



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 - 2019

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 suitable assumptions, derive an expression for Von-Mises criterion for Ductile material. | 6 |
| b. | Explain the importance of flow curves in metal working process. | 6 |
| c. | Define metal forming and explain the classification of forming process. | 8 |
| 2 a. | Explain the effect of temperature in metal working process. | 7 |
| b. | Explain the effects of strain-rate in metal working process. | 6 |
| c. | Explain the effect of friction and lubrication on metal working process. | 7 |

UNIT - II

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|------|--|----|
| 3 a. | Define Forging. With a neat sketch, explain the working of closed-die forging process. | 8 |
| b. | With a neat sketch, explain Hydraulic press used in forging. | 6 |
| c. | List the different forging operations. | 3 |
| d. | List the advantages of forgings. | 3 |
| 4 a. | With a neat sketch, explain; | 10 |
| | i) Cluster mil ii) 4-stand continuous mill (Tandem mill) | |
| b. | Explain hot rolling process. | 6 |
| c. | Write a note on rolling pressure. | 4 |

UNIT - III

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|------|---|----|
| 5 a. | With a neat sketch, explain indirect extrusion process. | 7 |
| b. | Explain production of seamless pipe and tubing by extrusion process. | 7 |
| c. | With a neat sketch, explain flat-faced die and conical die used in extrusion process. | 6 |
| 6 a. | Derive an expression for analysis of wire drawing process. | 10 |
| b. | List and explain the defects in wire drawing process. | 5 |
| c. | With a neat sketch, explain tube-drawing process by floating plug method. | 5 |

UNIT - IV

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|------|---|---|
| 7 a. | With a neat sketch, explain progressive forming process. | 6 |
| b. | With a neat sketch, explain spinning process used in sheet metal forming process. | 6 |
| c. | With a neat sketch, explain shearing process. | 8 |

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|------|--|---|
| 8 a. | With a neat sketch, explain stretch forming process. | 7 |
| b. | With a neat sketch, explain deep drawing process. | 7 |
| c. | Explain the effect of spring back and how it is eliminated in Bending process? | 6 |

UNIT - V

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|-------|---|----|
| 9 a. | With a neat sketch, explain rubber forming process. | 7 |
| b. | List the advantages of HERF process. | 4 |
| c. | With a neat sketch, explain explosive forming process. | 9 |
| 10 a. | List and explain any two methods used for the production of metal powders. | 10 |
| b. | List and explain any two methods of compaction used in powder metallurgy technique. | 10 |

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