



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN MECHANICAL ENGINEERING

EME 2108: ENGINEERING DRAWING II

SUPPLEMENTARY/SPECIAL EXAMINATIONS

SERIES: Select series 2016

TIME: 2 HOURS

DATE: Pick Date Select Month Pick Year

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, drawing instruments, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE (COMPULSORY)

Figure Q.1 shows details parts of a Vee block clamp. Draw to full scale in the first angle orthographic projection the following views

- i. Front elevation of correctly assembled block clamp
- ii. Sectional end elevation along plane A-A
- iii. Prepare a part list (20mks)

Question TWO

A cam is to be designed for a knife-edge follower with the following data:

Cam lift = 40mm during 90° of cam rotation with simple harmonic motion.

Dwell for the next 30° .

During the next 60° of the cam rotation, the follower returns to its original position with a simple harmonic motion.

Dwell during the remaining 180° .

Draw the profile of the cam when the line of stroke is offset 20mm from the axis of the cam shaft. (20mks)

Question THREE

a) With the aid of neat sketches, define the following screw thread terminologies.

- i. Crest
- ii. Major diameter
- iii. Pitch
- iv. Effective diameter (*8mks*)

b) Construct the profile for a single –start right –hand square thread with major diameter 100mm and lead 36mm, scale 1:1 (*12mks*)

Question FOUR

Figure Q.4 shows a slider-crank mechanism. The crank OA rotates about a fixed centre O. The connecting rod AP slides in a trunnion, which pivots about point X. if OA = 35mm, AP = 130mm and OX = 85mm, construct the locus of point P.. (*20mks*)

Question FIVE

a) Illustrate with diagrams the following types of fits:

- i. clearance fit
- ii. transition fit
- iii. interference fit(*6mks*)

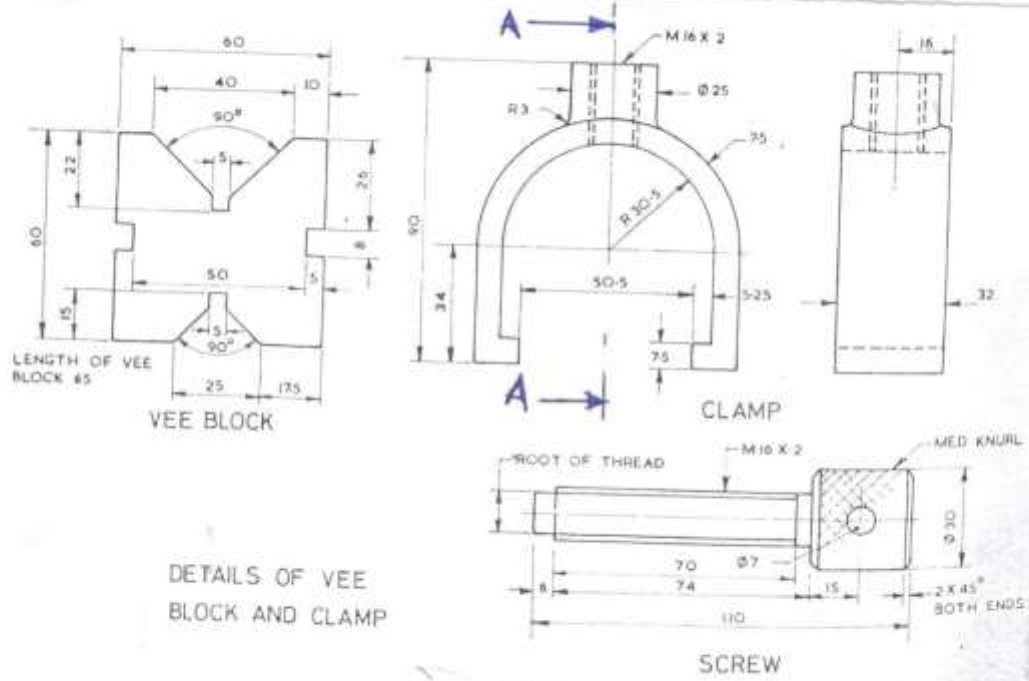
b) Define the maximum and minimum limits of size, for the hole and shaft, in the following rating systems:

