

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD
Technical and Vocational Education Examination



ELECTRICAL POWER SYSTEMS

ELECTRICAL TECHNOLOGY AND DIAGRAMS 2
5245

JUNE XXXX

INTERMEDIATE LEVEL

Subject Title	ELECTRICAL TECHNOLOGY AND DIAGRAMS
Subject Code No.	5245
Paper No.	TWO

DURATION - THREE HOURS

This paper has two sections A & B, and has a weighting of 35% of the whole subject.

Section A has THREE questions. Each question carries 30 Marks. Answer any TWO

Section B has THREE questions. Each question carries 20 Marks. Answer any TWO

Show all steps in your calculations, giving your answer at each stage and indicating the units and symbols used.

All sketches must be neat and clear.

You are allowed to use non-programmable calculators and mathematical sets.

You are reminded of the necessity for good English and orderly presentation in your answers.

Turn Over

SECTION A: ELECTRICAL TECHNOLOGY

1)

- (a) Compare and give two advantages and two disadvantages each of incandescent lamps over fluorescent lamps. **(6 marks)**
- (b) Explain the phenomenon of stroboscopic effect in fluorescent lamps. **(8 marks)**
- (c) If the choke of a fluorescent lamp is short circuited while the lamp is functioning, what will happen to the lamp? **(6 marks)**
- (d) Explain the possible causes of a fluorescent lamp glowing without starting. **(5 marks)**
- (e) What is the role of the powder inside the tube of a fluorescent lamp? **(5 marks)**

2)

- (a) Give the symbols of the following switch gears
- (i) One way switch **(1marks)**
 - (ii) Two way switch **(1 marks)**
 - (iii) Tele switch **(1 marks)**
 - (iv) Fused isolator **(1 marks)**
 - (v) Three phase contactor **(1 marks)**
 - (vi) Three phase thermal relay **(1 marks)**
 - (vii) Three phase circuit breaker **(1 marks)**
- (b) Give the area of application of each of the switch gears listed above **(7marks)**
- (c) Draw and label all the parts of the following lamps
- (i) An incandescent lamp **(9 marks)**
 - (ii) A fluorescent lamp **(7 marks)**

3)

- (a) Explain the term 'Renewable Energy'. **(4 marks)**
- (b) State any three main electrical energy power plants which are renewable energy sources. **(6 marks)**
- (c) With the aid of a diagram, explain the functioning principle of a hydroelectric power plant. **(10 marks)**
- (d) State the role of the following element found on a hydroelectric scheme.
- (i) A dam **(2.5 marks)**
 - (ii) An alternator **(2.5 marks)**
 - (iii) The turbine **(2.5 marks)**
 - (iv) The penstock **(2.5 marks)**

SECTION B: ELECTRICAL DIAGRAMS

- 4) To ensure effective functioning of a three phase induction motors, protective switch gears are installed in the starter circuit to protect against; single phasing, short circuit and earth leakage fault.
- (a)
- (i) What do you understand by single phasing? **(5 marks)**
 - (ii) When single phasing occurs, what physical phenomenon do you observe? **(3 marks)**

- (iii) Is the effect of single phasing very different from that of overload? Justify your answer. **(3 marks)**
- (b) List three protective switch gears that are installed in a motor circuit and state their functions in the circuit **(6 marks)**
- (c) In your own words, what do you understand by discrimination in the protection of electrical circuit? **(3 marks)**

- 5) In order to prevent the waste of energy in the stairs cage, a landlord of a building needs that when the light circuit is put on manually; it remains ON for 10 minutes and then switches off automatically.

Work required:

- (a) Considering four control post and three lamps, protection ensured by circuit breaker, propose a developed diagram of this installation. **(15 marks)**
- (b) State one main advantage and one disadvantage of the controlling method above over the other methods. **(5marks)**

- 6) The diagram of Figure 1 below represents the ground plan of the kitchen and dining hall of a 4 - STAR Hotel in Buea

