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BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL-2019

DEEE - SIXTH SEMESTER EXAMINATION

ELECTRICAL UTILISATION AND AUTOMATION

Time: 3Hrs

Max. Marks: 80

PART-A**10x3=30M**

Instructions: 1) Answer all the questions and each question carries Three marks
2) Answer should be brief and straight to the point and shall not exceed five simple sentences.

- 1) Define Luminous Flux and Illumination. 3
- 2) Define Reduction factor and Luminous intensity. 3
- 3) State any six advantages of electric heating. 3
- 4) State the methods of temperature control in resistance heating. 3
- 5) Compare Group drive and individual drive in any three aspects. 3
- 6) List the types of electric braking. 3
- 7) Define (i) Maximum speed. (ii) Average speed and (iii) Schedule speed. 3
- 8) State the methods of improving the coefficient of adhesion. 3
- 9) List the parts of PLC. 3
- 10) Distinguish between Relay based and PLC based control panels. 3

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PART-B

10x5=50M

Instructions: 1) Answer any five questions Each question carries 10 marks
2) The Answer should be comprehensive and the criterion for valuation is the content but not length of the Answer.

- 11) (a) State and explain inverse square law of illumination. 5
(b) The luminous intensity of a lamp is 200 candela and is mounted at a height of 5 m from the centre of a circular area 4 m dia. Find the maximum and minimum illumination on circular area. 5
- 12) (a) Explain direct resistance heating with a neat sketch. 5
(b) Explain the principle of dielectric heating. 5
- 13) (a) State any five factors governing the selection of electric drive. 5
(b) A motor has following duty cycle.
100 HP for 10 minutes
80 HP for 5 minutes
60 HP for 8 minutes
No load for 4 minutes
Which repeats indefinitely. Determine the suitable rating of motor. 5
- 14) (a) Explain rheostatic braking of D.C shunt motor with a neat sketch. 5
(b) Briefly explain about SCADA. 5
- 15) Derive an expression for the maximum speed, acceleration and retardation for a trapezoidal speed-time curve. 10
- 16) An electric locomotive is required to haul a train having 10 coaches each 25 tonne on a main line track. The initial acceleration is 1.2 kmph²/s up a gradient of 1.5 in 100, the permissible axle loading is 18 tonne per axle. Take rotational inertia to be 5% for coaches and 10% for locomotive. Find the adhesive weight and number of axles of locomotive, if tractive resistance is 40 N/tonne and coefficient of adhesion is 0.2. 10
- 17) (a) Explain the need of Booster transformer in electric traction. 5
(b) Explain the purpose and material used for pantograph collector. 5
- 18) Draw the block diagram of PLC and explain each part. 10