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B.Tech. 7th Semester (F) Scheme (EE) Examination,

December-2018

ELECTRIC DRIVES & CONTROL

Paper-EE-403-F

Time allowed : 3 hours] *[Maximum marks : 100*

Note : ***Question no. 1 is compulsory.*** *Attempt* ***one*** *question from each of* ***four*** *sections.*

1. (a) Compare ac and dc drive.

(b) Define Steady state stability. What is the condition for the system's steady state stability?

(c) What are the advantages of microprocessor based control of electric drive over dedicated hardware control.?

(d) Why is short time rating higher than continuous rating ? 4×5=20

Section-A

2. (a) Define Electric Drive. Discuss factors to be taken into account in selecting an electric drive. 10

(b) Draw and explain speed torque characteristics of DC motor. 10

3. (a) Explain different modes of operation of an electric drive. 10

(b) Why feedback loops are required in an electric drive ? Explain closed loop speed control scheme. 10

Section-B

4. Explain the term load equalisation. How is it done ? Derive the formula for moment of inertia of flywheel. 20

5. (a) Explain multiquadrant operation of electric drive with the help of suitable example. 10

(b) The temperature of an electric motor is 54° C after one hour of full load operation and 67° C after two hours of full load operation. When disconnected after a long period of running the temperature falls to 40° C in 2.7 hours. Find

(i) final Steady state temperature

(ii) heating time constant

(iii) cooling time constant

Assume ambient temperature equals to 30° C. 10

Section-C

6. Draw the circuits and explain working of : 20

(a) Single phase semi converter dc motor drive.

(b) Three phase fully controlled converter drive

7. (a) Explain BLDC drive. Mention advantages of brushless dc motor over conventional dc motor. 10

(b) Explain Switched Reluctance motor drive. Write advantages and disadvantages of the same. 10

Section-D

8. (a) Describe stator voltage control technique of Three phase Induction motor. 10

(b) Explain Dynamic and Regenerative braking of three phase induction motor. 10

9. What is Slip power recovery ? Explain speed control of induction motor using slip energy recovery scheme. 20