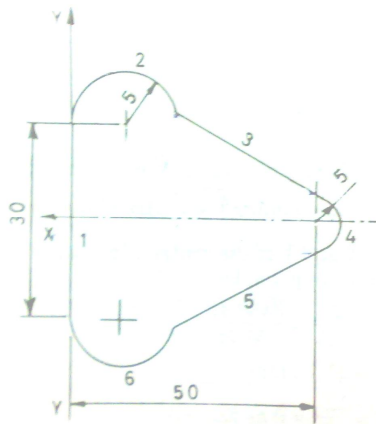


**GUJARAT TECHNOLOGICAL UNIVERSITY****M. E. - SEMESTER – II • EXAMINATION – WINTER • 2014****Subject code: 1720808****Date: 05-12-2014****Subject Name: Manufacturing Processes and Analysis****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

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

- Q.1** (a) Define flow curve and prove that  $\sigma = R^n$  **07**  
 (b) A steel Washer is of 44 mm outer diameter and 22 mm inner hole diameter and is 2 mm thick. If maximum shear stress is 405 N/mm<sup>2</sup> and percentage penetration is 24% determine: (a) Work done (b) Shear to be ground on the tool if maximum punch force is to be reduced to 0.05MN. **07**
- Q.2** (a) Explain continuous casting and give its advantages over other type of casting. **07**  
 (b) A metal component  $30 \times 36 \times 160$  mm having a yield stress of 0.9 Kg/mm<sup>2</sup> is to be pressed between flat dies to a size  $8 \times 100 \times 160$  mm. If  $\mu = 0.26$ , calculates the following (a) pressure at center, (b) pressure at edge, (c) total forging load. **07**
- OR**
- (b) Determine centre of pressure of the component shown in fig. below. All dimensions are in mm. **07**



- Q.3** (a) Describe following two theories regarding plastic yielding for ductile material. **07**  
 (i) Maximum Shear stress theory (ii) Von- Mises Theory.  
 (b) Explain Investment Moulding and give its advantages, limitation and applications. **07**
- OR**
- Q.3** (a) Explain Functional design of casting with example. **07**  
 (b) Write methods of improving fatigue life of welded structures and explain any one method. **07**
- Q.4** (a) Explain Major design factor and consideration for weld joint. **07**  
 (b) Define residual stresses in welding. Describe types of residual stresses in welding. How residual stresses in welding can be controlled? **07**

**OR**

- Q.4 (a)** What is the method of hot machining and what are the possible harmful effects of this method on the work material? **07**
- (b)** Write basic mechanism, transfer media, energy source and process when used mechanical, chemical, electro-chemical and thermo-electric energy. **07**
- Q.5 (a)** Describe the effect of Grain size, Jet Velocity and stand of distance on material removal rate in abrasive jet machining. **07**
- (b)** In an EDM operation employing relaxation circuit, discuss the effects of **07**
- (i) Supply voltage and break down voltage (ii) charging resistance
- (iii) capacitance on the metal removal rate
- OR**
- Q.5 (a)** Explain and analyze stereo lithography method of rapid prototyping and give its limitation. **07**
- (b)** Explain the Fused Deposition Modeling process with its advantages, disadvantages, and discuss the material used in FDM. **07**

