Seat No.:

# Enrolment No. **GUJARAT TECHNOLOGICAL UNIVERSITY** ME - SEMESTER- II(Old course) • EXAMINATION (Remedial) - WINTER- 2015

**Total Marks: 70** 

[7]

[7]

#### **Subject Code: 1720711** Date: 15/12/2015 Subject Name: ELECTRICAL POWER UTILIZATION

Time: 2:30 pm to 5:00 pm Instructions:

# 1. Attempt all questions.

2. Make suitable assumptions wherever necessary.

# 3. Figures to the right indicate full marks.

Q.1 (B) Write a complete note with neat diagram on Direct core type and coreless type induction furnace. [7]

Q.1 (B) What are the various applications of electrolysis? Explain extraction of metals. [7]

Q.2 (A)Comparison between the AC and DC Traction System.

O.2 (B) Draw the Speed Time Curve of Electric Traction. Explain it with respect to Urban Area and Suburban Area. [7]

### OR

Q.2 (B) Name the types of braking in Electrical Traction and explain each in detail. [7]

Q.3 (A) State and Explain the laws of Illumination.

Q.3 (B) Explain Eddy Current Heating with neat diagram also mention the advantages and application of it. [7]

### OR

Q.3 (A) Explain general principles that are generally employed in designing the street lighting? [7]

Q.3 (B) Explain the working of a fluorescent tube with the help of circuit diagram. State the units of power, Energy, Lux, Luminous Intensity. [7]

Q.4 (A) A train weighing 300 tonnes has its speed reduced from 80 to 48 kmph in travelling a distance of 1500 metres, down a gradient of 1 in 100. If regenerative braking is used, find the energy (kWh) returned to the line, if the train resistance is 50 Nm/tonne. Allowance for rotational inertia may be assumed to be 10% of the weight. [7]

Q.4 (B) Determine the power capacity and efficiency of a 3 phase arc furnace for melting steel taking a current of 5 KAmp, capacity being 2 tonnes of steel per 30 minutes. [7] Specific heat of steel = 0.12Latent heat of steel = 8.89 Kcal/kg Melting point of steel =  $1370^{\circ}$ C

Initial temperature = 20°C Arc voltage = 60 V Voltage across the furnace = 80 V

## OR

Q.4 (A) A 3 phase, 1250 kW arc furnace is fed through a step down transformer having an equivalent secondary resistance of 0.003 ohms and reactance of 0.006 ohms per phase respectively. The arc drop is 60 V. Determine the output voltage of the transformer for a current of 5 KAmp. Also determine the power factor of the load and the efficiency of the furnace. [7]

Q.4 (B) What do you mean by air conditioning system? What are the main parts of air conditioning systems? Explain function of each part in brief.	[7]
Q.5 (A) State the types of welding and briefly describe any two.	[7]
Q.5 (B) What is the principle of electro deposition? State and explain the factors on which t quality of electro deposition depends.	he [7]
OR	

Q.5 (A) Write a note on Construction of Vacuum Cleaner, Hair Dryer.	[7]
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Q.5 (B) Explain in detail the construction and working of washing machine. [7]

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