

B.E. Seventh Semester (Electrical & Electronics Engineering) (CGS)
10399 : Utilisation of Electrical Energy : 7 EX 01

P. Pages : 2

Time : Three Hours



AU - 2911

Max. Marks : 80

- Notes :
1. Answer **three** question from Section A and **three** question from Section B.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) Define Electric drive. What are the advantages of electric drive ? Enlist its 2 application. 7
b) What are the requirements of paper mill machine drives ? 7

OR

2. a) Give the detailed classification of electrical drives. 7
b) Describe the different process and drives used in Textile Mills. 7
3. a) What is the function of a flywheel in rolling mill drive ? Deduce an expression for the motor torque driving a rolling mill when equipped with a flywheel. 7
b) Define heating and cooling time constant. Draw heating and cooling curves for motor. 6

OR

4. a) Explain briefly different classes of duties of an electric motor. 7
b) A 10 HP motor has final temperature rise 20°C at normal rated load. Find the half hour rating & corresponding temperature rise if heating time constant is 30 min. Assuming losses are proportional to square of the load. 6
5. a) A d.c. series motor runs at 500 rpm on 220 V supply draws a current of 50 A. The total resistance of machine is $0.15\ \Omega$. Calculate the value of extra resistance to be connected in series with the motor circuit to reduce the speed to 300 rpm. The load torque being half of the previous value. Assume flux proportional to current. 6
b) Compare the characteristics of D.C. series & D.C shunt motor. Hence enlist applications of each. 7

OR

6. a) Describe any one type of breaking for a d.c. shunt motor. 7
b) Enlist different types of single phase motor. Draw its characteristics and suggest application on these motor. 6

SECTION - B

7. a) An electric train has an average speed of 42 kmph on level track having stops 1400 meters apart. Train is accelerated at 1.7 kmphs and braked at 3.3 kmphs. Draw speed time curve. 7

b) State and explain advantages 25 kV, 50 Hz AC system of track electrification. 7

OR

8. a) Define Crest Speed, Average Speed & Schedule Speed. Discuss the factor which affects the Schedule Speed. 7

b) What are the requirements of ideal traction system ? 7

9. a) Two 600 V DC series motor of coach are started by series-parallel method with the current per motor being 350 A, during starting time of 20 sec and each motor has 0.15Ω resistance. Calculate : 7

i) Energy lost in starting rheostat

ii) Energy lost in motor

b) Explain the various transition methods. 6

OR

10. a) Explain how locomotive are classified. What are the different types ? 6

b) Explain general features of traction motors. 7

11. a) What is induction heating ? State the factors affecting choice of frequency in induction heating. 6

b) A class room of size 30 m x 30 m is to be illuminated with 75 lux. The lamps are required to be hung 5 meter above the working plane. Assume space height ratio between 0.9 to 1.0. Utilization factor of lamp = 50%, Depreciation factor = 80%, Lamp efficiency = 15, Lumens/watt. Calculate the number & rating of lamp. 7

OR

12. a) Define & explain following terms briefly - 6

i) Glare

ii) Space Height Ratio

iii) Depreciation factor

iv) Candle power

b) Write a short note on street lighting. 7
