

MECHANICAL ENGINEERING DEPARTMENT
MCL 133 – Near Net Shape Manufacturing
Minor 1, 5th Feb 2018, 1.00 -2.00pm, LH 416

MAX MARKS 15

Note: Be brief and to the point, use figures to explain as far as possible!

- Q1.**
- a) Differentiate by schematics the working of Extrusion machine for i) Metals ii) Polymers.
 - b) What is the basic difference between an Injection Molding Machine and an Extruder for the thermoplastic material processing?
 - c) Why there is no dosing and packing of polymer melt in the polymer extrusion process?
 - d) What can happen if the non-return valve in Injection molding machine barrel does not work?
 - e) Why does a taper exist in a sprue and what decides its minimum and maximum diameters. (5)
- Q2.**
- a) What are the major reasons of voids and sink marks, how a part designer, mold designer and a molder can avoid these, as per individual expertise's! Explain with the help of an example.
 - b) Which polymer properties can affect warpage behavior of a part?
 - c) Which molding parameters can affect shrinkage behavior of a part?
 - d) What is the main reason for silver streaks in a molded part?
 - e) How jetting phenomenon can be minimized or eliminated in a molded part? (5)
- Q3.**
- a) Give a 3D sketch of your designed keychain of IITD.
 - b) What is the unique novelty or USP of your design?
 - c) How you would produce it as a near net shaped product? What are the alternative routes other than injection molding?
 - d) Indicate the schematic layout for a four-cavity mold, with feeding system, ejection system, parting line, core and cavity details of your designer IITD keychain.
 - e) What is the selection criteria for the final material of this keychain design, what were the options thought and why? (5)
-