

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: B.TECH  
BRANCH: MECHANICAL**

**SEMESTER : III  
SESSION : MO/2022**

**SUBJECT: PE213 MANUFACTURING PROCESSES**

**TIME: 3:00 Hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) How can you control the flow of molten metal in filling the mould cavity? [2] CO3,L2  
Q.1(b) What is pattern? How does it differ from the actual product to be made from it? [3] CO1,L4  
Q.1(c) Which casting process is suitable to manufacture similar type small objects in numbers like orthopedic implants? Mention its steps. [5] CO2,L5
- Q.2(a) Name at least five different metal cutting operations in which a single point cutting tool is used. [2] CO1,L1  
Q.2(b) Explain the process of cutting tool failure. [3] CO1,L2  
Q.2(c) In an orthogonal cutting operation, the tool has a rake angle =  $15^\circ$ . The chip thickness before the cut = 0.30 mm and the cut yields a deformed chip thickness = 0.65 mm. Suppose the rake angle were changed to  $0^\circ$ . If the friction angle remains the same, determine (a) the shear plane angle, (b) the chip thickness, and (c) the shear strain for the operation. [5] CO4,L3
- Q.3(a) State the quick return mechanism in shaper. [2] CO1,L1  
Q.3(b) How to specify a grinding wheel? [3] CO1,L2  
Q.3(c) Explain various drilling operations with suitable diagram. [5] CO1,L2
- Q.4(a) Why does more force require in direct extrusion than indirect extrusion? [2] CO3,L2  
Q.4(b) In a rolling operation using rolls of diameter 500 mm if a 30 mm thick plate cannot be reduced to less than 20 mm in one pass. Find the coefficient of friction between the roll and the plate. [3] CO4,L3  
Q.4(c) Define: Hot working, Cold working, Recovery, Recrystallization and Grain Growth [5] CO1,L1
- Q.5(a) What are the various welding positions? [2] CO1,L1  
Q.5(b) Differentiate between TIG and MIG welding. [3] CO3,L4  
Q.5(c) Classify resistance welding. Explain their principles with neat sketch. [5] CO1,L3

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