

CBCS SCHEME

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18IP821

Eighth Semester B.E. Degree Examination, July/August 2022 Advanced Joining Process and NDT

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List the cast weld processes and describe the one in detail that is used for welding the longitudinal seam of boilers and pressure vessels. (10 Marks)
- b. List the solid state welding process and explain the one used for welding of automobile axle to break drum. (10 Marks)

OR

- 2 a. What is surfacing? Discuss in brief the four variants of surfacing. (10 Marks)
- b. With a schematic diagram, explain thermal spraying process. (10 Marks)

Module-2

- 3 a. List the problems associated with weldability of austenitic stainless steel and explain any two in detail. (10 Marks)
- b. Discuss the problem encountered in welding aluminium. (10 Marks)

OR

- 4 a. Design in brief soldering and brazing processes. (10 Marks)
- b. List the various methods of welding of plastics and explain in brief any two methods. (10 Marks)

Module-3

- 5 a. List the general design principles that influence the considerations in selecting joint design. (10 Marks)
- b. A 150 mm wide 12 mm thick steel plate is welded to another plate with two equal 12 mm fillet welds and subjected to a pull of 300 kN as shown in Fig.Q5(b). Calculate weld lengths.
 - (i) If $\sigma_f = 140 \text{ N/mm}^2$, $f_s = 95 \text{ N/mm}^2$, calculate joint efficiency
 - (ii) Find required weld length if 300 kN force is applied 65 mm from one weld and 85 mm from other.

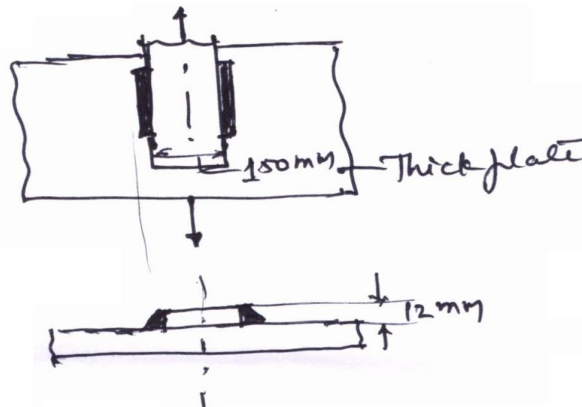


Fig.Q5(b)

(10 Marks)

OR

- 6 a. List the factors that affect fatigue life and discuss in brief the characterization of fatigue failure in welds. (10 Marks)
b. Define fracture toughness. List and discuss the factors affecting type of fracture. (10 Marks)

Module-4

- 7 a. List the eight types of welds and describe in detail:
(i) Fillet weld
(ii) Groove weld (10 Marks)
b. Illustrate the standard location of elements of a welding symbol. (10 Marks)

OR

- 8 a. Discuss in brief the adhesive materials and their properties. (10 Marks)
b. Discuss the typical joints used adhesive bonding and explain the mechanism of adhesive bond mentioning some of applications. (10 Marks)

Module-5

- 9 a. Describe the:
(i) ASME Boiler and Pressure Vessel Code (BPVC) in brief
(ii) ASME B31 code (10 Marks)
b. List the various service weldability tests and explain any one in detail. (10 Marks)

OR

- 10 a. List the NDT methods of testing weldments and explain liquid penetrant testing method. (10 Marks)
b. Discuss in brief the defects in adhesive bonded joints. (10 Marks)

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