



Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Agriculture Engineering/Artificial Intelligence & Machine Learning/Artificial Intelligence (AI) and Data Science/Artificial Intelligence/Automation & Robotics/Automobile Engineering/Bio Technology/Civil Engineering/Computer Science & Engineering/Computer Science & Engineering (Artificial Intelligence & Machine Learning)/ Computer Science & Engineering (Cyber Security)/ Computer Science & Engineering (Data Science)/ Computer Science & Engineering (IOT)/ Data Science/Electrical & Electronics Engineering/Electrical Engineering/Electronics & Communication Engineering/Electronics & Electrical Engineering/Food Technology/Information Technology/Mechanical Engineering/CSE (Internet of Things and Cyber Security including Block Chain Technology)/B.Tech Computer Engg./CSE/ECE (PIT))  
(Sem<sup>-1,2</sup>)

**BASIC ELECTRICAL ENGINEERING**

Subject Code : BTEE-101-18 M.Code : 75339

Date of Examination : 15-07-22

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each. 4. Select atleast TWO questions from SECTION - B & C

**SECTION-A**

Answer the following questions in brief :

1. a) Define apparent power and reactive power of an AC circuit.  
b) What is the effect of frequency on capacitive reactance?

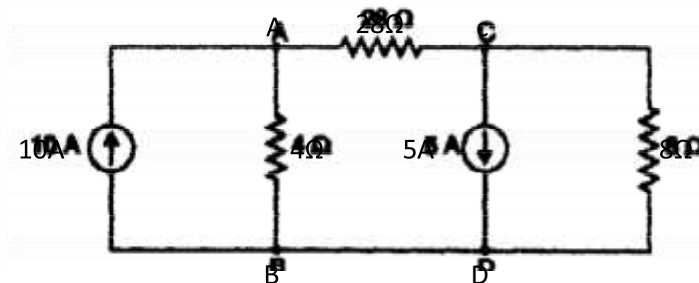
- c) A resistance of  $15\Omega$  is connected in series with an inductance of  $0.02\text{H}$ . This combination is connected across  $200\text{V}$ ,  $50\text{Hz}$  supply. Calculate (i) current flowing in the circuit, (ii) power factor.
- d) Differentiate between star and delta connections.
- e) What is series resonance?
- f) What material are used in these parts of a DC motor (i) commutator segments (ii) brushes?
- g) Define the voltage regulation for a transformer.
- h) What is admittance? Give its units.
- i) "For electric traction DC series motors are best suited". Why?
- j) List the properties of an ideal fuse wire.

SECTION-B

- 2. Derive the relationship between voltage and current for a purely inductive circuit. Also show that the average power consumed by the circuit is zero.
- 3. An alternating voltage is given as  $v = 220\sin 314t$ , determine its (i) maximum value (ii) effective value (iii) form factor (iv) value of voltage after  $0.002$  sec taking reckoning time from the instant when voltage is zero and becoming positive; (v) time after which voltage attains  $110\text{V}$  for the first time.
- 4. Discuss the principle of operation of a DC motor. Also, derive the emf equation.
- 5. Using a diagram explain the construction of an underground cable. Also write regarding is the function of each part.

SECTION-C

- 6. Distinguish between a three-phase squirrel cage induction motor and phase wound induction wound.
- 7. Find the current in  $28\Omega$  resistor using source conversion method.



- 8. For the "one time use" type of fuse what do the following convey?
  - a) Fuse Current Carrying Capacity
  - b) Breaking capacity

- c)  $I^2t$  value of fuse
- d) Rated voltage of fuse.
9. Discuss the construction of an auto-transformer and derive the expression for the copper savings in it.

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC against the Student.