- i. 55mm H8/f6
- ii. 225mm H7/p7
- iii. 7.5mm H7/k6

Which kind of fit is achieved in each instance?(*6mks*)

c) Figure Q.5 shows a sectional bush shaft assembly. Use BS4500 selected ISO fits table to find the limits and fits between:

- i. bush and housing
- ii. bush and shaft(*8mks*)



DETAILS OF VEE
 BLOCK AND CLAMP

FIGURE Q.1

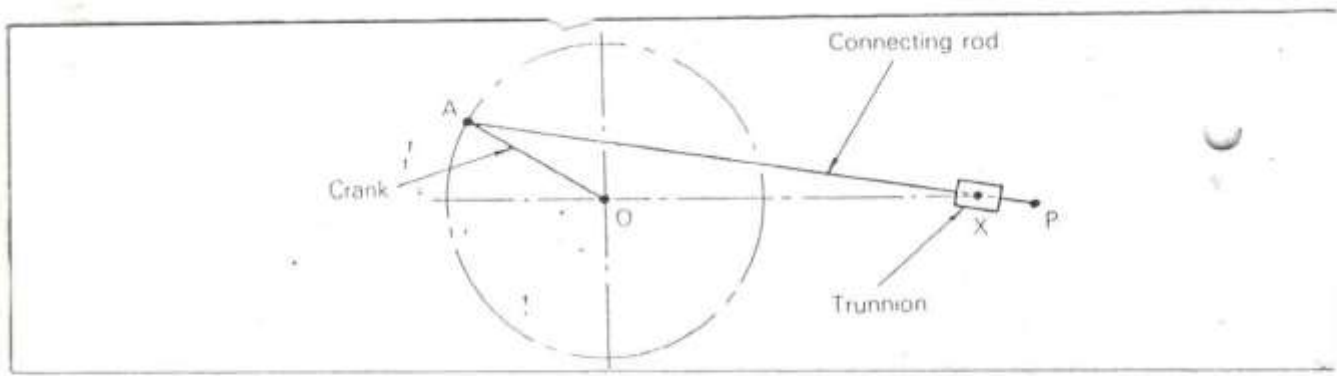


FIGURE Q.4

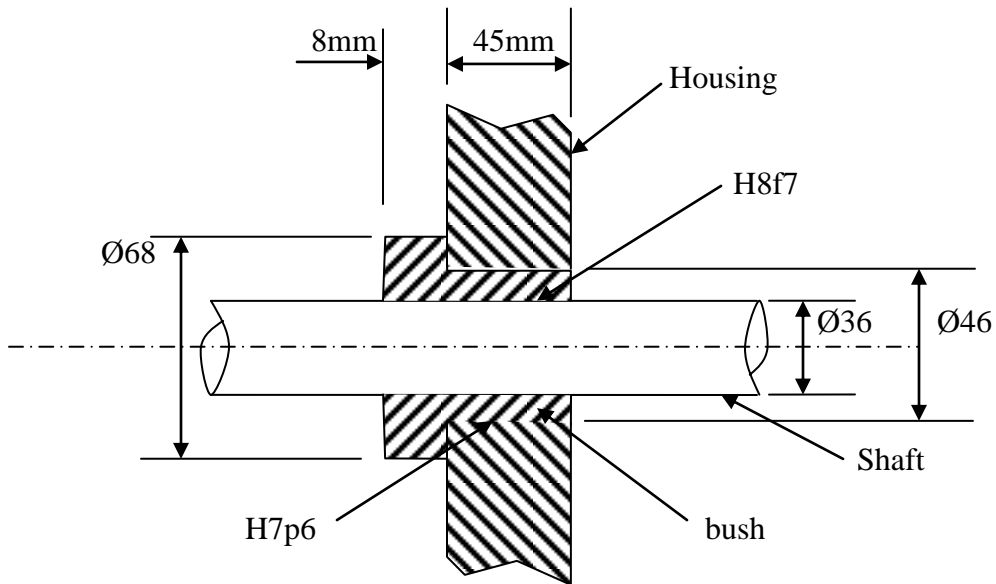
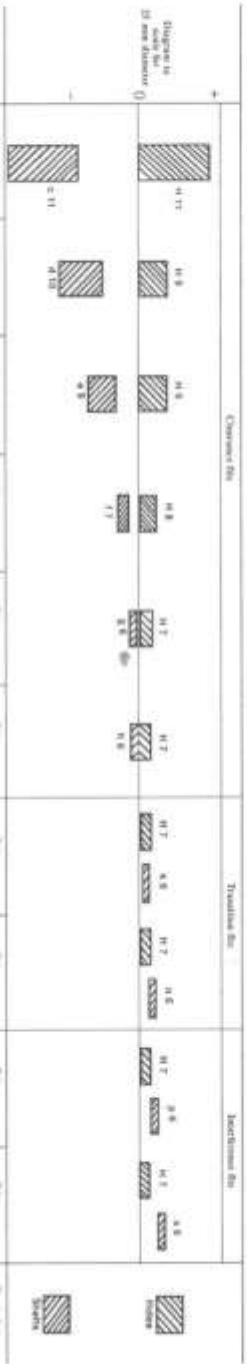


