(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2533 Roll No. | | | | | | | | | | |

B.Tech.

(SEMESTER-VI) THEORY EXAMINATION 2012-13

ADVANCED WELDING TECHNOLOGY

Time : 2 Hours] *[Total Marks : 50*

SECTION – A

1. Attempt **all** the questions : **5 × 2 = 10**

   (a) Why is important to clean the surfaces to be welded ?

   (b) State the difference between soldering and brazing.

   (c) What are the typical gas and solid state lasers used for welding process ?

   (d) What is under bead cracking ? How is it different from auto cracking ?

   (e) Name the testing methods for quality weld.

SECTION – B

2. Attempt any **three** question parts : **3 × 5 = 15**

   (a) (i) Briefly explain the working of electro-slag welding process.
   (ii) Write short note on friction welding.

   (b) What is the plasma effect in laser beam welding of metals ? Discuss the factors affecting it and the effects on penetration characteristics.

   (c) Describe the principle of underwater welding.

   (d) Discuss the effects of the following process variables on welding :
   (i) Welding current
   (ii) Arc voltage
   (iii) Electrode extension
   (iv) Arc travel speed
   (v) Shielding gas flow
   (vi) Electrode angle

   (e) Explain about thermal considerations of welding.

SECTION – C

Attempt **all** questions :

3. Attempt any **one** part : **5 × 1 = 5**

   (a) Micro alloyed steels are better in their HAZ properties than plain carbon steels. Why ?

   (b) Why a flux is used in soldering and brazing operations ? Indicate the factors influence their selection.

4. Attempt any **one** part : **5 × 1 = 5**

   (a) Discuss in detail the three different pressure modes of operation of the electron beam welding process.

   (b) Show schematically and explain the principle of ultrasonic welding.

5. Attempt any **one** part : **5 × 1 = 5**

   (a) What is solid phase welding ? Explain explosive welding and its industrial applications.

   (b) Describe the spray welding technique and list the advantages.

6. Attempt any **one** part : **5 × 1 = 5**

   (a) Mention the origin of different kinds of defects in welds and suggest suitable remedial measures.

   (b) Explain about the welding process applied in pipelines and pressure vessels.

7. Attempt any **one** part : **5 × 1 = 5**

   (a) What are the requirements to be met for the metallurgical bonding between two pieces of metals ?

   (b) Discuss critically the structure of weld metal in a single pass. How is it altered during multiple pass welding ?