

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION**

084

**ELECTRICAL DRAUGHTING
(For Both School and Private Candidates)**

Time: 3 Hours

Tuesday, 12th November 2013 p.m.

Instructions

1. This paper consists of **six (6)** questions.
2. Answer question **1** and any other **three (3)** questions.
3. Question 1 carries 40 marks while the other questions carry 20 marks each.
4. Calculators and Cellular phones are **not** allowed in the examinations room.
5. Write your **Examination Number** on every page of your answer booklet(s).
6. Whenever necessary use the following constant:
 - 1 inch = 25.4 millimeters



1. Figure 1 shows a pictorial drawing of a wall bracket. Draw in full size first angle orthographic projection of the following views:
- front view as indicated by arrow T,
 - end elevation as indicated by arrow S,
 - plan view.
- All dimensions are in mm. Construction lines must not be erased and drawings should be clearly shown in a standard paper format. **(40 marks)**

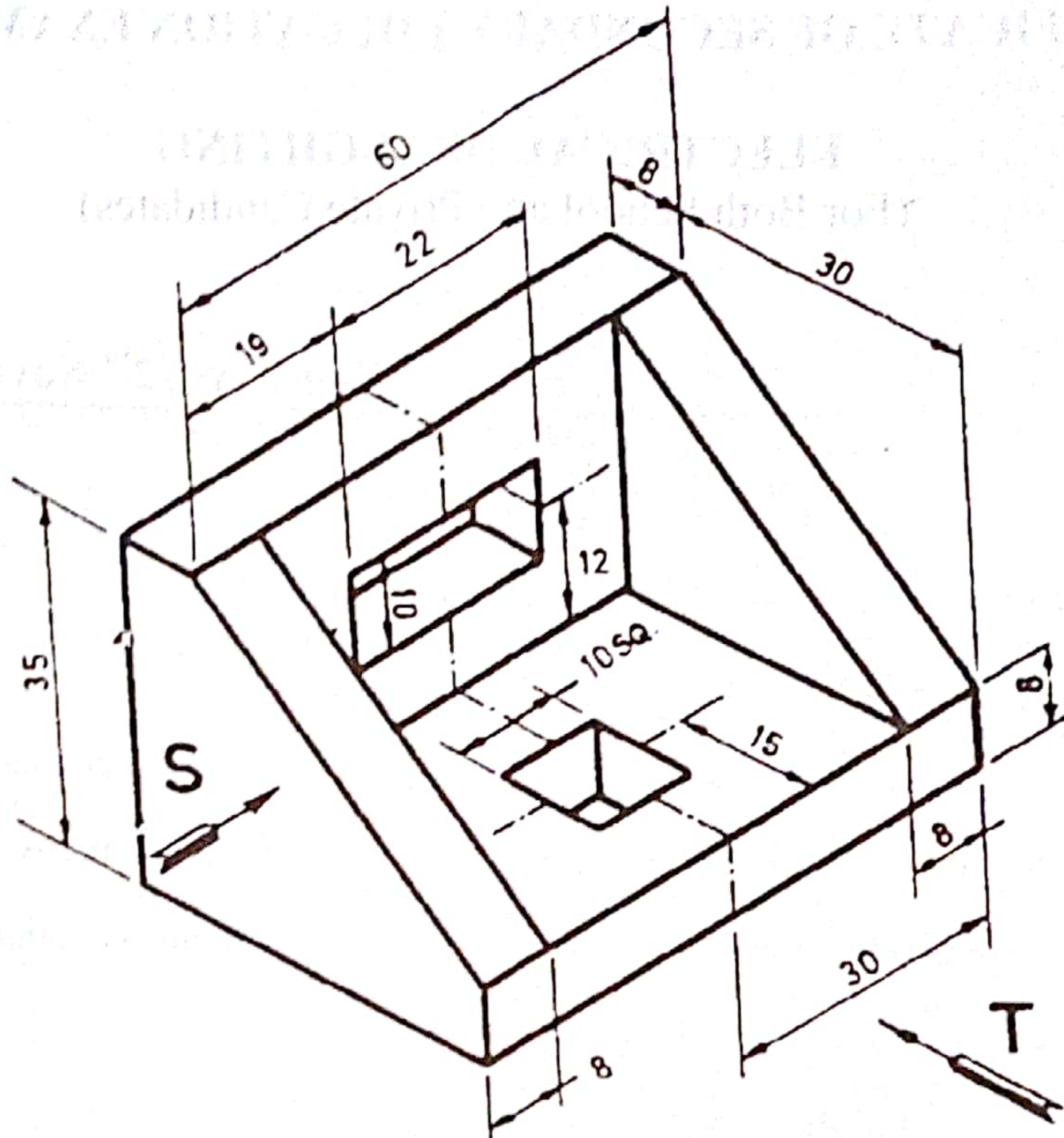
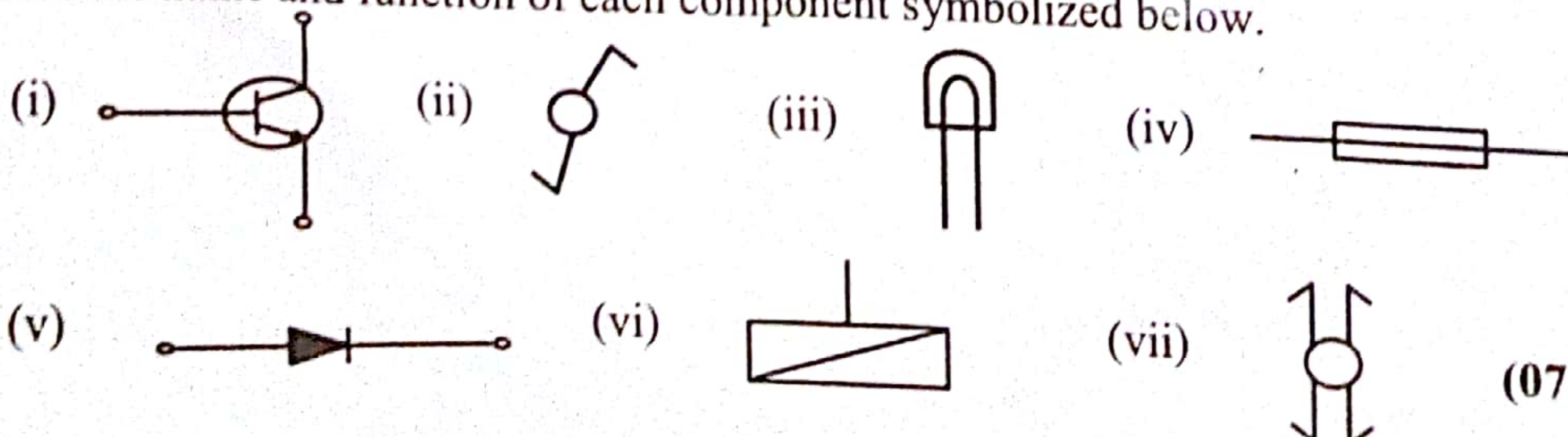


