

Code No: 153BR

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, March - 2022

PRODUCTION TECHNOLOGY

(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

- 1.a) Which type of Casting produce Precise Products? Explain in detail.
b) What are the requisite properties of the moulding sand? [8+7]
- 2.a) Describe about Caine's Method in detail.
b) Explain the constructional features of methods of mold making. [8+7]
- 3.a) What properties are required for the electrode in welding process?
b) Explain principle behind the Resistance welding with help of a diagram. [7+8]
- 4.a) Elaborate the working principle of thermit welding in detail.
b) Describe Submerged Arc Welding and its applications. [8+7]
- 5.a) Explain MIG welding with a diagram.
b) Define Weldability and explain the factors affecting Weldability. [8+7]
- 6.a) Discuss Explosive Welding and its Applications.
b) What are the causes and remedies involved in Welding Defects? [7+8]
- 7.a) Explain about Tube Drawing Operation with sketches.
b) Explain in detail about Stamping, Blanking and Piercing. [7+8]
- 8.a) Explain the principles of different types of forging operation.
b) What are the features of Electro Magnetic forming? Explain with suitable sketches. [8+7]

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- 1.a) What are composite moulds? Why are they used? Where are they used?
- b) What are the differences between natural sand and synthetic sand with regard to their properties? [7+8]
- 2.a) Describe the solidification of a pure metal with a neat sketch.
- b) What are the advantages and applications of die casting? [8+7]
- 3.a) Explain the effect of polarity on penetration in DC arc welding.
- b) Explain the process of thermit welding. Where would you recommend it? State and explain clearly the controlling parameters that influence the thermit welding. [7+8]
- 4.a) Why do properties vary widely in most welding heat affected zones?
- b) What is meant by weld quality? Discuss the factors that influence it. [8+7]
- 5.a) Explain the applications, advantages and limitations of explosive welding.
- b) Explain role of friction and strip tensions in rolling load and process. [8+7]
- 6.a) Explain the process of piercing. How does it differ from hot spinning? Explain.
- b) What are the advantages of mechanical press over hydraulic press? [8+7]
- 7.a) Identify the factors that influence the bending force F and explain why they do?
- b) Explain the effect of extrusion variables on extrusion pressure. [8+7]
- 8.a) Describe the rotary forging process with a sketch. What are its typical applications?
- b) Explain the principle of working of explosive forming. [8+7]

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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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Code No: 153BR**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech II Year I Semester Examinations, April/May - 2023****PRODUCTION TECHNOLOGY****(Mechanical Engineering)****Time: 3 Hours****Max. Marks: 75****Note:** i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A**(25 Marks)**

- 1.a) Can a finished casting be used as a pattern for making mould? Justify your answer. [2]
- b) Explain briefly about sweep pattern and match plate pattern. [3]
- c) Why weld should be panned with a hammer? [2]
- d) List out the advantages of gas welding. [3]
- e) What is the safety precautions observed in welding? [2]
- f) Why do most welding failures occur in HAZ? [3]
- g) What is angle bite? Write its importance. [2]
- h) Write three differences between cold working and hot working. [3]
- i) Describe classification of extrusion processes. [2]
- j) What properties of metals contribute to good forge ability? [3]

PART – B**(50 Marks)**

- 2.a) What are the materials that are generally used for making patterns? Explain the reasons for their choice.
- b) Explain the working principle of shell mould casting, hot chamber and cold chamber die casting process. [5+5]

OR

- 3.a) What are the common allowances provided on patterns? Why and how they are provided?
- b) Large castings are not made by investment casting. Give your comments. [5+5]
- 4.a) Write primary and secondary combustion equations in oxy-acetylene gas welding process. Is it an endothermic process or exothermic process?
- b) Explain the inert-gas metal arc welding. How does it differ from metal arc welding? [5+5]

OR

- 5.a) Write difference between Arc welding and forge welding.
- b) Discuss the merits of AC and DC welding and explain the VI characteristics of arc and power sources. [5+5]

- 6.a) Explain explosive welding with neat diagram.
b) What types of structure and property modifications can occur in welding heat zones? [5+5]

OR

- 7.a) Explain the mechanism of metal transfer in MIG/MAG welding.
b) What is the difference between shielded and unshielded arc welding process? Draw schematic representation of shielded metal arc welding. [5+5]

- 8.a) Explain about hot spinning and cold spinning applications.
b) What are different types of drawing? Explain each with a help of neat sketch. [5+5]

OR

- 9.a) What are various forces acting in rolling process, explain with suitable diagram?
b) Distinguish between bending and drawing in sheet-metal operations. [5+5]

- 10.a) Explain forward extrusion and backward extrusion with neat sketches.
b) Differentiate between roll forging and rotary forging. [5+5]

OR

- 11.a) Sketch and explain forging hammers. What are the advantages of cold forging?
b) Discuss about Electro-hydraulic forming and electro-magnetic forming. [5+5]

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papers 2023

Code No: 153BR**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech II Year I Semester Examinations, October - 2020****PRODUCTION TECHNOLOGY****(Mechanical Engineering)****Time: 2 hours****Max. Marks: 75****Answer any five questions****All questions carry equal marks**

- 1.a) What are the desired properties of moulding sand.
b) Discuss the working principle and applications of centrifugal casting. [7+8]
- 2.a) What are the principles and design of gating system.
b) What are the casting defects and its remedies? [8+7]
- 3.a) What is the principle behind oxyfuel gas cutting operation.
b) What are the components and its functions of the submerged arc welding equipment? [7+8]
- 4.a) How does thermit welding operation works and discuss its application?
b) Discuss the principle of resistance welding and the sequence takes place in the spot welding operation. [7+8]
- 5.a) Discuss the characteristic features of MIG welding process.
b) What are the various heating methods used in brazing process? [7+8]
- 6.a) How the microstructure of the base metal is influenced in head affected zone in any welding operation?
b) Describe the working principle of laser welding process. [8+7]
- 7.a) Derive the drawing force required to reduce the cross sectional areas.
b) What are the various rolling operations for getting different products? [7+8]
- 8.a) What are the principles of explosive forming?
b) Discuss the hydrostatic extrusion and its applications. [7+8]

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