Total No. of Printed Pages:4

SUBJECT CODE NO: E-61
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(Mech) Examination Nov/Dec 2017
Tool Engineering (REV.From 2015-2016 Batch)
(REVISED)

[Time: Four Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1) Q.4 and Q.8 are compulsory .Attempt any two questions from the remaining questions of each section
2) Use drawing sheet for Q.4
3) Assume suitable data and dimension if required
4) All dimensions are in mm

Section A

Q.1 a) The following equation for tool life has been obtained for H.S.S tool: 08

$$VT^{0.13} f^{0.77} d^{0.37}=C$$

A 60min. tool life was obtained while cutting at V=30m/min, f = 0.3 mm/rev and d = 2.5mm. Determine the effect of tool life if cutting speed, feed and depth of cut are increased by 25% individually and also taken together

b) Explain the condition recommended for the use of positive and negative rake angle in cutting tool. 04

Q.2 a) Define tool life? Explain Taylor's tool life equation in detail. Enlist the various tool life criteria. 08

b) Explain flank and crater wear 04

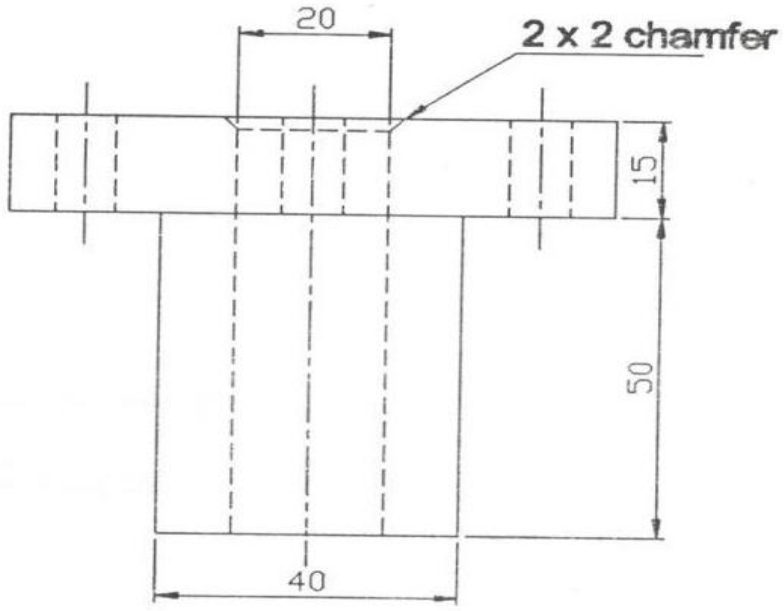
Q.3 a) Explain 3-2-1 principle followed in jig and fixture design ' 07

b) Define tool proofing. Explain it with suitable example 05

Q.4 Design, draw and dimensions a drill jig to drill a 4 holes of ϕ 8mm on PCD 60 in a finish component shown in fig.1 16

OR

Design draw and dimensions a milling fixture to mill a slot of 10×10mm deep in finish component shown in fig.2 16