FIGURE Q.5

Estimated
from
BS 4500 : 1990

BRITISH STANDARD SELECTED ISO FITS—HOLE BASIS

Data Sheet
4500A
Issue 2 February 1995
replaces BS 4500 : 1990



Tolerance zone	H11		H10		H9		H8		H7		H6		H5		H4		H3		H2		H1		Tolerance zone
	ES	ei	ES	ei	ES	ei	ES	ei	ES	ei	ES	ei	ES	ei	ES	ei	ES	ei	ES	ei	ES	ei	
3	+0.011	-0.011	+0.011	-0.011	+0.011	-0.011	+0.011	-0.011	+0.011	-0.011	+0.011	-0.011	+0.011	-0.011	+0.011	-0.011	+0.011	-0.011	+0.011	-0.011	+0.011	-0.011	3
6	+0.018	-0.018	+0.018	-0.018	+0.018	-0.018	+0.018	-0.018	+0.018	-0.018	+0.018	-0.018	+0.018	-0.018	+0.018	-0.018	+0.018	-0.018	+0.018	-0.018	+0.018	-0.018	6
10	+0.025	-0.025	+0.025	-0.025	+0.025	-0.025	+0.025	-0.025	+0.025	-0.025	+0.025	-0.025	+0.025	-0.025	+0.025	-0.025	+0.025	-0.025	+0.025	-0.025	+0.025	-0.025	10
18	+0.035	-0.035	+0.035	-0.035	+0.035	-0.035	+0.035	-0.035	+0.035	-0.035	+0.035	-0.035	+0.035	-0.035	+0.035	-0.035	+0.035	-0.035	+0.035	-0.035	+0.035	-0.035	18
30	+0.050	-0.050	+0.050	-0.050	+0.050	-0.050	+0.050	-0.050	+0.050	-0.050	+0.050	-0.050	+0.050	-0.050	+0.050	-0.050	+0.050	-0.050	+0.050	-0.050	+0.050	-0.050	30
40	+0.060	-0.060	+0.060	-0.060	+0.060	-0.060	+0.060	-0.060	+0.060	-0.060	+0.060	-0.060	+0.060	-0.060	+0.060	-0.060	+0.060	-0.060	+0.060	-0.060	+0.060	-0.060	40
50	+0.070	-0.070	+0.070	-0.070	+0.070	-0.070	+0.070	-0.070	+0.070	-0.070	+0.070	-0.070	+0.070	-0.070	+0.070	-0.070	+0.070	-0.070	+0.070	-0.070	+0.070	-0.070	50
65	+0.085	-0.085	+0.085	-0.085	+0.085	-0.085	+0.085	-0.085	+0.085	-0.085	+0.085	-0.085	+0.085	-0.085	+0.085	-0.085	+0.085	-0.085	+0.085	-0.085	+0.085	-0.085	65
80	+0.100	-0.100	+0.100	-0.100	+0.100	-0.100	+0.100	-0.100	+0.100	-0.100	+0.100	-0.100	+0.100	-0.100	+0.100	-0.100	+0.100	-0.100	+0.100	-0.100	+0.100	-0.100	80
100	+0.120	-0.120	+0.120	-0.120	+0.120	-0.120	+0.120	-0.120	+0.120	-0.120	+0.120	-0.120	+0.120	-0.120	+0.120	-0.120	+0.120	-0.120	+0.120	-0.120	+0.120	-0.120	100
120	+0.140	-0.140	+0.140	-0.140	+0.140	-0.140	+0.140	-0.140	+0.140	-0.140	+0.140	-0.140	+0.140	-0.140	+0.140	-0.140	+0.140	-0.140	+0.140	-0.140	+0.140	-0.140	120
