

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – SUMMER • 2014****Subject Code: 162301****Date: 19-05-2014****Subject Name: Plastic Extrusion Technologies****Time: 10:30 am - 01:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** [1] Define [any five] : Leakage flow ; Extrudate; Reduction gear box; Drag flow ; Die; Sizing; L/D ratio **07**
[2] Discuss significance of Feed , Transition and Metering section of a screw.
- (b)** With a neat line diagram, discuss the manufacture of Nylon Monofilaments. **07**
- Q.2 (a)** What are the various heating systems used on Extrusion machines. Discuss electrical heating in detail. **07**
- (b)** Differentiate between Single and Twin Screw Extruder in detail. **07**
- OR**
- (b)** Discuss in detail, devolatilization in screw extruders. **07**
- Q.3 (a)** A plastic film, 0.15 mm thick, is required to have its orientation in the transverse direction thrice that in the machine direction. If the film blowing die has an outer diameter of 200mm and an inner diameter of 155 mm, estimate the blow up ratio required and the lay flat film width. Neglect extrusion effects and assume there is no drawdown. **07**
- (b)** With a neat line diagram, discuss manufacture of PVC Pipes **07**
- OR**
- Q.3 (a)** What is grooved barrel technology? Discuss its importance in modern day extruders. **07**
- (b)** Discuss thrust bearing blocks of a single and twin screw extruders with diagrams. **07**
- Q.4 (a)** Discuss the various types of drives used on screw extruders. Highlight AC v/s. DC drives. **07**
- (b)** What are suction hoses? Discuss manufacture of Suction hoses along with its applications. **07**
- OR**
- Q.4 (a)** Discuss significance of : Helix angle; Flight depth ; Pitch; L/D ratio; C/R ratio ; breaker plate; IBC **07**
- (b)** What is the selection criteria of material for wire and cable covering? Discuss manufacture of wires and cables with a line diagram. **07**
- Q.5 (a)** Fill in the blanks: **07**
1. _____ materials are used for manufacture of milk bags.
 2. Extruder used for processing PTFE is _____
 3. Masterbatches are manufactured by _____ extruders.
 4. Leakage flows seen in twin screw extruders are _____
 5. Single screw extruder works on _____ principle.
 6. Gate assembly used for small dies is _____
 7. Thrust bearing block of twin screw extruder works on _____ principle.

- (b)** In a particular extruder screw, the channel width is 55mm , the channel depth is 2.6mm, the screw diameter is 55mm, the screw speed is 100 rev/min, the flight angle is 17.66 deg and the pressure varies linearly over the screw length of 1000 mm from zero at entry to 20 MN/m² at the die entry. Estimate: **07**
1. The Drag Flow.
 2. The pressure flow.
 3. The total flow.

Assume plastic material has a viscosity of 230 Ns/m².

OR

- Q.5 (a)** 1. Compare Counter v/s. Co rotating twin screw extruder. **07**
2. What is the function of GODET ?
- (b)** Discuss manufacture of HMHDPE films with a neat line diagram. **07**
