QUESTION BANK

EE6351- ELECTRICAL DRIVES AND CONTROLS

UNIT – I INTRODUCTION

1).What is an electrical drives?

A drive consists of various system combined together for the purpose of motion control or movement control. Especially the drives which employ electric motors for motion control are known as Electrical drives.

2).List the elements of an electric drive system.

- Group drive
- Individual drive
- Multimotor drive

3).State the some of the advantage of an electric drive system

- Control characteristic can be manipulated as per requirements
- Availability of simple and easy speed control methods
- Electric braking can be employed in easy manner
- The operation is pollution free
- The variety of electric drives with wide range of speed, power and torque ratings are available.
- The efficiency is higher as no load losses are less.
- They have short time overload capacity.

4).List the factors affecting the selection of electric drives.

Efficiency, Braking, Limits of speed range, starting requirements, power factor, load factor, availability of supply, effects of supply variations, economical aspects, reliability of operation, environmental effects.

5).State the selection of motor based on load variation

- Continuous or constant loads
- Continuous variable loads
- Pulsating loads
- Impact loads
- Short time loads

6).State the various classes of duty

- Continuous duty
- Continuous duty, variable loads
- Short time loads
- Intermittent periodic duty
- Intermittent periodic duty with starting
- Intermittent periodic duty with starting and braking

7).What are the elements of an electric drive system?
Electrical motors and load
Power modulator
Source
Control unit
Sensing unit

8).List the types of electrical drives?
DC drives
AC drives

9).Mention the application of electrical drives?
Paper mills
Electric traction
Cement mills
Steel mills

10).Define cooling time constant?

It is defined as the ratio between C and A. cooling time constant is denoted as ‘ ’

$$= C/A$$

Where C= amount of heat required to raise the temperature of the motor boby by 1 degree Celsius in / c

A= amount of heat dissipated by the motor per unit time per degree Celsius in J/S c

11).What are the three methods of operation for electrics drive?
Steady state
Acceleration including starting
Deceleration including stopping

12).Define four – quadrant operation?

A motor operate in two modes and braking. In motoring, it converts electrical energy into mechanical energy, which support its motion. In braking it works as a generator converting mathematical energy into electrical energy and thus, opposes the motion. Motor can provide motoring and braking operations for both forward and reverse directions.

13).Compare a.c. and d.c. drives.
S.No
DC Drives
AC Drives

14) Mention the necessity of power rating?

Power rating of electric drives for particular operation is important since, following reasons.

1.To get economy with realiability

2.To obtain the maximum efficiency on their full load without any damaging.

15).what is duty factor?

The ratio of ON time(Ton) of the drive to total time period(Ton +Toff) is called duty factor.

16) What is cooling curve?

When a machine is switched off from the mains or when the load on the motor is reduced, the machine cools. The curve obtained temperature drop Vs time when the drive is switched off or load on the drive is removed.

BIG QUESTIONS

1).What is electric drive? Explain the basic elements of an electric drive system.

2).Explain the classification of electric drives.

3).Explain the various classes of duty. How it affect the selection of rating of a motor for the drive?

4).Draw a typical temperature rise –time curve and derive equation for temperature rise in an electric drive

5).Write a note on cooling curve of an electric derives, stating its expression.

6) cooling curves problems