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Reg. No. :

Question Paper Code : 20788

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Fourth/Seventh Semester

Mechanical Engineering

ME 6008 – WELDING TECHNOLOGY

(Common to Production Engineering)

(Regulations 2013)

(Also common to : PTME 6008 — Welding Technology for B.E. (Part-Time) – Sixth Semester – Mechanical Engineering — (Regulations – 2014))

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the objectives of a welding process.
2. Differentiate Air Acetylene and Oxy Acetylene Welding.
3. List down the various resistance welding process.
4. Outline the aspects of percussion welding process.
5. Write the limitations of diffusion bonding and explosive welding.
6. Draw a neat sketch of Ultrasonic welding process.
7. What is atomic hydrogen welding?
8. List down various welding processes used in aerospace.
9. List out the steps to be followed for improving joint design.
10. What are the factors that commonly affect weldability nature of the subjected materials?

PART B — (5 × 13 = 65 marks)

11. (a) (i) Differentiate between TIG and MIG welding process. (5)
(ii) Explain the working, advantages and applications of submerged arc welding. (8)

Or

- (b) Demonstrate with illustrative sketches the principles and equipments needed for Electroslag welding process in detail.

12. (a) (i) Define resistance-welding process and give details of process control features and commercial applications. (8)
(ii) Explain the butt welding process. (5)

Or

- (b) (i) Detail the working principle of percussion welding with neat sketch. (7)

- (ii) Discuss the effects of the following over welding.
(1) High voltage (3)
(2) Material hardness. (3)

13. (a) (i) Describe the following type of welding techniques
(1) Explosive welding (4)
(2) Forge welding (4)
(ii) Describe the commercial role of friction welding. (5)

Or

- (b) Enumerate in detail the influence of process parameters on the working equipment and materials of laser roll welding process.

14. (a) (i) Differentiate Electron beam welding and Laser beam welding. (8)
(ii) Enlist the necessary characteristics of underwater welding. (5)

Or

- (b) Explain the Hyperbaric welding process and also mention the advantages and applications.

15. (a) Describe the following
(i) Atomic hydrogen welding process (5)
(ii) Welding automation (4)
(iii) Popularly practiced techniques for safety of welding employees. (4)

Or

- (b) (i) Explain various designs of weld joints. (10)
(ii) What are the factors that affect the weldability of engineering materials? (3)

PART C — (1 × 15 = 15 marks)

16. (a) A steel plate strip of 150 mm width and 10 mm thickness is welded by a compound fillet weld to another plate. The strip is required to carry an axial load P such that P is equal to tensile load capacity of the strip with a factor of safety of 2.5 on ultimate tensile strength of strip. Calculate the length of the fillet weld and show on diagram. Ultimate tensile strength of strip material is 380 MPa. Find fillet length if $P_{\min} = P/2$ and $P_{\max} = P$.

Or

- (b) Explain the failure analysis of the longitudinal weld in submerged arc welding, during the manufacturing process.