Reg.No. _____

Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 14ME2037 **Semester : 2016-17 ODD**
Sub. Name : Product Design and Development Strategies **Duration : 3hrs**
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	List out all the seven phases in morphology of design Explain the first three phases in detail with relevant sketches.	CO1	**10**
	b.	Sketch neatly the inverted bath tub curve and explain the stages involved in the Product life cycle.	CO1	**10**
		(OR)		
2.	a.	Compare between the scientific method and design method for approaching simplified design process with neat flowcharts.	CO1	**10**
	b.	Describe the five important steps involved in Problem-Solving Methodology.	CO1	**10**
3.	a.	Distinguish between concurrent engineering and sequential engineering with relevant sketches.	CO1	**10**
	b.	How the computer aided engineering helps in better product design. Sketch the cross sectional view of a single cylinder IC engine and explain its design analysis.	CO1	**10**
		(OR)		
4.	a.	Identify and explain the international codes and standards used for product design.	CO1	**10**
	b.	With neat sketches explain the stages of design improvement for railcar wheel.	CO1	**10**
5.	a.	Explain the steps in materials selection activities for the two different situations. i. Selection of the materials for a new product or design. ii. Re-evaluation of an existing product or design to reduce cost, increase reliability, improve performance, etc.	CO1	**10**
	b.	With a neat Schematic diagram of the design process suggest required design tools, materials and process selection to arrive at the best combination of material and manufacturing process.	CO1	**10**
		(OR)		
6.	a.	List out some important properties and applications of the following. (i) Physical (ii) Mechanical (iii) Chemical (iv) Electric properties (v) Thermal Properties.	CO2	**10**
	b.	Suggest a good material required for an Automotive Exhaust System by considering the product design specifications.	CO2	**10**
7.	a.	Briefly explain how the weighted property index is used for material selection	CO2	**10**
	b.	Evaluate the material selection for a cryogenic storage vessel for liquefied natural gas based on the following properties: (1) low-temperature fracture toughness, (2) low-cycle fatigue strength, (3) stiffness, (4) coefficient of thermal expansion (CTE), and (5) cost. Since the tank will be insulated, thermal	CO2	**10**

		properties can be neglected in the selection process. Determine the weighting factors for these properties using pairwise comparison.		
		(OR)		
8.	a.	Explain various simulated service tests performed for a horizontal aluminum alloy motor in case of material substitution.	CO2	**10**
	b.	With an example list out the advantages of the general tolerancing to facilitate easy manufacturing.	CO2	**10**
Compulsory:				
9.	a.	Explain the dimensioning rules and systems for the following with neat sketches. i) Aligned ii) Unidirectional iii) Tabular iv) Chain	CO2	**10**
	b.	Sketch and explain in detail about the technological properties of grey iron castings.	CO2	**10**

ALL THE BEST