FACULTY OF ENGINEERING & TECHNOLOGY
T.E (Mechanical)Year Examination - June– 2015
Tool Engineering
(Revised)

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

"Please check whether you have got the right question paper."

i) Attempt <u>any three</u> questions from each section.
ii) Use drawing sheet for design and draw.
iii) All dimensions given in figures are in mm.
iv) Assume suitable data , if required

SECTION-A

Q.1   a) Differentiate between positive and negative rake angles. How does rake angle affect the life of cutting   07
          tool?

      b) Explain 'Merchant force circle 'with neat sketch.   06

Q.2   In orthogonal cutting operation, cut of 2.5 mm wide was made with 0.26 mm feed and 0.5 M/S cutting   14
          speed using a H.S.S tool having 10° rake angle .The chip thickness ratio is found to be 0.6, the cutting
          force is 1200N and the feed thrust force is 340 N. Determine chip thickness , shear plane angle ,
          resultant force , resultant force , co-efficient of friction on the face of tool , friction force and normal
          force on the chip , shearing force and normal force on the shear plane ,specific energy .

Q.3   a) Sketch a twist drill and write brief on its lip angle, helix angle, chisel angle, and point angle.   07

      b) Describe with neat sketches the different types of drill bushes used in drill jigs.   06

Q.4   Design and draw a drill jig to drill theØ 12 mm holes (4 holes equispaced) in the component boss shown   13
          in fig. 1 Drilling of these holes is the last operation

Q.No.4 Fig.1. Boss.
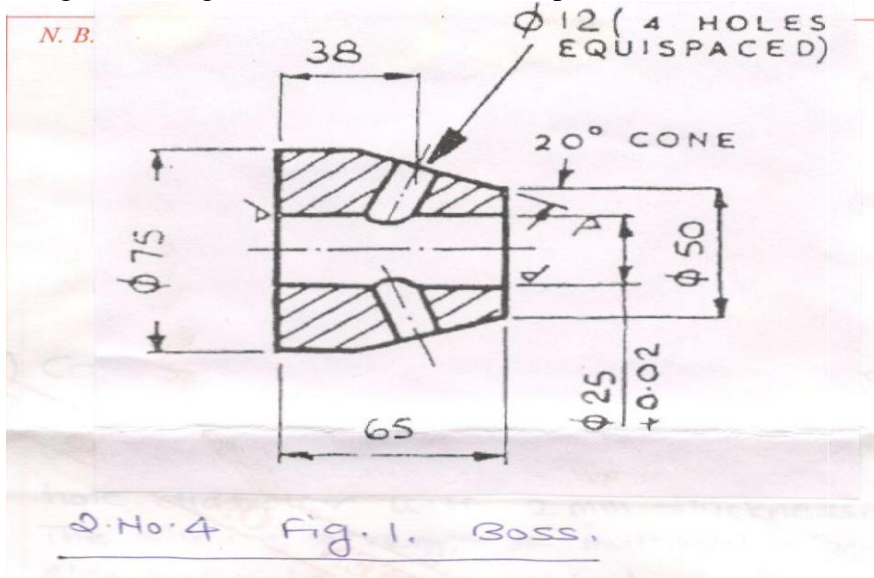
Q.5   Design and draw a milling fixture to machine the end surface of link connecting rod.in fig .2. (surface   13
       A and B) .Assume that the end holes are already bored to size .
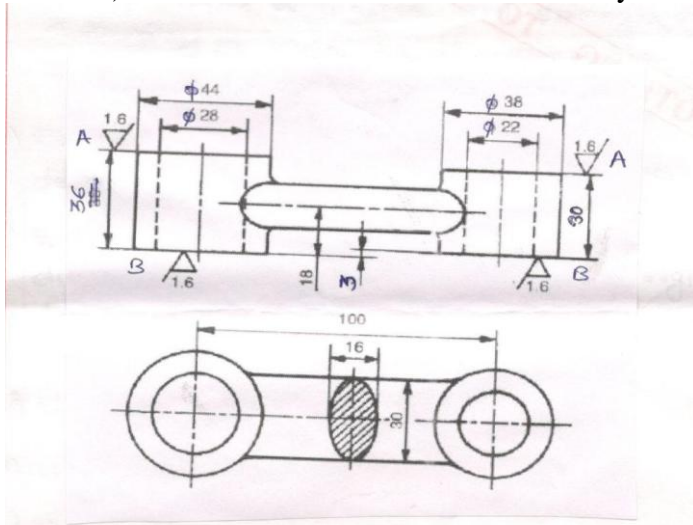
Q.No5. Fig.2. link connecting rod.

SECTION -B

Q.6   a) Differentiate between compound press tool and progressive press tool   07
       b) Explain the various methods employed to reduce the forces during sheet metal blanking and piercing   06
           operations .

Q.7   a) Describe with neat sketches embossing dies and bulging dies.   06
       b) How the size of blank and number of draws decided for drawing of cylinderical cup? Explain with   07
           suitable example .

Q.8   a) Calculate the maximum punch force necessary to produce steel washer of 30 mm outside diameter and   06
           18 mm hole diameter with 2mm thickness . The shear strengt of material is $360N/mm^2$ Also estimate
           the work done if penetration is 25%.
       b) Define bend allowance and springback in bending of sheet metal .Draw the sketch of V bending die.   07

Q.9   a) Explain the basic rules for die design of forging.   07
       b) What are the materials used for forging die block ? Enlist the properties ot material desired .   06

Q.10   a) Write note on " Injection mould ".   05
       b) Write note on "Strip layout".   05
       c) Write note on "3-2-1 principle of location .   04