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Third Semester M.Tech. Degree Examination, Dec.2013/Jan.2014
DFM Techniques and Product Design

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1   a. What are the basic principles of design for economic production? Explain with examples.
                                                                (08 Marks)
    b. What are design rules?   **(06 Marks)**
    c. What is manufacturability? Explain.   **(06 Marks)**

2   a. What are the design recommendations for screw machine-products?   **(10 Marks)**
    b. Explain the design recommendations with appropriate figures for burnishing considering wall thickness, cutouts, interrupted holes and blind holes?   **(10 Marks)**

3   a. What are the design recommendations and economics of deburring?   **(10 Marks)**
    b. Explain with suitable figures, the design recommendations for ceramic and glass parts.
                                                                (10 Marks)

4   a. Discuss automatic assembly with design recommendations.   **(10 Marks)**
    b. Explain how fastening in assembly can be made easy.   **(10 Marks)**

5   a. Explain any ten essential factors that are to be considered during product design.   **(10 Marks)**
    b. Taking an example explain in detail seven phases of design.   **(10 Marks)**

6   a. According to Kovan what are the producibility requirements in the design of machine components.   **(10 Marks)**
    b. What are the general producibility requirements in design for machining ease?   **(10 Marks)**

7   a. What is meant by optimum design? Give Siddal classification of design approaches.
                                                                (10 Marks)
    b. A total length of 100m tubes must be installed in a shell and tube type heat exchanger, in-order to provide the necessary heat transfer area. The total cost of installation in dollars includes,
       i)   The cost of the tubes which is constant at $900.
       ii) The cost of shell = $1100D^{2.5}L$.
       iii) The cost of floor space occupied by the heat exchanger = 320 DL, where,
       'L' is length of heat exchanger, and 'D' is the diameter of the shell, both in meters. The spacing of the tube is such that 200 tubes will fit in a cross-sectional area of $1m^2$ in the shell. Determine the diameter and length of heat exchanger for minimum first cost.
                                                                (10 Marks)

8   a. What is value? What is the nature and measurement of value?   **(10 Marks)**
    b. Explain the value analysis job plan.   **(10 Marks)**

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