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B.E/B.TECH (Full-time) Arrear End Semester Examination, April/May 2013

II Semester

Common to Mechanical Engineering and Materials Science Engineering

ME 9151 – CONCEPTS OF ENGINEERING DESIGN

(Regulation 2008)

Time: 3 Hours

Answer All Questions

Max. Marks: 100

PART-A (10 x 2 = 20 Marks)

1. Define the terms Codes and Standard. List the available standards with regard to engineering design.
2. State the differences between static and dynamic products.
3. What are prototypes?
4. What are the different types of models?
5. What is a concept map?
6. Bring out the strengths and weaknesses of utilizing TRIZ in design?
7. What do you understand from the term life-cycle design?
8. Define the term anthropometrics.
9. List the data a technical report has.
10. What are modality and coherence principles?

Part-B (5 x 16 = 80 Marks)

11. What is meant by morphology of design? Enumerate the steps in the process of design of a product.

12(a) (i) Explain in detail the basic module in the design process. (8)

(ii) Bring out the differences between scientific and design methodologies. (8)

[OR]

12 (b) (i) How do you identify the needs of a customer. What are different ways of gathering data from customers? (10)

(ii) Classify the requirements of customers. Explain each case in detail. (6)

13(a) How does TRIZ helps in generating an innovative solution to a design problem? Explain.

[OR]

13(b) Detail about the brainstorming and synectic creativity improvement techniques in design.

14(a) State and detail the strategies to protect our environment during the design process.

[OR]

14(b) What is understood from the term ergonomics? Explain about the importance of human factor design in the improvement of the quality of a product. How is the product performance influenced by human factor characteristics?

15(a) Explain in detail the process of planning and preparing the technical report on a design problem.

[OR]

15(b) How the product design concepts are communicated through oral presentations and by use of visual aids? Explain.