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**Question Paper Code : 23641**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Second Semester

Civil Engineering

GE 2151 — BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to All Branches)

(Regulations 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

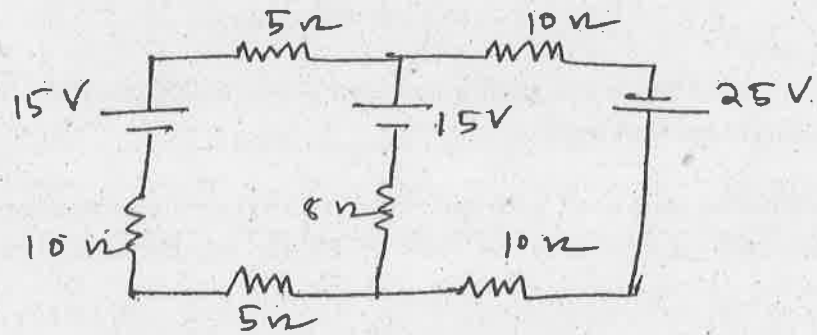
1. A  $120\Omega$  resistor has a specified maximum power dissipation of 1 W. Calculate the maximum current level.
2. Three inductive coils each with resistance of  $15\Omega$  and an inductance of 0.03 H are connected in star to a  $3\phi$  400 V, 50 Hz supply. Calculate the phase voltages.
3. Write the principle of DC motor.
4. What is meant by Transformation Ratio?
5. Give the applications of Zener Diode.
6. What are the different modes of Transistor operation?
7. Write the truth table of an Exclusive-OR gate.
8. Mention two types of D/A converters.
9. State the basic characteristic of an analog signal, with an example.
10. Give typical values of uplink frequency and downlink frequency in satellite communication.

PART B — (5 × 16 = 80 marks)

11. (a) (i) (1) State and explain Kirchoff's laws. (4)  
 (2) A sinusoidal current wave is given by  $i = 50 \sin(100\pi t)$ . Determine the root mean square value. (4)  
 (ii) Write short notes on moving Iron Measuring Instruments under the following headings :  
 (1) Operating principle. (4)  
 (2) Classification. (2)  
 (3) Advantages and disadvantages. (2)

Or

- (b) (i)  $3\phi$ , 200 kW, 50 Hz delta connected induction motor is supplied from a  $3\phi$ , 440 V, 50 Hz supply system. The efficiency and power factor of  $3\phi$  induction motor are 91% and 0.86 respectively. Calculate :  
 (1) (A) Current in each motor phase (2)  
 (B) Line current. (2)  
 (2) Phasor diagram of the circuit. (4)  
 (ii) Find the current in the  $8\Omega$  resistor in the following circuit using Kirchoff's laws. (8)



12. (a) (i) Draw the circuit diagram of the following three types of dc motors and write the relationships among the currents and voltages:  
 (1) Separately excited motor  
 (2) Series motor  
 (3) Shunt motor. (6)  
 (ii) Explain the characteristics of a d.c. shunt motor. Sketch the graphical representation of the concerned characteristics. (6)  
 (iii) A DC motor connected to a 460 V supply has an armature resistance of 0.15 ohms. Calculate  
 (1) the value of back emf when the armature current is 120 A  
 (2) the value of armature current when the back emf is 447 V. (4)

Or

- (b) (i) Explain the construction and working principle of capacitor start and capacitor run single phase induction motor. What are its advantages and practical applications? (8)  
 (ii) Explain the principle of operation of single phase transformer. (8)  
 13. (a) (i) With the help of V-I characteristics describe the working principle of zener diode. What is its symbol? Mention also the special properties of zener diode when compared to ordinary diode. (8)  
 (ii) What is the half-wave rectifier? Sketch its circuit. Discuss the operation of half-wave rectifier with help of necessary waveforms. (8)

Or

- (b) (i) Explain in brief the input and output characteristics of CE configuration of a NPN transistor. (10)  
 (ii) Compare the performance of a transistor in three different configurations. (6)  
 14. (a) Explain in detail about D Flip-Flop, T-Flip-Flop and JK Flip-Flop. (16)

Or

- (b) Explain working principle of D/A and A/D converters. (16)  
 15. (a) Explain the principle of Amplitude and Frequency modulation. (16)

Or

- (b) Draw and explain the functional block diagram of Monochrome TV transmitter and receiver. (16)