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**PRESIDENCY UNIVERSITY
BENGALURU
SCHOOL OF ENGINEERING
END TERM EXAMINATION – August 2024**

Semester :II SEM	Date :13.08.2024
Course Code :MEC 5009	Time : 9.30am -12.30pm
Course Name :CREATIVITY IN DESIGN	Max Marks :100
Program : M. Tech PDD	Weightage :50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ANY 4 QUESTIONS

4Q X 5M=20M

1	What is Design by Evolution? Give one suitable example and explain the disadvantages of evolutionary design	(CO 1)	[Knowledge]
2	With a neat sketch explain clearance Fit	(CO1)	[Knowledge]
3	Define the following terms: (i) Adaptive design (ii) Variant design	(CO1)	[Knowledge]
4	Define the following terms: Creative design, (iv) Configuration design	CO 2)	[Knowledge]
5	Explain the three basic design problems faced by Industrial Designer	(CO 2)	[Knowledge]
6	What is Meant by optimal design? It is feasible design (Or) does it have an objective function subject to constraints? Give an example.	(CO 3)	[Knowledge]

PART B

ANSWER ANY 5 QUESTIONS

5Q X 10M=50M

7	Give Siddal's classification of design approaches	(CO 3)	[Comprehension]
8	Explain optimization methods	(CO 3)	[Comprehension]
9	Explain Optimization by differential calculus	CO 3)	[Comprehension]

10	Using Morris Asimov's Philosophy with neat Flow chart explain the stages of Phase-I Feasibility Study	(CO 3)	[Comprehension]
11	With a neat sketch explain different types of fits	(CO 3)	[Comprehension]
12	With a neat sketch Explain morphology of design.	(CO 3)	[Comprehension]
13	With a suitable example explain Euler's relationship	(CO 3)	[Comprehension]

PART C

ANSWER ANY 2 QUESTIONS

2Q X 15M=30M

14	<p>A total of 300 m length of tubes must be installed in a heat exchanger, in order to provide the necessary heat-transfer surface area. The total dollar cost of the installation includes:</p> <ol style="list-style-type: none"> 1. The cost of the tubes, \$ 700 2. The cost of the shell = $25D^{2.5} L$ 3. The cost of the floor space occupied by the heat exchanger = $20DL$, <p>The spacing of the tubes is such that 20 tubes will fit in a cross-sectional area of 1 m^2 inside the shell. The optimization should determine the diameter D and the length L of the heat exchanger to minimize the purchase cost.</p> <p>The objective function is made up of three costs, due to shell, tube and floor space:</p>	(CO 4)	[Application]
15	With a neat sketch explain FEA approach for cantilever beam with end loading.	(CO 4)	[Application]
16	What are qualifying design concepts & test programs for products?	(CO 4)	[Application]