

Registration No:

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Total Number of Pages: 02

B.Tech
BE2102

1st Semester Back Examination 2017-18

Basic Electrical Engineering

BRANCH: BIOTECH, CHEM, CIVIL, CSE, ECE, EEE, EIE,
ELECTRICAL, ETC, FASHION, IEE, IT, MANUTECH, MECH, METTA, MME, PE, TEXTILE

Time: 3 Hours

Max Marks: 70

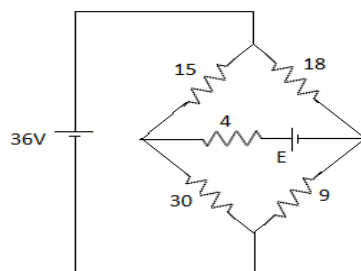
Q.CODE: B1141

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1⁰ Answer the following questions: (2 x 10)

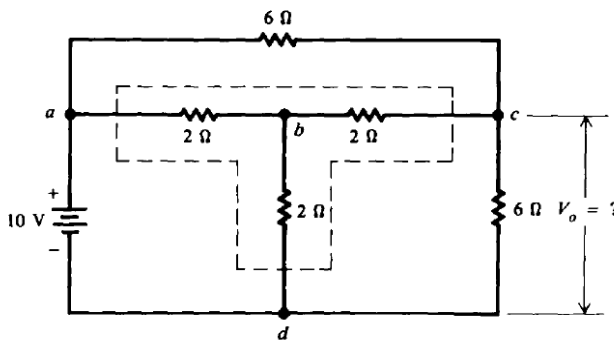
- Differentiate between the A.C. and D.C. system.
- The name plate of a meter reads '1 kwh = 15000 revolutions'. In a check up, the meter completes 150 revolutions during 50 seconds. How much power is consumed during this period ?
- A resistor of 50 ohms in series with a 0.2 H inductor is connected across a supply at 230V, 50hz. Calculate the magnitude of the steady current.
- Give the relation between phase and line for both voltage and current in a 3-phase delta connected power system.
- State and explain the Norton's theorem.
- The equation of alternating current is $i = 5 + 10\sin wt$. Find the rms current.
- A milliammeter of 2.5 ohms resistance reads upto 100 milliamperes. How much shunt resistance is to be added for measuring the voltage upto 10V. ?
- Write down the conditions for getting an ideal transformer.
- Write down the principle of operation synchronous motor.
- A 4 pole induction motor is connected to 400V, 50 Hz AC supply and is running at 1450 rpm. Find the slip of the induction motor.

Q2 a) Find the current flowing through the 4Ω resistor for the given network when E = 2V using Thevenin's theorem. (5)



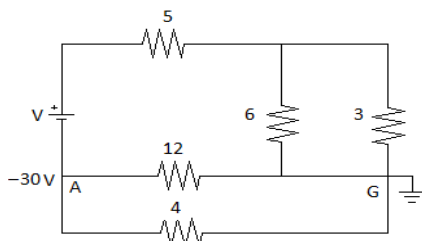
b) Derive the E.M.F. equation for D.C. generator. (5)

- Q3 a)** Find the total resistance R_T and voltage V_0 of the following circuit with a bridged T form. **(5)**



- b)** Derive the condition for maximum mechanical power developed in DC motor. **(5)**

- Q4 a)** The potential at 'A' in the given circuit is -30V. Using Kirchoff's Voltage Law, find (i) the value of 'V' and (ii) Power dissipated by 5Ω resistance. All resistances are in ohms. **(5)**



- b)** Derive the E.M.F equation of a three phase alternator. **(5)**

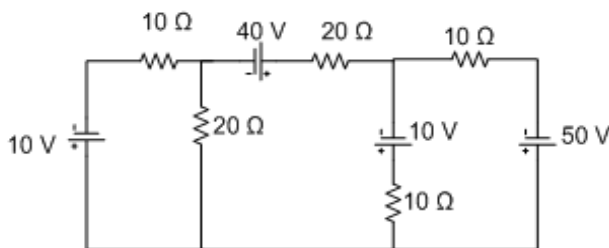
- Q5 a)** Sketch the layout of the steam power plant for power generation indicating its important accessories. **(5)**

- b)** The voltage per turn of a single phase transformer is 1.1 V. When the primary winding is connected to a 220V, 50 Hz A.C. supply, the secondary voltage is found to be 550 V. Find: (i) Primary and secondary turns. (ii) Core area if the maximum flux density is 1.1 Tesla. **(5)**

- Q6 a)** An iron ring of mean circumference of 900mm and cross-sectional area of 250mm² has flux of 500μWb. Calculate the mmf acting on the ring. An air gap of 2mm is now cut in the ring. Find the flux in the ring if the mmf remains same. A relative permeability of 1200 may be assumed. **(5)**

- b)** Derive the current growth equation for a R-L series circuit containing a DC source. **(5)**

- Q7** Differentiate between loop and mesh in a network. Find the branch currents in the network using loop current method. **(10)**



- Q8** Write short answer on any TWO:

- AD to DA conversion Circuit
- PMMC type instrument
- Torque-slip characteristic of three phase Induction Motor
- B-H curve of a magnetic material

(5 x 2)