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

097

MECHANICAL DRAUGHTING
(For Both School and Private Candidates)

TIME: 3 Hours **2006/10/23 a.m.**

Instructions

1. This paper consists of six (6) questions.
2. Answer question number 1 and any other **three** (3) questions.
3. Question **number 1** carries 40 marks while the rest carry 20 marks each.
4. Electronic calculators are **not** allowed in the examination room.
5. Cellular phones are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).

This paper consists of 4 printed pages.

1. Figure 1 shows detail drawing of a PILLAR DRILL TRAY.
Draw full size, first angle projection of the following views:

(a) The given plan including a partial section showing the clamp screw in position

(b) A sectional front elevation on cutting plane A - A
Add title block and parts list.

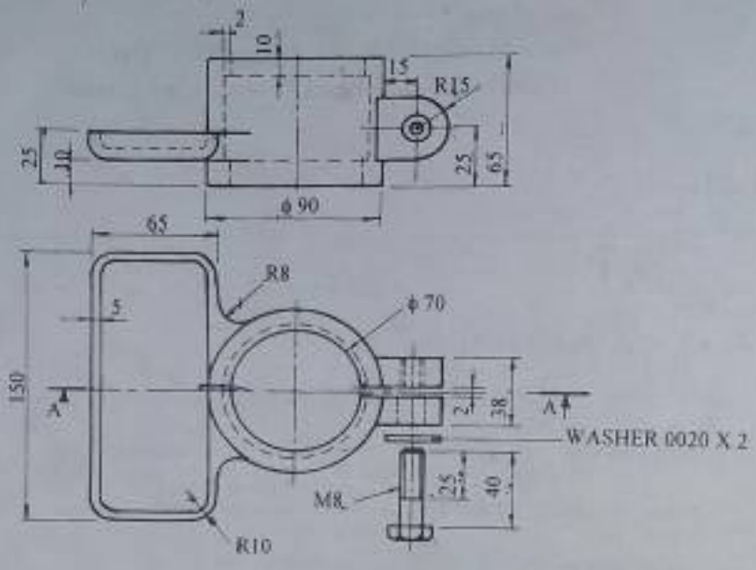


FIG. 1

2. Figure 2 gives two incomplete elevations of the joint between a V – trough of 50 mm side and a cylindrical pipe.
Draw

(a) the two views by completing them
(b) the true line of intersection

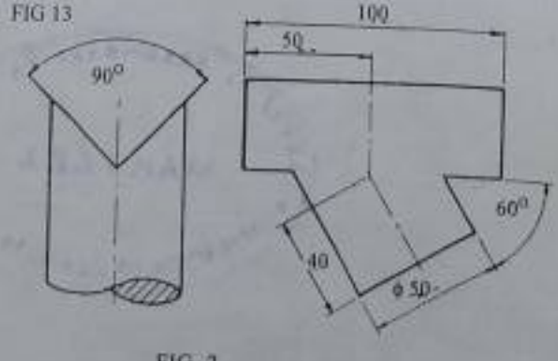


FIG. 2

3. Construct an ellipse if the major diameter is 120 mm and minor diameter is 80 mm. Use the concentric circle method.

4. Figure 3 shows a special machine mechanism.

Draw

(a) the given mechanism

(b) the locus of point 'E' for one complete revolution of the crank AB.

Show all the constructions clearly.

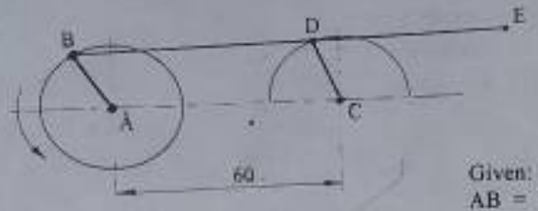
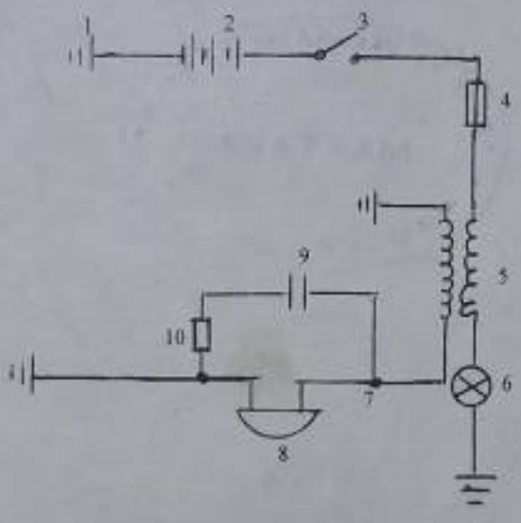


FIG. 3

Given:
AB = 25 mm
CD = 20 mm
BD = 60 mm
BE = 120 mm

5. (a) Name the various electrical symbols numbered 1 – 10 as shown in figure 4.



(b) Sketch the following locking devices:

(i) A lock nut

(ii) A slotted nut with split pin

(iii) A castle nut and split pin

(iv) A self-locking nut or simmond's nut

(v) A double spring washer

6 (a) Define the following terms:
(i) Tolerance
(ii) Upper limit
(iii) Nominal size
(iv) Positive deviation

(b) Describe two types of dimensions.

(c) Describe the following types of engineering fits:
(i) Clearance
(ii) Transition
(iii) Interference