

M.E. First Semester (Mecha. Engg. (Adv. Manu. & Mech. Sys. Design)) (New-CGS)  
**13466 : Elective - I : Ergonomics of Manufacturing : 1 MMD 5**

P. Pages : 1

AU - 3386

Time : Three Hours



Max. Marks : 80

- Notes :
1. Answer **three** question from Section A and **three** question from Section B.
  2. Assume suitable data wherever necessary.
  3. Illustrate your answer necessary with the help of neat sketches.

**SECTION – A**

1. What is ergonomics? Explain in brief the history, development & scope of ergonomics. **13**
2. Explain the interaction between human and machine in photocopying machine system. How can this interaction be evaluated? **13**
3. a) Comment on anthropometric design motto "Let the small person reach and let the tall person fit." **7**  
b) Explain the symptoms and causes for physiological hazards like heat stroke, heat exhaustion and heat cramp. **7**
4. What are the various work postures? How do you select suitable posture for various tasks? **13**
5. a) What 'Aerobic' & Anaerobic' metabolism? How much energy is available for a person to perform any physical work? **6**  
b) Discuss the various anthropometric design principles. **7**

**SECTION – B**

6. a) Discuss the Ergonomic design consideration for design of following controls: **9**  
i) Toggle switch ii) Crank iii) Push button  
b) Explain the concept of the design for maintainability. **5**
7. a) Explain design features of symbols, labels and visual displays. **7**  
b) Why do you say it is better to bend the metals than to bend the arms? **6**
8. a) What are the basic principles of auditory environment? **7**  
b) Explain 'Repetitive motion injury'. Give three examples with neat sketch. **6**
9. a) Define clothing unit, clo. How clothes are providing average insulation in industrial hot and cold situations? **8**  
b) Discuss the effect of illumination on the productivity of younger and older workers. **5**
10. Explain the following; **13**  
I) Luminance and Illuminance II) Visual comfort probability index  
III) Human ear and its mechanism

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