

B.Tech II Year I Semester (R15) Supplementary Examinations June 2018

**ELECTRICAL & MECHANICAL TECHNOLOGY**

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Answer all the questions  
(Use single answer booklet only)

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**PART – A**  
**(Electrical Technology)**

**UNIT – I**

- 1 (a) State and explain Kirchhoff's laws.  
(b) A circuit consists of  $2\ \Omega$ ,  $4\ \Omega$ ,  $10\ \Omega$  and  $20\ \Omega$  resistors connected in parallel. A total current of 10 A flows into the circuit, determine total resistance and current in each resistor.

OR

- 2 (a) Derive the delta-star transformation for a resistive network.  
(b) State and write the mathematical expressions for form factor and peak factor.

**UNIT – II**

- 3 (a) Derive the EMF equation of the DC generator.  
(b) Draw and explain the characteristic curves of a DC shunt generator.

OR

- 4 (a) Explain the principle of operation of DC motor.  
(b) Explain the speed control methods of DC shunt motor.

**UNIT – III**

- 5 (a) Derive the expression for EMF equation of a single phase transformer.  
(b) Explain the different losses in single phase transformer and efficiency transformer.

OR

- 6 (a) Explain the constructional details of three phase induction motor.  
(b) Explain the torque-slip characteristics of three phase induction motor.

**PART – B**  
**(Mechanical Technology)**

**UNIT – I**

- 7 (a) Define welding and classify welding processes.  
(b) Compare TIG & MIG welding processes.

OR

- 8 (a) Compare soldering and brazing process.  
(b) Explain the working of submerged arc welding process.

**UNIT – II**

- 9 (a) Compare 2 stroke & 4 stroke engines.  
(b) Explain the working of impulse and reaction turbine.

OR

- 10 (a) Explain the working of single and multistage reciprocating air compressor with a neat sketch.  
(b) Compare belt and gear drive which provides better power transmission.

**UNIT – III**

- 11 With a block diagram explain the vapour compression refrigeration system and list the common refrigerants.

- 12 List the different mechanical handling equipment and explain any one.

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