140	+0.160	-0.160	+0.160	-0.160	+0.160	-0.160	+0.160	-0.160	+0.160	-0.160	+0.160	-0.160	+0.160	-0.160	+0.160	-0.160	+0.160	-0.160	+0.160	-0.160	+0.160	-0.160	140
160	+0.180	-0.180	+0.180	-0.180	+0.180	-0.180	+0.180	-0.180	+0.180	-0.180	+0.180	-0.180	+0.180	-0.180	+0.180	-0.180	+0.180	-0.180	+0.180	-0.180	+0.180	-0.180	160
180	+0.200	-0.200	+0.200	-0.200	+0.200	-0.200	+0.200	-0.200	+0.200	-0.200	+0.200	-0.200	+0.200	-0.200	+0.200	-0.200	+0.200	-0.200	+0.200	-0.200	+0.200	-0.200	180
200	+0.225	-0.225	+0.225	-0.225	+0.225	-0.225	+0.225	-0.225	+0.225	-0.225	+0.225	-0.225	+0.225	-0.225	+0.225	-0.225	+0.225	-0.225	+0.225	-0.225	+0.225	-0.225	200
225	+0.250	-0.250	+0.250	-0.250	+0.250	-0.250	+0.250	-0.250	+0.250	-0.250	+0.250	-0.250	+0.250	-0.250	+0.250	-0.250	+0.250	-0.250	+0.250	-0.250	+0.250	-0.250	225
250	+0.280	-0.280	+0.280	-0.280	+0.280	-0.280	+0.280	-0.280	+0.280	-0.280	+0.280	-0.280	+0.280	-0.280	+0.280	-0.280	+0.280	-0.280	+0.280	-0.280	+0.280	-0.280	250
280	+0.315	-0.315	+0.315	-0.315	+0.315	-0.315	+0.315	-0.315	+0.315	-0.315	+0.315	-0.315	+0.315	-0.315	+0.315	-0.315	+0.315	-0.315	+0.315	-0.315	+0.315	-0.315	280
315	+0.350	-0.350	+0.350	-0.350	+0.350	-0.350	+0.350	-0.350	+0.350	-0.350	+0.350	-0.350	+0.350	-0.350	+0.350	-0.350	+0.350	-0.350	+0.350	-0.350	+0.350	-0.350	315
355	+0.400	-0.400	+0.400	-0.400	+0.400	-0.400	+0.400	-0.400	+0.400	-0.400	+0.400	-0.400	+0.400	-0.400	+0.400	-0.400	+0.400	-0.400	+0.400	-0.400	+0.400	-0.400	355
400	+0.450	-0.450	+0.450	-0.450	+0.450	-0.450	+0.450	-0.450	+0.450	-0.450	+0.450	-0.450	+0.450	-0.450	+0.450	-0.450	+0.450	-0.450	+0.450	-0.450	+0.450	-0.450	400
450	+0.500	-0.500	+0.500	-0.500	+0.500	-0.500	+0.500	-0.500	+0.500	-0.500	+0.500	-0.500	+0.500	-0.500	+0.500	-0.500	+0.500	-0.500	+0.500	-0.500	+0.500	-0.500	450
500	+0.550	-0.550	+0.550	-0.550	+0.550	-0.550	+0.550	-0.550	+0.550	-0.550	+0.550	-0.550	+0.550	-0.550	+0.550	-0.550	+0.550	-0.550	+0.550	-0.550	+0.550	-0.550	500

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