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B.M.S.College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Industrial Engineering and Management **Duration: 3 hrs.**
Course Code: 23IM5PCHFE **Max Marks: 100**
Course: Human Factors Engineering

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Discuss working roles in which an engineer can use ergonomics and human factors knowledge to positively impact a workplace.	CO2	PO1 PO4	**10**
	b)	How are ergonomics and human factors connected to engineering?	CO1	PO1	**10**
		OR			
2	a)	Define ergonomics and human factors. Explain the purpose of production ergonomics and its connection to engineering.	CO2	PO1 PO4	**10**
	b)	Discuss the musculo-skeletal system's role in ergonomics and list the common disorders associated with it.	CO2	PO1 PO4	**10**
		UNIT - II			
3	a)	Considering the problem from an engineering perspective, identify what exactly makes physical loading a risk?	CO2	PO1 PO4	**10**
	b)	Explain the causes and consequences of Bad Posture.	CO2	PO1 PO4	**10**
		OR			
4	a)	Explain Hagg's theory of cumulative loading known as the "Cinderella Hypothesis", named after the fairy tale character that was always "first to rise and last to go to bed".	CO2	PO1 PO4	**10**
	b)	Reflect on your own working life as a student, engineer or the like. What are the typical postures, forces and time frequencies of exposure that occur in your daily life? Are you at risk for unhealthy loading?	CO2	PO1 PO4	**10**
		UNIT - III			
5	a)	Discuss Static Measurements and Dynamic Measurement with suitable examples.	CO3	PO2 PO6	**10**

		b)	"Almost every human body has the same "biomechanical layout", as there is significant variation in body sizes and proportions between individuals. What do you think the main reasons are for the variations in the anthropometric data, explain the same?	*CO3*	*PO2* *PO6*	**10**
			OR			
	6	a)	Explain hierarchy of time-related factors that can be used to describe production assembly work.	*CO3*	*PO2* *PO6*	**10**
		b)	In anthropometry, explain what it means to "design for the 5^{th} to 95^{th} percentile" of a population.	*CO3*	*PO2* *PO6*	**10**
			UNIT - IV			
	7	a)	Using the SRK model by Rasmussen, explain the difference between how a novice and an expert process information, when performing a task.	*CO3*	*PO2* *PO6*	**10**
		b)	Discuss the various design principles geared at supporting the human cognitive capabilities of attention, perception, memory and mental models.	*CO3*	*PO2* *PO6*	**10**
			OR			
	8	a)	How can cognitive ergonomics improve industrial production? Discuss with examples.	*CO4*	*PO3*	**10**
		b)	What are the parameters that influence vision? What are the key design factors for presenting visual information?	*CO4*	*PO3*	**10**
			UNIT - V			
	9	a)	"Heuristic Evaluation IS one rough inspection or "checklist" method that enables general ergonomics issues to be identified" explain.	*CO4*	*PO3*	**10**
		b)	Explain the NIOSH Lifting Equation with an example.	*CO4*	*PO3*	**10**
			OR			
	10	a)	Discuss the various posture analysis method with an example of your choice.	*CO4*	*PO3*	**10**
		b)	Discuss about JSI, EAWS and RAMP based on multi-aspect ergonomics evaluation method.	*CO4*	*PO3*	**10**

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