MBA – INFORMATION TECHNOLOGY MANAGEMENT (MBAITM)

Term-End Examination
December, 2014

MBM-026 : SOFTWARE QUALITY ENGINEERING

Time : 3 hours   *Maximum Marks : 100*

Note :

   (i)   Section I is **compulsory**.

   (ii)   In Section II, answer any **five** questions.

   (iii) Assume suitable data wherever required.

   (iv) Draw suitable sketches wherever required.

   (v)   Italicized figures to the right indicate maximum marks.

SECTION I

1. **Case study :**

   Scenario 1 :

   The Design team is faced with modifying legacy software in addition to developing new software. By following the Goal/Question/Metric paradigm, the goal of the project team is to reduce the

defect density of the product. The team further notices that the software becomes more "brittle" over time as it is changed and experiences a drifting usage. Also, it is observed that the brittle software also possesses more defects.

Questions :

(a) *Formulate* questions for knowing status of the defect density reduction goal and establish metrics in quantifiable terms. Also, elaborate other aspects of the metrics viz. Operational Definitions, Frequency of Measurement and Type of Indicator Graph to be used. *5*

(b) Based on common knowledge of the quality models, *derive factors* that will be necessary to predict Software Brittleness so that a process performance model/quality model can be used by each feature team during "Design" to predict how "brittle" software is, and subsequently to make the correct design decisions regarding degree of modification vs rewrite from scratch. *5*

(c) Explain the situations when new software is appropriate rather than modifying the legacy software. *5*

Scenario 2 :

A Software Product Development company is developing a cloud based application for enterprise Supply Chain Management. The company has so far worked only on enterprise ERP products and is newly getting into SCM products and for cloud deployment. The company plans to follow Incremental Iterative Software Development. Also, since the company is new to the domain, it plans to ensure that a high quality product is released in the market by improving Defect Removal Effectiveness of their processes.

Questions :

(a) *Identify* the Defect Prevention and Removal activities and briefly explain each.   5

(b) Identify the process model that is best suitable for switching from ERP to SCM. Explain the process steps.   5

(c) Does the company follow the same ERP product development metrics for the new product development also ? Explain the pros and cons.   5

SECTION II

[Your answers should not exceed 200 words each]

2. Ishikawa's 7 Quality Tools have proved to be most useful for engineering and controlling quality. These tools have also proved instrumental for the Software Development, Maintenance as well as Implementation businesses. Explain with suitable sketches and examples the tools to be used for the scenario 2.   7+7

3. (a) Why is prototype process development model popular ? Give reasons.   5

    (b) Defect Prevention Process (DPP) is not a development process itself. Comment on it. Explain the details of the DPP.   3+6

4. For an outsourced software development scenario, explain in brief the usage of process metrics and product metrics. In this scenario, which metrics would be used and why ? Explain with operating definitions of 3 metrics of each type.   6+3+5

5. (a) Explain the importance of IBM PTF check-list for project monitoring.   4

    (b) Briefly explain the importance of the following project management tools :   5+5
      (i) Pareto diagram
      (ii) Run charts

6. As a Business Development person, you are making a proposal for outsourced development and maintenance of a large Supply Chain Management system for a retail departmental store chain. The suppliers are spread across 23 countries and the stores are in 110 countries. Each continent has Regional Headquarters Office which operates as a control room for the supply chain. Explain the detailed size estimation approach that you would take for such an application. The size estimation should be technology and development life-cycle independent. Also, the size measure should be an industry standard so that the client IT team understands the same.   *14*

7. Explain the different methods of measuring Software Complexity and practical application of each one. Calculate complexity of the below provided logical flow using one of the methods : *5+9*
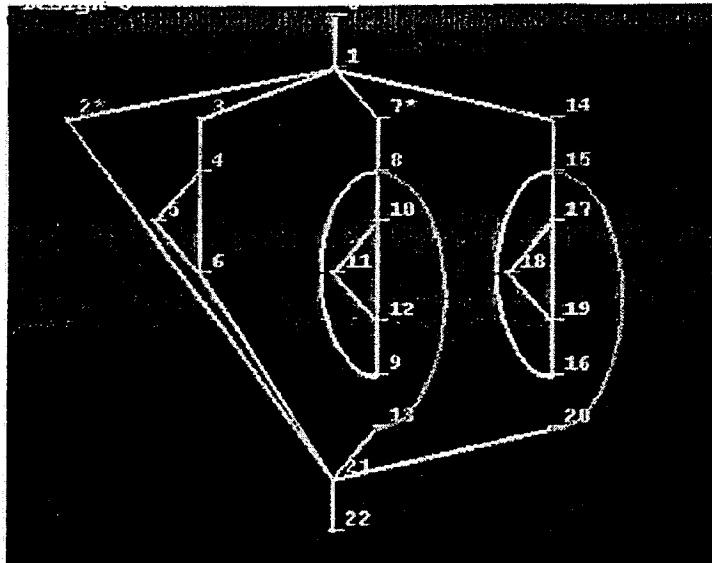
8. (a) What is quality measurement ? Describe the following issues related to quality measurement :   *5+5*

  (i) Reliability

  (ii) Validity

  (b) For a C-to-C e-Commerce application to be successful it must be available 100% and also it needs to be maintainable. What factors affect the quality of service delivered by the system ?   *4*

9. You are a Project Leader responsible for conducting a Formal Technical Review (FTR). You get two subject matter experts on-board to conduct the FTR of Design Review. But you have a problem; the SMEs are not aware about the process of conducting a review. You decide that you will list out the activities you have to do for the SMEs to perform the review. Use the ETVX method to explain the FTR process.   *14*

———