Code No: K0221 **R07** **Set No. 1**

IV B.Tech. II Semester Regular Examinations, April - 2013

UTILIZATION OF ELECTRICAL ENERGY

(Electrical & Electronics Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
****

1. a)Discuss the advantages and the disadvantages of the electric drive over the other drives. [8]
   b) Compare group drives and individual drives. [8]

2. a) What are the advantages and disadvantages of direct and indirect arc furnaces? [8]
   b) A piece of an insulating material is to be heated by dielectric heating. The size of the piece is 10 x 10 x 3 cm^3 . A frequency of 30 mega cycles is used and the power absorbed is 400 W. Determine the voltage necessary for heating and the current that flows in the material. The material has a permittivity of 5 and a power factor of 0.05. [8]

3. a) What are the differences between resistance welding and arc welding. [8]
   b) Explain with neat diagrams about the principle of operation of spot and seam weldings. [8]

4. Explain the inverse square law and Lamberts cosine law of illumination from basics. [16]

5. a) Explain the construction and working principle of a fluorescent lamp [8]
   b) A room of size 10 x 4 m is to be illuminated by ten 150 W lamps. The MSCP of each lamp is 300.Assuming a depreciation factor of 0.8 and a utilization factor of 0.5. Find the average illumination produced on the floor. [8]

6. Explain Regenerative braking and further explain how it is applied to Dc series motor. [16]

7. a) Draw the speed time curve of a main line service and explain how it works.
   b) A train has a scheduled speed of 55 KMPH between two stops, which are 7 Km apart. Determine the crest speed over the run, if the duration of stops is 60 seconds and acceleration and retardation are 3KMPHPS each .Assume simplified trapezoidal aped time curve.

8. Write short notes of the following:
   a) Quadrilateral speed time curve
   b) Induction heating
   c) Florescent tubes.

Code No: K0221 **R07** **Set No. 2**

IV B.Tech. II Semester Regular Examinations, April - 2013

UTILIZATION OF ELECTRICAL ENERGY

(Electrical & Electronics Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
****

1. a) Explain the characteristics of dc series motor. [8]
   b) Classify the different types of loads with respect to duty cycle. [8]

2. a) Explain the principle of high frequency eddy current heating. [8]
   b) List some of the applications of induction heating. [8]

3. Discuss the difference between carbon and metallic arc welding. Give their relative merits and demerits. [16]

4. Define the following terms with respect to illumination:
   a) Luminous Flux b) Radiant efficiency
   c) Candle power d) Space to height ratio [16]

5. a) Explain the construction and operation of Incandescent lamp [8]
   b) A lamp of 50 W operates at 220V and power factor 0.8.Its power factor is to be corrected to unity. Determine the capacitance required for the condenser. [8]

6. Explain the Rheostatic or dynamic braking and further explain how it is applied to Dc motors. [16]

7. a) For a trapezoidal speed time curve of an electric train, Derive the expression for maximum speed and the distance between the stops.
   b) Derive expression for the tractive effort for a train on a level track.

8. Write short notes of the following:
   a) Rheostatic braking
   b) Dielectric heating
   c) Flood Lighting.

Code No: K0221 **R07** **Set No. 3**

IV B.Tech. II Semester Regular Examinations, April - 2013

UTILIZATION OF ELECTRICAL ENERGY

(Electrical & Electronics Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
****

1. a) Explain the various factors that govern the size and the rating of a motor for particular applications. [8]
   b) The rotor of a six pole,50 hz,3-phase induction motor has a resistance of 0.3 ohms per phase and speed at 960 rpm .If the load torque remains unchanged, calculate the additional rotor resistance that will reduce the speed by 20 %. [8]

2. a) Explain with a neat sketch the principle of operation of a Ajax-Wyatt induction furnace. [16]

3. a) Differentiate flash and upset butt weldings [8]
   b) Explain in brief about i) Electron beam welding and ii) Laser beam welding. [8]

4. What do you understand by polar curves? Explain Rousseau's construction for calculating mean spherical candle power (MSCP) of a lamp [16]

5. a) List the draw backs of discharge lamps. [8]
   b) An illumination of 40 lux is to be produced on the floor of a room 16 x 12 m x8m. 15 lamps are required to produce this illumination in the room; 40% of the emitted light falls on the floor. Determine the power of the lamp in candela. Assume maintenance factor is unity. [8]

6. a) List the advantages of the Electric braking over the mechanical braking. [8]
   b) Explain the concept of Plugging applied to induction motor. [8]

7. a) A train is to be run between two stations 8 Kms apart at an average speed of 45 KMPH. If the maximum speed is limited to 65 KMPH, acceleration to 3km/hr/sec, braking retardation to 4 Km/hr/sec and coasting retardation to 0.2 km/hr/sec, Find the speed at the end of coasting, duration of coasting period and braking period.
   b) Explain the Quadrilateral speed time curve with a neat labeling.

8. Write short notes of the following:
   a) Tractive effort b) Regenerative Braking c) Laws of illumination.

Code No: K0221 **R07** **Set No. 4**

IV B.Tech. II Semester Regular Examinations, April - 2013

UTILIZATION OF ELECTRICAL ENERGY

(Electrical & Electronics Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
****

1. a) What do you mean by load equalization? How it is achieved? [8]
   b) Explain how you would estimate the rating of motor for the intermittent duty cycle. [8]

2. a) Explain with a neat sketch the principle of operation of core type induction furnaces [8]
   b) List some applications of Di-electric heating. [8]

3. What are the types of electrodes used for welding operation? Give the advantages of coated electrodes. [16]

4. Define the following terms with respect to illumination:
   a) Solid angle b) Luminous Intensity
   c) Illumination d) Maintenance factor [16]

5. a) What is a stroboscopic effect? How it can be prevented in fluorescent lamp.[8M]
   b) Explain the term Energy efficient Lighting and its importance in present day scenario. [8]

6. a) List the advantages and disadvantages of Electric Traction. [8]
   b) Explain the operating characteristics of the Dc series motor [8]

7. Derive and explain the tractive effort required for propulsion of train and prove that is equal to the sum of force required for linear and angular acceleration ,force required to over come gravity, and force required to over come the resistance to the motion .

8. Write short notes of the following:
   a) Coefficient of Adhesion
   b) Plugging
   c) Polar curves.