GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

SM19002027

Registration No: | | | | | | | | | | |

Total Number of Pages : 1 **M.TECH**

M.TECH 2ND SEMESTER (AR 17) SUPPLEMENTARY EXAMINATIONS, APRIL/MAY 2019

ADVANCED ELECTRIC DRIVES

Branch: PE, Subject Code:MPEPC2020

Time: 3 Hours **Max Marks : 70**

PART-A (10 X 2=20 MARKS)

1. Answer the following questions.

a. What are the basic components of Electrical Drive?
b. Write basic torque equation for a motor load system.
c. What is the standard voltage of AC traction and DC traction in India.
d. Write different speed control methods for Induction motor.
e. Compare A.C drives and D.C drives.
f. Why is starting current high in a DC Motor?
g. Draw speed-time, distance-time & speed-time curve for traction.
h. What are the main features of V/f control?
i. What is meant by Voltage control in induction motor? And where it is applicable?
j. Write the classifications of PWM techniques.

PART-B (5 X 10=50 MARKS)

Answer any five questions from the following.

2. a) Explain how an induction motor is brought to stop by (i) Plugging and (ii).dynamic braking. [5]
   b) A motor drives two loads, One has rotational motion it is coupled to the motor through a reduction gear with a=0.1 and efficiency of 90%.The load has a moment of inertia of 10 kg-m^2 and a torque of 10 N-m. Other load has translational motion and consists of 1000kg weight to be lifted up at an uniform speed of 1.5 m/s. Coupling between this load and motor has an efficiency of 85% .Motor has an inertia of 0.2 kg-m^2 and runs at a constant speed of 1420 rpm .Determine the equivalent inertia referred to the motor shaft and power developed by the motor. [5]
3. a) Explain synchronous motor variable speed drives [5]
   b) Explain chopper controlled DC motor drive for motoring and braking operation. [5]
4. a) Explain speed-time, distance-time & speed-time curve for traction [5]
   b) Explain the typical control circuits for DC Series and Shunt motors [5]
5. a) Explain with neat sketch the operation of chopper fed DC Series Motor drive. Also, derive the expression for average motor current. [5]
   b) A 200 V, 10.5 A,2000rpm.shunt motor has the armature and field resistance of 0.50Ω and 400Ω respectively. Its drives a load whose torque is constant at rated motor torque. Calculate the motor speed if the source voltage drops to 175 V [5]
6. a) Explain the working of following methods with neat circuit diagram.
   i) Kramer system ii) Scherbius system. [5]
   b) Discuss the speed control of AC motors by using three phase AC Voltage regulators [5]
7. a) A 3 phase.4 pole, 415 V,50 HZ induction motor has a star connected stator. The rotor impedance at standstill is 0.1+j0.9Ω.The stator to rotor turns ratio is 1.75.calculate the external resistance per phase required in the rotor to limit starting rotor current to 60 A, using rotor resistance starter [5]
   b) Explain AC traction for PWM VSI squirrel cage IM drive. [5]
8. Write short notes on
   a) Drives for Sugar mill [5]
   b) Regenerative braking in DC motor [5]

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