

GUJARAT TECHNOLOGICAL UNIVERSITY**BE SEM-VI Examination-Nov/Dec-2011****Subject code: 162502****Date: 23/11/2011****Subject Name: Welding Technology****Time: 10.30 am -1.00 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) State the advantages and disadvantages of welding as a joining process and compare fusion versus non fusion welding process. **07**
- (b) Oxy-acetylene flame is the same heat source used for gas cutting or gas welding process. State the different types of flames generally used in these processes and the factors that help in deciding the choice of type of flame used. **07**

- Q.2** (a) Define a welding arc. Explain the way energy is converted from the electrical field to heat energy in a welding arc. Explain the method of arc initiation and maintenance in GMAW process. **07**
- (b) Draw a schematic of plasma arc welding torch and explain the process of plasma arc welding. Bring out the similarities and differences between plasma arc welding and gas-tungsten arc welding process. **07**

OR

- (b) What is the effect of parameters, arc current and electrode polarity on the penetration for SAW process? Plot the effect of both of these variables on bead penetration and hence explain the effects with appropriate reasons. **07**

- Q.3** (a) Draw a schematic of shielded metal arc welding process and explain the characteristics, advantages and applications of the process. **07**
- (b) Explain the principle of projection welding process and state its merits and demerits. **07**

OR

- Q.3** (a) Draw a schematic sketch of friction stir welding process and bring out the merits, demerits of the process. **07**
- (b) Explain the principle of upset welding process and state its merits and demerits. **07**

- Q.4** (a) Define Weldability and state the objectives of performing the weldability test. Explain any one weldability test and mention the information revealed by such test. **07**
- (b) Enlist the types of welding defects. Explain the cause of occurrence and its remedies for any two welding defects. **07**

OR

- Q.4** (a) Explain the method of hydrostatic testing, state the information it reveals and enlist precautions in carrying out such tests. Why is it necessary to carry out hydrostatic pressure testing in pressure vessels? **07**

- (b) Select the most suitable non-destructive testing method/methods for each of the following applications. Justify your choice with major contributing reasons: **07**
- (i) A fatigue crack in a weld
 - (ii) Blow holes and shrinkage cavities in a weld.

- Q.5** (a) State the objectives of flux coating on the welding electrode and explain the role of acidic and basic coating on electrode. Also suggest the conditions wherein such coating is to be applied on the welding electrode. **07**
- (b) Explain the significance of the heat affected zone with reference to residual stresses and final weld properties. **07**

OR

- Q.5** (a) State the basis of classification and coding of welding electrodes. How is welding electrode coded for mild steel as per AWS or IS? Explain the meaning of the specification. **07**
- (b) Sketch butt, lap, T and L weld joint. A single pass, butt joint of 1.5 mm thickness of mild steel is welded by manual metal arc welding process. Specify the weld joint by suitable welding symbols and assume suitable data needed to specify the same. **07**
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