COLLEGE OF ENGINEERING & TECHNOLOGY

Department : Electrical & Control Engineering

Lecturer : Prof. Ahmed Anas Elwogoud Helal

Course : Design of Elect. & Electo-mechanical Systems for Commercial and Industrial installations

Time: 2 hours

Course Code: EE 548 **Date:** 11/ 1 / 2016

Marks: 40

Starting time: 14:00

Final Exam Paper

Answer the following questions:

1. ***Discuss*** the different codes and standards related to electromechanical systems installations. *[A.6]* (3 Marks)
2. ***Define*** the branch circuit in low voltage electrical system installation, ***state*** its main components, ***what are the main procedures*** needed to identify such components? *[A.14-B.14]* (3 Marks)
3. ***Explain*** how to check your initial (concept) design for low voltage branch circuits. *[B.17]* (3 Marks)
4. (a) ***Explain in full details*** the types of elevators, elevator main components, and their protection systems for both personal and equipment.
   (b) ***Draw*** the schematic operation sequence of a two speed contactor type lifts. *[A.14-A.19-B.17]* (5 Marks)
5. (a) ***Define*** the term; power system quality. ***Explain*** three of the disturbances affecting the power system.
   (b) ***State*** the main sources of harmonics in electrical power systems, ***discuss*** the problem of neutral line triplen harmonics in three phase four wire systems. *[A.14]* (5 Marks)
6. ***Define*** the following; Luminous flux (φ),Luminous intensity (I), Illuminance or Luminous flux density (E) , Luminance (L), Colour Rendering, and Colour Temperature. *[B.17]* (3 Marks)
7. ***Compare*** between the following types of lamps; Incandescent lamp, Fluorescent lamp, Compact fluorescent lamp, Discharge lamp, and LED. *[A.14]* (5 Marks)
8. ***Explain*** the main elements of fire detection and alarm Systems. *[B.17]* (3 Marks)
9. A meeting room with the following data;
   - Dimension 5 × 5 m^2, h_{cc} = 1m, h_{rc} = 2.7, h_{fc} = 0.8, and required illuminance 250 Lux.
   - Reflectance factors: ceiling (ρc) for standard white paint equal 0.8, walls (ρw) for rough light paint equal 0.3, and floor (ρf) for dark concrete equal 0.2.
   - Light Loss Factor (LLF) = 0.4.

Members of course Examination Committee:	Signature:	Date:
Lecturer: Prof. Ahmed Anas Elwogoud Helal	Ahmed	5/1/2016
Course Coordinator : Prof. Amany Hanafy		6/1/2016
Head of Department: Prof. Hamdy Ashour	Hamdy	6/1/2016