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**University Examinations 2014/2015**

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE COMPUTER TECHNOLOGY

**CIC 3327: SOFTWARE DEVELOPMENT TOOLS AND ENVIRONMENTS**

 **DATE: APRIL 2015 TIME: 2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Differentiate between a complier and an assembler (2 Marks)
2. Differentiate between programming and software engineering (2 Marks)
3. Give any two situations where a questionnaire is preferred as a fact finding tool (2 Marks)
4. Identify at least four participants in structured walkthrough describing their functions

(4 Marks)

1. Outline four contents of a requirement specification document (4 Marks)
2. Identify three functions of an operating system when executing a program (3 Marks)
3. Explain two situations where agile system development is preferred compared to other methods (4 Marks)
4. Programming language and development tools have evolved since 1945 to date. Outline the history of programming and development tools from 1945 to date (5 Marks)
5. Outline features to consider when evaluating a database management system to be used as a data store in a management information system (4 Marks)

**QUESTION TWO (20 MARKS)**

1. (i) A company is evaluating the viability of a project which has the following returns

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | 1 | 2 | 3 | 4 | 5 |
| Returns | 150000 | 200000 | 300000 | 400000 | 300000 |

The amount of money invested is Kshs.1,000,000. If the project lifespan is 5 years, determine its viability using net present value with a discounting rate of 10%. (6 Marks)

(ii) Briefly describe the advantages of using Net Present Value over Pay Back method

 when analyzing the cost benefit analysis (2 Marks)

1. During evaluation of an information system, the following factors were considered about the interface
2. Whether all the information needed by the user appears on the secreen
3. Time used to carry out a task, system recovery or failure rate of the system
4. Mental effort required by the user to use the interface
5. Ease of learning to use the interface and help incorporated

For each factor, identify the usability metric considered by the evaluator (4 Marks)

1. (i) According to 2002 Scandish report, 70% of IT projects failed due to managerial

 problems. Give any four management problems that cause IT projects to fail

(4 Marks)

 (ii) Explain ways of managing the above problem identified in 4 a(i) (4 Marks)

**QUESTION THREE (20 MARKS)**

1. Identify any two tools used in object oriented system design (2 Marks)
2. Compare software projects and other physical infrastructure projects (6 Marks)
3. During development of a system, the designer documented the following information. Use it to answer the questions that follow:

 2.1 If invoiced amount is less than 100

 2.1.1 Then (authorize payment)

 2.2 ELSE IF invoice amount is between 100 to 1000

 2.2.1 IF invoice age is less or equal to 10 days

 2.2.1.1 THEN authorize payment

 2.2.1.2 ELSE set aside

 2.2.2 ELSE authorize payment

 2.3 ELSE IF invoice amount greater than 1000

 2.3.1 Write cash requirement report

1. Identify the design tool used by the designer ( 1 Mark)
2. Use a decision tree to represent the above information (4 Marks)
3. Give two disadvantages of using a decision tree (2 Marks)
4. ABC Company uses a computerized sales processing system. The system handles purchase, payment, credits and debit adjustments. Transactions are input to the system and processed on monthly basis. The transactions involve creation, updating or deleting of customers’ files and other transaction details. An invoice is printed out and the serial number recorded in an invoice register. The system also displays the total purchases, payment, transaction data and current balances form monthly transactions. Use this information to construct a HIPO chart for the system (5 Marks)

**QUESTION FOUR (20 MARKS)**

1. Jane, a systems analyst working with an electoral commission, has the responsibility of analyzing the political systems of a particular country. Use software system methodology to outline the procedure she would use to achieve her objectives (6 Marks)
2. Explain the meaning of the following terms used in measure software quality: (4 Marks)
3. Usability
4. Interoperability
5. Outline five criteria used to evaluate the suitability of a programming language in relation to a problem to be solved (5 Marks)
6. Outline five functions of an operating system when executing a program (5 Marks)

**QUESTION FIVE (20 MARKS)**

1. You are tasked with estimating the effort required to write 250,000 lines of codes of a system using a familiar programming language, operating system with a team of experienced programmer
2. Use COCOMO to estimate the effort required to complete the project (3 Marks)
3. Estimate the number of programmers required to complete the project in 2 days (3 Marks)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **System type** | **A** | **b** | **c** | **D** |
| Organic | 2.4 | 1.05 | 2.5 | 0.38 |
| Semi-det | 3.0 | 1.12 | 2.5 | 0.35 |
| Embedded | 3.6 | 1.2 | 2.5 | 0.32 |

1. A company dealing with computer accessories sales, enter details of ordered products via the keyboard, details are verified using data from accessory details file and data on the credit status of the customer from customer file stored on the disk. A valid order is then kept in a pending orders file on a disk, otherwise an error report is generated. A purchase requisition is raised which is sent to the supplier while the requisition details are kept in the purchase order file on a disk. The customer order is then processed and an invoice printed. Draw a data flow diagram to represent this information (6 Marks)
2. The following are tasks required to complete a system:
3. Problem definition: - a) Concept formation b) Feasibility analysis
4. Analysis: - a) Investigation b) Requirement analysis
5. Design: - a) Physical design b) Logical design
6. Coding: - a) Interface b) processes c) Database configuration d) Reports design
7. Testing: - a) Unit testing b) System testing
8. Implementation

 Use Work Breakdown structure represent the above tasks (4 Marks)

1. Explain ways of reducing risks when developing software according to Boehm (4 Marks)