

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII • EXAMINATION – WINTER • 2014****Subject Code: 182003****Date: 02-12-2014****Subject Name: Quality Assurance and Reliability****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary and clearly mention the same.
3. Figures to the right indicate full marks.
4. Draw neat diagrams. Shabbily drawn diagrams may not be awarded any credit.

Q.1 (a) Explain the effect of following parameters on Material Removal Rate (MRR) and surface roughness for abrasive jet machining (AJM). **07**
Nozzle tip distance; abrasive size; abrasive flow rate; traverse velocity of nozzle and jet pressure.
Support your answer with suitable graphs and neat diagrams.

(b) With the help of neat diagrams describe the working principle of sine bar and autocollimator. Also explain the difference of accuracy level in angular measurement by both of the instruments. **07**

Q.2 (a) Explain submerged arc welding (SAW) and flash welding with the help of schematic diagrams of the welding processes. Briefly discuss the applications of these welding processes. **07**

(b) Explain the working principle of interferometry. Draw suitable diagrams to explain the presence of flat, concave and convex surfaces under observation. **07**

OR

(b) 1. Mark a center on cylindrical component, the diameter of which is unknown, using a scribing block. Use the following devices and articles for the performance of the task: Scribing block, Surface plate, V-block, Vernier height gauge and chalk stick. **07**
2. How is the sine bar utilized to measure an angle of 70° ? Explain with the help of suitable diagrams.

Q.3 (a) Briefly explain the following terms: **07**
Facing sand; Backing sand, Pouring basin (with sketch); Distortion allowance on pattern (with sketch); Refractoriness of molding sand

(b) What is hot working and cold working process? Compare relative merits and demerits of these processes with critical reasoning. Give suitable examples of hot working and cold working processes. **07**

OR

Q.3 (a) Differentiate between hot spot and hard spot in a casting with neat sketches. Also mention the causes of their formation and prevention techniques. **07**

- (b) What is called progressive die set and combination die set for the operation on sheet metal. Explain the difference between them using suitable example. **07**
- Q.4** (a) Evaluate the sentence – Although the locators are placed on proper surface, poor dimensional control may result due to improper positioning on that surface. **07**
- (b) Name the most appropriate non-traditional machining operation for the following application with strong contributing reasons. **07**
1. Machining of leather material
 2. Machining of underwater steel structure
- OR**
- Q.4** (a) Draw location system of the following with brief description: **07**
Arbor mounted slab milling cutter; Sleeve to be held in spindle nose
- (b) Explain the working principle of Electro-Chemical Machining (ECM) and describe deburring operation performed by ECM. **07**
- Q.5** (a) Describe the following terms in relation to casting process. **07**
1. Casting yield
 2. Pressurized and non-pressurized gating system.
- (b) What are the various flushing systems available in Electro-Discharge Machining (EDM)? Draw diagrams of them and explain. **07**
- OR**
- Q.5** (a) Explain the difference between constant current and constant voltage power source of welding process. Support your answer with the help of V-I characteristic of welding power source. **07**
- (b) Compare and contrast machining and forging process for manufacturing a bolt. Which is to be selected for manufacturing bolt from raw material of steel rod? Give your choice with strong reasons. **07**
