Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

V SEMESTER B.TECH. (MECHATRONICS ENGINEERING)
END SEMESTER EXAMINATIONS, DEC- 2016/JAN- 2017

SUBJECT: MANUFACTURING TECHNOLOGY [MTE-3101]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

1A. List out the advantages and disadvantages of metal inert gas welding. **4**

1B. With a neat sketch, Explain the principle of radial drilling machine. **4**

1C. Describe part family which is a central feature of group technology. Also give a simple example for part family. **2**

2A. What are the different types of shearing operations in sheet metal? **2**

2B. Write a part program to obtain the model shown in below (fig 2B) from the workpiece of given size. (all the dimensions are in mm) **3**

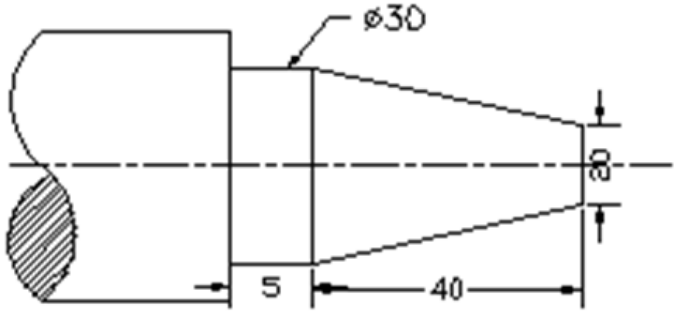

Fig 2B : Taper turning operation

2C. Discuss hot and cold chamber die casting process with a sketch. **5**

3A. Select an appropriate surface finishing process for finishing bores of IC engine cylinder and discuss about the internal surface finishing process. **2**

3B. Determining Number of Vehicles in an AGVs required, given the AGVS layout shown in Fig 3B. Vehicles travel counter clockwise around the loop to deliver loads from the load station to the unload station.
Loading time at the load station = 0.75 min, and unloading time at the unload station = 0.50 min. It is desired to determine how many vehicles are required to satisfy demand for this layout if a total of 40 del/hr must be completed by the AGVs. The following performance parameters are given: **3**
vehicle velocity= 50m/min, availability = 0.95, traffic factor = 0.90,and operator efficiency does not apply, so E = 1.0

Determine: (a) travel distances loaded and empty, (b) ideal delivery cycle time, and (c) number of vehicles required to satisfy the delivery demand.

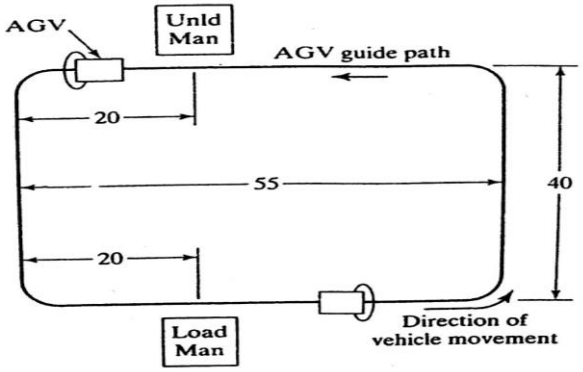

Fig 3B: AGV Path

3C. Write the short note on the following:
(a) In-line layout
(b) Loop layout
(c) Ladder layout
(d) Open field layout
(e) Robot centered layout. **5**

4A. Differentiate between traditional and non-traditional machining process. **4**

4B. With the help of schematic illustration, Explain shearing process in sheet metal forming. **3**

4C. Write a part program to obtain the model shown below from the workpiece of given size. Dill 4 holes at the corner using drill bit of 5mm diameter. **3**

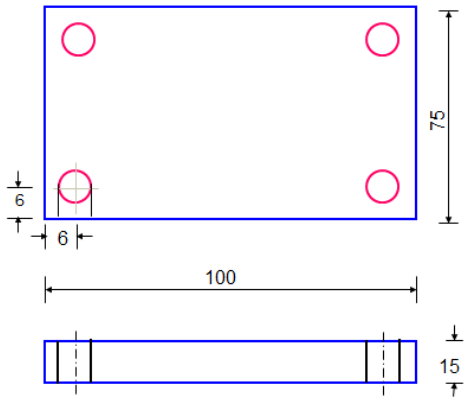

Fig 4C: Four holes at the corner(all dimensions are in mm)

5A. Discuss features and typical applications for material handling equipment's. **5**

5B. Discuss various types of spindle bearings used in CNC and NC machines. **3**

5C. List out the design criteria for CNC machine tool design. **2**