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

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Industrial and Production Engineering

Semester End Examination; May/June - 2018

Theory of Metal Forming

Time: 3 hrs

Max. Marks: 100

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

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| 1 a. | With a neat sketch, explain flow curve. | 3 |
| b. | Derive an expression for Von Mises and Tresca criterion. | 8 |
| c. | Illustrate the classification of forming process. | 9 |
| 2 a. | Difference between hot and cold working process. | 10 |
| b. | Explain the role of lubrications in metal working process. | 10 |

UNIT - II

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|------|---|----|
| 3 a. | Illustrate the open die and closed die forging processes and list out the advantages and disadvantages of the same. | 15 |
| b. | With a neat diagram, explain working principles of board drop hammer. | 5 |
| 4 a. | Illustrate the types of Rolling mills. | 8 |
| b. | Briefly explain the geometric relationships in Rolling process. | 8 |
| c. | Explain Rolling defects. | 4 |

UNIT - III

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|------|--|----|
| 5 a. | Illustrate the Hydrostatic extrusion process. | 10 |
| b. | Explain different variable which effect extrusion process? | 5 |
| c. | With neat diagram, explain impact extrusion process. | 5 |
| 6 a. | With neat diagram, explain the tube drawing process without using mandrel. | 10 |
| b. | With neat diagram, explain the various elements which affect drawing of die. | 10 |

UNIT - IV

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|------|--|----|
| 7. | Explain the following with neat sketches : | |
| a) | Spinning back in bending | 7 |
| b) | Deep drawing process | 7 |
| c) | Spinning process | 6 |
| 8 a. | List out different forming methods and explain any 3 methods. | 12 |
| b. | With a neat diagram, explain how the large contoured products can be sketched? | 8 |

UNIT - V

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|-------|---|----|
| 9 a. | Illustrate the method which is adopted to manufacture powder? | 8 |
| b. | List out the different steps involved in powder production and explain any 3 methods. | 12 |
| 10 a. | With a neat sketch, explain explosive forming using stand-off techniques. | 8 |
| b. | List out the advantages and disadvantages of powder metallurgy. | 6 |
| c. | List out the advantages and disadvantages of HERF process. | 6 |