R13

B.Tech IV Year I Semester (R13) Supplementary Examinations June 2018
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

PART – A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
 (a)   Define lamp efficiency.
 (b)   Define space-height ratio.
 (c)   Explain spot welding.
 (d)   Name the materials commonly used for heating elements.
 (e)   What is the main disadvantage of electric traction?
 (f)   Why A.C series motors used for traction services are designed to operate at low frequency.
 (g)   Define coefficient of adhesion.
 (h)   Define crest speed or maximum speed.
 (i)   List various energy efficient lighting controls.
 (j)   Define the demand factor.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2   What polar curves are applied to light sources? Show how these curves are used for finding in MSCP.
OR
3   A lamp fitted with 150 degrees angled cone reflector illuminates circular area of 150 meters in diameter.
        The illumination of the disc increases uniformly from 0.15 meter-candle at the edge to 1.8 meter -candle
        at the centre. Determine: (i) The total light received. (ii) Average illumination of the disc. (iii) Average c.p
        of the source.

UNIT – II

4   Explain the principle of dielectric heating and applications.
OR
5   Differentiate between DC and AC welding.

UNIT – III

6   Explain the characteristics of DC series motors and why these are used in traction?
OR
7   What are the different types of electric braking employed for bringing the train to rest? Explain clearly.

UNIT – IV

8   For a quadrilateral speed-time curve of an electric train, derive expression for the distance between stops
        and speed at the end of the coasting period.
OR
9   Calculate the specific energy consumption if a maximum speed of 12.2 m/s and for a given run of
        1,525 meters an acceleration of 0.366 m/s^2 are desired. Train resistance during acceleration is
        52.6 Newton's/1000 kg and during coasting is 6.12 Newton's/1000 kg, 10% being allowable for rotational
        inertia. The efficiency of the equipment during the acceleration period is 50%. Assume a quadrilateral
        speed- time curve.

UNIT – V

10 (a) What do you understand by power factor? Give the disadvantages of poor power factor.
    (b) What are the advantages of improved power factor?
OR
11 (a) What are waste heat recovery boilers? Explain the need and benefits.
    (b) Explain any three types of 'recuperators'.

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