

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

**CLASS: B.TECH.  
BRANCH: Production and Industrial Engineering**

**SEMESTER: VII  
SESSION: MO/2025**

**SUBJECT: PE407 ADVANCED MANUFACTURING PROCESSES**

**TIME: 3 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) | What are the steps followed in rheocasting process?<br>Name a few rheocast parts used in automobile.  | 3+2   | 1 2 |
| Q.1(b) | What are the advantages of vacuum casting?<br>What type of mould is used in vacuum casting?<br>Name some applications of vacuum casting.                | 2+1+2 | 1 1 |
| Q.2(a) | Explain the mechanism of cold welding with suitable sketch.<br>Which metals are suitable for cold welding?  | 4+1   | 2 2 |
| Q.2(b) | Discuss conduction mode and keyhole mode of laser beam welding.<br>Which situations demand automated welding operation?                                 | 4+1   | 2 3 |
| Q.3(a) | Explain the working principle of hydroforming.<br>What are the advantages of hydroforming?  | 3+2   | 3 2 |
| Q.3(b) | Compare hot and cold isostatic pressing operations. Mention their applications.   | 5     | 3 4 |
| Q.4(a) | How can you classify powder compaction methods in powder metallurgy?<br>Mention the effects of powder characteristics on compaction.                    | 3+2   | 4 2 |
| Q.4(b) | What is activated sintering of powders?<br>Describe the stages in solid state sintering.  | 1+4   | 4 2 |
| Q.5(a) | Schematically show an injection molding set-up.<br>Which plastic processing technique is suitable for manufacturing submarine hulls made of ABS sheets? | 4+1   | 5 3 |
| Q.5(b) | What are intraply and interply hybrids in fibre reinforced polymers (FRP)?<br>Explain any of the methods for processing of continuous fibre FRP.        | 2+3   | 5 2 |

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