EXAMINATION MAY/JUNE 2018
SUBJECT CODE NO:- H-159-B
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Mechanical)
Tool Engineering
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1) <u>Q.4 & Q.8 are compulsory</u>. <u>Attempt any two</u> questions <u>from the remaining question of each section</u>.
2) Use drawing sheet for Q.4
3) Assume suitable data and dimensions it required.
4) All dimensions are in mm

Section A

Q.1 a) During the orthogonal cutting operation, the following data has been observed: 08
Uncut chip thickness $t=0.15mm$
Cutting speed $v=2m/s$
Chip thickness $t_c=0.3mm$
Rake angle $\alpha=10^0$
Width of cut $b=6.2mm$
Cutting force $F_c=575 N$
Thrust force $f_t=250 N$
Determine: shear angle, the friction angle, shear stress along shear plane and the power for the cutting operation.

b) Discuss various types of tool wear.   04

Q.2 a) Define tool life. Explain Taylor's tool life equation in detail. Enlist the various tool life criteria.   08
b) How does rake angle affect the life of cutting tool?   04

Q.3 a) Explain in detail following drilling bushes with neat sketches   08
i)Press fit bushing
ii)Renewable bushing
b) Define jig and fixture. Why they are used.   04

Q.4 Design draw and dimension a drill jig to drill two holes of Ø 10mm in a component as show in   16
fig.1
OR
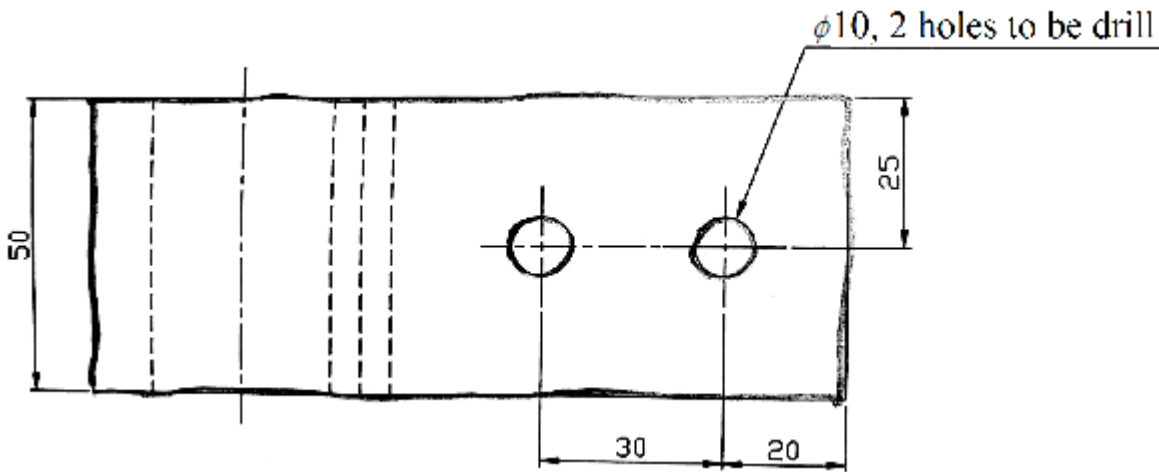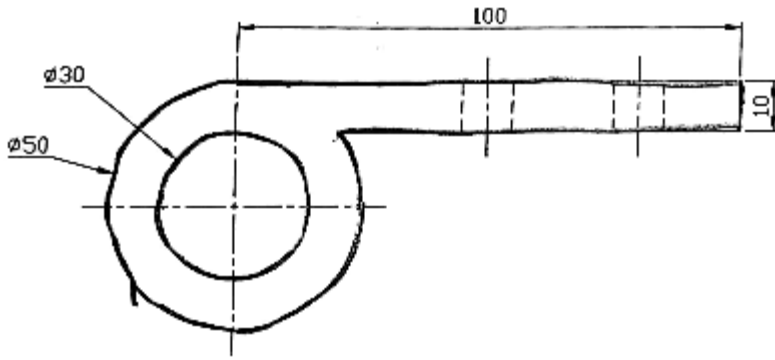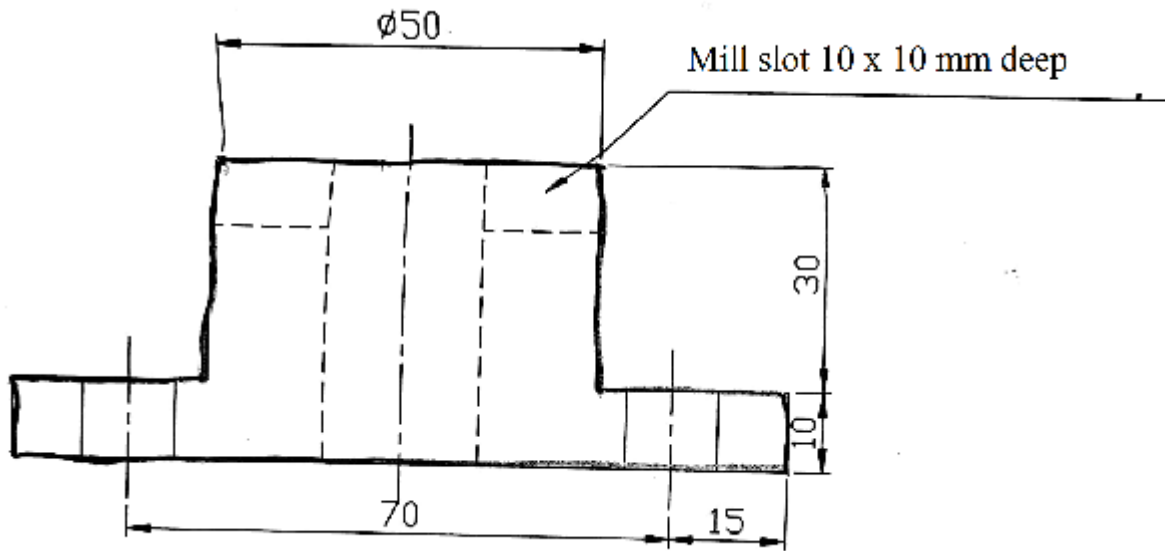Design and draw a milling fixture to mill the slot 10×10mm deep in a component shown in   16
fig.2

