

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

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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

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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