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**Question Paper Code : 51645**

**B.E/B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016**

**Second Semester**

**Civil Engineering**

**GE 2151 / 10133 EE 206/EE 1153/EE 26/080280011 – BASIC ELECTRICAL AND  
ELECTRONICS ENGINEERING**

**(Common to all Branches)**

**(Regulations 2008/2010)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. Two resistances of 4  $\Omega$  and 6  $\Omega$  are connected in parallel across 10 V battery. Determine the current through 6  $\Omega$  resistance.
2. Define RMS value.
3. Define voltage regulation of a transformer.
4. Why is starter necessary for a dc motor ?
5. Compare PN junction diode and Zener diode.
6. What is effect of saturation of a transistor ?
7. Define Flip-Flop.
8. What are the different sources of errors in DAC ?

9. As related to amplitude modulation, what is overmodulation, undermodulation and 100% modulation ?
10. Why are digital signals said to be noise immune ?

**PART – B (5 × 16 = 80 Marks)**

11. (a) (i) Explain the working of Single-Phase Energy Meter with necessary diagram. (8)
- (ii) Calculate the
- (1) Form Factor and
- (2) Peak Factor of a full wave rectified sine wave. (8)

**OR**

- (b) (i) Explain the operation of attraction type of M.I instrument. (8)
- (ii) Explain the working of Dynamometer type wattmeter with necessary diagram. (8)
12. (a) Explain the construction and working principle of DC generator with neat diagram. (16)

**OR**

- (b) Explain the working principle of various types of Single Phase (1 $\phi$ ) Induction Motor with neat diagram. (16)
13. (a) (i) With neat diagrams, explain how a voltage regulator circuit regulates the output voltage under the following conditions :
- (1) Load resistance increases (4)
- (2) Input voltage decrease (4)
- (ii) (1) Using the two diode analogy, explain why the base-emitter junction has to be forward biased to provide collector current.
- (2) Sketch a common emitter amplifier circuit with an NPN transistor. (8)

**OR**

- (b) (i) (1) Explain the avalanche effect that accounts for the reverse breakdown voltage (PIV) of a diode. (4)
- (2) What is the effect on capacitance of a PN junction diode as forward and reverse bias are applied? (4)
- (ii) (1) Explain the amplifying action of a transistor. (6)
- (2) In a CE,  $I_B$  changes from  $100 \mu\text{A}$  to  $150 \mu\text{A}$  which causes a change in  $I_C$  from  $5 \text{ mA}$  to  $7.5 \text{ mA}$ . If  $V_{CE}$  is held constant at  $10 \text{ V}$ , find  $\beta_{ac}$  ( $h_{fe}$ ). (2)

14. (a) Write short notes on : (16)
- (i) RS flip-flop
- (ii) D flip-flop
- (iii) JK flip-flop
- (iv) T flip-flop

**OR**

- (b) With necessary diagrams, explain the functioning of any one type of ADC and DAC. (16)

15. (a) Why modulation is necessary? Write in detail about frequency modulation.

**OR**

- (b) Discuss the usage of satellite for long distance communication with a neat block diagram of basic satellite transponder.