

Code No: 153BR

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year I Semester Examinations, August/September - 2022

PRODUCTION TECHNOLOGY

(Mechanical Engineering)

Time: 3 Hours

Max.Marks:75

Answer any five questions
All questions carry equal marks

- 1.a) Define gating ratio. Explain the steps involved in designing a gating system.
b) Calculate the sizes of riser for casting steel bar of $75 \times 12.5 \times 12.5$ cm with top riser placed at the center of the bar. Use modulus method. [8+7]
- 2.a) With neat sketch, explain the principle and working of cupola furnace.
b) Calculate the optimum pouring time for a casting whose mass is 20 kg and having an average section thickness of 15 mm. The materials of the casting are grey cast iron and steel. Take the fluidity of iron as 711.2 mm. [9+6]
- 3.a) Explain the principle, limitations and applications of explosive welding.
b) What types of structure and property modifications can occur in welding heat zones? [8+7]
- 4.a) Explain the method and application of friction stir welding.
b) Determine the melting efficiency in the case of arc welding of steel with a potential of 22V and current of 230 A. The cross-sectional area of the joint is 22 mm^2 and the travel speed is 5 mm/s. Heat required to melt steel may be taken as 12 J/mm^3 and the heat transfer efficiency as 85%. [8+7]
- 5.a) Explain the forces and power calculations required for drawing operation.
b) Explain the cold work - annealing cycle. [5+10]
- 6.a) Explain about bending process. What is spring back and what are its remedies?
b) Calculate the bite angle when rolling plates of 15 mm thickness, using work rolls of 400 mm diameter and reducing the thickness by 3 mm. [8+7]
- 7.a) Explain the role of container and die in the analysis of forward extrusion process.
b) Explain the terms of lapping and backing as related to forging practice. [8+7]
- 8.a) Explain the differences between open die forging and impression die forging.
b) Distinguish between electro-hydraulic forming and electro-magnetic forming. [8+7]

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