

Code No: 134BK**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech II Year II Semester Examinations, December - 2018****MANUFACTURING PROCESS****(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, c as sub questions.

PART- A**(25 Marks)**

- 1.a) What points are to be considered before the selection of “casting process” for manufacturing a component? [2]
- b) What are the advantages of true centrifugal casting process? [3]
- c) Explain various welding positions. [2]
- d) Explain the effect of polarity on penetration in DC arc welding. [3]
- e) Why do properties vary widely in most welding heat affected zones? [2]
- f) Describe the difference between brazing and soldering. [3]
- g) Explain the effect of microstructure and strain rate on forming. [2]
- h) Explain the advantages of cold working. [3]
- i) Explain the role of lubricant in extrusion. [2]
- j) Write short note on forging die design. [3]

PART-B**(50 Marks)**

- 2.a) What is the significance of shrinkage in the production of castings?
- b) Calculate the size of a cylindrical riser (Height and diameter equal) necessary to feed a slab casting $45 \times 45 \times 25$ cm with a side riser, casting poured horizontally in to the mould. Use Chapeau's equation and take constants in Chapeau equation as $a = 0.18$, $b = 0.05$ and $c = 1.0$. [5+5]

OR

- 3.a) Why is it important to provide a means of venting gases from the mold cavity?
- b) Why might directional solidification be desirable in the production of a cast product? [5+5]
- 4.a) With the help of a neat sketch of welding torch explain the oxy acetylene process of welding.
- b) Why is cleaning of metal important for successful resistance welding? Explain. [5+5]

OR

- 5.a) What is meant by edge preparation? Show neat sketches of various edge preparations.
- b) Explain different forge welding techniques. [5+5]

- 6.a) Explain the reasons and suggest remedies for the following welding defects:
(i) Distortions (ii) Cracks.
b) Describe with neat sketches the TIG welding method and give its specific applications. [5+5]

OR

- 7.a) With the help of a neat sketch explain induction welding process.
b) What is arc blow? What are the measures to be taken to avoid arc blow? [5+5]

- 8.a) Explain the changes in structure and properties during cold working, recovery and recrystallization.
b) Explain why spring back in bending depends on yield stress, elastic modulus, sheet thickness and bend radius. [5+5]

OR

- 9.a) A coil of brass, 30m long by 0.7 m wide, is produced after a reduction from 5mm down to 4mm in a single pass on a two high mill under constant load conditions. The steel roll diameters are 0.6m, the diameters of the roll neck bearings are 0.5m and the rolls rotate at 30r.p.m.. If the constant load is 600 ton, determine the horse power developed, the energy consumed and the percentage of the total work extended in overcoming bearing friction for:

i) Roller bearings $\mu = 0.002$

ii) Bronze bearings $\mu = 0.06$

The rolls have a matt finish ground on them.

- b) Why are multiple passes usually required in wire drawing operations? Explain. [5+5]
- 10.a) Suggest and explain the method of manufacturing collapsible tubes.
b) Explain the various forging operations and list the forging defects. [5+5]

OR

- 11.a) Write a note on impact extrusion and list the advantages of impact extrusion over other extrusion processes.
b) What principles are normally considered good practice in the design of drop forgings? [5+5]

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