

R18

Code No: 153BR

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year I Semester Examinations, December - 2019

PRODUCTION TECHNOLOGY

(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A

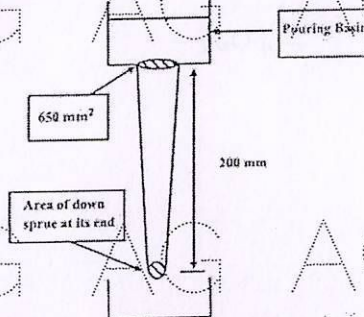
(25 Marks)

1. a) List out the basic ingredients of moulding sand and their functions. [2]
- b) Differentiate soldering and brazing. [2]
- c) Differentiate hot and cold extrusion. [2]
- d) Describe various types of weld joints. [2]
- e) What is spring back effect in bending? [2]
- f) Give the classification of welding processes. [3]
- g) What are the different types of rolling mills? [3]
- h) Discuss various additives used in moulding sand and their application. [3]
- i) Explain explosive welding with neat sketch. [3]
- j) Explain about hydrostatic extrusion? [3]

PART - B

(50 Marks)

2. a) 200 mm long down sprue has an area of cross-section of 650 mm^2 where the pouring basin meets the down sprue (i.e. at the beginning of the down sprue). A constant head of molten metal is maintained by the pouring basin. The molten metal flow rate is $6.5 \times 10^5 \text{ mm}^3/\text{s}$. Considering the end of the down sprue to be open to atmosphere and an acceleration due to gravity is 10^4 mm/s^2 , the area of the down sprue at its end (avoiding aspiration effect) should be?



- b) Describe various materials used for making patterns. What are its merits and demerits? [6+4]

OR

3. a) Explain Investment casting process. Discuss advantages and applications of the process. [5+5]
- b) Sketch and explain the features of different types of patterns. [5+5]

- 4.a) Explain Oxy-Acetylene Gas cutting in detail.
b) Two pipes of inner diameter 100 mm and outer diameter 110 mm each are joined by flash welding using 30 V power supply. At the interface, 1 mm of material melts from each pipe which has a resistance of 42.4Ω . If the unit melt energy is 64.4 MJ/m^3 , then find the time required for welding. [5+5]

OR

- 5.a) Analyse the features of submerged and welding.
b) List out the advantages, limitations and applications of resistance welding. [6+4]

- 6.a) With neat sketch explain TIG welding? List out its advantages, limitations and applications.

- b) Compare and Contrast solid state welding processes with fusion welding processes. [7+3]

OR

- 7.a) Explain layer welding. Also mention its applications. [5+5]
b) Explain briefly about Friction Stir Welding.

- 8.a) In a single-pass rolling operation, a 200 mm wide metallic strip is rolled from a thickness of 10 mm to a thickness of 6 mm. The roll radius is 100 mm and it rotates at 200 rpm. The roll-strip contact length is a function of roll radius and initial and final thickness of the strip. If the average flow stress in plane strain of the strip material in the roll gap is 500 MPa, the amount of roll separating force is? [6+4]
b) Discuss about Blanking and piercing.

OR

- 9.a) Derive an expression for forces and power required for blanking process. [5+5]

- b) Explain about bending, spring back and its remedies.

- 10.a) Explain about drop Forging and Rotary forging in detail. [7+3]
b) Discuss about the causes of forging defects.

OR

- 11.a) What is extrusion? Derive an expression for extrusion force. [7+3]

- b) Explain Tube extrusion process. List out applications.

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