

2502/204

PLANT ENGINEERING DRAWING

Oct./Nov. 2022

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN MECHANICAL ENGINEERING  
(PLANT OPTION)

MODULE II

PLANT ENGINEERING DRAWING

3 hours

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

*Answer booklet;*

*Drawing instruments;*

*A2 Drawing papers.*

*This paper consists of TWO sections; A and B.*

*Answer **BOTH** questions in section A (Compulsory) and TWO questions from section B.*

*Maximum marks for each part of a question are indicated.*

*Candidates should answer the questions in English.*

**This paper consists 5 printed pages.**

**Candidates should check the question paper to ascertain that all the pages are printed as indicated as printed and that no questions are missing.**

**SECTION A (Compulsory)**

*Answer ALL questions in this section.*

1. Figure 1 shows details of each component of a coil winding machine. Draw a full size view in their angle projection of:
- (a) a sectional front elevation along the cutting plane Y-Y;
  - (b) plan of the unit completely assembled. Do not show hidden details.

Include any six major dimensions;

Use balloon reference to identify the parts and provide a parts list.

(30 marks)

easyvet.com

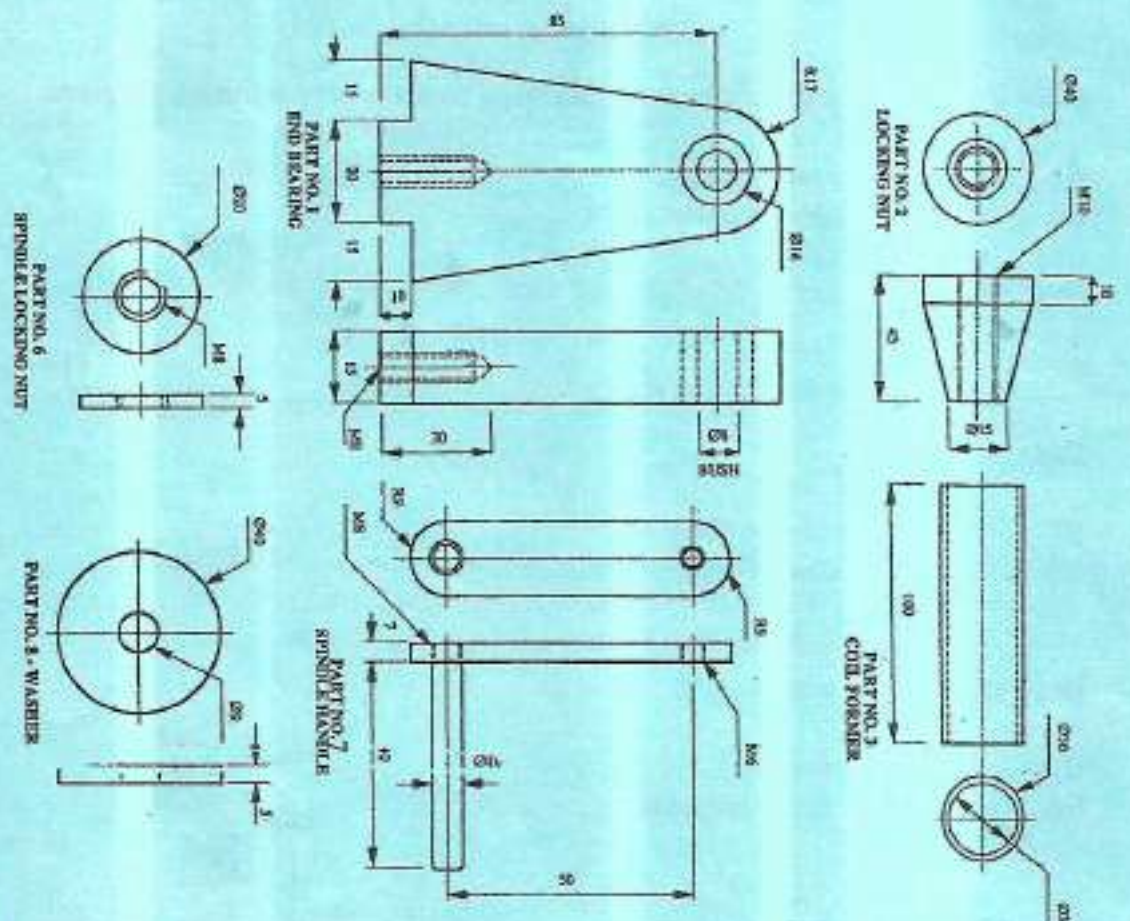
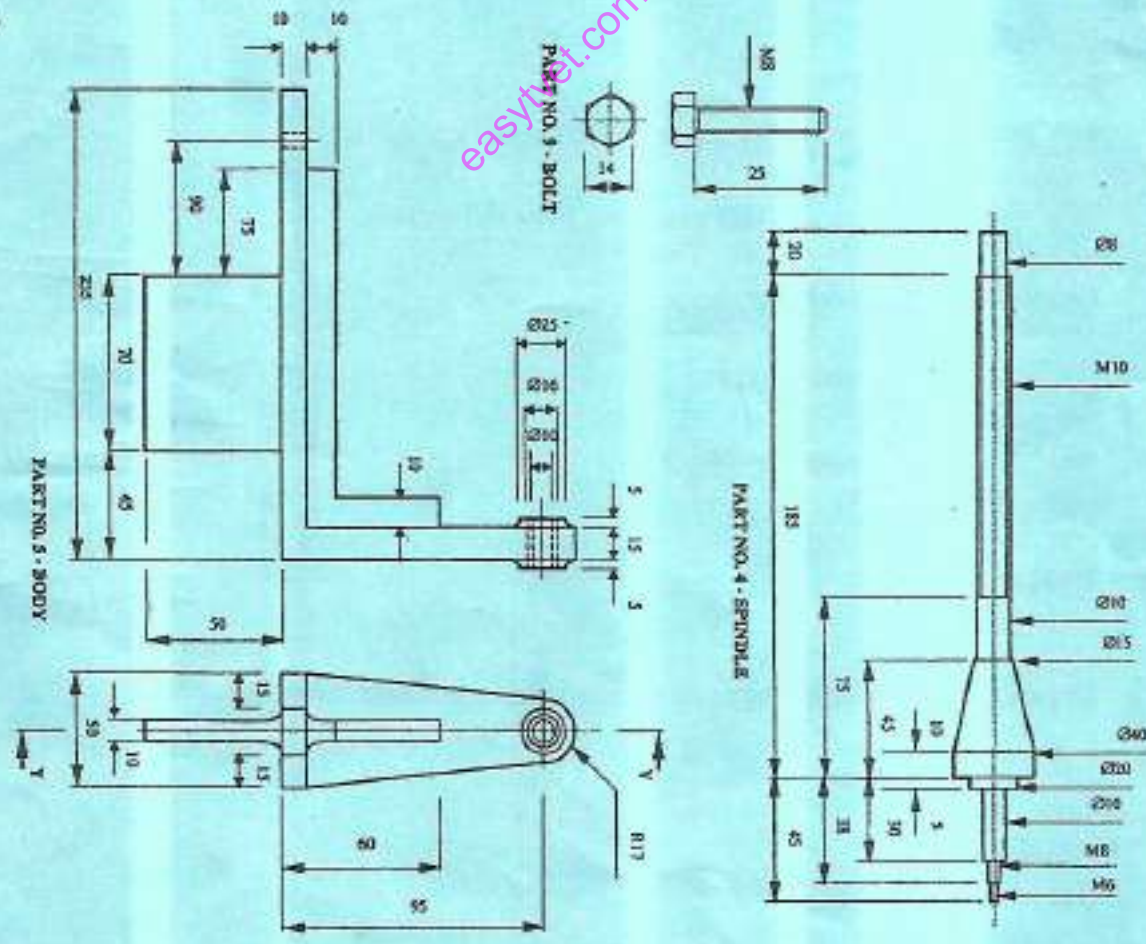