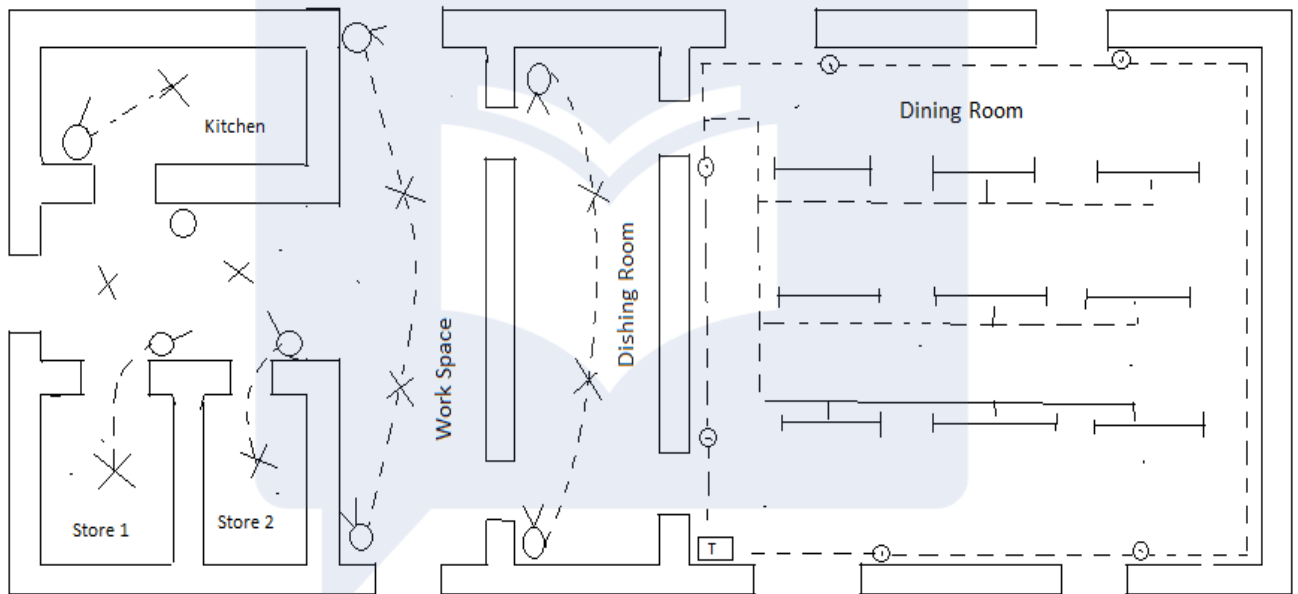
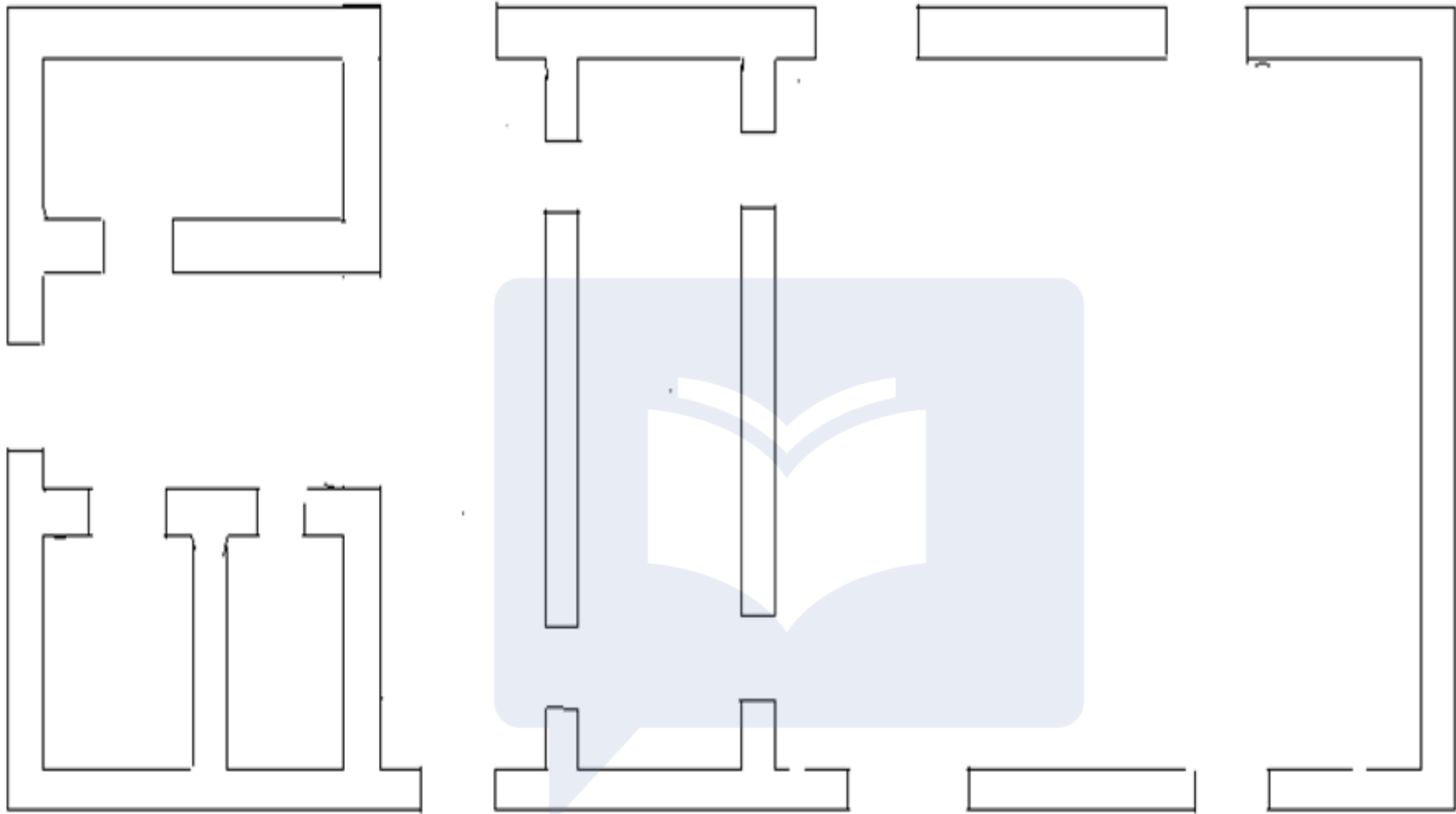


Figure 1

- (a) Draw the developed diagram of the Dining Room **(8 marks)**
- (b) Draw the wiring diagram of the Kitchen, Store 1, Store 2, Work Space and the Dishing Room using APPENDIX 1 **(12 marks)**



APPENDIX 1