

**W 2611**

M.E. DEGREE EXAMINATION, JANUARY 2007.

First Semester

Industrial Engineering

IE 1601 – WORK SYSTEM DESIGN

(Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define the terms – Productivity, Labour Productivity, Capital Productivity and Total Productivity.
2. How are the living standards in an organization/firm interrelated and how are they essential for high or low productivity?
3. What is meant by total time for a job or an operation? Provide examples.
4. Brief the Methods and Motions as applicable for Operations Analysis.
5. Explain the term “Standard Data” and their uses in Work Measurement.
6. Explain briefly “Learning Effect” and its applicability for a time study man and an operator in Work Measurement.
7. Define the term ‘Work Sampling’ providing good examples.
8. What is indirect labour and how is it measured?
9. Explain the term ‘Ergonomics’ and its connectivity with man and machine.
10. Brief the aims of Ergonomics for any concern/firm.

PART B — (5 × 16 = 80 marks)

11. (a) Explain, in detail, with examples the following terms in Ergonomics. (4 × 4)
- (i) Human Performance in physical works.
  - (ii) Anthropometry and its uses.
  - (iii) Human-Machine Systems and Human components of a Work System.
  - (iv) Design of Displays and Controls.

Or

- (b) (i) Classify the various types of displays and give examples with application. (8)
- (ii) Discuss the ergonomic considerations in the design of controls. (8)
12. (a) Discuss Motion Study, Time Study and Methods Study providing enough examples; discuss also the relationship between Motion study, Time study and productivity.

Or

- (b) Explain in detail Work Methods Design and its uses on productivity; discuss also the various productivity measurement techniques along with models used.
13. (a) What is meant by Operation Analysis? Explain in detail with examples; list down and explain the Ten primary approaches as adopted in 'Operation Analysis'.

Or

- (b) Discuss the following in detail along with examples – Total work content, Total Time needed for performing an operation/job, Ineffective time and Various Graphic Tools used/needed.
14. (a) Discuss in detail 'work measurement' and list down the various methods used; explain elaborately the Stop Watch Time Study techniques.

Or

- (b) Elaborate the various techniques of development of Production Standards, highlighting elaborately about Methods Time Measurement (MTM). Also give necessary examples.

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× 4)
- (a) Discuss in detail, the various Organisational Practices and Methods (O & M) for applying Work Measurement in an organization. Give examples.

Or

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- (b) Detail the applications of Work Measurement to various applications, particularly to Wage Incentive plans and Wage payment/revisions in any good organization. Illustrate with necessary examples.
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