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Question Paper Code : 53285

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Fourth/Seventh Semester

Mechanical Engineering

ME 6008 – WELDING TECHNOLOGY

(Common to Production Engineering)

(Regulation 2013)

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

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define welding and list any four applications of welding.
2. Distinguish between transferred type and non-transferred type plasma arc welding.
3. What is high frequency resistance welding?
4. What is the minimum distance maintained between two successive spot welds made by resistance welding? Why?
5. Define solid state welding and mention any four advantages of solid state welding.
6. What is forge welding? List the materials that be joined by forge welding.
7. Is it possible to make dissimilar welding of aluminium to steel in friction stir welding? Justify.
8. State the reasons for implementing welding robots in aerospace industries.
9. Find the angular distortion in a double fillet weld of a T-joint between a flange 1000 mm wide and a vertical member when the thickness of both the members is 6 mm and the weld length is 8 mm.
10. Two plates are to be welded with a single V butt using SMAW process. A sealing run is also to be laid which is required to be ground flush. Sketch the desired weld and its symbol.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Describe with a neat sketch the components of oxyacetylene gas welding equipment. (7)
- (ii) Sketch the three types of flames in oxy-acetylene welding and state their characteristics. (6)

Or

- (b) (i) Compare tungsten inert gas and metal inert gas welding process. (7)
- (ii) Describe electroslag welding process with neat sketch and state its major applications. (6)
12. (a) (i) With neat sketch explain the principle of resistance welding. (7)
- (ii) Discuss the merits, demerits and applications of resistance welding process. (6)

Or

- (b) (i) Explain the parameters which influencing in resistance welding. (6)
- (ii) With neat sketches explain the different types of resistance seam welding and state its advantages, disadvantages and applications. (7)
13. (a) (i) Discuss the working principle of cold welding process with neat sketch. (6)
- (ii) With neat sketch explain the working of ultrasonic welding process and state its applications. (7)

Or

- (b) (i) Explain friction welding process with neat sketch and state its applications. (6)
- (ii) Write the advantages, disadvantages, applications and working principle of explosive welding with neat sketch. (7)
14. (a) (i) Describe the welding process used for joining railway tracks. (6)
- (ii) Explain the construction and working of LASER beam welding process with neat sketch and state its merits, demerits and applications. (7)

Or

- (b) (i) What is friction stir welding? With neat sketch explain friction stir welding and discuss the process parameters involved in friction stir welding. (7)
- (ii) Draw the functional main units of multi-sensor automated robotic welding and discuss its various components. (6)

15. (a) (i) Two flat plates are to be welded with a single V butt weld. The groove angle is 60 degree and a root gap of 2 mm is used. A backing strip is also to be used which is, (1) to be held in position with double fillet welds, and (2) to be removed after welding. The process to be employed is shielded metal arc welding. Sketch the desired welds and their symbols. (7)
- (ii) A rod is to be welded to a plate by single flare-bevel groove using gas metal arc welding process. Sketch the weld and show the welding symbol if the diameter of the rod is 18 mm and effective weld throat is 5 mm. (6)

Or

- (b) (i) An H-section placed perpendicular on a square plate is to be welded all round using a fillet weld with a length of 8 mm by CO₂ welding. The weld is to be made at site. Show a sketch of weld and its welding symbol. (7)
- (ii) Discuss the various design considerations in welding. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Describe the weldability of aluminium and its alloys.

Or

- (b) Describe the weldability of copper and its alloys.
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