

M.TECH DEGREE EXAMINATION
Model Question Paper
First Semester
Specialization: Industrial Engineering and Management
MMEIM 104 - WORK SYSTEM DESIGN

(Regular 2013 Admission)

Time: Three Hours

Maximum: 100 Marks

Answer all questions.
Each full question carries 25 marks.

1. (a) Define productivity? What are the management techniques to improve productivity?
(b) What is a chronocyclegraph? What are the two factors that you can understand from it?
(c) What is meant by therbligs? Define and draw the following therbligs
(i) assembly, (ii) inspect, (iii) plan, (iv) avoidable delay
(d) What is SIMO Chart? Explain with an example. Explain the steps involved in developing standard data.

(5+5+5+10 = 25 marks)

Or

2. (a) Define ineffective time. Which are the factors reducing productivity?
(b) Define 'Micro-motion' study. Explain the steps in micro-motion study.
(c) Explain various steps involved in method study, and how does it improve productivity.
(d) Define the method study. Discuss the following tools used for the purpose:
(i) Operation process chart, (ii) Flow diagram, (iii) Travel chart

(5+5+7+8 = 25 marks)

3. (a) Differentiate between standard time and basic time.
(b) Differentiate between snap back and continuous stopwatch methods.
(c) What is rating in time study? Explain the different rating methods.
(d) What is meant by work sampling? A work sampling study showed that 20% of a work, week of 48 hours was consumed by available delays. If each time a work sampling observation was made, the operator was rated and the average of such a ratings was 110%. If 100 units were produced by the operator in that period, calculate the standard time.

(4+4+7+10 = 25 marks)

Or

4. (a) What is Standard data? State its applications.
(b) Assuming that the total observed time for an operation of assembling an Electronic switch is 1.00 minute. If the rating is 120% find the normal time. If the allowance of 10% is allowed for the operation, determine the standard time.
(c) Assume you are the supervisor. Work measurement is to be introduced into your department. How would you explain to your men the technique of work measurement and how it might affect them?
- (5+10+10 = 25 marks)

5. (a) Define Ergonomics. What are the factors governing the performance of man-machine system?
(b) Explain some ways to reduce musculo-skeletal stress through work place design.
(c) Show the plan of a suggested work place layout with typical dimensions.
- (5+10+10 = 25 marks)

Or

6. (a) Mention the factors considered in ergonomic analysis.
(b) What is Anthropometry and explain principles used in application of anthropometric data.
(c) Explain the methods of measurement of fatigue in work physiology?
- (5+10+10 = 25 marks)

7. (a) Explain the role of physical environment on the human performance.
(b) Explain the physiological effects of heat & cold. Explain its remedies
(c) What are the various displays used in a man-machine system? Discuss the functional requirement and criteria used for their design.
- (5+10+10 = 25 marks)

Or

8. (a) Write a short note on effect of light and sound on human performance.
(b) Write a short note on effect of cognitive load on human performance. What are the methods for measuring cognitive load.
(c) Write short note on: (i) Hand tool design, (ii) Concept of visibility.
- (5+10+10 = 25 marks)