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

(An Autonomous Institution affiliated to VTU, Belgaum)

Third Semester, B.E. - Automobile Engineering

Semester End Examination; Dec - 2016/Jan - 2017

Manufacturing Technology - 1

Time: 3 hrs

Max. Marks: 100

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

### UNIT - I

- 1 a. Give the broad classification of engineering manufacturing processes along with two examples for each. 6
- b. Sketch the mold showing the following and explain their function : 10  
 i) Pouring basin    ii) Sprue    iii) Gate    iv) Runner    v) Riser.
- c. List the different factors that are considered, while selecting a manufacturing process. Explain briefly. 4
- 2 a. Explain shrinkage, draft and distortion allowances provided to the pattern. 10
- b. List the essential properties of molding sand. Explain any six of them. 10

### UNIT - II

- 3 a. Discuss different types of binders used in molding sand. 6
- b. What are the ingredients of core sand? Explain briefly. 8
- c. With a sketch, explain the construction of a core blowing machine. 6
- 4 a. Give a step-by-step procedure for the investment casting process with suitable sketches. 10
- b. Explain with a neat sketch, horizontal centrifugal casting process. 10

### UNIT - III

- 5 a. With sketch, give the description of Cupola furnace and briefly explain its operation. 10
- b. List the advantages and disadvantages of an induction furnace. 6
- c. Write a note on crucible furnaces. 4
- 6 a. State the functions of a riser. Explain different risers with neat sketches. 10
- b. List the common defects in castings. Explain any three. 10

### UNIT - IV

- 7 a. With a neat sketch, discuss the principle and operation of TIG welding process. 12
- b. Write a note on atomic hydrogen welding process. 8
- 8 a. Explain briefly the principle of resistance welding. 4
- b. With the help of a neat sketch, explain the principle of resistance spot welding. 10
- c. What are the advantages and applications of seam resistance welding process? 6

**UNIT - V**

- 9 a. Discuss the formation of different zones in welding. 9
- b. What are the defects in welding? State the causes and the remedy. 8
- c. List the applications of brazing. 3
- 10 a. With a neat sketch, explain the working principle of ultrasonic method of NDT. List its advantages. 12
- b. With a neat sketch, discuss the radiography method of inspecting a weld. 8

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