FACULTY OF SCIENCE AND TECHNOLOGY

COMPUTING SCIENCE STUDIES DEPARTMENT

ICT211: SYSTEMS AND SOFTWARE ENGINEERING

22nd January 2018

TEST II- 15%

1. You have learned about evolutionary prototyping.
   a. What is evolutionary prototyping model? **(2 Marks).**
   b. When is it appropriate to use evolutionary prototyping **(1 Marks).**
   c. Who are the possible stakeholders in evolutionary prototyping if Mzumbe University E-learning system is to be improved using such a model? **(4 Marks).**
2. In some cases of systems development models, User requirements are expressed as stories, with each story written on card.
   a. In which of the development models do user stories more applicable? **(1 Marks).**
   b. What are the advantages of using user stories as requirements? **(3 Marks).**
   c. What are the disadvantages of using user stories as requirements? **(4 Marks).**

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OPERATING SYSTEM (CSS 223)

TEST 1 (SEMESTER 2 2019/2020)

BSc. ITS, MICT-EDL, ICTM & ICTB-II

Time: 45 minutes

Answer all 5 questions in brief. Your answers in each question do not exceed normal 10 answer sheet. Be to the point.

1. Based on the concept of operating system, how can user program disturb the normal operation of the system? **(3 marks)**

2. Based on the process operating context, what is the use of process communication? **(3 marks)**

3. Based on the context of two modes of operating systems, compare user threads and kernel threads. **(3 marks)**

4. [illegible] system call is important in the context of process and operating system? **(3 marks)**

5. Why race condition is not recommended in multiple process execution? **(3 marks)**

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Mzumbe University

MSS 224: Test 1 Numerical Analysis

Date: Wednesday 1st July, 2020

Duration: 1 Hour

Instructions:

1. Answer **ALL** questions.
2. ALL **details** of your work must be **neatly** and **clearly** shown.

1. Given that, the function f is defined as

$$f(x,y,z) = \frac{5xy^2}{z^3}, \ \Delta x = \Delta y = \Delta z = 0.001, \text{ and } x = y = z = 1$$

Determine the maximum relative error $(E_R)_{\max}$ of the function f. (2 Marks)

0'006 or 0.006

2. Determine

   (a) the fourth Taylor polynomial for $f(x) = \cos x$ about $x = 0$ and use it to approximate $\cos(0.01)$. (4 Marks)

   (b) Required to use the fourth Taylor polynomial and its remainder term to approximate (4 Marks)

$$I = \int_0^{0.1} \cos x dx$$

0'9995

3. The equation $x^3 - 1.3x^2 + 0.4x - 0.03 = 0$ is known to have a root near $x = 0.7$. By the means of Newton-Raphson technique, determine the root to six significant figures. (5 Marks)

2'8

ALL THE BEST

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QUESTION ONE

(25 MARKS)

a) Evolutionary Systems Development is a class of methodologie that attempt to formally implement evolutionary prototypin Define and illustratively explain the Evolutionary prototyp model life cycle **(10 Marks**

b) The waterfall model represents the fundamental proces activities of specification, development, validation, and evolutio as separate and distinct phases. What are the most factors tha distinguish the use of waterfall Model from other softwar development models? **(4 Marks)**

c) What are the four key issues that System Engineering Mode should accomplish? **(8 Marks)**

d) Differentiate Software Engineering methods, tools an procedures. **(3 Marks)**

QUESTION TWO

(25 MARKS)

a) Consider how you have been interacting with Mzumb University e-learning system (Moodle).

i) Precisely state three user requirements in relation to the systems working environment **(5 Marks)**

ii) Precisely state three systems requirements in relation to the systems working environment **(5 Marks)**

b) What are the characteristics of the software? **(5 Marks)**

c) Requirements Gathering/ Analysis phase includes gathering requirements from users and other stakeholders of the system. What are the four basic questions that could be used to provide inputs for the Requirements Document **(5 Marks)**

d) What does "Refactoring" means and used during the process of software development? **(5 Marks)**

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QUESTION THREE **(25 MARKS)**

a) Consider the following problem description for an Airline Reservation System: FastJet Airlines runs regular flights between Dar-es-salaam and 5 other cities in Tanzania. There are several daily numbered flights on regular schedule. The reservation system keeps track of passengers who will be flying in specific seats on various flights as well as people who will form the crew.

For the crew, the system needs to track what everyone does, and who supervises whom. There are three kinds of employees in the organization, pilots, hosts and ground personnel. Only the ground personnel uses the reservation system. But the potential passengers may do reservations using the system's web interface.

There is also a frequent-flier program which shows flight points to frequent passengers and they may use their points during reservation. FastJet Airlines personnel sometimes fly as passengers in scheduled flights. Besides, there is a regular 50% discount for airlines personnel and their families. The system should be able to help to perform at least the following functions:

- Creating a new flight or modifying the attributes of a flight
- Searching for a particular flight
- Cancelling a flight on a specific day
- Making or cancelling a booking on a particular flight

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- Reporting names of crew and passengers (marking Fast Airlines personnel separately) on a particular flight and th payment type/discounts (cash, credit card, flyer points, cr points, etc.).

