## 11-CS-4, Engineering Management

### 3 hours duration

**NOTES:**

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made.

2. This is a CLOSED BOOK EXAM. No calculators are permitted.

3. Any 5 questions constitute a complete exam paper. Only the first five questions as they appear in your answer book will be marked.

4. All questions are of equal value.

Marking Scheme

1. (i) 7, (ii) 7, (iii) 6

2. (i) 7, (ii) 7, (iii) 6

3. (i) 7, (ii) 7, (iii) 6

4. (i) 6, (ii) 7, (iii) 7

5. (i) 7, (ii) 6, (iii) 7

6. (i) 7, (ii) 6, (iii) 7

7. (i) 5, (ii) 5, (iii) 5, (iv) 5

1.

(i). In conducting a risk analysis, explain the use of Fishbone cause and effect diagram (show the diagram). State categories typically used to identify risk causes.

(ii). What is the purpose of Influence Diagram in performing risk analysis? (Give a figure).

(iii). What are the key elements of a risk management plan?

2.

(i). In the context of product design, explain the concepts of sequential design vs. simultaneous integrated design.

(ii). Explain the various design criteria that should be followed in developing a product.

(iii). State the use of simulation models in tracking production processes and identifying production problems.

3.

(i). Explain the basis of developing advertising plans. State the essentials or components of an advertising plan.

(ii). What are the key elements of a sales plan.

(iii). State the role of a sales engineer in a manufacturing company.

4.

(i). Explain the difference between management and leadership.

(ii). Describe the traditional and non-traditional methods employers use to recruit new employees.

(iii). What are the requirements for managing a diverse workforce?

5.

(i). What are the key components of a balance sheet? Define each component.

(ii). What is the purpose of: (a) engineering economics analysis and (b) financial analysis?

(iii). State your understanding of the following engineering economic analysis techniques: (a) net present value (NPV), (b) rate of return on investment (ROI) and (c) internal rate of return (IRR).

6.

(i). Briefly explain the following quality management techniques: (a) Kaizen, (b) failure mode and effect analysis (FMEA and (c) quality function deployment (QFD).

(ii) What is the purpose of root cause analysis used in process management? State the root case analysis techniques used to dig deeply into a problem.

(iii) What are the typical project management software programs used in industry?

7.

Many Canadian companies have adopted a form of workforce management that they believe will enable them to compete better in the world market. They keep a "core of management and valued workers" whom they favour with good benefits and permanent jobs. They take on and shed other workers as business spurs and slumps." These jobs pay less and have few if any benefits. Answer the following questions:

(i) What is likely to be the impact of this trend on employee motivation? Will temporary workers be as motivated as permanent employees, especially if they continue to look for a "decent" job?

(ii) How will this, in turn, affect production and service to customers? Given the growing importance of teamwork and cooperation, is quality production likely to suffer?

(iii) What are the long-term impact on the competitiveness of companies?

(iv) How can companies develop employees' long-term loyalty in such circumstances?