TEE-101 **1371**

Odd Semester Examination, 2017-18

B.TECH. (SEMESTER-I)

BASIC ELECTRICAL ENGINEERING

Time: 03:00 Hours **Max Marks: 100**

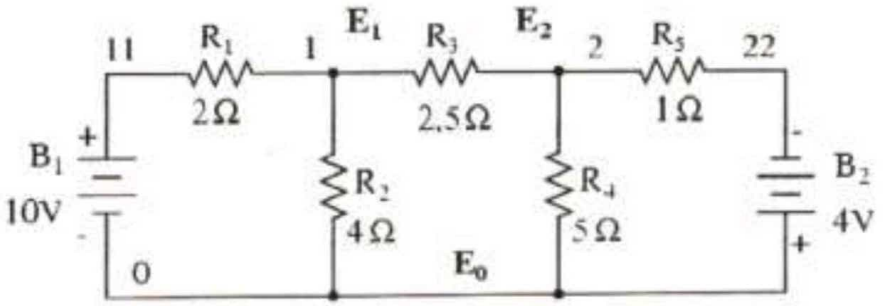
Note: Attempt **all** questions.

1. Attempt **any four** parts of the following: [5x4=20]

(a) What do you understand from true power, active power & reactive power?

(b) State and prove maximum power transfer theorem .also find the expression for maximum power.

(c) Using nodal analysis find the value of E1 & E2.



(d) What do you understand by half power frequencies? Also find the values of lower cutoff frequency (f1) and upper cutoff frequency (f2).

(e) A 100v, 60w Lamp is to be operated on 220v,50hz supply. Find the value of (i) inductance (ii) resistance that would be required in order that the lamp will run on the correct voltage. Which method is preferable and why?

(f) What do you understand by Rms and average value of a wave form? Find the Rms and average value of a sinusoidal wave.

2. Attempt **any four** parts of the following: [5x4=20]

(a) Relation (using phasor diagram) between line voltage and phase voltage and line and phase current in balanced delta connection.

(b) Two wattmeter method for 3- phase power measurement for balanced star connection using phasor diagram

(c) A three phase 400v, 50hz ac supply is feeding a three phase delta load with each phase having a resistance of 25 ohm and inductance of 0.15H and a capacitor of 120 μf in series .find the line current, volt amp, active power & reactive volt amp.

(d) Write short note on :

(i) Difference between magnetic and electric circuit

(ii) Types of torque

(e) Define attraction type moving iron instrument?

(f) Explain single phase dynamometer type wattmeter with diagram

3. Attempt **any two** parts of the following: [10x2=20]

(a) Explain following:

(i) Principle & working of transformer

(ii) Types of losses

(iii) Condition of maximum efficiency

(b) Explain :

(i) Draw the exact equivalent circuit of the loaded transformer and draw the phasor diagram of practical transformer for lagging power factor.

(ii) A primary and secondary winding of a transformer have resistance of 7.8Ω & 0.0085 Ω .the transformer draws no load current of 0.328A at p.f of 0.3 lagging . calculate the efficiency at full load if the power factor of the load is 0.8 lagging

(c) A Single phase transformer gave following test result:

Rating =200kVA, 2000/440V, 50 Hz

O.C TEST: 2000V, 1.8A, 1.75K.W

S.C TEST: 13V, 300A, 1kW

Determine equivalent circuit parameter of the transformer

4. Attempt **any two** parts of the following: [10x2=20]

(a) Describe the construction and working principal of three phase synchronous motor. Explain why it is not self staring?

(b) A 400v dc motor running at 1200 rpm takes armature current of 32.8A. ra= 0.5AA, if the load is increasesd by 10%. Find (i) Ia (ii) speed (iii) output of machine.

(c) Write down the construction, principle of D.C motor? What are the main speed control methods of DC motor?

5. Attempt **any two** parts of the following: [10x2=20]

(a) Explain:

(i) The torque slip and torque speed characteristic of three phase induction motor.

(ii) Why 3 phase induction motor is called asynchronous motor

(b) Explain different starting methods of single phase induction motor with diagram.

(c) Explain :

(i) Stepper motor

(ii) Principle of single phase induction motor.

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