

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014**

**Subject code: 710807N****Date: 24-06-2014****Subject Name: Advanced Materials and Processes****Time: 02:30 pm - 05:00 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) Write any three advanced engineering polymer materials and their applications. **07**  
(b) List the conventional processing techniques used for advanced materials and explain any one with suitable example. **07**
- Q.2** (a) What are the advantages of nondestructive evaluation technique over the destructive evaluation technique? Enlist the applications of any three nondestructive evaluation techniques. **07**  
(b) Write the short note on delayed fracture with example. **07**
- OR**
- (b) Enlist the various characterization and evaluation techniques in which X-ray are used and describe any one. **07**
- Q.3** (a) Discuss any three factors responsible for developing residual stresses with appropriate example. **07**  
(b) Write the basic principles of designing for economical production. **07**
- OR**
- Q.3** (a) Describe the weighted property indices and benefit-cost analysis methods used for material selection. **07**  
(b) Justify the design rules for machining with appropriate example: a) Minimize the number of machined features, b) Provide adequate accessibility. **07**
- Q.4** (a) What do you mean by progressive solidification? Write a design guide line which supports same with suitable case. **07**  
(b) Describe the factors to be considered during the design of weld joints. **07**
- OR**
- Q.4** (a) Write the short note on casting simulation and soft tools used for it. **07**  
(b) Write any three basic requirements of forging die with justifications. **07**
- Q.5** (a) What is the application of Keeler-Goodman forming diagram? Draw the sketch of same. **07**  
(b) Write the design considerations for parts to be manufacture by injection molding process. **07**
- OR**
- Q.5** (a) Explain the viscoelastic and creep behavior of plastics. **07**  
(b) Explain the design principles for part to be manufacture by punching operation. **07**

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