

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
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B. Tech 5th Semester Examination
Electrical Drives & Fact Devices (OS)
EE-5003

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : All the questions carry equal marks. Attempt five question in total while selecting one question each from sections A, B, C and D. Section-E is compulsory. Answers to the questions should be precise and to the point.

SECTION - A

1. (a) What are the characteristics of load torque? (5)
(b) Write a short note on:
(i) application of drives in electrical fraction.
(ii) textile mills. (10)
(c) Derive the torque equation for different types of load. (5)
2. (a) Explain the process of torque production in variable reluctance motor drive. (10)
(b) Explain in detail the dynamic simulation of the speed controlled dc motor drive. (10)

SECTION - B

3. (a) Draw the circuit of a 3- ϕ cycloconverter and explain the operation of it. (10)

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- (b) Mention the merits and demerits of VSI and CSI. (5)
- (c) Discuss the operation of modified MC Murray inverter with necessary waveforms. (5)
4. (a) Why chopper based dc drives gives better performance than rectifier controlled drives? (5)
(b) Explain the operation of chopper controlled DC drives and draw its speed-torque characteristics with necessary equation and determine its performance. (15)

SECTION - C

5. (a) What are the factors which limit the loading capabilities of transmission line? Explain. (10)
(b) Describe the capabilities of series compensation in improving transient stability, power oscillation damping and voltage stability. (10)
6. (a) What is "Series Compensation" in transmission system? (10)
(b) With the help of line diagram, discuss the impact of series compensation on a power system. (10)

SECTION - D

7. Explain series compensation method for reactive power compensation in transient state stability. (20)
8. A dc shunt motor has the armature resistance of 0.04Ω and the field winding resistance of 10Ω . Motor is coupled to an overhauling load with a torque of 400 Nm. Following magnetisation curve was measured at 600 rpm.

Field current, A	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25
Back emf, V	25	50	73.5	90	102.5	110	116	121	125	129

Motor is braked by self-excited dynamic braking with a braking resistance of 1Ω . At what speed motor will hold the load?

(20)

SECTION - E

9. (a) What is the purpose of free wheeling diode? (2)
- (b) Why the power factor of a converter circuit is poor? (2)
- (c) What is the effect of source inductance in rectifier? Give equation. (2)
- (d) Explain Hysteresis current controller. (3)
- (e) Application of drives in steel mills and its characteristics. (3)
- (f) Write short note on overlap angle. (2)
- (g) What are different types of facts controllers? Explain any of it. (3)
- (h) Explain importance of controllable parameter in transmission system. (3)