**14EE703**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular / Supplementary) DEGREE EXAMINATION** | | | |
| **January, 2021** | **Electrical and Electronics Engineering** | | |
| **Seventh Semester** | **Utilization of Electrical Power** | | |
| **Time:** Three Hours | | **Maximum :** 60 Marks | |
| *Answer ALL Questions from PART-A.* | | | (1X12 = 12 Marks) |
| *Answer* ***ANY FOUR*** *questions from PART-B.* | | | (4X12=48 Marks) |
| **Part - A** | | | |

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| 1 | Answer all questions | | (1X12=12 Marks) | |
|  | a) | Define the short time rating of motor | |  |
|  | b) | Explain the term heating time constant | |  |
|  | c) | Write the advantages of electric braking. | |  |
|  | d) | What do you mean by electric traction? | |  |
|  | e) | Define schedule speed | |  |
|  | f) | What is coefficient of adhesion? | |  |
|  | g) | What is meant by good weld? | |  |
|  | h) | For carbon-arc welding only dc can be used. Why? | |  |
|  | i) | What is pinch effect? | |  |
|  | j) | Define maintenance factor. | |  |
|  | k) | What is meant by glare? | |  |
|  | l) | Why is tungsten selected as the filament material? | |  |
| **Part - B** | | | | |
| 2 | a) | A motor has the following load cycle: Accelerating period 0-15 sec Load rising uniformly from 0 to 1000 h.p. Full speed period 15-85 sec Load constant at 600 h.p. Decelerating period 85-100 sec h.p. returned to line falls uniformly from 200 to zero Decking period 100-120 sec Motor stationary. Estimate the size of the motor. | | 6M |
|  | b) | Write short notes on load equalisation. | | 6M |
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| 3 | a) | A 40 KW motor when run continuously on full load, attains a temperature of 35oC, above the surrounding air. Its heating time constant is 90 min. What would be the ½ hour rating of the motor for this temperature rise? Assume that the machine cools down completely between each load period and that the losses are proportional to square of the load. | | 6M |
|  | b) | Explain the operation of dynamic braking applied to dc shunt motor with braking characteristics. | | 6M |
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| 4 | a) | State the system of track electrification employed for the main line services. | | 4M |
|  | b) | Sketch the typical speed-time curve for the train movement of sub-urban service and from this derive a simplified speed-time curve. | | 8M |
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| 5 | a) | A 350-tonne electric train runs up gradient of 1 percent with the following speed-time curve: i) uniform acceleration of 1.6 kmphps for 25 seconds, ii) constant speed for 50 seconds, iii) coasting for 30 seconds, and braking at 2.56 kmphps to rest. Calculate the specific energy consumption if train resistance is 50 N/tonne, effect of rotational inertia 10 percent, overall efficiency of transmission gear and motor is 75%. | | 8M |
|  | b) | Why plugging is most inefficient method of braking compared to other methods? | | 4M |
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| 6 | a) | What are the advantages of electrically produced heat? What are the properties to be possessed by the element used in resistance oven? | | 6M |
|  | b) | Write short notes on design of heating element for electric furnace. | | 6M |
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| 7 | a) | Write short notes on arc welding | | 6M |
|  | b) | What is resistance welding? What are its limitations? | | 6M |
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| 8 | a) | Explain the principle of operation of sodium vapour lamp and its advantages. | | 8M |
|  | b) | State the functions of starter and choke in a fluorescent lamp. | | 4M |
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| 9 | a) | Two powerful street lamps of 1,000 candela and 800 candela (assumed uniform in all directions) are mounted 12.5 m above the road level and are spaced 25 metres apart. Find the illumination produced at a point on the ground in-between the lamp posts and just below the lamp posts. | | 6M |
|  | b) | Short notes on incandescent lamp characteristics. | | 6M |

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