored in an inductor. 7 M

8. Describe the construction and characteristics of Nickel iron cell. 14 M