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FACULTY OF ENGINEERING & TECHNOLOGY

B.E(EEP/EE/EEE)Year Examination June– 2015

Electric Traction & Utilization(EL-II)

(Revised)

[Time: Three *Hours*] **[Max. Marks: 80]**

"Please check whether you have got the right question paper."

i) Question No.1 & Question No.6 are compulsory.

ii) Solve <u>any two</u> questions from remaining from each section.

SECTION A

Q.1 Solve <u>any five</u> of the following

a) State main requirements of ideal traction system. 02

b) State merits &demerits of electric traction system 02

c) Advantages & disadvantages of electric traction system. 02

d) Draw single line diagram of typical electric system. 02

e) Calculate sag to be given to a trolley wire 1cm. in diameter and weighing 0.72kg/ meter .when erected with a span o0f 60meter and if the stress in wire erected is 640 kg/cm^2. 02

f) What is need of starter in d.c traction motors 02

g) Enlist the traction motors ne3ed in electric traction system. 02

h) What is function of traction X'mer in ETS 02

Q.2 a) Explain the requirement for ideal traction and show which drive satisfy almost all the requirements. 07

b) Describe in detail trolley bus system of electric traction. 08

Q.3 a) Explain in brief current collectors for overhead system in electric traction. . 08

b) Derive the sag& tension formulae for trolley wire system 07

Q.4 a) Explain desirable characteristics of traction motors. 08

b) Explain suitability of series motors for traction duties. 07

Q.5 Write a short note on following

a) 1Ø high frequency a.c. system. 05

b) Signaling interference in telecom circuits 05

c) Compensated repulsion motors 05

SECTION-B

Q.6 Attempt <u>any 5</u> of following

a) Draw series/ parallel control arrangements of traction motors. 02

b) Under what condition is field weakening adopted for controlling speed of dc series traction motors? 02

c) What are advantages of thyristor control of traction motors? 02

d) Why ordinary mechanical breaking control be totally replaced by electrical breaking 02

e) What is mean by mechanical regenerative breaking? 02

f) Why master controller is equipped with dead mans handle? 02

g) What is practical unit of refrigeration and define it? 02

h) Draw neat sketch of refrigeration cycles. 02

Q.7 a) Explain with suitable connection diagrams the resistance control method used in d.c. traction drives. 07

b) Explain use of metadyne and megavolt in traction control. 08

Q.8 a) Discuss a method of electrical braking for traction motors. 08

b) Explain speed time curve for 07

1) Tramcar
2)
3) Trolley buses
4) Urban services
5) Sub- urban electric train.

Q.9 a) With help of circuit diagram explain the working of water of water cooler 07

b) Explain central air conditioning system 08

Q.10 Write short notes on

a) Method of traction motor controls 05
b) Tractive effort calculations 05
c) Domestic refrigerators 05