USN ☐☐☐☐☐☐☐☐☐☐   **10AE35**

Third Semester B.E. Degree Examination, Dec.2016/Jan.2017
Manufacturing Processes

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1 a. Discuss the factors to be considered while selecting proper pattern materials.   **(06 Marks)**
   b. What is pattern allowance? Discuss various pattern allowances with their importance.
                                                                                          (08 Marks)
   c. Explain sweep pattern with the help of a neat sketch.   **(06 Marks)**

2 a. Explain the desirable properties of moulding sand.   **(08 Marks)**
   b. Explain top gate, bottom gate and parting line gate systems with the help of neat sketches.
                                                                                          (12 Marks)

3 a. Explain Jolt squeeze machine and sand slinger with the help of neat sketches.   **(10 Marks)**
   b. Explain the steps involved in shell moulding with the help of neat sketches.   **(10 Marks)**

4 a. Explain the working principle of arc welding state the advantages and disadvantages of arc welding process.   **(12 Marks)**
   b. Explain forward and backward welding techniques with the help of neat sketches.   **(08 Marks)**

PART – B

5 a. What are the differences between soldering and brazing?   **(06 Marks)**
   b. Explain eddy current inspection of welding defects with a neat sketch.   **(08 Marks)**
   c. Explain ultrasonic method of inspection of welding defects with a neat sketch.   **(06 Marks)**

6 a. During turning a steel rod of diameter 160 mm at speed 560 rpm, feed 0.32 mm/rev and depth of cut 4.0 mm by a ceramic insert of geometry 0°, −10° , 6° , 6° , 15° , 75° , 0 (mm) The following were observed:
      P_Z = 1600 N, P_X = 800 N and chip thickness = 1 mm. Determine with the help of Merchant's circle diagram, the possible values of F, N, m_a , P_s , P_n cutting power and specific energy consumption.   **(10 Marks)**
   b. In turning of a steel rod by a given cutting tool, the tool life decreases from 80 min to 20 min due to increase in cutting velocity from 60 m/min to 120m/min. At what cutting velocity the life of the toll will become 40 min?   **(06 Marks)**
   c. What are the advantages and limitations of Merchant's circle diagram.   **(04 Marks)**

7 a. What are the essential properties of cutting fluids? Explain.   **(06 Marks)**
   b. Write a note on different types of cutting fluids.   **(08 Marks)**
   c. What are the factors affecting heat generation in metal cutting? Explain.   **(06 Marks)**

8 a. Explain ultrasonic machining with a neat sketch.   **(10 Marks)**
   b. Explain the construction and working principle of plasma arc machining with a neat sketch.
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