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 ***Thursday morning 25/10/2007***

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).

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.

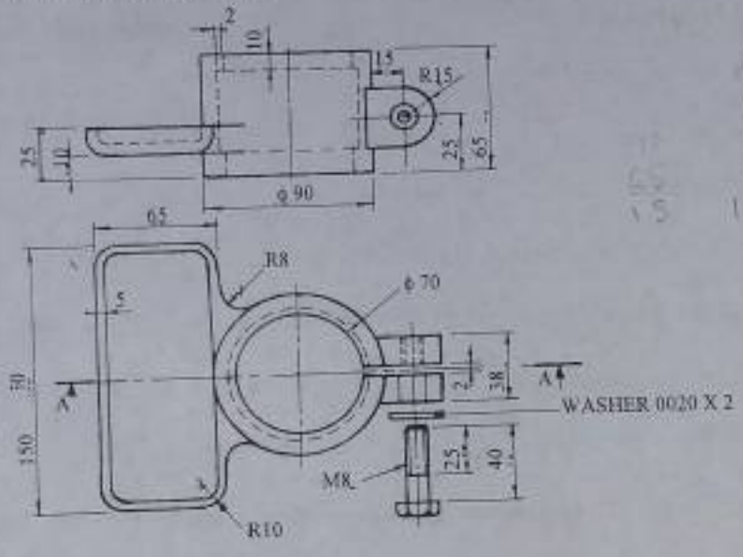

FIG. 1

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 13

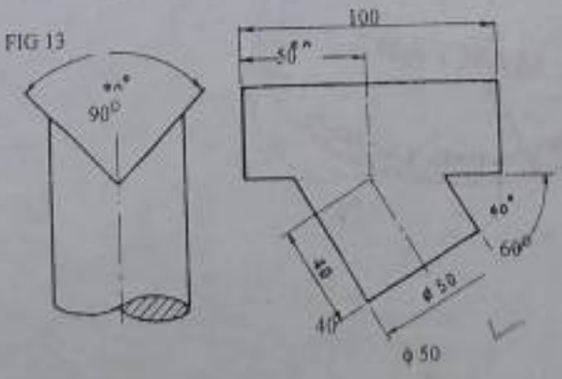

FIG. 2

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.

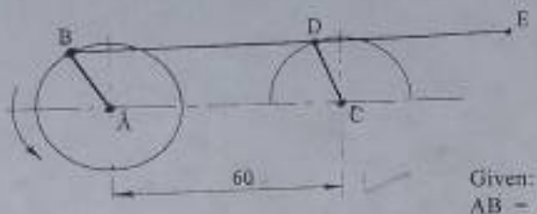

FIG. 3

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.

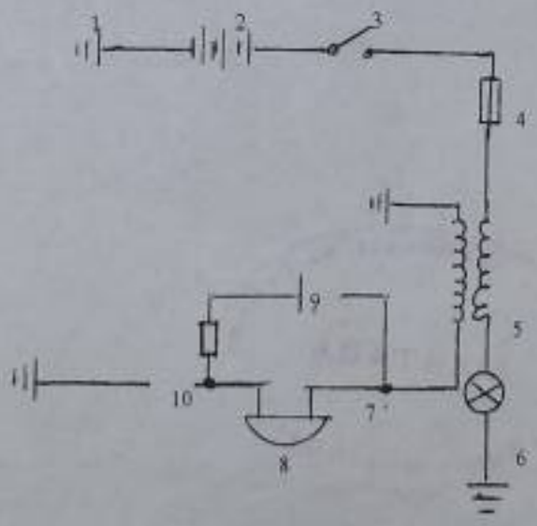

Fig. 4

(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