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**Question Paper Code : 71943**

18/05/17  
F2

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Second Semester

Mechanical Engineering

**GE 6252 — BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

(Common to Mechanical Engineering (Sandwich), Aeronautical Engineering, Agriculture Engineering, Automobile Engineering, Civil Engineering, Environmental Engineering, Geoinformatics Engineering, Industrial Engineering, Industrial Engineering and Management, Manufacturing Engineering, Marine Engineering, Materials Science and Engineering, Mechanical and Automation Engineering, Mechatronics Engineering, Petrochemical Engineering, Production Engineering, Robotics and Automation Engineering, Chemical Engineering, Chemical and Electrochemical Engineering, Fashion Technology, Food Technology, Handloom and Textile Technology, Petrochemical Technology, Petroleum Engineering, Plastic Technology, Polymer Technology, Textile Chemistry, Textile Technology, Textile Technology (Fashion Technology))

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

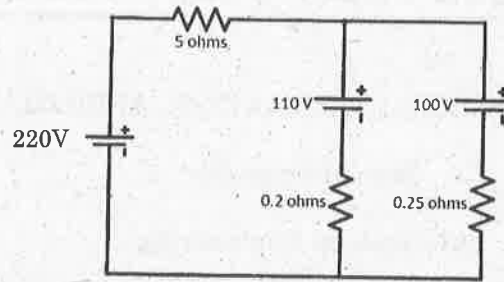
Answer ALL questions.

**PART A — (10 × 2 = 20 marks)**

1. State Kirchoff's Laws.
2. Define power factor.
3. Mentions few applications of D.C. Generator.
4. Why single phase Induction Motor is non-self-starting?
5. What do you mean by biasing?
6. Define  $\alpha$  and  $\beta$ .
7. State De Morgan's theorems.
8. Convert  $(777)_8$  to decimal.
9. List out the limitations of amplitude modulation.
10. What is the function of a satellite transponder?

PART B — (5 × 16 = 80 marks)

11. (a) (i) For the given circuit given below, calculate the magnitude and direction of current in each battery and the total current taken from the 220 V supply mains. (12)



- (ii) A coil takes a current of 6A when connected to a 24 V d.c supply. To obtain the same current with a 50Hz a.c. supply, the voltage required is 30 V. Calculate  
 (1) the inductance of the coil  
 (2) the power factor of the coil. (4)

Or

- (b) Explain the construction and working of Dynamometer type watt meter. Mention its merits and demerits. (12 + 4)

12. (a) (i) With a neat diagram explain the construction and working of D.C. Generator. (12)  
 (ii) Derive the EMF equation. (4)

Or

- (b) Explain the construction and working of single phase transformer. (16)

13. (a) (i) Explain the working of PN junction diode and mention its applications. (8)  
 (ii) Draw the circuit diagram for full wave rectifier and explain its working. (8)

Or

- (b) For the CE transistor configuration, draw the circuit and explain the input and output characteristics. (16)

14. (a) (i) Prove the Boolean identity  $AB + A\bar{B} + \bar{A}B = A + B$ . (4)  
 (ii) Explain the working of JK and D flip flops. (12)

Or

- (b) With a neat diagram explain the working of 4 bit binary ripple counter. (16)

15. (a) Short notes on  
 (i) Microwave communication. (8)  
 (ii) FAX. (8)

Or

- (b) Draw the block diagram and explain the fiber optic communication. Mention its applications. (12 + 4)