TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

BACHELOR OF SCIENCE IN ELECTRICAL & ELECTRONICS ENGINEERING

EME 2113: ENGINEERING DRAWING & DESIGN II

END OF SEMESTER II YEAR I EXAMINATION

SERIES:APRIL2016

TIME:2HOURS

DATE: Pick DateSelect MonthPick Year

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

1. You are required to have the following for this examination:
    - Drawing paper/ Examination Booklet, Examination pass and student ID.
    - Drawing instruments
    - Scientific calculator
2. This paper consists of **FIVE** Questions.
3. Answer Question **ONE** (Compulsory) and any other **TWO** Questions.
4. **Do not write on the question paper.**

QUESTION ONE

Figure Q1 shows details of a small machine vice (drawn in first angle projection) and a key to its assembly. Draw, in full size and in correct orthographic projection, the following views (in third angle projection) of the completely assembled vice, the sliding jaw being approximately 25mm from the fixed jaw.

(a) A sectional front elevation on a vertical plane passing through the axis of the square threaded screw, in the direction indicated by X-X in the key.
(b) A plan in projection with the sectional front elevation

Enlist a bill of material and include only SIX important dimensions in the assembly drawing. All parts are made of mild steel.

(30 Marks)

QUESTION TWO

Figure Q2 shows two incomplete views (in first angle projection) of an intersection of two unequal hexagonal prisms meeting at an angle of 45^{o}. Draw:-

(a) The complete two views and include the end view projected from the front view to the left hand side.
(b) The surface development of the branch (smaller) prism.

(20 Marks)

QUESTION THREE

(a) The front view of an oblique truncated cone is shown in Figure Q3. Copy the view and draw the plan. From the views drawn, construct the surface development of the cone taking the seam line to be along the shorter length of the slanting sides of the cone.
(b) The focus of a hyperbola is 20mm from the directrix. Draw the curve if the eccentricity is $\frac{3}{2}$.

(20 Marks)

QUESTION FOUR

Plot the cam profile which meets the following specifications:
Shaft diameter = 10mm
Minimum diameter = 25mm

Performance:

- $0 - 90^o$, uniform velocity to ½ maximum lift.
- $90^o - 180^o$, simple harmonic motion to maximum lift.
- $180^0 - 270^o$, uniform acceleration to ½ maximum lift
- $270^o - 360^o$, uniform retardation to maximum fall.

Take rotation to be anticlockwise.

(20 Marks)

QUESTION FIVE

(a) Define the following terms with reference to limits and fits:

(i) Tolerance

(ii) Allowance

(iii) Fundamental deviation

(3 Marks)

(b) With the aid of sketches, explain the following types of fit:

(i) Clearance fit

(ii) Interference fit

(iii) Transition fit

(6 Marks)

(c) (i) Given a hole of $30^{+0.25}_{-0.00}\,mm$ diameter and a shaft of $30^{+0.18}_{+0.02}\,mm$ in diameter, determine:

- Tolerance on hole
- Tolerance on shaft
- Allowance
- Maximum interference
- Maximum clearance
- Type of fit

(ii) A hole is specified as $35^{+}_{-}0.016mm$ diameter. Determine the gauge limits for 'GO' and 'NOT GO' plug gauge to check this dimension. Take gauge maker's tolerance as 10% of the work tolerance.

(11 Marks)