Figure 1

2. (a) Sketch the correct symbols of the following electronic components.
- NAND gate
 - NOR gate
 - XNOR gate
 - Inverter
 - LED
 - Diac
- (06 marks)**
- (b) (i) Simplify the following Boolean expression $y = \bar{A}BC + A\bar{B}C + ABC + B\bar{C}$ and then draw the logic circuits for the simplified expression.
- (ii) If the value of $A = 0$, $B = 1$ and $C = 1$, compute the value of y . **(07 marks)**
- (c) Give the name and function of each component symbolized below.



(07 marks)

3. (a) (i) Describe a printed circuit board.
(ii) Explain three types of printed circuit board. **(08 marks)**
- (b) Explain in detail six basic steps of making a complete printed circuit board. **(12 marks)**
4. (a) Sketch symbols of the following components:
(i) PNP transistor
(ii) Thyristor
(iii) Photodiode
(iv) Rectifier
(v) Zener diode. **(05 marks)**
- (b) You have been given one NPN transistor, four resistors and three capacitors. Design a simple stable amplifier using the given components. Use common emitter transistor configuration. **(05 marks)**
- (c) Draw a block diagram of a communication system. Explain the function of each block. **(10 marks)**
5. (a) (i) What do you understand by the term specifications.
(ii) It is very important to provide items specification of electrical equipments before starting installation work. Support the statement by giving three reasons. **(04 marks)**
- (b) A consumer is connected with two-wire mains for his light and fan of total load 1 kW at 230 V. Write down all specifications for the following accessories:
(i) Main switch
(ii) Socket outlet
(iii) Fuse wire **(08 marks)**
- (c) (i) What do you understand by the term 'estimating'?
(ii) You are required to determine the cost to execute domestic internal electrification. Give seven points to be adhered to while preparing an estimate for the job. **(08 marks)**
6. A building has got a Manager's office, other four rooms and a verandah. A Manager can call any one of his four subordinates, i.e attendant, typist, cashier or head clerk sitting in different rooms by pressing a common push button after adjusting a selector switch installed by the side of the push button. The bell of the subordinates' room rings only for the period for which the Manager's bell push button remains pressed. Perform the following on the basis of the given information:
- (a) Prepare a plan of the office. **(06 marks)**
- (b) Draw a single line and wiring diagram of a selector switch circuit. **(14 marks)**