Register Number: …….

**B.E.DEGREE EXAMINATIONS: NOV/DEC 2010**

Third Semester

**ELECTRONICS AND COMMUNICATION ENGINEERING**

U07EC301: Electrical Machines and Power System

**Time: Three Hours** **Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. Which of the following DC motor will have least percentage of current $i_i$ for the same percentage in torque?

   a) cumulative compound b) differential compound c) series d) shunt

2. In a DC compound motor four point starter is employed

   a) decrease $I_f$ b) increase $I_f$ c) equal to $I_f$ d) not to affect when the $I_f$ changes

3. Efficiency of power transformer around

   a) 50% b) 60% c) 80% d) 95%

4. In a transformer circuit more core loss is respect as

   a) series R b) series L c) shunt R d) shunt L

5. Three phase induction motor with rotor circuit open will

   a) run normally b) get over heated c) not run d) makes noise

6. Actual speed of rotation of rotor of an induction motor is given as

   a) $N_S$ b) (1-S) $N_S$ c) $SN_S$ d) 0.96 $N_S$

7. A synchronous motor will deliver maximum power when load angle to

   a) internal angle is zero b) input power factor unity c) load angle 45º d) load angle is zero

8. In a synchronous motor, the rotor Cu losses me by

   a) motor input b) armature input c) supply lines d) DC source

9. 100% string efficiency is zero

   a) self-capacitance is zero b) shunt-capacitance is maximum

   c) self-capacitance is maximum d) shunt-capacitance is zero

10. The domestic load that has unity power factor is

    a) fan b) mixer c) tube d) filament lamp

**PART B (10 x 2 = 20 Marks)**

11. Will a DC shunt motor operate on an AC supply?

12. Which is the dominant field winding in a compound DC machine?

13. What functions are performed by instrument transformer?
14. What are the advantages of back to back test in determining the efficiency of a transformer?
15. How does a double squirrel cage induction motor operate (i) at starting (ii) under running condition?
16. Why does ordinary DC series motor not function satisfactorily on AC supply?
17. What do you mean by hunting of a synchronous motor?
18. Mention the advantages and disadvantages of various types of stepper motor.
19. Why is the overall efficiency of a steam power station very low?
20. What are the usual AC voltages in the line of power system?

**PART C (5 x 14 = 70 Marks)**

21. a) (i) Explain in detail about the construction and working principle of a DC motor. (7)

(ii) Obtain the characteristics of a DC motor and also mention its losses. (7)

**(OR)**

b) (i) Explain the various methods of control the speed of the DC motors (7)

(ii) What is the necessity of a starter in a DC motor? Explain any one type of the starter? (7)

22. a) (i) Write down the working principle of a transformer and also derive its EMF equation (10)

(ii) A single phase 25 Hz transformer has 50 primary turns and 600 secondary turns. The cross sectional area of the core is 400 sq.cm. If the primary of the transformer is connected to 230V supply. Find (i) secondary induced emf (ii) maximum flux density in the core.

**(OR)**

b) (i) Write short notes on

(1) Core loss in single phase transformer (4)

(2) Copper loss in single phase transformer (3)

(ii) Explain about the open circuit and short circuit test on single phase transformer with suitable diagram (7)

23. a) Explain the construction and working principle of a variable reluctance stepper motor in one phase ON mode and two phase ON mode with truth table and necessary diagram. (7)

**(OR)**

b) Write short notes about the principle of operation of

(i) Reluctance Motor (7)

(ii) Repulsion Motor (7)

24. a) (i) Explain the principle of operation of a three phase induction motor using double field revolving theory? (10)

(ii) Obtain the speed-torque characteristics of a three phase induction motor. (4)

**(OR)**

b) (i) Explain the Auto-Transformer starting and Stator resistance starting methods for three phase Induction motors. (7)

(ii) With neat diagram explain split phase starting and capacitor start & run starting methods for single phase induction motor. (7)

25. a) Discuss any one electrical power generating methods.

**(OR)**

b) (i) What is sub-station? Discuss the different ways of classifying various sub-stations? (7)

(ii) Discuss the advantages and disadvantages of EHVAC and EHVDC in transmission system. (7)

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