



KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2015/2016 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER
MAIN EXAMINATIONS

FOR THE DEGREE OF BSc. (RENEWABLE ENERGY)

COURSE CODE: SUT 262

COURSE TITLE: ELECTRICAL TECHNOLOGY

DURATION: 2 HOURS

DATE: THURSDAY 5TH MAY 2016 **TIME:** 8 – 10AM

INSTRUCTIONS TO CANDIDATES

- Answer **QUESTION ONE** (Compulsory) and any other two (2) Questions.
- Indicate **answered questions** on the front cover.
- Start every question on a new page and make sure question's number is written on each page.

This paper consists of 3 printed pages. Please Turn Over



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Question One

- (a) Explain how motors are selected for specific engineering applications. (16 Marks)
(b) Differentiate between the 'squirrel cage' and 'phase wound' rotor types of induction motors. (14 Marks)

Question Two

(a) A power supply is having the following loads:-

Type of load	Max. demand (kW)	Diversity of group	Demand factor	
Domestic	1500	1.2	0.8	
Commercial	2000	1.1	0.9	
Industrial	10,000	1.25	1	

If the overall system diversity factor is 1.35, determine the maximum demand and connected load of each type. (8 Marks)

- (b) Explain the following terms – (i) Busbar, (ii) load, (iii) system, (iv) outage. (4 Marks)
(c) Explain the terms (i) real power, (ii) apparent power and (iii) reactive power for ac circuits and also the units used. (8 Marks)

Question Three

- (a) State any five common system problems and solutions in electrical power distribution system of a typical industry (10 marks)
(b) (i) State the types of automatic power factor control. (ii) Explain briefly the working principle of operation.

(10 Marks)

Question Four

- (a) (i) State and explain the various voltage levels at which power is transmitted and distributed, (ii) Explain how high voltage transmission helps energy efficiency (12 Marks)
(b) State the characteristics of Direct current and Alternating current (8 Marks)

Question Five

- (a) (i) State the disadvantages of low power factor (5 Marks)
- (ii) Explain how power factor can it be improved (5 Marks)
- (b) State and explain the advantages and disadvantages of high voltage DC transmission (10 Marks)