REQUIRED

Draw the use case diagram for the above system **(10 Mark**

b) How do "static Verification &Validation" techniques differ fro dynamic V&V techniques? **(5 Marks)**

c) Which of the following are applicable to "static V&V techniques" and which are applicable to "dynamic V&V techniques? *(Align them to the specific techniques which apply)* **(5 Marks)**

'Requirements', 'prototype' 'high-level', 'formal detailed program, specification, design "specification design"

d) Distinguish the terms "verification" and "validation" as they are used in software engineering and particularly when delivery of the Quality product is of major concern. **(5 Marks)**

QUESTIONS FOUR **(25 MARKS)**

a) Consider the UML sequence diagram extracted from Ian Somerville's, weather mapping system case study.

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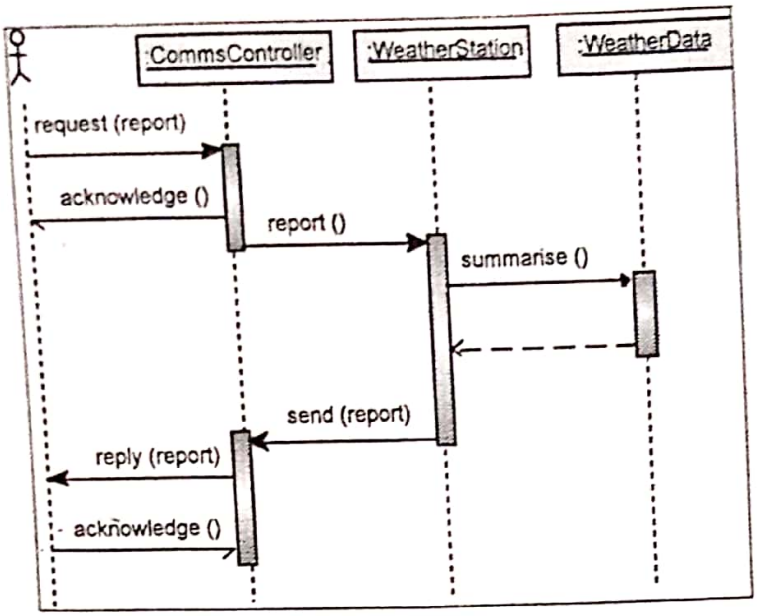

i) Briefly describe what is being modeled in the context of the weather mapping system. (Be specific.) **(4 Marks)**

ii) How is time represented in the model? **(4 Marks)**

iii) What do the labelled arrows linking the vertical lines represent? **(4 Marks)**

iv) What do the thin (vertically oriented) rectangles represent? **(3 Marks)**

b) Match each description below to the SINGLE MOST APPROPRIATE TERM by writing a Letter from List B against a Number from List A among the following. (Note: terms may apply to none, one, or more than one description.) **(10 Marks)**

List A	List B
i) In contrast to system testing, the objective is to check that the system is good enough for external use; systematic forms include "requirements-based testing" and "scenario testing." ii) End-user testing performed in the customer environment prior to general release. iii) Undertaken to demonstrate that a system operates as intended. iv) Involve people examining a system artifact	A. Validation testing B. Defect testing C. Release testing D. Alpha testing E. Performance testing F. Stress testing G. Partition testing H. Regression testing I. Black-box testing J. White-box testing

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Constr obj.) P → Amount of prod
→ Several sources
→ several destination
→ Amount of product available at
each source

MZUMBE UNIVERSITY
FACULTY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF MATHEMATICS AND STATISTICS STUDIES (MSS)
MSS 225 (MATHEMATICAL METHODS OF OPERATIONAL RESEARCH)
TEST 1 (15%)

INSTRUCTIONS: **DATE:** June 21, 2020

- Duration is **50 minutes**
- Attempt **ALL two** questions
- Show your work clearly

QUESTION ~~TWO~~: 02 **(7.5 MARKS)**

(c) Briefly but concisely define the following terms as they are used in linear programming

(j) Unbounded LP problem (ii) Surplus variable

(1.5 marks each)

(d) A firm has to buy 200kg of an alloy containing gold and silver. The condition is that the alloy must have at least 100kg of gold and not more than 35kg of silver. The firm buys the alloy from two sources I and II at prices of Tsh.200 and Tsh.400 per Kg respectively. Source I gives the alloy with gold and silver proportions at 25 and 10 percent while source II gives these proportions as 75 and 20 percent respectively. To minimize the cost what quantities should be bought from the two sources? Establish **only initial tablue** **(4.5 marks)**

$X_1 + X_2 \leq 200$

$0.25X_1 + 0.75X_2 \geq 100$

$0.1X_2 + 0.2X_2 \leq 35$

$X_1, X_2 \geq 0$

$Min\ (z) = 200X_1 + 400X_2$

QUESTION ~~THREE~~: 01 **(7.5 MARKS)**

(c) Briefly but concisely define the following terms as they are used in linear programming

(i) Basic variable (ii) Artificial variable

(1.5 marks each)

(d) An investor desires to allocate \$ 150 per month to a mixture of investments in stock and bonds. The estimated annual return on each dollar invested in stock is 20 cents which includes dividends and estimate of the appreciation in the price of stock. The annual return on each dollar invested in bonds is 10 cents. Whereas the return on bonds is certain, the return on stock is an estimate subject to variability. Since the return on stock involves risk, the investor wants to limit the amount invested in stock to \$ 40 a month. To ensure minimum cash flow return, the investor will invest at least \$ 20 a month in bonds. Using simplex tableau method with big M technique obtain the investor's optimal strategy.

