KUMARAGURU
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Register Number: …….

B.E DEGREE EXAMINATIONS: MAY 2015

(Regulation 2013)

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

UI3EIT304: Electrical Machines and Control Devices

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The generators that are used in welding applications are
   a) Shunt b) Series
   c) Cumulative compound d) Differential compound
2. …….. motors are called constant speed motors.
3. The ratio of rotor copper loss to rotor input
   a) 1:s b) s:1
   c) s:s-1 d) s-1:s
4. The induction motor cannot be run at …… speed
5. The maximum efficiency of a transformer occurs when
   a) Iron loss = hysteresis loss b) Copper loss = eddy current loss
   c) Iron loss = copper loss d) hysteresis loss = eddy current loss
6. There are no ……..losses in the transformer
7. Overload relays are of …… type
   a) induction b) Solid state
   c) electromagnetic d) All the above
8. Relay with inverse time characteristics will operate within …….. seconds
9. Which of the following synchros are used for error detection in a servo control system
   a) Control transmitter b) Control transformer
   c) Control receiver d) Both a and c
10. Wave excitation of a stepper motor results in …….

PART B (10 x 2 = 20 Marks)

(Not more than 40 words)

11. What is the principle of operation of DC generators?
12. What is the function of yoke in DC machines?
13. Why is a synchronous motor not self starting?
14. Give the advantages of slip ring induction motors.
15. Why is the secondary of a CT always short circuited?
16. Why transformers are rated in KVA?
17. What is a relay?
18. Define operating time of a relay.
19. What are the differences between ac and dc series motor?
20. What are the advantages of brushless DC motor?

PART C (5 x 14 = 70 Marks)

(Not more than 400 words)

Q.No. 21 is Compulsory

21. Explain why a single phase induction motor is not self starting, using Double field revolving theory. Also explain the working of different types of induction motors with neat sketches.

22. a) i) Explain the constructional features of DC Machines with neat diagrams. (7)

ii) Explain the performance characteristics of different types of dc generators with neat sketches. (7)

(OR)

b) i) Derive the torque equation of a DC Motor. (7)

ii) Explain the performance characteristics of different types of dc motors with neat sketches (7)

23. a) i) Explain the operation of a transformer on load with neat phasor diagrams. (7)

ii) Explain the reasons for the voltage drop in transformers and thereby derive its equivalent circuit. (7)

(OR)

b) i) Explain the different types of three phase transformer connections. State the advantages and disadvantages of each type. (7)

ii) Explain the construction and working of Current and Potential transformers. (7)

24. a) Explain with neat diagrams the different types of switches and their applications.

(OR)

b) Explain with neat diagrams the different types of electromechanical relays and their applications.

25. a) With neat sketches explain the construction, principle of operation and working of a Variable reluctance stepper motor.

(OR)

b) With neat sketches explain the construction, principle of operation and working of Synchros.

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