

**M.E. PRODUCTION ENGINEERING**

**FIRST YEAR**

**FIRST SEMESTER EXAM 2024**

**INDUSTRIAL ERGONOMICS (PT)**

T: 3 Hrs.

FM:100

Use separate Ans. Script for each part.

**PART –I (60 Mks.)**

Ans. any 3 Q-s.

1. a) Define Ergonomics. Discuss the importance & scope of Ergonomics. 3  
b) Discuss the ill effects of static loads. Outline the bad effects of standing at one place. 7+7  
c) Discuss the function of nerves. 3
- 2(a) Discuss muscle power in relation to "age" & "sex". Outline the maxm. hand power, maxm. foot pressure while sitting & bending strength. 4+3+3+1  
(b) Discuss the importance of anthropometry in workplace design. 5  
(c) Discuss physiological principles regarding heavy work. 4
3. a) What is metabolism, explain with neat sketches. 5  
b) How does the disc trouble start due to wrong ways of lifting load? 5  
c) What is learning? When is the learning complete? With a suitable example show the stages in learning an activity (say writing). 3+3+4
4. a) What is the limit of interabdominal pressure for lifting loads? Discuss the ways of carrying a burden. 1+2  
b) Discuss heart rate during physical activity. Define the following terms in this regard: Resting pulse, Working pulse, Workpulse, Total workpulse & Total recovery pulse. 2+5  
c) Discuss the following terms: (i) New "syntop" chair design, (ii) Seat profiles for a multipurpose chair & for an easy chair. 2+4

[Turn Over

d) Discuss why the workplaces are not designed for an average person? What factors affect the anthropometric variations between individuals? 1+3

5. a) Write short notes on:

(i) Innervation of a muscle, (ii) Sodium-potassium pump 5+3

b) Discuss the sources of energy for the mechanical working of a muscle, with special emphasis on the role of glucose, fat & O<sub>2</sub>. 5

c) Discuss with neat sketches the working heights for: (i) Precision work, (ii) Light work, (iii) Heavier work. 7

**MASTER OF PRODUCTION ENGINEERING EXAMINATION-2024**

(1<sup>st</sup> year, 1<sup>st</sup> Semester)

**INDUSTRIAL ERGONOMICS**

Time: Three hours

Full Marks: 100

Use separate Answer-script for each part.

**PART- II (40 Marks)**

Answer **any TWO** questions.

- 6.(a) Define the man-machine system and explain how it works. What are its components? 7
- (b) Explain the following terms:  
(i) Acuteness of vision, (ii) Sensitivity of contrast, (iii) Speed of perception. 6
- (c) How ergonomics can be applied to design of instruments and display units? 7
- 7.(a) What are the sources of noise? Discuss the psychological effects of vibration on human visual perception, psychomotor performance and visibility. 5+5
- (b) Describe the methods of protection against noise in a manufacturing environment. 10
- 8.(a) Explain information processing as a part of man-machine system. Discuss about the memory and sustained alertness. 10
- (b) Explain the process of heat exchange between the human body and surroundings. 10

..... X X X X X .....