1

C142800AE5F0DF479EFD8DBDE5DFB08A

Fig.1

2

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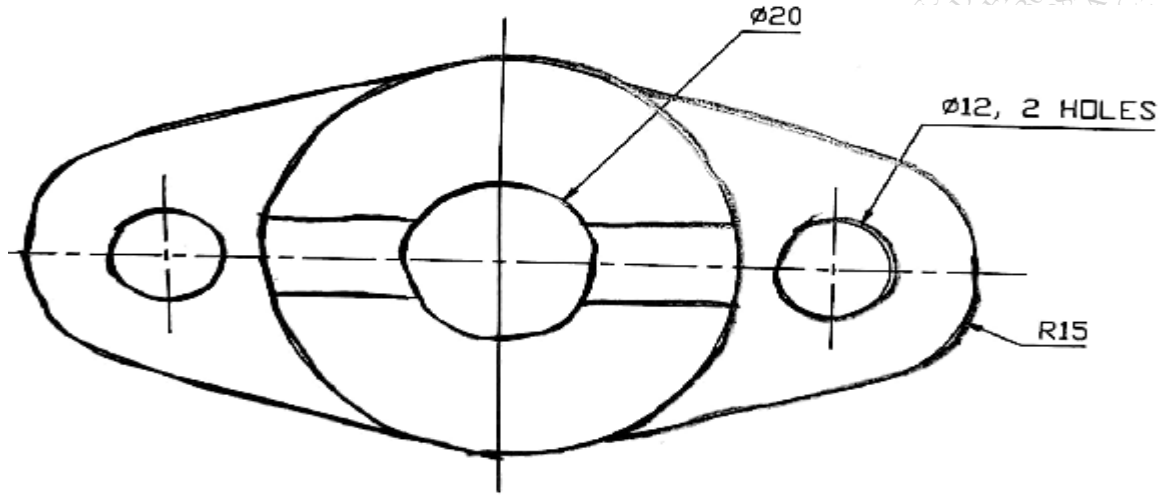
Fig.2

Section 'B'

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Q.5	Draw neat sketches of following with nomenclature of their elements (<u>Any Two</u>)	12
	i. Twist drill	
	ii. Single point cutting tool	
	iii. Pull type broach	
Q.6	a) What is clearance? Explain its importance.	08
	b) Write short note on methods of punch holding.	04
Q.7	a) How the size of blank and number of draws are decided for drawing a cylindrical cup?	08
	b) Explain importance of bend allowance.	04
Q.8	a) Sketch and design progressive die to make a steel washer 40mm outside diameter with 20mm hole from 1.6mm thick sheet. The ultimate shear strength of material is 313N/mm^2.Calculate	16
	1) Punch and die size	
	2) Maximum punch force	
	3) Draw two views of assembly	
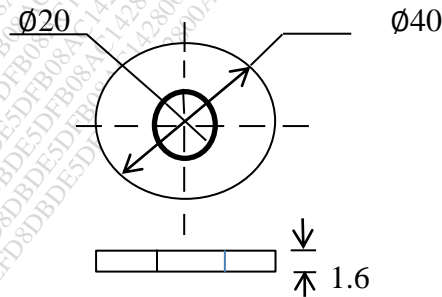
Fig.3

3

OR

b) The symmetrical cup work piece is shown in figure 4 has to be made from cold rolled   16
steel (yield strength $427N/mm^2$)0.8mm thick. Make the necessary calculation for
designing the drawing die for this part.

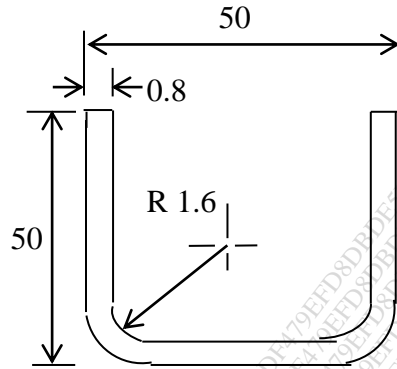**Fig.4**

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