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

Autonomous Institute Affiliated to VTU

## July 2023 Semester End Main Examinations

**Programme: B.E.**

**Branch: Aerospace Engineering**

**Course Code: 21AE8HSERG**

**Course: ERGONOMICS**

**Semester: VIII**

**Duration: 3 hrs.**

**Max Marks: 100**

**Date: 04.07.2023**

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

<b>Important Note:</b> Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.			<b>UNIT - I</b>	<i>CO 1</i>	<i>PO 1</i>	<b>Marks</b>
	1	a)	Define human factors, its evolution and explain the objectives of ergonomics.	<i>CO 1</i>	<i>PO 1</i>	<b>10</b>
		b)	Discuss goal of safety with an example.	<i>CO 1</i>	<i>PO 1</i>	<b>10</b>
			<b>UNIT - II</b>			
	2	a)	Describe different types of display units that often are associated with the products. Discuss the general guidelines that are to be considered while designing these display units.	<i>CO 2</i>	<i>PO 1</i>	<b>10</b>
		b)	Discuss the design aspects of the following controlling devices with reference to the ergonomics: (i) Push Buttons (ii) Toggle Switches (iii) Cranks	<i>CO 2</i>	<i>PO 1</i>	<b>10</b>
			<b>OR</b>			
	3	a)	Discuss the relationship between the display devices and control devices. (Any one experiment)	<i>CO 2</i>	<i>PO 1</i>	<b>10</b>
		b)	Name the controls that require considerable force and briefly explain the same.	<i>CO 2</i>	<i>PO 1</i>	<b>10</b>
			<b>UNIT - III</b>			
	4	a)	Explain the man-machine systems with a suitable block diagram. What are the characteristics of man-machine systems?	<i>CO 3</i>	<i>PO 1</i>	<b>10</b>
		b)	What are the criteria for evaluating a man-machine system? Explain.	<i>CO 3</i>	<i>PO 1</i>	<b>10</b>
			<b>OR</b>			

5	a)	Discuss the various types of man-machine systems with an example.	CO 3	PO 1	10
	b)	Discuss muscular performance and kinds of muscular activity.	CO 3	PO 1	10
		<b>UNIT – IV</b>			
6	a)	What is fatigue? Brief out different types of fatigues. Also, state the adverse effects of fatigue?	CO 3	PO 1	10
	b)	Briefly describe the general principles of carrying out physical activities. (2 points under each heading) <ul style="list-style-type: none"> <li>Guidelines for Body Postures</li> <li>Guidelines to organize the Work</li> <li>Guidelines for Layout of Work Place</li> <li>Guidelines for Lifting and Carrying Loads</li> <li>Guidelines for Considerations of Seats, Tables and Work Place and Suitable Body Postures</li> </ul>	CO 2	PO 1	10
		<b>UNIT – V</b>			
7	a)	Define Anthropometry and mention any 2 fields where this can be used. Describe the design for anthropometry.	CO 4	PO 1	10
	b)	Enumerate on the application of ergonomics in aerospace engineering. (Any 5 with Explanation)	CO 2	PO 1	10

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