

C 1259

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Name.....

Reg. No.....



**FOURTH SEMESTER B.TECH. (ENGINEERING) [14 SCHEME] DEGREE
EXAMINATION, APRIL 2016**

ME 14 406—CASTING AND JOINING

Time : Three Hours

Maximum : 100 Marks

Part A

Answer any eight questions.

1. Suggest joining methods that might be used : (a) to join two sheets of metal face-to-face together, (b) to attach a metal clip to a flat metal surface, (c) to join two thick steel bars, (d) to join two steel sheets edge-to-edge or with a slight overlap, (e) to attach leather to a metal frame.
2. Compare investment casting and die casting as methods for the production of a product.
3. Consider a situation in which a welding operation is being performed with $V = 20$ volts, $I = 200$ A, and the cross-sectional area of the weld bead is 30 mm. Estimate the welding speed if the workpiece and electrode are made of : (a) aluminium (specific energy $u = 2.7 \text{ J/mm}^3$) ; and (b) carbon steel (specific energy $u = 2.7 \text{ J/mm}^3$) and use an efficiency of 75%.
4. Explain different filler materials used in brazing.
5. Discuss about the need for riser in casting and list out main requirement of an effective riser.
6. How is fluidity defined ? Why is it important ?
7. Explain briefly about CO_2 moulding process.
8. Discuss the basic principle of diffusion bonding with a neat sketch.
9. Explain the construction of cupola furnace with a neat sketch.
10. Illustrate the advantages and disadvantages of Electro Slag Welding (ESW).

(8 × 5 = 40 marks)

Part B

Answer any one question from a module.

11. (a) Figuratively state different types of gating system, explain its salient features and limitations.

Or

- (b) Explain about different types of patterns used in casting with a neat sketch.

12. (a) Explain the following with the neat sketch and give its advantage and disadvantages

(i) Centrifugal casting.

(7 marks)

(ii) Squeeze casting.

(8 marks)

Or

Turn over

(b) Explain the following in detail and give its advantages and disadvantages :

(i) Expanded polystyrene process. (8 marks)

(ii) Shell moulding. (7 marks)

13. (a) Explain the following with respect to resistance welding :

(i) Squeeze time. (4 marks)

(ii) Hold time. (4 marks)

(iii) Weld time. (4 marks)

(iv) Offtime. (3 marks)

Or

(b) With the help of neat sketches explain the working principle of Shielded Metal-Arc Welding (SMAW) and Submerged-Arc Welding (SAW).

14. (a) Explicate in detail about different types of brazing methods.

Or

(b) Explain the following :

(i) Theory of soldering. (7 marks)

(ii) Polyamide and polyurethane melt adhesives. (8 marks)

[4 × 15 = 60 marks]