

**M.E. PRODUCTION ENGINEERING
FIRST YEAR
FIRST SEMESTER EXAM 2025**

INDUSTRIAL ERGONOMICS

T: 3 Hrs.

FM:100

Use separate Ans. Script for each part.

PART –I (60 Mks.)

Ans. any 3 Q-s.

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|--|-------|
| 1.a) Discuss with neat sketch the maximum pushing & pulling force while standing (as % of body weight) | 5 |
| b) Outline the rules for maximum skill. | 10 |
| c) What is the difference between | |
| i) Sensory nerves & motor nerves | |
| ii) Dynamic (rhythmic) effort & static (postural) effort. | 2+3 |
| 2.a) Explain: basal metabolism, leisure calories & work calories. | 4+4+3 |
| b) What is slipped disc? How does it occur? Why bending the back while lifting loads is to be avoided? | 6 |
| c) For a skilled work, how is the skill acquired? | 3 |
| 3.a) Discuss heart rate as a measure of work load. Also discuss blood system & respiration, vasomotor adaptation, rise in blood pressure, increased supply of sugar (glucose). | 12 |
| b) State & briefly explain the golden rules for office chair. | 8 |
| 4.a) Discuss practical guidelines for work layout. | 10 |
| b) List the recommended rules to be followed while lifting loads. | 7 |
| c) Discuss Seat angles for general purpose & easy chairs. | 3 |
| 5.a) What is the difference between reflexes & skills? | 5 |
| b) What is the difference between somatic & autonomic nervous system? | 5 |
| c) Briefly discuss the concepts of man-machine system in Ergonomics. | 4 |
| d) Discuss limiting values for lifting loads | |
| i) occasionally, ii) frequently. | 4 |
| e) Discuss: feeding the intervertebral discs. | 2 |

[Turn over

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EXAMINATION - 2025**

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) Differentiate between the qualitative display and quantitative display.
(b) Describe the physiological requirements of artificial lighting, arrangement and overall distribution of light for fine work and for VDT offices.
(c) Discuss ergonomics as applied to design and control of instruments and display units.
(5+8+7)
- 7.(a) What are the sources of noise? Illustrate the effects of noise on health and performance of a worker.
(b) Discuss the effect of vibrations on Human health.
((5+10)+5)
- 8.(a) Define the man-machine system and explain how it works. What are its components?-Discuss.
(b) As an ergonomist recommend for comfort indoor, air and ventilation and guidelines for working in very hot conditions.
(10+10)