# (DCE 226)

## B.Tech. DEGREE EXAMINATION, MAY - 2015

## (Examination at the end of Second Year)

## CIVIL ENGINEERING

### Paper - VI : Fundamentals of Electrical Science & Mechanical Science

**Time : 3 Hours** **Maximum Marks : 75**

*Answer question No.1, 6 compulsory* ***(15 × 1 = 15)***

*Answer ONE question from each unit* ***(4 × 15 = 60)***

**PART - A**

***1)*** a) Define voltage and current. **(1)**

b) State the working principle for DC Generator. **(1)**

c) What is the significance of Back e.m.f. of DC motor. **(1)**

d) What are the main parts of a transformer. Name them. **(1)**

e) Define 'stress' in over head conductors. **(1)**

f) On which principle, does the transformer depends upon. **(1)**

g) Define 'power' and write its units. **(1)**

h) What is meant by Sag of a transmission line. **(1)**

**UNIT – I**

***2)*** a) Explain with the help of circuit diagram, the principle and working of half-wave rectifier. **(8)**

b) Describe the constructional features of a DC machine. **(7)**

OR

***3)*** a) What is Back E.M.F. in a D.C. motor. Derive the torque equation of D.C. motor. **(8)**

b) Explain the different types of a transformer with a neat sketch. **(7)**

## UNIT – II

*4)* a) Derive the torque equation of a 3-phase induction motor. **(8)**

b) Explain the principle of operation of alternator. Derive its induced EMF equation. **(7)**

OR

*5)* What are the different types of electrical towers and write the effects on it? **(15)**

## PART – B

## (MECHANICAL SCIENCE)

*6)* a) What is meant by slip of the belt drive? **(1)**

b) What is meant by drawing operation? **(1)**

c) Define the term soldering. **(1)**

d) What is meant by casting? **(1)**

e) Write the principle of Gas turbine. **(1)**

f) Give the classification of Gas turbines. **(1)**

g) What are the types of weldings? **(1)**

## UNIT – III

*7)* a) Show that $\frac{T_1}{T_2} = e^{\mu\theta}$ . **(10)**

b) Explain velocity ratio. Why should it can be calculated. **(5)**

OR

*8)* Briefly discuss about the principles of five manufacturing processes. **(15)**

## UNIT – IV

*9)* Derive an expression for the length of belt for an open belt drive? **(15)**

OR

*10)* a) Write about ‘multistage air compression’. State its advantages. **(8)**

b) Explain the differences between Impulse and Reaction turbine. **(7)**

❄❄❄