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10ME753

Seventh Semester B.E. Degree Examination, Dec.2015/Jan.2016

Engineering Design

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

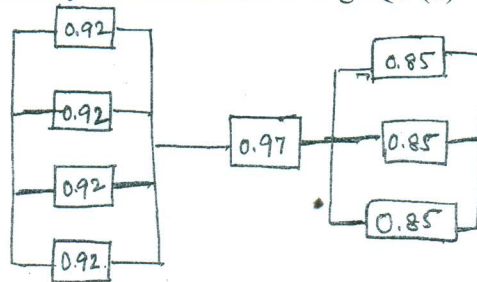
PART - A

- 1 a. Explain the five steps for identifying customer needs. (10 Marks)
- b. Explain the different methods used to gather raw data from customers. (05 Marks)
- c. With an example, explain the customer need understanding. (05 Marks)
- 2 a. Explain the Design process steps (08 Marks)
- b. Write a note on
 - i) Spectrum of Engineering activities
 - ii) The product life cycle
 - iii) Technological Forecasting
 (12 Marks)
- 3 a. Explain Brain-Storming technique. (05 Marks)
- b. Write a note on product design specification (05 Marks)
- c. Explain Morphological Analysis method of conceptual design, with an example. (05 Marks)
- d. With a neat sketch explain a Decision tree. (05 Marks)
- 4 a. What do you mean by Mathematical modeling explain with a suitable example. (10 Marks)
- b. Write a note on simulation and Geometric modeling. (10 Marks)

PART - B

- 5 a. Briefly explain Ergonomics. (05 Marks)
- b. Explain Anthropometry (Man as occupant of space) with neat sketches. (10 Marks)
- c. With a neat sketch, explain design of controls (05 Marks)
- 6 a. Calculate the Reliability of the system as shown in Fig. Q6 (a) (08 Marks)

Fig. Q6 (a)



- b. Explain Bath tub curve with a sketch. (06 Marks)
- c. Derive an expression for the Reliability of a system, when its components x_1 and x_2 are in series. (06 Marks)
- 7 a. Write a note on performance characteristics of materials. (06 Marks)
- b. List the different sources of information on material properties. (04 Marks)
- c. Explain in detail the methods material selection. (10 Marks)
- 8 a. Define Robust design and mention the objectives of Robust design. (05 Marks)
- b. Explain in detail the steps in Robust design process. (10 Marks)
- c. Define Noise & control factors with examples. (05 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.