

B.Tech. SEM -VII Electrical 2014 Course (CBCS) : SUMMER - 2019

SUBJECT: AC-DC DRIVES

Day: Thursday
Date: 09/05/2019

S-2019-2809

Time: 02.30 PM TO 05.30 PM
Max. Marks: 60

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to right indicate **FULL** marks.
- 3) Assume suitable data if necessary.

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- Q.1** a) Write a note on load equalization. (05)
b) What is the selection criterion of drives for certain application? (05)
- OR**
- a) What are the advantages of electrical drives over other types? (05)
b) What are the different components of electrical drives? (05)
- Q.2** a) Draw and explain about rheostatic braking. (05)
b) Write a note on regenerative braking. (05)
- OR**
- a) Discuss drawback of plugging in case of 3 phase induction motor. (05)
b) Why DC dynamic braking is advantageous as compared with other braking types? (05)
- Q.3** a) A 200 V, 875 rpm, 150 A separately excited DC motor has an armature resistance of 0.06 Ω . It is fed from 1 phase fully controlled rectifier with an AC source voltage of 220 V, 50 Hz. Assuming continuous conduction, calculate firing angle for rated torque and 750 rpm. (05)
b) Explain with necessary sketch the closed loop speed control below and above the base speed. (05)
- OR**
- a) Explain chopper control of DC series motor with motoring and regenerative braking action. (05)
b) What do you mean by continuous conduction mode? (05)
- Q.4** a) Explain why CSI fed induction motor drive is operated at constant rated flux? (05)
b) What are the advantages of static rotor resistance control over conventional methods of rotor resistance control? (05)
- OR**
- a) What are relative merits and demerits of VSI & CSI of induction motor? (05)
b) Explain why variable frequency control of induction motor is more efficient than stator voltage control? (05)
- Q.5** a) Constant speed drive has duty cycle: (i) load rising from 0 to 400 kW in 5 min. (ii) Uniform load of 500 kW for 5 min. (iii) Remains idle for 2 min. Estimate power rating of the motor of using a motor of wrong rating. (05)
b) State and explain disadvantages of using a motor wrong rating. (05)
- OR**
- a) What are the energy saving methods for induction motor drive? (05)
b) Explain why a motor of small rating is selected for short time duty? (05)
- Q.6** a) Describe an efficient unipolar drive for stepper motors. (05)
b) Explain centrifugal drive in case of sugar mills. (05)
- OR**
- a) Explain what type of drives are required in machine tool applications? (05)
b) Explain four quadrant operation of drives used for rolling mills. (05)