MCL131 MANUFACTURING PROCESSES 1	B.Tech. MINOR –I LH108
Max.Marks : 40	Date: 5.02.18- Monday,4.00PM-5.00PM

1. Write your name, entry number and group number on BOTH the answer sheets.
2. PART A and PART B should be answered in separate answer sheets
3. Be brief and specific in your answers. Draw suitable, neat sketches wherever required.

PART A

1. Specify the material and the associated manufacturing process for the following components. (4)

Component	Crane Hook	Filament of bulb	sparkplug	piston
Material				
Manufacturing process				

2. Specify the function of a riser and with a sketch, explain the types of risers (5)

3. Write the difference between the following (6)
   a) Strainer core and splash core b) Skim bob and shrink bob

4. Specify the carbon morphology (form of carbon) of the following cast irons and explain the procedure of obtaining the same. (10)
   a) Malleable CI b) Nodular CI

PART B

PART-B (Max. Marks: 15)

5. a) A rigid plastic metal with linear strain hardening has a yield stress of 120 MPa and the strength coefficient is 300 MPa. Draw the flow curve and write equation for flow stress.

   (2)

   b) The strain hardening behavior of a material is given by $\sigma = 1000\varepsilon^{0.2}$MPa. Bar A of this material is first cold worked to reduce area of cross section by 20%, followed by an additional cold work of 30%. Bar B of this material is cold worked to reduce cross sectional area by 50%. After cold working, if the required minimum yield stress is 920 MPa, which of these two bars can be used? (4)

6. a) Give any one example for a metal forming process in which the state of stress is
   a. Pure tension
   b. Combined tension and compression
   c. Pure shear
   d. Cylindrical

   (2)

   b) Draw yield loci of Von Mises and Tresca yield criteria for a plane stress system and show the points corresponding to equi-biaxial tension and pure shear. (3)

   c) The state of stress at a point is given by $\sigma_{11} = 70$ MPa, $\sigma_{22} = 120$ MPa, $\tau_{12} = 35$ MPa. If the uniaxial yield stress of the material is 125 MPa, determine whether yielding will occur according to a) Von-Mises yield criterion and (b) Tresca yield criterion. (4)