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   [3]
        induction furnace.
    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 [7]
        variation of applied voltage method**.**
    b) The rotor of an 8 pole, 50 cycle, three phase induction motor has a resistance of [7]
        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%.

3. a) Explain with a neat diagram the working of Ajax Wyatt vertical core type   [7]
        furnace.
    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   [7]
        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.

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   [7]
        traction system has to be selected:
        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   [7]
        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.