Fig. 1



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2. (a) Draw a sectional view of each of the following components used in steam plant.:

- (i) lever loaded safety valve;
- (ii) spring loaded safety valve;
- (iii) feed check valve;
- (iv) blow off cock.

(18 marks)

(b) Draw:

- (i) a horizontal in-line filter;
- (ii) an automatic revolving viscous filter.

(6 marks)

(c) Draw sectional view of a:

- (i) flush fire hydrant;
- (ii) dry powder fire extinguisher.

(6 marks)

**SECTION B (40 marks)**

*Answer TWO questions from this section.*

3. (a) Draw a sectional view of a:

- (i) sliding expansion joint;
- (ii) screw flanged joint;
- (iii) socket and spigot joint;
- (iv) callard joint;

Used in pipe joints.

(13 marks)

(b) Draw each of the following components used in machine mounting.

- (i) through bolt;
- (ii) "J" bolt;
- (iii) "U" bolt;
- (iv) expander.

(7 marks)

4. (a) Draw a

- (i) flat face cam follower;
- (ii) swinging cam follower.

(6 marks)

(b) Draw the profile of a cam operating a roller reciprocating follower given the following data:

Minimum radius of cam = 25 mm;  $\rightarrow$   
lift = 30 mm;  
roller diameter = 15 mm

The cam lifts the follower for  $120^\circ$  in simple harmonic motion, followed by a dwell period of  $30^\circ$ . Then the follower lowers down during  $150^\circ$  of the cam rotation with uniform acceleration and deceleration followed by a dwell period. The cam rotates at a uniform speed of 150 rpm.

(14 marks)

5. (a) Draw a sectional view of a:

- (i) stuffing box unit;
- (ii) frictional coupling unit.

(8 marks)

(b) Draw a:

- (i) radial;
- (ii) thrust;
- (iii) combination radial and thrust types of bearing load application.

(6 marks)

(c) Sketch a spur gear and indicate the following:

- (i) addendum;
- (ii) dedendum;
- (iii) circular pitch;
- (iv) top land;
- (v) bottom land;
- (vi) flank.

$$\begin{array}{r} 30 \\ 6 \\ \hline 36 \end{array} \quad \begin{array}{r} 36 \\ 10 \\ \hline 46 \end{array}$$

(6 marks)

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