Printed pg.:1   **Sub Code: NEE301**

Paper Id: | 2 | 0 | 2 | 8 | **Roll No.** | | | | | | | | | | |

B. TECH
(SEM-III) THEORY EXAMINATION 2017-18
ELECTRO-MECHANICAL ENERGY CONVERSION-I

Time: 3 Hours   *Total Marks: 100*

Note: 1.   Attempt all Sections. If require any missing data; then choose suitably.
      2.   Any special paper specific instruction.

SECTION A

1.   Attempt *all* questions in brief.   2 x10 = 20
   a)   Write advantage of 3-phase transformer.
   b)   State various power losses in transformers.
   c)   Discuss the necessity of starter for DC motors.
   d)   Define energy and co-energy.
   e)   How magnetic hysteresis can be overcome?
   f)   Why the transformer ratings in KVA?
   g)   Draw the phasor diagram of an ideal transformer when loaded.
   h)   Give the classification of insulating material with their temperature ranges.
   i)   Explain singly excited system.
   j)   Why are breathers used in transformers?

SECTION B

2.   Attempt any *three* of the following: 10 x 3 = 30
   a)   Explain methods of speed control of DC shunt motors.
   b)   How to determine the efficiency of shunt machines using Hopkinson's test? Explain in detail.
   c)   Explain the transformer on no-load in detail.
   d)   Explain an ideal transformer in detail.
   e)   Describe the real transformer and equivalent circuit.

SECTION C

3.   Attempt any *one* part of the following: 10 x 1= 10
   a)   Derive the EMF equation and torque equation of DC machine.
   b)   Explain an armature reaction in detail.

4.   Attempt any *one* part of the following: 10 x 1= 10
   a)   Illustrate the characteristics of DC generators.
   b)   Define starting of DC motors and braking of DC motors.

5.   Attempt any *one* part of the following: 10 x 1= 10
   a)   Explain energy in magnetic system, field energy and mechanical force.
   b)   Describe the multiply-excited magnetic field systems.

6.   Attempt any *one* part of the following: 10 x 1= 10
   a)   Explain the excitation phenomenon and harmonics in transformers.
   b)   Describe Parallel operation of single phase and three phase transformers.

7.   Attempt any *one* part of the following: 10 x 1= 10
   a)   Explain Efficiency, Merits, demerits and applications of an auto-transformer.
   b)   With the help of circuit connection and phasor diagram, explain the Scott connection feeding a 2-Phase balanced load at 0.70 p.f. lagging.