

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. Sem. – IInd - Examination – June/July- 2011****Subject code: 1722803****Subject Name: Product Design for Manufacturing****Date: 27/06/2011****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) Discuss on design consideration for assembly. **07**
 (b) List out the method for evaluating the concept design and explain best one. **07**
- Q.2** (a) What is engineering design and explain form function relation. **07**
 (b) What is parametric design and explain the parametric design of bolt. **07**
- OR**
- (b) Steps in formulating a design problem. **07**
- Q.3** (a) Discuss an integrated perspective of product and process design. **07**
 (b) Discuss on design consider for forging. **07**
- OR**
- Q.3** (a) Discuss FMEA. **07**
 (b) Discuss the evaluating factors for an industrial design. **07**
- Q.4** (a) Explain in brief Taguchi method of robust design. **07**
 (b) Explain the psychological association of following colors. **07**
 Blue, Yellow, Green, Red, Orange, Gold, White
- OR**
- Q.4** (a) A C.I. pulley is press fitted on a steel shaft with following data:- **07**

Parameters	Steel shaft	C.I. pulley hub.
Stress	$\Sigma_v = 385 \text{ M Pa}$	$\Sigma_a = 300 \text{ M Pa}$
(E) Mod. Of elasticity	$2.1 \times 10^5 \text{ MPa}$	$1.0 \times 10^5 \text{ MPa}$
Diameter	150 mm	300 mm O.D.
Poisson's ratio	0.3	0.25

Length of hub = 250 mm, Co –efficient of friction = 0.12. Maximum tangential stress for C.I. = 35 MPa.

- Determine:
- (i) Maximum interference of the joint
 - (ii) Minimum interference of the joint
 - (iii) Torque Transmitted by the joint.

- (b) Discuss design for safety, reliability and maintainability. **07**
- Q.5** (a) Describe in brief: Ergonomic and aesthetic considerations in design **07**
 (b) What are the ergonomic considerations to be kept in mind while designing hand and foot operated components? **07**
- OR**
- Q.5** (a) What is preferred numbers and preferred series? Find the preferred numbers belonging to R 10 series. Why R 80 series is not used in practice? **07**
 (b) Explain how the human considerations are involved in designing the operating and controlling system for the automobiles **07**
