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

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E.   Semester: V
Branch: Industrial Engineering and Management   Duration: 3 hrs.
Course Code: 22IM5DCHFE   Max Marks: 100
Course: Human Factors Engineering   Date: 23.02.2023

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

UNIT - I

1 a) "When part of the production system is human, the performance of the system as a whole may vary depending on the daily form of the human workers". Considering a furniture manufacturing industry is being set up where you are in charge of the Production Ergonomics aspect of the firm explain about your purpose. **10**

b) "This condition is caused by highly repetitive work in extreme positions, in combination with high force development". Justify the said condition. What is the function of the spine? **10**

UNIT - II

2 a) "A neutral posture is considered the least amount of loading, and resembles a relaxed, standing, symmetrical body position with the arms hanging along the sides of the body". Explain the techniques that are extensively used in measuring posture. **10**

b) A software engineer is working day and night sitting on a chair in front of a screen. What are typical postures, forces and time frequencies of exposure that occur in his/her daily life? **10**

OR

3 a) Many film & gaming industries are using a technique to capture the precise and accurate measurement of the human posture. Name the posture and explain the same with differences based on internal and external loading. **10**

b) What are the conceptions that an ergonomics engineer has for a body posture? Briefly explain the factors influencing the body postures **10**

UNIT - III

4 a) "Usually, it is not feasible to design workplaces to suit everyone perfectly from the shortest to the tallest". Justify this statement with appropriate explanation. **10**

   b) What are the reasons for the variations between anthropometric data? Explain the same with suitable examples. **10**

OR

5 a) Discuss the Gaussian distribution & about Correlation of anthropometric data for Stature. **10**

   b) Explain Static Measurements and Dynamic Measurement with suitable examples. **10**

UNIT - IV

6 a) "As we practise anything, be it physical or cognitive, we gradually develop skills. We progress from being a novice who is dependent on instruction". Explain the statement based on Rasmussen's SRK Model. **10**

   b) With a suitable example segregate the 13 design principles into Attention, Perception, Memory and Mental Models. **10**

UNIT - V

7 a) Inspection or checklist method that enables general ergonomic issues to be identified is a heuristic evaluation. Justify the statement. **10**

   b) When designing for lifting tasks, what limitation in applicability does the NIOSH lifting equation have for a female population? **10**

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