

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

M.E DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Third Semester

PRODUCT DESIGN AND DEVELOPMENT

PD4006- Human Factors Engineering in Product Design

Regulations - 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART – A(ANSWER ALL QUESTIONS) (Marks 10*2=20)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	Define anthropometry and its significance in ergonomics.	RE	1	2
2.	What is meant by design for everyone?	UN	1	2
3.	Explain the importance of workplace design for standing workers.	UN	2	2
4.	What are the factors affecting manual handling activity tasks?	UN	2	2
5.	What are the design principles for visual displays?	RE	3	2
6.	State the factors to consider while designing auditory displays.	RE	3	2
7.	Discuss the role of lighting in environmental design.	UN	4	2
8.	Define the term "noise" in the context of environmental ergonomics.	RE	4	2
9.	What is human error, and how does it affect human-machine interaction?	UN	5	2
10.	Explain the significance of cognitive ergonomics in product design.	UN	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Explain the application of anthropometric data in product design.	UN	1	7
	ii Describe the principles of applied anthropometry in ergonomics.	UN	1	6
	Or			
	b i Explain the challenges involved in designing for a diverse population.	UN	1	7
	ii How can design be made inclusive for all types of users?	RE	1	6
12.	a i Analyze the ergonomic design principles for seated workers.	AN	2	7
	ii Examine the considerations for designing repetitive tasks.	AN	2	6
	Or			
	b i Discover the impact of work-related stress and fatigue on productivity.	AN	2	7
	ii Identify the solutions to reduce fatigue in a workplace design.	AP	2	6
13.	a i Derive the design principles for auditory and visual displays.	AP	3	7
	ii Examine the design considerations for virtual environments.	AN	3	6
	Or			
	b i Analyze the ergonomics involved in control system design.	AN	3	7
	ii Develop the role of virtual environments in modern product design.	UN	3	6

14.	a	i	Evaluate the impact of environmental factors like noise and vibration on worker efficiency.	EV	4	7
		ii	Discuss how lighting affects human vision and productivity in workspaces.	CR	4	6
Or						
	b	i	Design a product that mitigates the effects of extreme temperatures (heat/cold) in the workplace.	CR	4	7
		ii	Discuss the impact of sound design on the comfort of workers in industrial environments.	CR	4	6
15.	a	i	Explain the concept of human-machine interaction and its effect on safety.	EV	5	7
		ii	Discuss the importance of cognitive ergonomics in enhancing user performance.	CR	5	6
Or						
	b	i	Assess human error and its causes in the context of human-machine interaction.	EV	5	7
		ii	Explain how human-computer interaction influences memory and language skills.	EV	5	6

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>	<i>Questions</i>			<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	i	Propose a design solution to improve the ergonomics of a control panel in a virtual environment.	CR	3	8
		ii	Evaluate the performance of an existing product design using cognitive ergonomics principles.	EV	5	7
Or						
	b	i	Design an ergonomic workstation layout for a seated worker, focusing on reducing fatigue.	CR	2	8
		ii	Evaluate the impact of environmental factors (light, noise) on human performance in a manufacturing environment.	AN	4	7