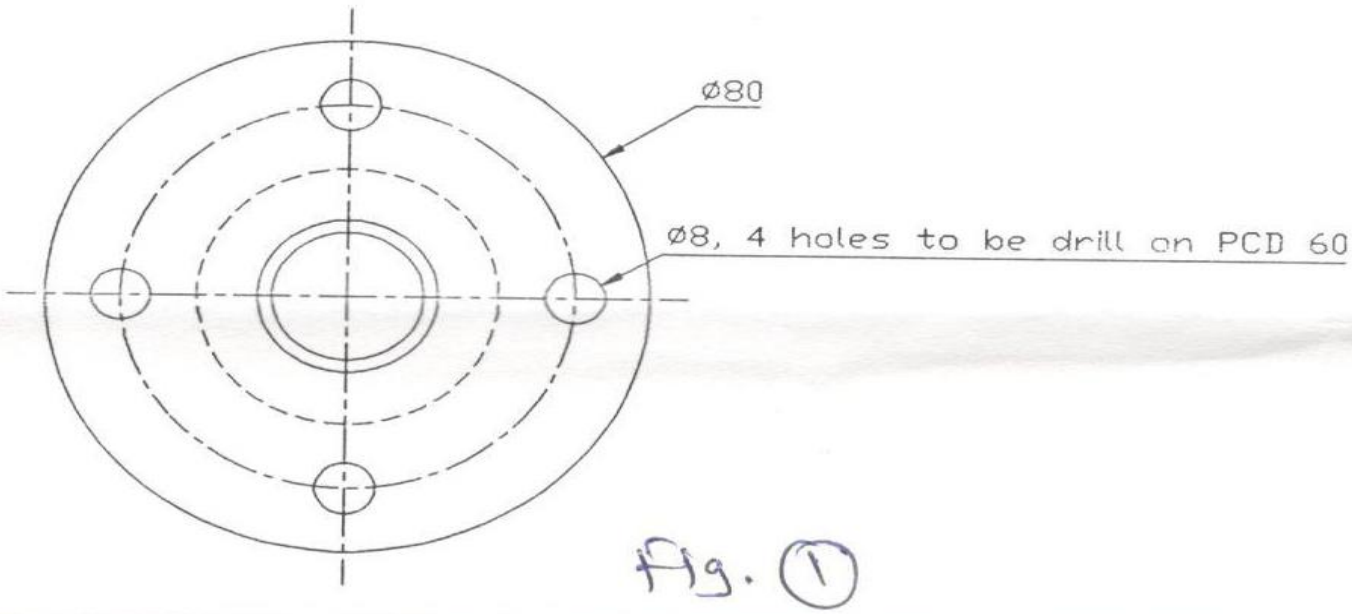
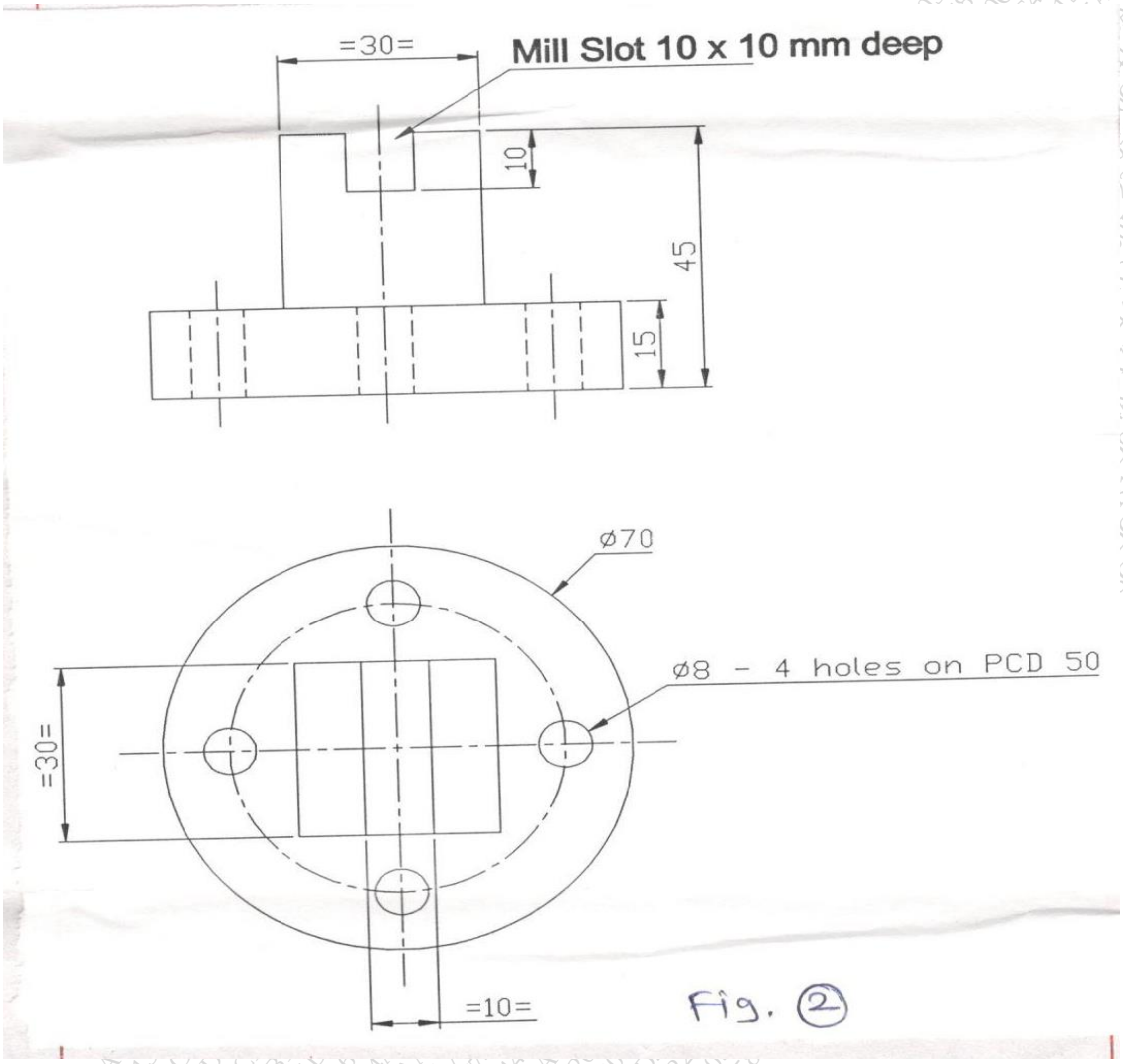


