



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND YEAR SECOND TERM EXAMINATION FOR

DIPLOMA IN BUILDING AND CIVIL ENGINEERING.

2707/206/WT: ELECTRICAL WORKSHOP TECHNOLOGY

DATE: 4/6/2021

TIME: 2.30-5.30 PM

INSTRUCTIONS

Attempt any Five of the following Eight Questions.

1.
 - a)
 - i Define the term "wiring system". (3 marks)
 - ii State any three advantages of a trunking wiring system. (3 marks)
 - b)
 - i Outline three main functions of earthing an electrical system.
 - ii Show with a labeled diagram the earth fault loop path taken by a fault current in a consumer's installation. (6 marks)
 - c)
 - i Define the term 'a conductor joint'. (2 marks)
 - ii Describe the procedure for making a Telegraph joint for a single-core conductor. (6 marks)
2.
 - a) State the following ;
 - i. The three classifications of Hydro – Electric power plants according to the water head.
 - ii. Any four advantages of an Hydro – Electric power plant. (7 marks)
 - b) Explain any three factors to be considered in the site selection for an Hydro – Electric power plant. (6 marks)
 - c)
 - i With the aid of a labeled 2-wire diagram show the Sequence of Control Equipment at the in-take point of a consumers installation. (4 marks)
 - ii State the functions of any three-control equipment in Q2c(i) above. (3 marks)

3.
 - a) Define the following terms with regard to protection devices
 - i. Current rating.
 - ii. Fusing factor.
 - iii. Rated minimum fusing current. (6 marks)
 - b) State the following;
 - i. The three essential features of a consumers intake point as required by the IEE regulations.
 - ii. Any four disadvantages of a rewirable fuse . (7 marks)
 - c) Describe with the aid of a labeled diagram the construction and operation of an Electromagnetic overload trip. (7 marks)
4.
 - a) Define the following terms;
 - i. Wiring Accessory
 - ii. Ceiling rose. (4 marks)
 - b) Explain any three factors to consider when choosing the type of wiring system to be installed. (6 marks)
 - c) Describe the following civil Engineering works of an hydro – electric power plant
 - i. Forebay
 - ii. Penstock. (4 marks)
 - d)
 - i Show a labeled Water – Steam flow diagram of a thermal power plant . (4 marks)
 - ii State any two reasons that makes it necessary to heat water before feeding back to the boiler mentioned in the diagram of Q4(d)(i) above. (2 marks)
5.
 - a) Define the following terms of protection devices;
 - i. A Fuse
 - ii. Fuse – link . (4 marks)
 - b) With the aid of a labeled diagram explain the Construction of a high – breaking capacity fuse used for protection in large industrial loads. (6 marks)
 - c) Describe the following types of jointing methods
 - i. Welding
 - ii. Crimping. (4 marks)
 - d) State the following;
 - i. Any three advantages of non – metallic conduit wiring system.
 - ii. Any three advantages of an electromagnetic overload trip compared to a fuse. (6 marks)

6. a) Show with the aid of wiring diagram the following;
- i. A One – Way switch control of two lamps
 - ii. Two 2 – way switch control of two lamps. (4 marks)
- b) Define the following terms with regard to earthing;
- i. Earth – continuity conductor
 - ii. Earth Electrode (4 marks)
- c) Explain with the aid of a labeled diagram the current operated earth leakage circuit breaker. (6 marks)
- d) Describe the functions of the following types of auxiliary equipment for a thermal power plant;
- i. Condenser
 - ii. Economiser. (6 marks)
7. a) Explain the following classes of Fuses;
- i. Class P fuses
 - ii. Class Q1 fuses. (4 marks)
- b) State the following;
- i. Any three advantages of a diesel electric plant.
 - ii. Any three applications of a diesel electric plant. (6 marks)
- c) i Explain the operation of a 4 – stroke engine for a diesel electric plant. (4 marks)
- ii Show with the aid of wiring diagram a 3 – point control of three lamps by use of one intermediate switch and two 2 –way switches . (2 marks)
- d) State any four properties of an insulation material as used in electrical cables . (4 marks)
8. a) State the following ;
- i. Any two Disadvantages of a Hydro – electric power plant .
 - ii. Any two Advantages of a Pumped storage hydro – electric plant. (4 marks)
- b) i Describe with the aid of a diagram the Boiling Water Reactor used in a Nuclear Power Plant . (6 marks)
- c) Explain the following components of an underground cable ;
- i. Bedding
 - ii. Armouring. (4 marks)
- d) Describe the following types of wiring systems ;
- i. PVC sheathed
 - ii. MIMS. (6 marks)