The Co-operative University of Kenya

END OF SEMESTER EXAMINATION MAY-2022

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE(YR III SEM II), BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY(YR II SEM II) AND BACHELOR OF BUSINESS INFORMATION TECHNOLOGY (YR III SEM I)

UNIT CODE: BCSC 3260/3112

UNIT TITLE: SOFTWARE ENGINEERING

DATE: 13TH MAY, 2022   **TIME: 2:00 PM – 4:00 PM**

INSTRUCTIONS:
- Answer question **ONE (compulsory)** and any other **TWO** questions

QUESTION ONE
  (a) Define the following terms   (5 marks)
      i.   Software crisis
      ii.   CASE tool
      iii. Modularization
      iv. Software engineering
      v.   Cohesion
  (b) Outline 2 merits of using flow charts during software design.   (2 marks)
  (c) State 3 causes of the software crisis.   (3 marks)
  (d) Discuss the need for software engineering.   (5 marks)
  (e) Differentiate software validation from verification   (3 marks)
  (f) State 3 problems that an organization would face it if fails to develop SRS document. (3 marks)
  (g) Define the term software configuration management.   (2 marks)
  (h) Explain 4 types of CASE tools   (4 marks)
  (i) Discuss 3 types of black-box testing techniques.   (3 marks)

QUESTION TWO
During the ICT day at Co-operative University of Kenya, Mr. Fred Derricks, a re-known system analyst gave a very interesting talk where he explained the need for lifecycle models when developing ICT systems.

  (a) Using a diagram, explain the waterfall model outlining its phases, application, merits and demerits.   (10 marks)
  (b) Agile as a software development lifecycle has gained immense popularity in most development projects carried out by blue-chip organizations.
      i.   Explain the phases of agile approach   (8 marks)
      ii.   State 2 merits of agile approach.   (2 marks)

QUESTION THREE
It is an encouraged practice to utilize software design tools when developing any new software.

(a) Discuss the following software design tools.   (6 marks)
    i.   Data dictionary
    ii.   Entity relationship diagram

(b) Give 3 merits of using a data flow diagram   (3 marks)
(c) Outline 2 demerits of using data flow diagrams.   (2 marks)
(d) A car dealer has a spare parts department where customers buy parts for their cars. A customer places an order. The order is passed to a member of staff who finds the part in the stockroom. The part is then given to the customer together with an invoice. The number in stock of that part is updated. The manager orders further stock from a supplier when needed. Draw a data flow diagram of the scenario.   (9 marks)

QUESTION FOUR
(a) Discuss the 4 different types of software maintenance.   (8 marks)
(b) Explain the tasks done in software configuration management.   (8 marks)
(c) Describe 2 participants of the software configuration management (SCM) process.
                                                                                            (2 marks)

QUESTION FIVE

(a) Your company is considering whether it should tender for two contracts (MS1 and MS2) on offer from a government department for the supply of certain components. The company has three options:

    i.   Tender for MS1 only; or
    ii.   Tender for MS2 only; or
    iii. Tender for both MS1 and MS2.
If tenders are to be submitted the company will incur additional costs. These costs will have to be entirely recouped from the contract price. The risk, of course, is that if a tender is unsuccessful the company will have made a loss.

The cost of tendering for contract MS1 only is £50,000. The component supply cost if the tender is successful would be £18,000.

The cost of tendering for contract MS2 only is £14,000. The component supply cost if the tender is successful would be £12,000.

The cost of tendering for both contracts MS1 and contract MS2 is £55,000. The component supply cost if the tender is successful would be £24,000.

For each contract, possible tender prices have been determined. In addition, subjective assessments have been made of the probability of getting the contract with a particular tender price as shown below. Note here that the company can only submit one tender and cannot, for example, submit two tenders (at different prices) for the same contract.

Option	Possible tender prices (£)	Probability of getting contract
MS1 only	130,000	0.20
	115,000	0.85
MS2 only	70,000	0.15
	65,000	0.80
	60,000	0.95
MS1 and MS2	190,000	0.05
	140,000	0.65

Using a decision tree, suggest what the company should so and why?　　　(10 marks)

(b) The   Pizza Ordering System allows the user of a web browser to order pizza for home delivery. To place an order, a shopper searches to find items to purchase, adds items   one at a time to a shopping cart, and possibly searches again for more items. When all items have been chosen, the shopper provides a delivery address. If not paying with cash, the shopper also provides credit card information. The system has an option for shoppers to register with the pizza shop. They can then save their name and address information, so that they do not have to enter this information every time that they place an order.

Develop a use   case diagram, for a use case for placing an order. The use case should show a relationship to two previously specified use cases, Identify Customer, which allows a user to register and log in, and Pay by Credit, which models credit card payments. 　　　　　　　　　　　　　　　　　　　　　　　　　　　　(10 marks)