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Reg. No. :

Question Paper Code : 40018

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Second Semester

Aeronautical Engineering

BE 8253 – BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING

(Common to Automobile Engineering/Industrial Engineering/Industrial Engineering and Management/Manufacturing Engineering/Marine Engineering/ Material Science and Engineering/Mechanical Engineering/Mechanical Engineering (Sandwich)/Mechanical and Automation Engineering/Mechatronics Engineering/Production Engineering and Robotics and Automation Engineering)

(Regulations 2017)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions.

PART – A (10×2=20 Marks)

1. State Kirchoff's laws.
2. What is Thevenin's theorem ?
3. A washing machine of 300 watts, 0.85 power factor is connected across an ac supply of 230 V, 50 Hz. Calculate the current in the circuit.
4. Write the power equation and the relation between line voltage and phase voltage of balanced three phase Y connected system.
5. Specify the different losses in a DC machine.
6. Draw the simple circuit of Capacitor Start Capacitor run motor.
7. What is forward biasing and reverse biasing in a PN junction ?
8. Draw the circuit symbol for an operational amplifier and label it.
9. State some of the applications of resistive transducer.
10. What are instrument transformers ?

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PART – B (5×13=65 Marks)

11. a) In the circuit shown in Figure 11 (a), find the current in each branch using Mesh analysis.

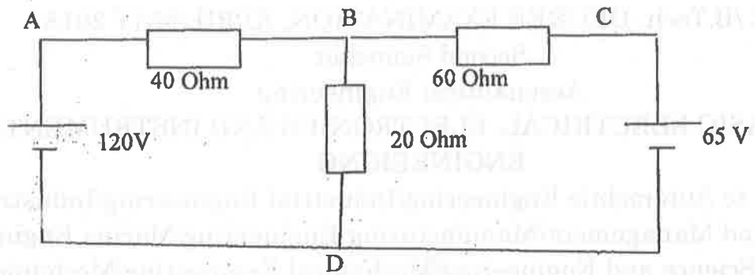

Figure 11(a)

(OR)

b) In the circuit shown in Figure 11(b), find the current in each branch using super position theorem.

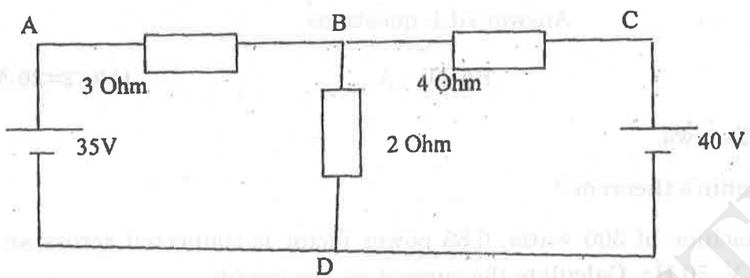

Figure 11 (b)

12. a) A balanced three phase load consists of three coils, each of resistance 8 ohm and inductive reactance of 10 ohm. Determine the line current and power absorbed when the coils are star connected, delta connected across 400 V, 3 phase supply.

(OR)

b) Explain with a neat diagram the staircase using circuit diagram.

13. a) Explain the principle of operation of a transformer with neat sketch. Also state where it is used in power system.

(OR)

b) Explain the principle of operation of a three phase induction motor with essential constructional feature. Also define a slip of an induction motor.

14. a) i) What are P Type and N Type materials and how they are obtained ? (8)

ii) What is PN Junction ? (5)

(OR)

b) What are Inverting and Non-inverting amplifiers ? Find the Voltage Gain of both amplifiers.

15. a) Explain the working principle of Hall Effect transducer. Also give some of its applications.

(OR)

b) Explain the two wattmeter method of power measurement in a three phase circuit with a neat circuit diagram.

PART – C (1×15=15 Marks)

16. a) The 3 phase 4 Wire, 75 kW LT industry draws power from the Utility Grid. 5 Amps max capacity energy meter is fixed in the industry. The current transformer having with ratio of 200/5 Amps is connected in the lines and its secondary is connected to Energy meter.

i) Why current transformer is needed ? Explain. (10)

ii) What factor to be used along with Energy meter reading to arrive the actual consumption ? Explain. (5)

(OR)

b) Find the voltage across R_L in Figure 16 (b) when (i) R_L = 1000 ohm (ii) R_L = 2000 ohm (iii) R_L = 9000 ohm. Use Thevenin's theorem to solve the problem.

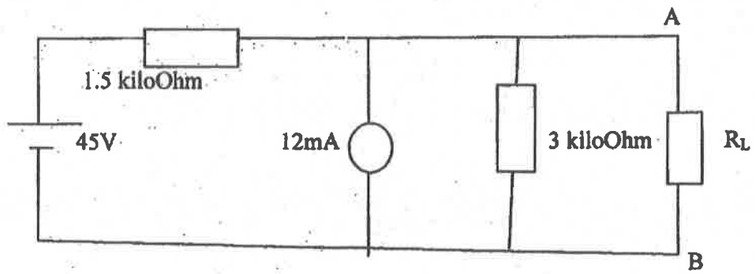

Figure 16 (b)

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