[Total No. of Questions - 9] [Total No. of Printed Pages - 2]
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B. Tech 5th Semester Examination

Electrical Drives and Fact Devices (O.S.)

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 questions in total while selecting one question each from section 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 advantages of electrical drive over mechanical drive? **(5)**

   (b) Explain the status of DC and AC drive. **(5)**

   (c) Briefly classify the power modulators. **(10)**

2. (a) Explain voltage fed current regulated inverter drive with torque and flux control of induction motor. **(10)**

   (b) Explain the different control strategies employed for synchronous motor drive. **(10)**

SECTION - B

3. (a) What are the applications of cyclo converter? What are the effects of load inductance on the performance of cyclo converter? **(10)**

   (b) Explain the voltage control of single phase inverter with the help of wave forms. **(10)**

4. (a) Explain the 1-phase bridge voltage source converter. **(10)**

(b) Describe the fundamental and harmonic voltages for a 1-phase bridge converter.

SECTION - C

5. (a) Why transmission interconnections are necessary and what are the major constraints of todays power system? **(10)**

(b) Can fact technology provide solutions to the above constraints, if so discuss them in detail. **(10)**

6. (a) What are the series compensation schemes available using thyristor? **(10)**

(b) Describe the principle of operation of thyristor controlled series compensator (TCSC). **(10)**

SECTION - D

7. (a) Explain TCR-FC (Thyristor Controlled Reactor with Fixed Capacitor) in transient state reactive power compensations. **(10)**

(b) Explain the different types of reactive power characteristics. **(10)**

8. Explain the need of Electrical Breaking? What are the types of electrical breaking? Explain in detail. **(20)**

SECTION - E

9. (i) In SPWM for power factor improvement, Derive the following:

(a) displacement angle **(3)**

(b) supply power factor **(3)**

(c) displacement factor **(3)**

(d) harmonic factor **(3)**

(ii) What do you understand by synchronous load? Explain. **(3)**

(iii) Explain the application of drives in textile mills and its characteristics. **(3)**

(iv) Describe the efficiency optimization control by flux program of induction motor drive. **(2)**