

B. TECH
(SEM-VII) THEORY EXAMINATION 2019-20
UTILIZATION OF ELECTRICAL ENERGY & ELECTRIC TRACTION

Time: 3 Hours

Total Marks: 70

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. **Attempt all questions in brief.** **2 x 7 = 14**
- a. What is arc heating?
 - b. Explain conduction mode of heat transfer?
 - c. Define the term Electric welding.
 - d. What are the limitations of resistance welding?
 - e. State and explain refrigeration process.
 - f. Give examples of various traction systems in daily life.
 - g. Draw and explain speed-time curve for traction system.

SECTION B

2. **Attempt any three of the following:** **7 x 3 = 21**
- a. Explain the working of arc furnaces and describe with the help of a sketch the construction and working of any one type of arc furnace.
 - b. Describe with neat sketches the various methods of electric resistance welding. Give its merits and demerits.
 - c. Define air conditioning. On what factor does the air conditioning depends? Explain in detail
 - d. What are the advantages and disadvantages of linear induction motor as compared to the rotary induction motor?
 - e. Discuss the suitability of series motor for traction duties with the help of characteristic curve.

SECTION C

3. **Attempt any one part of the following:** **7 x 1 = 7**
- (a) Explain indirect resistance heating. Give their advantages and disadvantages and its applications.
 - (b) Give classification of electric heating. Enlist its advantages and disadvantages.
4. **Attempt any one part of the following:** **7 x 1 = 7**
- (a) What is electric arc welding? Explain its type and discuss carbon arc welding.
 - (b) If 22.092g of nickel is deposited by 110A current flowing for 11 minutes, how much copper would be deposited by 55A current in 7minutes? Atomic weight of nickel and copper are 58.6 and 63.18 respectively and valency of both is 2.
5. **Attempt any one part of the following:** **7 x 1 = 7**
- (a) Explain the construction and operation of fluorescent tube and compare it with tungsten filament lamp.
 - (b) Discuss the domestic type refrigerator in detail. What is the main difference between a refrigerator and water cooler?
6. **Attempt any one part of the following:** **7 x 1 = 7**
- (a) An electric train has an average speed of 42km/h on a level track between stop 1400m apart. It is accelerated at 1.7km/h/s and broken at 3.3km/h/s. draw the speed time curve for the run.
 - (b) What is specific energy consumption of a train? Discuss various factors affecting it.
7. **Attempt any one part of the following:** **7 x 1 = 7**
- (a) What are the advantages and disadvantages of diesel electric traction? Discuss the main characteristic of diesel engine with special reference to its application for traction system.
 - (b) Give the characteristics of D.C. shunt motor. Why are such motors not suitable for traction purpose?