TEE-101   237   **Printed Pages : 7**

Paper Code & Roll No. to be filled in your Answer Book

Roll No. | | | | | | | | | | | |

Odd Semester Examination-2016

B.Tech (Semester-I)

BASIC ELECTRICAL

[Time : 3 Hours]   [Maximum Marks :100]

Note : Attempt **all** questions. All questions carry **equal** marks.

1. Attempt **any four** questions :   [5x4=20]

    (a) Define.

         (i)   Unilateral

         (ii) Bilateral elements

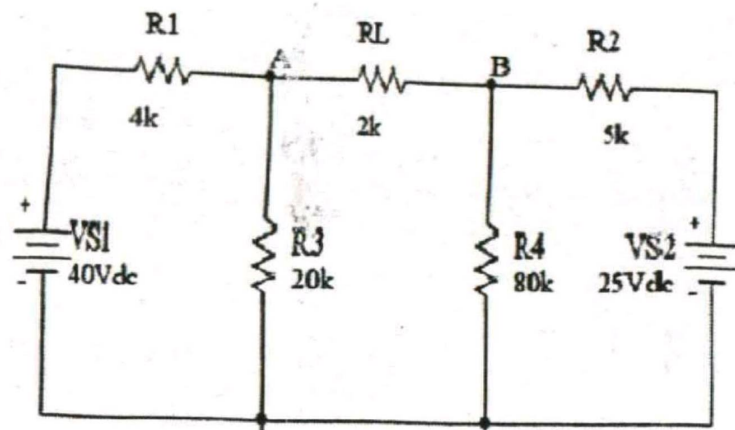   (iii) Active

         (iv) Passive elements

         (v)   MMF

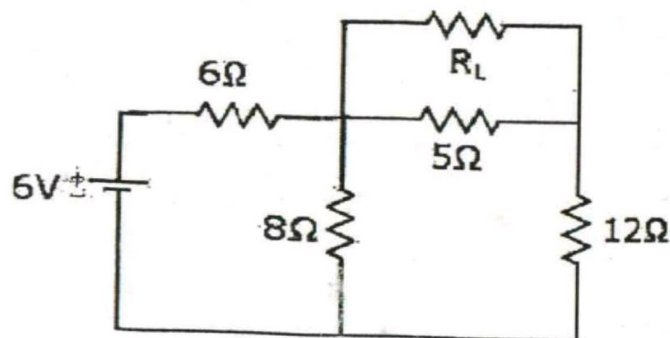   (b) State the Thevenin's theorem and solve the question using it.

(c) State and derive the maximum power transfer theorem. For the given. Calculate the value of R_L for which maximum power is transferred, also find P_{max}.

(d) Find the form factor and peak factor of an alternating wave.

(e) A coil having resistance R and inductance L have p.f=0.8 is connected in series with a capacitor of $110\mu F$. The supply frequency is 50 Hz. The potential

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difference across the coil and potential difference across the capacitor is equal. Calculate R and L.

(f) **Explain** :

    (i)   Resonance condition in RLC series circuit.

    (ii)   Difference between magnetic circuit and electric circuit

2.   Attempt **any two questions** :   [10x2=20]

(a)   **Solve** :

    (i)   Relation (using phasor digram) between line voltage and phase voltage and line and phase current in balanced star connection.

    (ii)   Three identical coils each having a resistance of $8\,\Omega$ and inductive reactance of $6\,\Omega$ are connected in star across 400v, 50 Hz. Determine :

        (i)   Line current

        (ii)   Power factor

        (iii)   Total active and reactive power.

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(b)   **Solve :**

(i)   Two wattmeter method for 3-phase power measurement for balanced star connection using phasor digram.

(ii)   A balance star connected inductive load is connected to a 400V, 50 hz supply. Two wattmeters are used to measure power indicate 8000 W and 4000W. Find the power factor and line current.

(c)   Write the construction working and mathematical expression of PMMC instruments. Also write its advantages and disadvantages.

3.   Attempt **any two** questions :   [10x2=20]

(a)   What do you understand by the term transformer? Write its construction working and principle. Also draw the phasor diagram of actual transformer on inductive load.

(b)   What are the different types of losses present in the transformer.

(i)   Also derive the condition for maximum efficiency.

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(ii) A transformer is rated at 100kVA. At full load copper loss is 1200W and its iron loss is 960W. Calculate :

(1) The efficiency at full load at unity pf.

(2) The efficiency at half load and 0.8 pf

(c) A 200 KVA, 2000/440 V, 50 Hz single phase transformer gave following test results:

O.C. Test: 2000V, 1.8A, 1.75kW

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

Calculate the equivalent circuit parameters. Percentage voltage regulation when supplying full load at 0.8 pf lagging.

4. Attempt **any two** questions : [10x2=20]

(a) Why three phase synchronous motor is not self starting. How can we make to run it as self staring motor?

(b) **Write :**

(i) Write down the voltage build-up process in DC shunt generator i.e magnetising characteristic.

(ii)   A 4 pole, 50kW, 250V DC shunt gen•,r
       with a wave wound armature has arr•e
       and shunt resistances of 0.06 ohm an0
       ohm. Find the speed at which gen•r
       should be driven if flux per pole is 3Ci**b**
       and number of conductors is 400.

(c)   What is the principle of D.C. motor? Also ex**µ**:

       (i)   The different characteristic of DC m•

       (ii)   What are the main speed control mets
              of DC machine?

5.   Attempt **any two** questions :   [10x2]

(a)   **Explain** :

       (i)   The torque slip and torque s**µ**
              characteristic of three phase induc**ɑ**
              motor.

       (ii)   What do you understand by slip and**ɔ**
              speed ? A 3 phase, 6 pole, 50 Hz induc**ɑ**
              motor with slip 5% at certain load. Fir

              (1)   Frequency of rotor

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(2) Speed of motor

(3) Speed of rotor magnetic field w.r.t

stator

(b) Why is the single phase induction motor not self starting? Also explain different starting methods of single phase induction motor.

(c) Explain

(i) Steeper motor

(ii) Working principle of three phase induction motor. Why it is called asynchronous motor.

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