***C-14 -AEI -302***

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING**

**MODEL PAPER -I**

**ELECTRICAL MACHINES**

[Time: 3 Hours] [Total Marks: 8**0]**

 **PART – A 10x 3 = 30**

**Instructions :** *(1) Answer all questions. Each question carries two marks.*

1. *Answer should be brief and straight to the point and shall not*

*exceed five simple sentences.*

1. State the Operating principle of DC Motor.
2. State the EMF Equation of DC Generator.
3. List the Various Losses in DC Machine.
4. Define Efficiency of a Transformer.
5. State the condition for maximum efficiency of a 1-Ф Transformer
6. Define (i) Slip Speed (ii) Slip.
7. List the applications of 3-Ф Induction motor.
8. Define (i) Pitch factor (ii) Distribution factor of armature winding
9. List the applications of synchronous motor.
10. State working Principle of Repulsion motor.

 **PART – B 5 x10 = 50**

**Instructions :** *(1) Answer any five questions. Each question carries ten marks*

1. *The answers should be comprehensive and the criteria for valuation the content but not the length of the answer?*
2. Explain Operation of 3-point starter with neat sketch. (10)
3. Explain the speed control methods of DC Motor by (5+5)
4. Armature control method
5. Field control method.
6. Explain O.C. and S.C. tests on a 1-Ф Transformer . (5+5)
7. (a) State the E.M.F. equation of a 1-Ф Transformer. (5+5)

(b) A 1-Ф transformer has 400 primary and 1000 secondary turns, the net cross

 sectional area of the core is 60cm2. Maximum flux density in the core is

 0.976wb/m2 .If the primary winding is connected to 50Hz supply. Calculate the

 primary induced voltage .

15) Explain the working principle of 3-Ф induction motor. (10)

16) . Explain the Constructional details of squirrel cage and slip ring induction motor (10)

17) Explain the working principle of an alternator. (10)

18) (a) List the applications of synchronous motor. (5+5)

 (b) Explain the working principle of stepper motor.

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**STATE BOARD OF TECHNICAL EDUCATION & TRAINING**

**MODEL PAPER -II**

**ELECTRICAL MACHINES**

[Time: 3 Hours] [Total Marks: **80]**

 **PART – A 10x 3 = 30**

**Instructions :** *(1) Answer all questions. Each question carries two marks.*

*(2) Answer should be brief and straight to the point and shall not*

*exceed five simple sentences.*

 1.state the working principle of a DC motor.

 2. state the need of a starter in a DC motor

 3. Classify DC Generators based on excitation .

 4. List the various losses in a 1-Ф Transformer.

 5. Define transformer.

 6. State the Torque equation of 3-Ф Induction motor.

 7. Draw the Circuit diagram for

 (i) Capacitor start Induction motor (ii) Capacitor Run Induction motor.

 8. State the EMF equation of an alternator.

 9. Explain the terms

 (i) Synchronous Impedance (ii) Voltage Regulation.

 10. List the applications of universal motor.

 **PART – B 5 x 10 = 50**

**Instructions :** *(1) Answer any two questions. Each question carries seven marks*

 *(2) The answers should be comprehensive and the criteria for valuation is the*

 *content but not the length of the answer?*

11. Explain the constructional details of DC Machine (10)

12. (a) State the EMF Equation of a DC Generator. (5+5)

 (b) A 4-Pole, 1200rpm, Lap wound dc generator has 760 conductors if the flux per

 pole is 0.02wb, calculate the EMF generated of Generator.

13.Explain the Working Principle of a 1-Ф Transformer. (10)

14. (a) Define Efficiency of a 1-Ф Transformer . (3+7)

 (b) A 400 KVA transformer has an iron loss of 2.5 KW and Copper Loss of 7.2KW,

 the primary and secondary voltages are 5000 V and 320 V respectively. If the power

 factor of the load is 0.85 lagging, determine the efficiency of the transformer on full

 load,.

15.Explain the Constructional details of squirrel cage type and slip ring induction motor. (10)

16. Explain torque-slip characteristics of 3-Ф induction motor. (10)

17. Derive the EMF Equation of an alternator. (10)

18.(a) Mention the starting methods of synchronous motor. (3+7)

 (b) Explain the working principle of universal motor.