TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

DIPLOMA IN ELECTRICAL POWER ENGINEERING (DEPE 3)

EEP 2203: ELECTRICAL INSTALLATION TECHNOLOGY II

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2014
TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*
- *Non-programmable Scientific Calculator*

This paper consists of **FIVE** questions. Answer any **THREE** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (Compulsory)

a) State:
- **(i)** FOUR factors to be considered when choosing a wiring system. **(4 marks)**
- **(ii)** TWO regulation requirements for caravan installation **(2 marks)**

b) Define:
- **(i)** The term wiring system
- **(ii)** Caravan
- **(iii)** Caravan site **(6 marks)**

c) Explain:
- **(i)** Diversity in electrical installations **(2 marks)**
- **(ii)** How diversity affects the design of an electrical installation **(2 marks)**
- **(iii)** With the aid of a circuit diagram, describe magnetic tripping mechanism of a single phase residual current earth leakage circuit breaker (ELCB) **(4 marks)**

Question Two

a) Define
- **(i)** A damp situation
- **(ii)** A hazardous area
- **(iii)** A temporary installation **(6 marks)**

b) State:
- **(i)** TWO precautionary measures taken on long conduit run in a damp situation **(2 marks)**
- **(ii)** TWO precautionary measures taken on cables in a damp situation **(3 marks)**

c) Explain the dangers posed by static electricity in hospital operation theatres and how they are minimized. **(3 marks)**

d) Distinguish between the following explosive risk zones and state the wiring system to be used in each zone i.e.

Division 0
Division 1
Division 2 **(6 marks)**

Question Three

a) Define corrosion. **(2 marks)**

b) State THREE factors each that govern the rate of corrosion due to each of the following:
- **(i)** Environment
- **(ii)** Material **(6 marks)**

c) State:
- **(i)** THREE effects of corrosion on an electrical installation
- **(ii)** FOUR methods of applying anticorrosive coatings **(4 marks)**

d) With the aid diagrams describe the following methods of corrosion protection:

(i) The sacrificed anode protection

(ii) The impressed current protection **(8 marks)**

Question Four

a) Define the following terminologies:

(i) Design current

(ii) Current rating

(iii) Fusing current

(iv) Close excess current protection

(v) Discrimination **(10 marks)**

b) A 240V, single phase 15kw load operates at a power factor of 0.7 lagging, and is fed from a distribution board located 20m away by a 2-core PVC insulated and armoured cable with aluminum conductors. The cable is clipped direct to a cable tray. The ambient temperature is 45^{o}C and close excess current protection is provided. Determine using the correction factors and tables of current rating and voltage drops, $9K_3$ and $9B_1$ provided the most economical size of conductor or the cable for this load. **(10 marks)**

Question Five

a) States:

(i) FOUR considerations that determine the need for lightining protection in a building

(ii) TWO types of lightining **(4 marks)**

b) Define:

(i) Lightning stroke

(ii) Isokaraunic lines **(4 marks)**

c) Explain:

(i) The objectives of a lightining protection system **(4 marks)**

(ii) With the aid of a diagram, explain the term zone of protection **(5 marks)**

(iii) With the aid of a diagram explain the reason for overlapping zones of protection **(5 marks)**