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Roll No .....

EE-8301 (GS)

B.E. VIII Semester Examination, June 2020

Grading System (GS)

Advanced Electrical Drives

(Elective-III)

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. What do you understand by Brushless drives? Explain the operation of permanent magnet Brushless drive.

2. What are the strategies of a chopper controlled dc motor drive? Explain the operation of two quadrant chopper fed dc shunt motor with suitable waveforms.

3. A 220V, 1200 rpm, 15A separately excited motor has armature resistance and inductance of Ω8 and 32 mH respectively. This motor is controlled by a single phase fully-controlled rectifier with an ac source voltage of 230V, 50 Hz. Identify the modes and calculate developed torque for :

   (i) $\alpha = 60^{o}$ and speed = 450 rpm

   (ii) $\alpha = 60^{o}$ and speed = 1500 rpm

4. A 220V DC voltage supplied converter feed 110V DC shunt motor. Draw and explain motor characteristics affected by converter.

5. A three phase fully controlled bridge rectifier is supplied from a 415V, 50Hz supply having an inductance of 1.5mH. The converter load consists of a resistance of 5Ω and a large inductance causing perfect smoothing. Calculate the average value of load current and voltage for firing angles of $\alpha = 0°$ and $\alpha = 60°$. What are the overlap angle.

6. Explain the effects of power electronic equipments on load side and supply side.

   OR

   List the different types of drives. What do you understand by constant torque and constant power.

7. A 220V, 1500rpm, 50A separately excited motor with armature resistance of 0.5Ω is fed from a 3-phase fully controlled rectifier. Available ac source has a line voltage of 440V, 50 Hz. 50

   A star-delta connected transformer is used to feed the armature so that motor terminal voltage equals rated voltage when converter firing angle is zero.

   (i) Calculate transformer ratio.

   (ii) Determine the value of firing angle when :

   Motor is running at 1200 rpm and rated torque.

8. Write short notes on any two :

   a) Vector control technique for synchronous motor

   b) Sensorless operation of induction motor

   c) Different types of sensors and transducers

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