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Seventh Semester B.E. Degree Examination, Jan./Feb.2021
Electrical Power Utilization

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. Briefly explain what are the advantages of electrically produced heat. (04 Marks)
- b. Explain the construction and working of AJAX-WYATT vertical core type furnace. (06 Marks)
- c. With neat sketches, explain the working of different types of resistance welding. (10 Marks)
- 2 a. State Faradays laws of electrolysis and explain, (i) Electro-chemical equivalent (ii) Current efficiency (iii) Energy efficiency. (10 Marks)
- b. Briefly explain what are the factors governing deposition process. (10 Marks)
- 3 a. A lamp having a uniform CP of 200 in all directions is provided with a reflector which directs 60 percent of total light uniformly on to a circular area of 10 m diameter. The lamp is hung 6 m above the area. Calculate the illumination (i) At the centre (ii) At the edge of the surface with and without the reflector. Determine also the average illumination over the area without the reflector. (10 Marks)
- b. What are the factors to be considered while designing the street lighting scheme? (10 Marks)
- 4 a. Describe with a circuit diagram the working of a fluorescent lamp. Enumerate its advantages and disadvantages. (10 Marks)
- b. Briefly explain the construction and working of C.F.L. lamp. (06 Marks)
- c. Write short notes on Glare and its remedy. (04 Marks)

PART - B

- 5 a. Which are the two types of simplified form of speed time curves? Derive an expression for the crest velocity in case the run is in the form of trapezoidal speed time curves. (10 Marks)
- b. A train is required to run between two stations 2 km apart an average speed of 40 km per hour. The run is to be made according to a simplified quadrilateral speed time curve. If the maximum speed is to be limited to 60 km per hour, acceleration to 2 km phps coasting retardation to 0.15 km phps and braking retardation 3 km phps, determine the duration of accelerating, coasting and braking periods. (10 Marks)
- 6 a. What do you understand by tractive effort? Derive the expression for tractive effort for, (i) Acceleration (ii) Propelling a train. (10 Marks)
- b. Define a term 'Co-efficient of adhesion' and explain the factors on which it depends. (04 Marks)
- c. A locomotive accelerates a 350-tonne train up a gradient of 1 in 100 at 0.8 km phps. Assuming the coefficient of adhesion to be 0.25, determine the minimum adhesive weight of the locomotive. Assume train resistance 45 NW per tonne and allow 10 percent for the effect of rotational inertia. (06 Marks)
- 7 a. Discuss series and parallel operation of series and shunt motors with unequal wheel diameter. Comment on the load sharing in each case. (10 Marks)
- b. Briefly explain the arrangement required for employing regenerative braking in D.C. series motors. (10 Marks)
- 8 a. With block diagram, explain configuration of electrical vehicles. (10 Marks)
- b. Briefly explain traction motor characteristics. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.