Fig. (1)

2017



Section – B

Q.5 Draw neat sketches of the following with nomenclature of their elements (any two) 12

i) Spiral point hand tap
ii) Hand reamer ‘
iii) Peripheral milling cutter

Q.6 a) Differentiate between blanking dies and piercing dies 06
b) Explain the principle of metal cutting in sheet metal working 06

Q.7 a) Why more than one draw is needed to draw a cup? How to calculate required number of draws? 06
b) Write short note on V- bending and U- bending 06

Q.8 a) A steel washer of 36mm outer diameter and 20mm inside diameter is to be made from 1.2mm thick sheet in one operation. If the shear stress is 400 N/mm^2 and percentages penetration is 20% calculate 16

1) Maximum punch force necessary to blank and punch the washer, if both punches operate at same time
2) Percentage reduction in punch force, if 0.5mm double shear is ground on the tool

OR

b) Figure 3 shows a symmetrical cup warkpiece with a shell height of 40mm and shell diameter of 50mm the corner radius is 1.6mm, the warkpiece material is 1020 cold rolled steel with 0.8mm thickness and tensile strength 315N/mm^2 calculate 16

i) Blank size and % reduction
ii) Draw ratio
iii) Radius on punch and die
iv) Die clearance and draw pressure

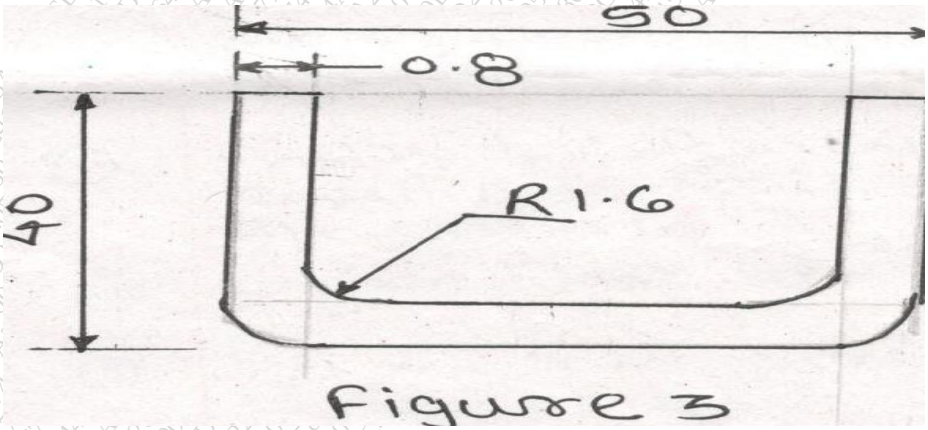


Figure 3