

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR  
(AUTONOMOUS)**

**B.Tech I Year I Semester Regular Examinations July-2021**

**BASIC ELECTRICAL AND MECHANICAL ENGINEERING**

(Common to CE & AGE)

Time: **3 hours**

Max. Marks: **60**

(Answer all Six Units **6 X 10 = 60** Marks)

**PART-A**

**UNIT-I**

- 1 a State and explain Ohm's law. L1 5M  
 b Explain Basic circuit components in detail. L2 5M

**OR**

- 2 Explain about the Star-Delta and Delta-Star transformation. L2 10M

**UNIT-II**

- 3 State and prove the Super position theorem with example. L3 10M

**OR**

- 4 State and prove the Norton's theorem with example. L3 10M

**UNIT-III**

- 5 a Discuss about the principle of operation of DC motors. L5 5M  
 b Calculate the value of torque established by the armature of a 4-pole DC motor having 774 conductors, 2 paths in parallel, 24mwb flux per pole when the total armature current is 50A. L5 5M

**OR**

- 6 a Derive Torque equation of dc motor. L3 5M  
 b The counter emf of Shunt motor is 227 V. The field resistance is 160Ω and field current 1.5A. If the line current is 36.5A, find the armature resistance also find armature current when the motor is stationary. L5 5M

**PART-B**

**UNIT-I**

- 7 a What is casting? Briefly explain the casting process with neat sketch. L1 5M  
 b Sketch and explain the Centrifugal casting. L2 5M

**OR**

- 8 a Explain the soldering process with neat sketch L2 5M  
 b Classify the various metal joining processes with advantages. L1 5M

**UNIT-II**

- 9 a Draw a line diagram of the lathe and describe functions of main parts. L2 5M  
 b Explain the working of CNC machine with block diagram. L2 5M

**OR**

- 10 a What is planer? Explain its working principle with neat diagram. L2 5M  
 b Describe the working principle of boring machine of neat sketch. L1 5M

**UNIT-III**

- 11 a What is Automobile? Draw the layout of automobile. L2 5M  
 b Explain with neat sketch of rear wheel drive. L1 5M

**OR**

- 12 a Define air conditioning? Classify various air conditioning systems. L2 5M  
 b Write the differences between vapour compression refrigeration and vapour absorption systems. L2 5M

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