KADI SARVA VISHWAVIDHYALAYA

B.E. Semester VII

Subject Code:- EE-704 **Subject Name:-Electrical Power Utilization & Traction**

Date: 16/11/2016 **Time: 10:30 am to 1:30 pm** **Total Marks:- 70**

Instruction

1. Answer each section in separate Answer sheet.
2. Use of scientific calculator is permitted.
3. All questions are **compulsory.**
4. Indicate **clearly**, the options you attempt along with its respective Question number.
5. Use the last page of main supplementary of **rough work.**

SECTION-I

Q.1

[A] Using simplified trapezoidal speed time curve, drive expression for the maximum speed in km per hour in terms of acceleration, retardation, distance between stops and actual time of run between stops. **[05]**

[B] Write short note on Tramways and trolley buses. **[05]**

[C] What is electric drive? Explain the advantages and disadvantages of electric drive. **[05]**

OR

[C] Define dead weight, accelerating weight, adhesion weight, coefficient of adhesion, and effective weight. **[05]**

Q.2

[A] Draw speed torque characteristics of following motors. **[05]**
1.D.C Shunt motor 2. D.C. Series motor 3. Three Phase Induction motor

[B] Explain star delta starter of three phase induction motor. **[05]**

OR

Q.2

[A] Classify electric drives and state the factors affecting selection of drive. **[05]**

[B] What is braking of electric motors? What are the advantages and disadvantages of electric braking over mechanical braking? **[05]**

Q.3

[A] State the methods of speed control of shunt motor. Explain flux control method with circuit diagram. **[05]**

[B] An electric train has an average speed of 42 kmph on a level track between stops 1400m apart. It is accelerated at 1.5 kmphps is and it is braked at 3.3 kmphps. Draw speed time curve and estimate the specific energy consumption. Assume tractive resistance as 50 N/tonne and allow 10% for rotational inertia. Assume motor efficiency 90% **[05]**

OR

Q.3

[A] Explain the factors affecting the Schedule Speed. **[05]**

[B] A 240volt d.c. shunt motor has a field resistance of 400 ohm and armature resistance of 0.1ohm. The armature current is 50 Amp and speed is 900 rpm. Calculate additional resistance required to increase the speed to 1000 rpm for the same armature current. Assume a straight line magnetization curve. **[05]**

SECTION-II

Q.4

[A] State and Explain the square law of Illumination. **[05]**

[B] Explain street lighting. **[05]**

[C] 100 lux illumination is required in hall size 30 m *10 m by 80 Watt tube lights with a luminous efficiency of 40 lumens per Watt. Find the number tube lights and spacing if the U.F.,D.F. and W.L.F are 0.4,1.4 and 1.2 respectively. Assume mounting height of tube light as 2.5 meter. **[05]**

OR

[C] Explain principle and working of a vertical core type furnace. **[05]**

Q.5

[A] Explain different methods of arc welding. **[05]**

[B] Explain design procedure of heating element. **[05]**

OR

Q.5

[A] State and explain advantages of electrically produced heat. What are the essential properties of resistance heating elements. **[05]**

[B] Explain advantages of electrical welding. **[05]**

Q.6

[A] Write short note on Faraday's law of electrolytic. **[05]**

[B] Define following terms. **[05]**

1. Electro-Chemical Equivalent 2.Atomic Weight 3. Current efficiency 4.valency 5. Anions & Cations

OR

Q.6

[A] Explain Electroplating. **[05]**

[B] Explain current efficiency. **[05]**

----------All the Best ----------

KADI SARVA VISHWAVIDYALAYA

B.E. SEMESTER VII THEORY EXAMINATION (November 2015)

SUBJECT CODE: EE-704 **SUBJECT NAME: ELECTRICAL POWER UTILIZATION & TRACTION**

DATE: 01/12/2015 **TIME: 10:30 a.m. to 1:30 p.m.** **TOTAL MARKS: 70**

Instructions:

1. **Answer each section in separate Answer sheet.**
2. **Use of Scientific Calculator is permitted.**
3. **All questions are compulsory.**
4. **Indicate clearly, the options you attempted along with its respective question number.**
5. **Use the last page of main supplementary for rough work.**

Section 1

Q:1 **(All Compulsory)**

(A) The speed-time curve of a train consist of: (1) Uniform acceleration of 6 km/hr/s for 25 sec, (2) Free running for 10 minutes, (3) Uniform declaration of 6 km/hr/s to stop the train, (4) A stop of 5 seconds. Find the distance between the stations, the average and the schedule speeds. 5

(B) Write short note on Tramways and trolley buses. 5

(C) Briefly discuss various methods of controlling the speed of a 3-phase induction motor. Draw speed-torque characteristics in each case. 5

OR

(C) Explain major equipment of locomotive and their function with neat diagram. 5

Q:2 **Answer the following Questions**

(A) Explain the construction and working of Ajax Wyatt vertical core type furnace 5

(B) Write Advantages and disadvantages of electric braking over mechanical braking. 5

OR

(A) Write short note on Faraday's law of electrolytic. 5

(B) Explain Street lighting.

Q:3 **Answer the following Questions**

(A) Explain construction and working of fluorescent tube with neat diagram. 5

(B) What is electric welding ? Explain resistance and electric arc welding. 5

OR

(A) Define: Lumen, Luminous flux, Utilization factor, solid angle, Depreciation factor 5

(B) What are the advantages of electric drive? 5

Section 2

Q:4 (All Compulsory)

(A) A DC series motor with unsaturated magnetic circuit and negligible resistance, when running at a certain speed on a given load, takes 50A at 500V. If the load torque varies as the cube of the speed, find the resistance to be inserted to reduce the speed by 50%. 5

(B) Explain major equipment of locomotive and their function with neat diagram. 5

(C) Write short note on speed control of DC shunt motor 5

OR

(C) Define: Dead weight, Accelerating weight, Adhesion weight 5

Q:5 Answer the following Questions

(A) Explain electric arc furnace. Draw its equivalent circuit & derive the condition for maximum output. 5

(B) Enlist different methods of Heating. Why electric heating is preferred over other forms of heating? 5

OR

(A) Explain electro deposition & electroplating. 5

(B) Explain flood lighting. 5

Q:6 Answer the following Questions

(A) Write short note on sodium vapor lamp. 5

(B) Enlist types of braking. Explain regenerative braking. 5

OR

(A) What is eddy current heating? Give advantages of electrically produced heat. 5

(B) Enlist different traction systems. Enlist various systems of electric traction. 5

***** All the Best *****