Code: DE1 **DECEMBER 2008** **Subject: INDUSTRIAL ENGINEERING**
Time: 3 Ho **Max. Marks: 100**

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q. 1. must be written in the space provided for it in the answer book supplied and nowhere else.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or best alternative in the following: (2x10)

a. In an economic system, the state of profit occurs in a system when efficiency is

(A) Greater than one **(B)** Lesser than one
(C) Equal to one **(D)** None of the above

b. A system for measuring and inspecting a phenomenon

(A) Statistics **(B)** Quality
(C) Control **(D)** None of the above

c. The range of 'x' in normal distribution is

(A) –1 to 1 **(B)** 0 to ∞
(C) $-\infty$ to 0 **(D)** $-\infty$ to ∞

d. The methods used for solving transportation problems are

(A) Linear programming and Graphical method
(B) Poisson and Normal distribution
(C) Vogel's approximate and North-West corner method
(D) PERT and CPM

e. The most precisely and widely used method of job evaluation is

(A) Ranking method **(B)** Grading method
(C) Factor comparison method **(D)** Point method

f. The number of standards in the ISO9000 series are

(A) Two **(B)** Three
(C) Four **(D)** Five

g. The method aims at reducing the transportation of in-process inventory from section to section

(A) Travel chart **(B)** Load path matrix method
(C) Correlation chart **(D)** Process flow chart

h. The method that uses algebraic equations

(A) Graphical technique **(B)** Simplex method
(C) Both of the above **(D)** None of the above

i. The first Ph.D granted in the USA in the field of industrial engineering with research done in area of motion study by Cornell University in 1933 was awarded to

(A) Ralph M. Barnes **(B)** Hugo Diemer
(C) H. B. Maynard **(D)** A. G. Anderson

j. The system used to evaluate speed rate of an operator with the help of predetermined motion time standards

(A) Speed rating **(B)** Skill and effort rating
(C) Synthetic rating **(D)** Objective rating

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. What do you mean by productivity? Also explain the factors affecting productivity. **(10)**

b. Describe the principles of plant layout. **(6)**

Q.3 a. What are the requirements of a good product design? Explain briefly. **(6)**

b. What are objectives and elements of total quality management? **(5)**

c. Define and discuss macrodata & microdata. Where are these used? **(5)**

Q.4 a. Explain basics of statistical quality control. **(8)**

b. Define ergonomics. What are its objectives? **(4)**

c. What are the objectives of work measurement? **(4)**

Q.5 a. Use the simplex method to maximize the given objective.

$$\begin{aligned} \text{Maximize} \quad & P = 8x + 17y + 14z \\ \text{Subject to} \quad & 3x + 7y + 4z \le 70 \\ & 2y + 4z \le 80 \\ & x, y, z \ge 0 \end{aligned}$$

(6)

b. Describe the following:
(i) Smoothing technique (ii) Crashing of Network **(4)**

c. What are the applications of goal programming? **(6)**

Q.6 a. What is the importance of plant maintenance? **(4)**

b. What are the advantages of using standard data for maintenance control? **(4)**

c. Explain breakdown maintenance. **(8)**

Q.7 a. What are the duties and responsibilities of a foreman towards management and workers? **(8)**

b. Discuss the roles and functions of Industrial Engineer. **(8)**

Q.8 a. Discuss materials management. State the functions and objectives of materials management. **(8)**

b. What is the concept of inventory models? Also enlist the different types of inventory models. **(4)**

c. What are the advantages of good control over the inventories? **(4)**

Q.9 a. What is the necessity of ABC analysis? State the steps of ABC analysis. **(4)**

b. Mention the outputs generated by material requirements planning (MRP) that can be used in the planning and management of plant operations. Also give the benefits of MRP **(6)**

c. Define merit rating. Explain the different methods of merit rating. **(6)**