Total No. of Questions : 12]

SEAT No. :

P1202

[Total No. of Pages : 4

[4659]-316
B.E. (Polymer)
POLYMER PROCESSING OPERATIONS-II
(2008 Course) (Semester-I) (409363)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer any 3 questions from each section.***
2) ***Answers 3 questions from Section I and 3 questions from Section II.***
3) ***Answers to the two sections should be written in separate books.***
4) ***Neat diagrams must be drawn, wherever necessary.***
5) ***Figures to the right indicate full marks.***
6) ***Your answers will be valued as a whole.***
7) ***Use of logarithmic tables, slide rule,Mollier charts, electronic pocket calculator and steam tables is allowed.***
8) ***Assume suitable data if necessary.***

SECTION-I

Q1) a) Write in short about die shaping. How does it help in thickness distribution in case of continuous extrusion blow molding? **[4]**

b) How acetaldehyde content can be controlled in blow moulding of PET bottles using single stage as well as two stage injection stretch blow moulding? **[6]**

c) Draw a cycle time chart for single station continuous extrusion blow molding and explain the major operations and their function. **[8**

OR

Q2) a) A narrow neck bottle with high blow ratio is to be blow moulded. Discuss the relative merits of convergent or divergent die/ mandrel design in this case. **[5]**

b) Explain redial flow die head assembly design. Draw a neat sketch and explain the functioning of major parts. **[8]**

c) Why accumulator type extrusion blow moulding is used in case of moulding of large containers? **[5]**

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Q3) a) Discuss any four defects in thermoformed articles and suggest remedies for the same. **[8]**

b) Discuss the following terms w.r.t thermoforming. **[8]**

i) Heat reversion.

ii) Soaking time

iii) Equilibration

OR

Q4) a) Discuss the various mold materials used for thermo forming. Discuss how the mold material parameters affect the cooling time. **[8]**

b) Discuss any two methods of thermoforming:- **[8]**

i) Drape forming.

ii) Plug assisted vacuum forming.

iii) Matched die forming.

Q5) a) Discuss any two of the following w.r.t calendaring. **[8]**

i) Drive systems ii) Types of bearings

b) Derive an equation for maximum pressure and point of maximum pressure in case of calendaring. **[8]**

OR

Q6) a) Discuss all the post calendaring equipments used in the process of calendaring. **[8]**

b) Differentiate between the different calendar designs giving their advantages and disadvantages. **[8]**

SECTION-II

Q7) a) Explain the effect of following on rotational molding: **[6]**

i) Mould release agents.

ii) Mould materials.

b) Explain the method of heat inclusion and heat exclusion used in rotational moulding to control product wall thickness. **[5]**

c) Explain the effect of particle size distribution and shape on the rotational molded article. **[5]**

OR

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Q8) a) Bubbles are integral part of rotational moulding. Explain various techniques by which the bubbles can be eliminated. Write with reference to mould material and process control. **[5]**

b) Explain how kiss-off ribs and kiss of points can be rotational moulded without bridging. **[5]**

c) Write in detail about rotational molding features of poly amides. **[6]**

Q9) a) Discuss various types of binders and debind mechanisms with respect to powder metal injection molding. **[5]**

b) Write short notes with reference to gas injection moulding (any one): **[5]**

i) Gas dissolution into polymer.

ii) Benefits of gas injection moulding over conventional process.

c) Write in short about applications of micro-injection molding. **[4]**

d) Write in short about morphological structure development during injection moulding of polyamides. **[4]**

OR

Q10)a) With reference to water injection molding discuss at least two processes with neat sketches:- **[8]**

i) Full shot process with over spill.

ii) Core pulling process.

iii) Short shot process.

b) Give features and characteristics of structure development in injection moulded slowly crystallising polymers and fast crystallising polymers. Give suitable examples. **[8]**

c) Compare in short, gas assisted injection moulding and water injection moulding. **[2]**

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Q11) a) Discuss the process of laser machining in polymers. **[8]**

b) Discuss the types of printing techniques on plastic products. **[8]**

OR

Q12) a) Write short notes on any two of the following w.r.t plastics. **[8]**

i) Vacuum metallising

ii) Hot stamping

iii) Electroplating

b) How does machining of plastics differ from machining of metals? Discuss. **[8]**

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