24007

B.Tech. 1st Semester Examination,

December–2013

ELECTRICAL TECHNOLOGY

Paper–EE-101-F

Time allowed : 3 hours] *[Maximum marks : 100*

Note : (i) ***Question No. 1 is compulsory.***

(ii) Attempt ***four*** *questions from remaining four sections selecting* ***one*** *question from each section.*

(ii) Use of non-programmable calculator is allowed.

Section–A

1. (i) Distinguish between unilateral and bilateral Network. 4

(ii) Define the terms 4

Crest and Peak factor, Active and Reactive power

(iii) Derive the emf equation for 1-phase transformer. 4

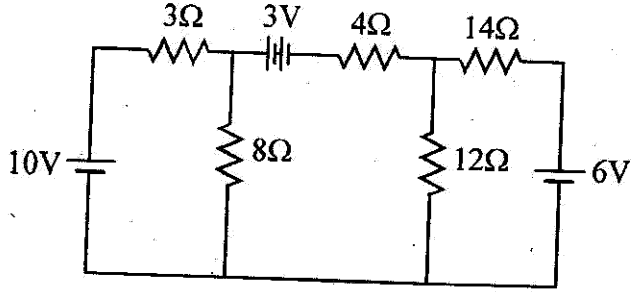
(iv) How rotor of DC motor rotate ? 4

Explain the significance of Power factor in AC

Section–B

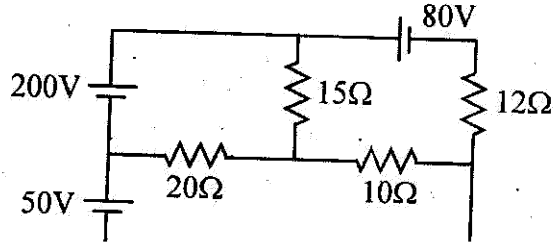
2. (a) Explain the Kirchoffs voltage law and Kirchoffs current law with some suitable example. 10

(b) Use nodal analysis to find the current in various resistors of the circuit shown. 10



3. (a) State and Explain Maximum power theorem with some suitable example. 10

(b) Using Thevenin's Theorem obtain current in 13Ω resistance. 10



Section–C

4. (a) Define and explain the term given below: 10

(i) RMS values and

(ii) Average values of an AC Sinusoidal signal

(b) A large coil of inductance 1.405H and resistance 40Ω is connected in series with a capacitor of 20μF. Calculate the frequency at which the circuit resonates. If a voltage of 100V at the corresponding frequency is applied to the circuit. Calculate the current drawn from the supply and voltage across the coil and across the capacitor. 10

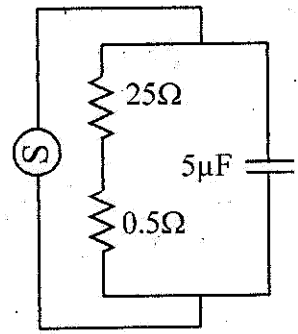
5. (a) Explain series resonance and derive its expression. 10

(b) For the circuit shown below (on page No. 4) determine : 10

(i) Resonant frequency

(ii) Total impedance of the circuit at resonance

(iii) Bandwidth



Section–D

6. (a) Explain two wattmeter method of power measurement in 3-phase AC system at balance load. 10

   (b) Derive the relation between Line Voltage and Phase Voltage, Line current and phase current for star connection in 3 phase system. 10

7. Derive the equation for voltage regulation of 1-phase transformer at Inductive load by drawing the phasor diagram. 10

Section–E

8. (a) Prove that 1-phase induction motor is not self starting. 10

   (b) Explain how the revolving flux produced in the stator of 3-phase induction motor. 10

9. Explain the construction and working of :