



# P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

**Third Semester, B.E. - Industrial and Production Engineering**

**Semester End Examination; Dec. - 2019**

**Manufacturing Technology - I**

Time: 3 hrs

Max. Marks: 100

**Note: i) PART - A** is compulsory. **Two** marks for each question.

**ii) PART - B:** Answer any **Two** sub questions (from a, b, c) for Maximum of **18 marks** from each unit.

| Q. No.               | Questions   | Marks     |
|----------------------|---|-----------|
| <b>I : PART - A</b>  |   | <b>10</b> |
| I a.                 | Summarize the classification of production processes based on the property of metal.            | 2         |
| b.                   | Define base sand.   | 2         |
| c.                   | Mention any two advantages and disadvantages of submerged Arc welding (SAW).                    | 2         |
| d.                   | List the advantages of gas welding.   | 2         |
| e.                   | What are the functions of flux?   | 2         |
| <b>II : PART - B</b> |   | <b>90</b> |
| <b>UNIT - I</b>      |   | <b>18</b> |
| 1 a.                 | Explain with a flow chart, briefly explain sand casting process.                                | 9         |
| b.                   | Define pattern. Describe the functions of a patterns and materials used for pattern.            | 9         |
| c.                   | Describe the general steps involved in cleaning of casting.                                     | 9         |
| <b>UNIT - II</b>     |   | <b>18</b> |
| 2 a.                 | Describe in detail the requirements of base sand for producing a good casting.                  | 9         |
| b.                   | Explain in detail about squeeze type molding with necessary diagrams.                           | 9         |
| c.                   | Explain in detail about the centrifugal casting with a neat sketch.                             | 9         |
| <b>UNIT - III</b>    |   | <b>18</b> |
| 3 a.                 | With necessary diagram, describe in detail the constructional features of electric arc furnace. | 9         |
| b.                   | Describe briefly the need for welding. Explain the basic principle of Metal-Arc welding.        | 9         |
| c.                   | Explain in detail about inert gas welding with neat sketch.                                     | 9         |
| <b>UNIT - IV</b>     |   | <b>18</b> |
| 4 a.                 | Explain with neat sketch the basic principle of oxy-acetylene welding.                          | 9         |
| b.                   | Describe the following resistance welding techniques with neat diagrams:                        | 9         |
| i)                   | Butt welding  | 9         |
| c.                   | With neat sketch, explain the principle and theory of operation Laser welding.                  | 9         |
| <b>UNIT - V</b>      |   | <b>18</b> |
| 5 a.                 | Explain the principle and working of friction stir welding.                                     | 9         |
| b.                   | Explain briefly about the following welding defects:  | 9         |
| i)                   | Cracked welds   | 9         |
| ii)                  | Spatter welds   | 9         |
| iii)                 | Incomplete penetration  | 9         |
| c.                   | Explain in detail why weld usually fails in Heat Affected Zone (HAZ).                           | 9         |