KUMARAGURU
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Register Number: ……..

**B.E DEGREE EXAMINATIONS: NOV 2015**

(Regulation 2009)

Seventh Semester

**MECHANICAL ENGINEERING**

MEC135: Modern Concepts of Engineering Design

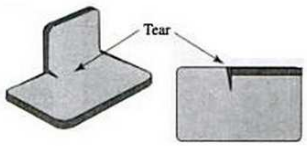
**Time: Three Hours** **Maximum Marks: 100**

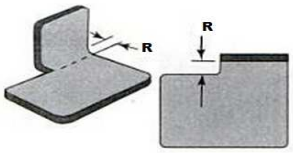
**Answer all the Questions:-**

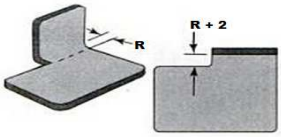
**PART A (10 x 1 = 10 Marks)**

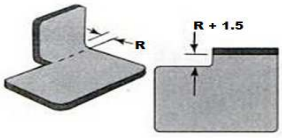
1. First step of planning for manufacture is
   a) Detail Design b) Process Sheet
   c) Primary Design d) Conceptual Design
2. PDS stands for
   a) Product Database Service b) Product Data Specification
   c) Product Design Specification d) Product Data Steps
3. Technique selected to design first Teflon-coated plain bearings
   a) Variant design b) morphology of design
   c) original design d) adaptive design
4. A common method to determine the customer needs before detailed product development is
   a) Focus group b) Scenario analysis
   c) Laggards d) Field trials
5. Brainstorming belongs to which concept generation
   a) Directed method b) Intuitive method
   c) logical method d) Reasoning Method
6. Maximum impact normalization as defined in concept scoring is
   a) Limiting each criteria to a maximum impact in the concept evaluation b) Normalization of the concept scores to reduce its ranges
   c) an impact mapping to the raw value score d) Maximum allowed effect of yield
7. Example of integral product architecture from the list
   a) Lego bricks b) Mainframe Computer
   c) Wooden pencil d) Tinkertoys

8. Which is the correct design for manufacturing

a) 


b) 


c) 


d) 


9. A new and useful composition of matter will be patented by

a) Design patent
b) Plant patent
c) useful patent
d) utility patent

10. Select the incorrect statement from the list

a) Robustness will not be considered for the subsystems
b) Interactions among control factors are highly undesirable
c) Parameter design reduces the sensitivity of the design sources
d) Two and Three level orthogonal arrays are most often used in DOE

**PART B (10 x 2 = 20 Marks)**

11. Differentiate between original design, adaptive design and variant design.
12. How is the quality of the part defined?
13. Illustrate the steps in the product planning process.
14. What are the models used to assess the technical feasibility of brake mounting stiffness?
15. Define the purpose of concept testing.
16. What are the steps used in concept generation?
17. Distinguish between modular architecture and integral architecture.
18. How does industrial design establish a corporate identity?
19. List any four salient features of tolerance design.
20. What are the limitations of quantitative analysis?

**PART C (5 x 14 = 70 Marks)**

21. a) Discuss the various factors to be considered in the conceptual phase of design process.

**(OR)**

b) Describe the innovation process and the steps in new product development.

22. a) Discuss the issues involved in evaluating and prioritizing projects in product planning.

**(OR)**

b) Explain the relationship between needs and metrics by constructing a needs-metrics matrix for a bike suspension system.

23. a) Propose five concepts for a CD case and evaluate against the datum of the standard CD case with the Pugh concept selection method.

**(OR)**

b) Explain the various survey format used in concept testing.

24. a) Explain how the quality of industrial design is assessed by considering a Motorola starTAC.

**(OR)**

b) Explain the various steps to be considered while planning for a prototype with the aid of an illustrative example.

25. a) Discuss the influence of the qualitative factors on project success.

**(OR)**

b) Explain how optimum values of design factors leading to economical designs with low variability are obtained by parameter design.

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