Reg.No.					



MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent unit of MAHE, Manipal)

II SEM M. Tech. (MANUFACTURING ENGG & TECHNOLOGY) DEGREE END SEMESTER EXAMINATIONS, APRIL 2018

SUBJECT: DESIGN OF MANUFACTURING TOOLS (MME 5221) REVISED CREDIT SYSTEM

Time: 3 Hours

Max. Marks: 50

Instructions to Candidates:

- Answer **ALL** questions.
- The use of CERTIFIED DATA SHEET is permitted.
- Missing data, if any, may be assumed appropriately.
- 1. a) Discuss the concept of '**Strip Layout**' with reference to shearing operation in sheet metal working. [04]

b) Design a circular form tool for machining the component shown in **Fig. Q. 1b.** The work material is steel with hardness 250 BHN. The centre of the tool is 4 mm above the centre of the work and the outside diameter of the form tool is 50 mm. **[06]**



Fig. Q. 1b

(MME 5221)

- 2. a) Design a machine reamer for reaming Ø30H7 hole in high carbon steel work material. Take the tolerance band for Ø30H7 hole as +0.027, 0.00. [05]
 b) Design a parting-off tool for cutting Ø25mm Aluminium bar at a feed rate of 0.1 mm/rev. [05]
- 3. a) Discuss with an example the importance of computing centre of pressure of the component to be produced through piercing operation. [04]
 b) Design a die and punch and select a suitable press for piercing a 40x30 mm hole in 5 mm thick steel sheet having 250 MPa shear strength. [06]
- a) Design a twist drill for drilling 18.25 mm diameter and 90 mm deep hole in the Aluminium blank. Take the flute cutter diameter as 80mm. [07]
 b) Recommend the appropriate shank end for the drilling tool designed as per the problem definition in Q. 4. a and show the working drawing of the drilling tool with dimensions. [03]
- 5. a) Design the machine tap for threading 60 mm deep blind hole in high carbon steel work material to M20x2.5 (6H grade). Let the tensile strength of the work material be 1000MPa.
 b) Draw the designed tapping tool as per the problem definition in Q. 5. a.

b) Draw the designed tapping tool as per the problem definition in Q. 5. a, showing important dimensions. [03]