Code No: **R1641021** **R16** **Set No. 1**

IV B.Tech I Semester Regular/Supplementary Examinations, Jan/Feb - 2022

UTILIZATION OF ELECTRICAL ENERGY

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) List the dependent factors that will rise the temperature of the motors. [3]
   b) Explain the method by which pinch effect can be eliminated in direct core type of induction furnace. [3]
   c) Distinguish between a plane angle and Solid Angle. [2]
   d) Explain the use of Choke or ballast in a fluorescent lamp. [2]
   e) List the features of a good braking system in traction motors [2]
   f) Define the term Specific energy consumption [2]

PART–B *(4x14 = 56 Marks)*

2. a) Explain the speed control of DC Shunt motor by variation of Flux method and by variation of applied voltage method**.** [7]
   b) The rotor of an 8 pole, 50 cycle, three phase induction motor has a resistance of 0.25 Ω per phase and runs at 700 rpm. If the load torque remains unchanged, calculate the additional rotor resistance that will reduce its speed by 15%. [7]

3. a) Explain with a neat diagram the working of Ajax Wyatt vertical core type furnace. [7]
   b) Explain the process of Dielectric heating and give its application. [4]
   c) Distinguish between Seam welding and Butt welding. [3]

4. a) Explain the following lighting schemes w.r.t Illumination: [7]
      i) Direct lighting ii) Indirect lighting iii) Semi – direct lighting
      iv) Semi – indirect lighting v) General diffusing lighting
   b) Explain with a neat diagram the operation of a Sodium discharge lamp [7]

5. a) Explain the significance of LED Lighting and list its advantages. [7]
   b) A lamp giving 500 candlepower in all directions below the horizontal is suspended 4 metres above the Centre of a square table of 2 metre side. Calculate the maximum and minimum illumination on the surface of the table. [7]

6. a) List the advantages and disadvantages of Electric traction. [7]
   b) Explain the following three types of passenger services by which the type of traction system has to be selected: [7]
      i) Main line service ii) Urban or city service and iii) Suburban service

7. a) Explain the various factors that affect the schedule speed of a train [7]
   b) The distance between two stops is 1.6 km. A schedule speed of 50 kmph is required to cover that distance. The stop is of 20 seconds duration. The values of the acceleration and retardation are 4 km/h/s and 6 km/h/s, respectively. Then, determine the maximum speed over the run. Assume a simplified trapezoidal speed–time curve. [7]