

B.TECH SEM – V (2007 COURSE) (MECHANICAL ENGG.) :
WINTER - 2017

SUBJECT: ADVANCE MANUFACTURING PROCESSES

Day: Thursday
Date: 18/01/2018

Time: 02.30 PM TO 05.30 PM
Max. Marks: 80

W-2017-2477

N.B:

- 1) **Q.No.1 and Q.No.5 are compulsory.** Out of the remaining attempt **ANY TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer book.
- 4) Assume suitable data if necessary.

SECTION-I

- Q.1** Design a drilling Jig to drill $\varnothing 14$ mm, $\varnothing 16$ mm holes on the component (14) shown in fig.1.
- Q.2** a) Explain with neat sketch the functions of various tool parts? Give the tool signature. (06)
- b) In an orthogonal cutting operation following data has been observed. (07)
- i) Cutting speed = 0.24 m/sec
 - ii) Uncut chip thickness = 0.08mm
 - iii) depth of cut = 4.13 mm
 - iv) Chip thickness ratio = 0.16
 - v) Rake angle = 20°
 - vi) Cutting force = 363N
 - vii) Thrust force = 128N
- Determine shear angle, friction angle, chip velocity and shear strain.
- Q.3** a) Explain with neat sketch the 3-2-1 principle for location system. (06)
- b) Give Design Principles for Milling fixtures and classify the milling fixtures. (07)
- Q.4** a) Explain with neat sketch ultrasonic machining process and also state its applications. (07)
- b) Explain with neat sketch the gear hobbing process. (06)

SECTION-II

- Q.5** Design a deep drawing die for the component shown in fig.2. (14)
- Q.6** a) Explain with neat sketch the various sheet metal operations? (06)
- b) A cup of diameter 40mm and height 70mm is to be drawn from 0.8mm thick aluminum sheet. Determine the number of draw on the basis of percentage reduction and find the force required for each draw. Given that yield strength is 175N/mm^2 . (07)
- Q.7** a) What are the primary elements in T1 tool steel that provide red hardness? Explain the heat treatment cycle for it. (07)
- b) Define hardenability. How hardenability is measured? (06)
- Q.8** a) Write an APT program to mill the contour as shown in fig.3. (08)
- b) Explain in detail the DNC concept? (05)

P.T.O.

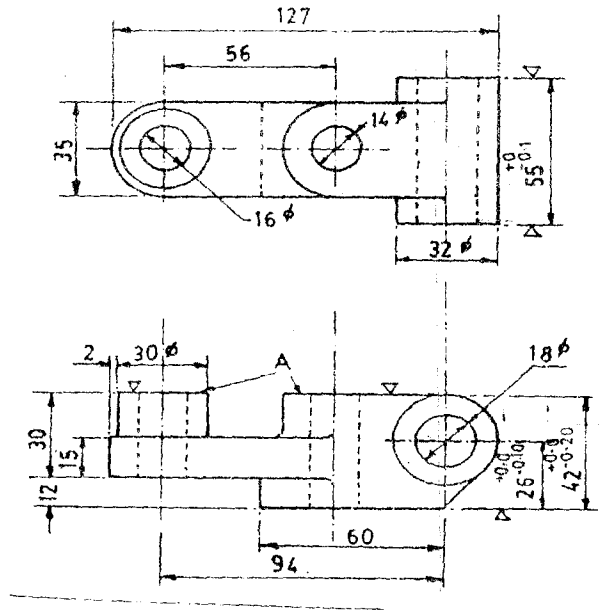
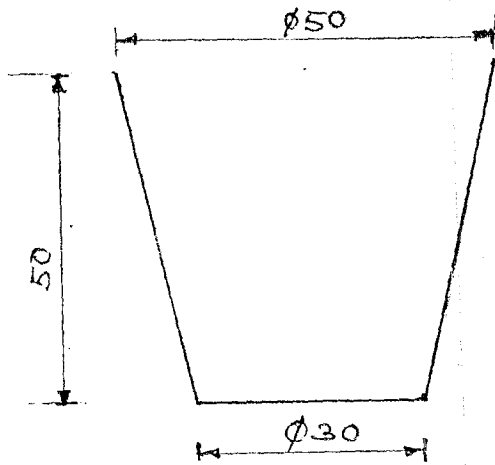
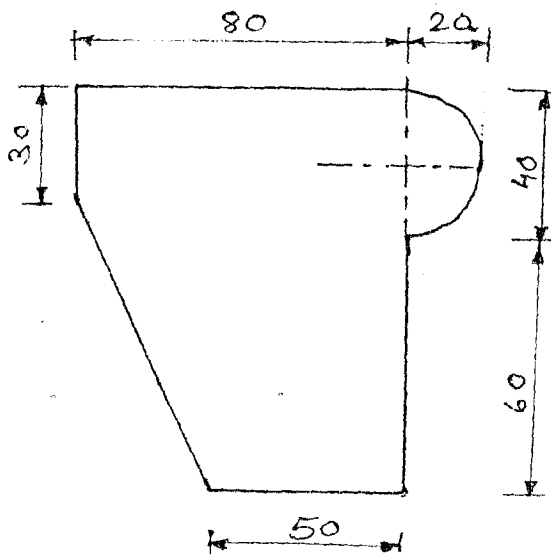


Figure 1



Thickness - 0.8 mm
 material - S. steel
 U.T.S. - 420 N/mm²

Figure 2.



Thickness - 10 mm
 (Figure Not to the scale)

Figure 3