

**National Exams Dec 2018**  
**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 allowed for this exam.
3. Any five questions constitute a complete paper. Only the first five questions as they appear in your answer book will be marked.
4. All questions are of equal value.
5. Write your answers in point-form whenever possible, but fully.

**Marking Scheme (marks)**

1. (i) 8, (ii) 7, (iii) 5
2. (i) 6, (ii) 7, (iii) 7
3. (i) 7, (ii) 7, (iii) 6
4. (i) 6, (ii) 7, (iii) 7
5. (i) 6, (ii) 8, (iii) 6
6. (i) 8, (ii) 6, (iii) 6
7. (i) 5, (ii) 5, (iii) 5, (iv) 5

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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) What are the new engineering technologies available to develop products and processes?  
(ii) State the criteria used to evaluate design alternatives in developing new products and processes  
(iii) What are the design analysis tools used to conduct feasibility assessments to determine their benefits in a product and process development?
3. (i) State the benefits of customer feedback. What measures are taken to gauge customer satisfaction?  
(ii) State the business requirements necessary to address changing customer requirements.  
(iii) What are the basic elements of total quality management.
4. (i) State the primary funding sources available for financing engineering projects.  
(ii) State the alternative funding sources available for financing projects.  
(iii) What are the key components of a business plan.
5. (i) State the requirements for the implementation of a successful budget.  
(ii) What are the key elements of the following budgeting procedures: (a) zero-based budgeting (ZBB), (b) budgeting for total quality management (TQM) and (c) activity-based budgeting (ABB).  
(iii) Explain the manner by which the contents of business/financial plans can be evaluated.
6. (i) What is your understanding of the following schools of management thought: (a) management process school, (b) behavioral school and (c) mathematical school  
(ii) What is your understanding of the concept of systems thinking and in particular the disciplines proposed by Senge.  
(iii) Explain the role of a mediator in conflict resolution?

7. The 3M Company is often used as a great example of a company that encourages creativity. Its policy dictates that 30 percent of annual sales come from products less than four years old. But 3M wasn't always that progressive. Answer the following questions:
- (i) Do large companies find it difficult to innovate because they resist change? Is it because they are big or because they are afraid of the unknown? Why is that?
  - (ii) Do smaller companies do better at innovation because they are not so risk averse? Is that because most of them are private companies and not so accountable to outside shareholders?
  - (iii) Can you see any connection between innovation and continuous improvement (CI)? Does CI require innovation?
  - (iv) If you were vice-president in charge of production at a big company, how would you encourage innovation?