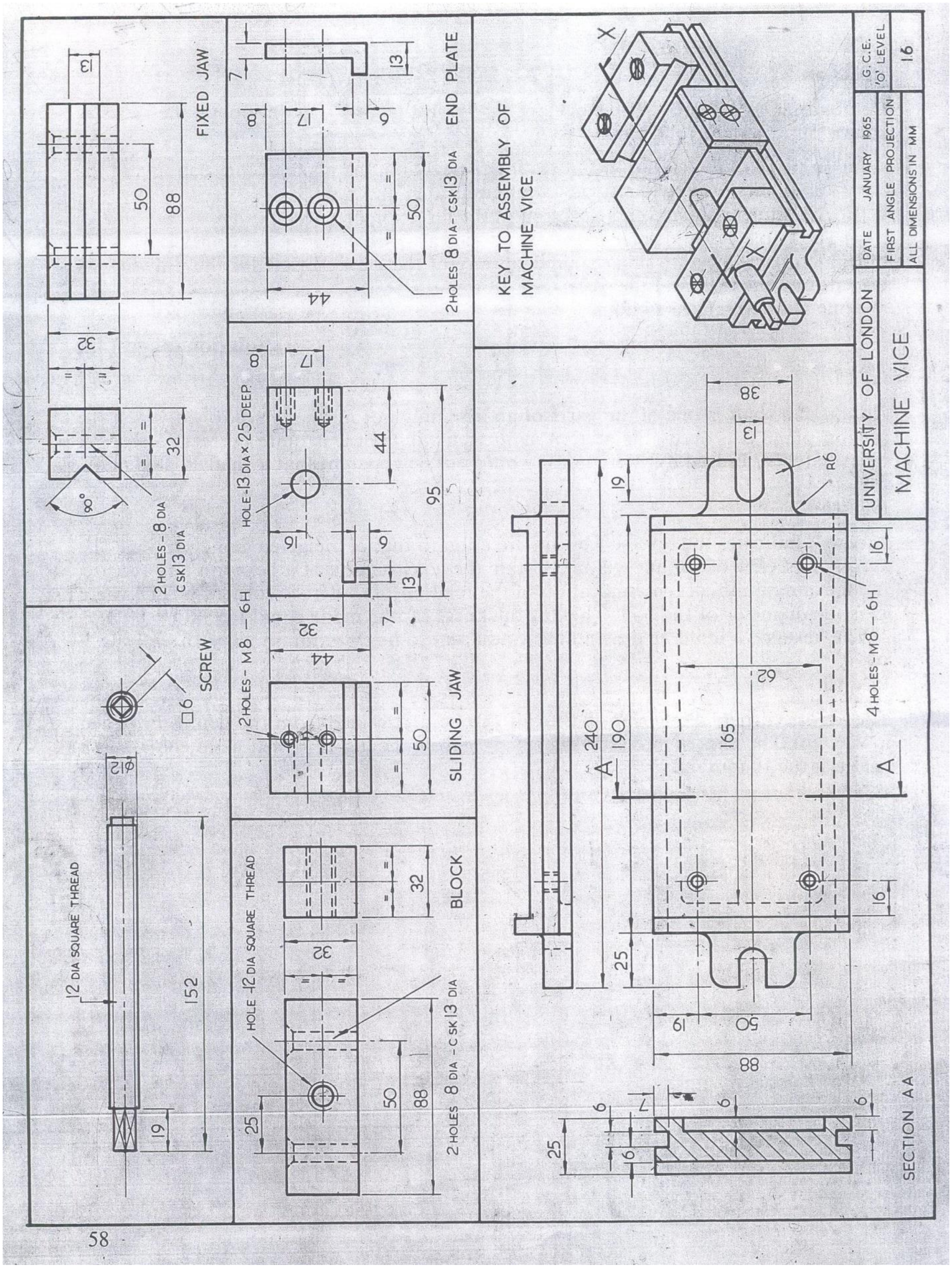
FIXED JAW
2 HOLES - 8 DIA CSK 13 DIA
END PLATE
2 HOLES 8 DIA - CSK 13 DIA
KEY TO ASSEMBLY OF MACHINE VICE
SCREW
12 DIA SQUARE THREAD
SLIDING JAW
HOLE - 13 DIA × 25 DEEP
2 HOLES - M8 - 6H
BLOCK
HOLE 12 DIA SQUARE THREAD
2 HOLES 8 DIA - C SK 13 DIA
4 HOLES - M8 - 6H
SECTION AA
UNIVERSITY OF LONDON
MACHINE VICE
DATE JANUARY 1965
FIRST ANGLE PROJECTION
ALL DIMENSIONS IN MM
G.C.E. 'O' LEVEL
1.6
58

Figure Q1

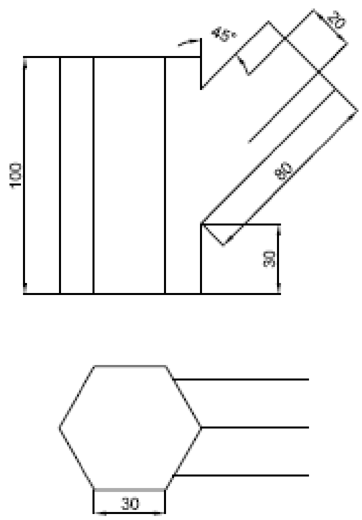

Figure Q2

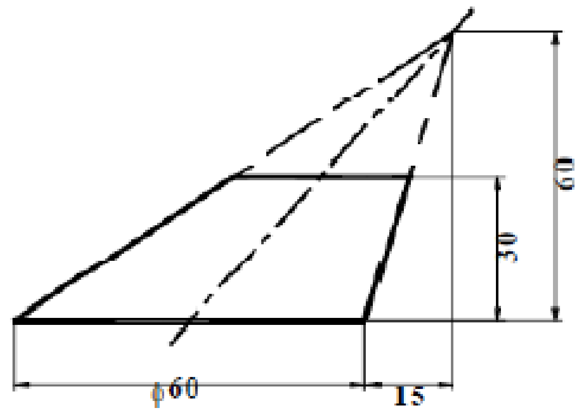

Figure Q3