Code No: 138FB **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, September - 2020
UTILIZATION OF ELECTRIC POWER
(Electrical and Electronics Engineering)

Time: 2 Hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks
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1.a) What are electric drives? What are the main advantages and applications of electric drives?
b) What is meant by load equalization? Discuss its purpose. [8+7]

2.a) How to choose a motor for electric drive application?
b) A motor fitted with a fly wheel that supplies a load of torque 500m for 33 sec. during no load period the fly wheel regains its original speed. The motor torque is required to be limited to 400n-m. The no load speed of the motor is 800 rpm and its full load slip is 10% determine the moment of inertia of the fly wheel. [8+7]

3.a) Explain the different methods of Electric heating and give an example of each type.
b) A slab of insulating material 150 cm^2 in area and 1cm thick is to be heated by dielectric heating. The power required is 400 W at 30 MHz. Material has relative permittivity of 5 and p.f. of 0.05. Absolute permittivity is 8.854×10^{-12} F/m. Determine the necessary voltage. [8+7]

4.a) Describe with neat sketches various methods of electric resistance welding. Give its merits and demerits with respect to arc welding.
b) Explain the difference between carbon and metallic arc welding and give their relative merits and demerits. [8+7]

5.a) State and explain different laws of illumination.
b) A lamp with a reflector is mounted 12m above the centre of a circular area of 24 meters diameter. If the combination of the lamp and reflector gives a uniform Candle Power of 1000 over the circular area, determine the maximum and minimum illumination produced on the area. [7+8]

6.a) Make a comparison between tungsten filament lamps and fluorescent tubes.
b) A lamp of 500 watts having MSCP of 1000 is suspended 2.7 meters above the working plane. Calculate i) Illumination directly below the lamp at the working plane, ii) Lamp efficiency iii) Illumination at a point 2.5 meters away on the horizontal plane from vertically below the lamp. [8+7]

7.a) What is electric traction? What are the motors used in electric traction? Discuss the merits of electric traction.
b) Discuss in details the regenerating braking scheme for electric drives. Also list their advantages and applications. [8+7]

8.a) Explain the different factors effecting the Specific Energy consumption.
b) A suburban train runs with an average speed of 36 kmph between two stations 1.8 km apart. The values of acceleration and retardation are 1.8 kmphps and 3.6 kmphps. Calculate the maximum speed of the train assuming trapezoidal speed-time curve. [8+7]

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