

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E Sem-I Examination January 2010****Subject code: 710807****Subject Name: Advanced Materials and Processes (Elective)****Date: 27 / 01 / 2010****Time: 12 .00 – 2.30 pm****Total Marks: 60****Instructions:**

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

Q.1 (a) Explain the term standardization in the context of design for machining. Is it necessary that standardization would always reduce the manufacturing cost? Give your Comments. **06**

(b) Give your comments on the influence of service conditions on the performance of materials. **06**

Q.2 (a) Give justification for the development of advanced materials. How advanced ceramic materials are processed? **06**

(b) Suggest design guidelines to be followed for the machining of Rotational components. **06**

OR

(b) Suggest design guidelines to be followed for the machining of Nonrotational components. **06**

Q.3 (a) Enlist design considerations for the design of a sand casted component. **06**

(b) You have to design a connecting rod for an automobile. Suggest the manufacturing process and criterion for design for manufacturing of it. **06**

OR

Q.3 (a) Discuss about the Development, Measurement and Mitigation of residual stresses in a welded component. **06**

(b) Give your comments on importance of parting line selection and machining allowance in the forging die design. **06**

Q.4 (a) Prepare a list of design considerations for the manufacture of a sheet metal washer with 50 mm diameter X 2.5 thickness with 25 mm inside diameter. **06**

(b) Discuss the characteristics of extruded products with forward and backward mode. Suggest some design guidelines for the manufacture of extruded sections. **06**

OR

Q.4 (a) As a design engineer you have to design a Plastic chair. Give your thoughts on various design rules to be followed. **06**

(b) What is Concurrent Engineering? How Design and Manufacturing affect the product development cycle, if treated individually and Simultaneously? **06**

Q.5 (a) State difficulties in the processing of advanced materials. Give your thoughts to overcome those difficulties. **06**

(b) What do you mean by Material Characterization? Discuss about the X-Ray technique as Non destructive evaluation for materials. **06**

OR

Q.5 (a) What do you mean by Smart Material? Discuss about the engineering applications of Smart Materials. **06**

(b) Critically evaluate the methods for material selection. **06**