(4.5 marks)

$X_1 + X_2 \leq 150$

$X_1 \leq 40$

$X_2 \geq 20$

Opportunity cost

$Max(z) = 20X_1 + 10X_2$

~~Is~~ the penalty is not chosen the correct decision

Decision Make

Is the quantity that a decision maker can cut

QUESTION ONE **(25 MARKS)**

a) A final exam for a given course is prepared by the course instructor and submitted to the undergraduate studies director. The undergraduate office sends all exams to the Faculty of Science and Technology office where copies are made. On the day of the exam, copies are given to the invigilator who takes them to the examination room where the exam is given. The students write the exam on a booklet, and return to the invigilator at the end of the exam. The written booklets are given to the lecturer for marking. Draw a sequence diagram that captures this description **(10 Marks)**

b) A book is written by an author, published by a publisher, sold by a book store, and read by a reader. Moreover, for a reader to read a book, she must buy it from a book store that is selling it. Draw a use case diagram for this scenario, showing relationships between different use cases. **(10 Marks)**

c) List and explain five (5) factors of software quality **(5 Marks)**

QUESTION TWO **(25 MARKS)**

a) Suppose you are involved in a large project concerning the development of a patient planning system for a hospital. You may opt for one of two strategies. The first strategy is to start with a thorough analysis of user requirements, after which the system is built according to these requirements. The second strategy

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starts with a less complete requirements analysis phase, after which a pilot version is developed. This pilot version is installed in a few small departments. Further development of the system is guided by the experience gained in working with the pilot version. Discuss the pros and cons of both strategies.

(12 Marks)

b) How does the spiral model subsume prototyping, incremental development, and the waterfall model?

(7 Marks)

c) What are the two (2) drawbacks of spiral model?

(6 Marks)

QUESTION THREE **(25 MARKS)**

a) List and explain the following types of testing done during the testing phase **(10 Marks)**

i. Unit testing

ii. Integration testing

iii. System testing

iv. Black box testing

v. White box testing

b) Describe in detail two (2) metrics which are used to measure the software **(5 Marks)**

c) Explain five (5) causes of software errors **(10 Marks)**

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QUESTION FOUR **(25 MARKS)**

a) Explain the first five (5) design principles of object-oriented (abbreviated as SOLID principles of OO) design **(10 Marks)**

b) Describe the four (4) characteristics of bad design **(8 Marks)**

c) Explain the steps involved in the prototyping **(7 Marks)**

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Mzumbe University

MSS 224: Numerical Analysis

Test 2: Numerical Analysis

Sunday 26th July, 2020

Duration: 1hour

Instructions:

1. Answer **ALL** questions.
2. ALL **details** of your work must be **neatly** and **clearly** shown.

1. a) Given $u_0 = 1, u_1 = 11, u_2 = 21, u_3 = 28, u_4 = 30$.

   Determine $\Delta^4 u_0$. **(2 Marks)**

   b) The table below lists values of a function at various points. Use an appropriate Gregory-Newton's interpolating polynomials of degree 4 to approximate $f(1.1)$. **(5 Marks)**

x	1.0	1.3	1.6	1.9	2.2
$f(x)$	0.7651977	0.6200860	0.4554022	0.2818186	0.1103623

2. Compute the integral

$$I = \sqrt{\frac{2}{\pi}} \int_0^1 e^{-\frac{x^2}{2}} dx$$

using Simpson's $\frac{1}{3}$ rule, taking $h = 0.125$ **(4 Marks)**

3. Apply Bessel's interpolation formula to obtain y_{25}, given that $y_{20} = 2860$, $y_{24} = 3167$, $y_{28} = 3555$ and $y_{32} = 4112$. **(4marks)**

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OPERATING SYSTEM (CSS 223): TEST 2 (SEMESTER 2 2019/2020)
BSc. ITS, MICT-EDU, ICTM & ICTB-II

Time 40 minutes

Answer ALL questions in brief.

5. Write TRUE for the correct statement and FALSE for incorrect statement.
   e) Providing information in advance about what resources will be needed by processes do not guarantee that deadlock will not exist..... **(1/2 Marks)**
   f) Deadlock is a problem that can exist when a group of processes compete for access to variable resources..... **(1/2 Marks)**
   g) Hold and wait means there must be a process holding one resource, releasing and waiting for another resource..... **(1/2 Marks)**
   h) A logical and physical address is the memory location generated by the CPU..... (1/2 Marks)
6. Define the following term as used in memory management in OS: Swapping, segmentation and paging **(3 Marks)**
7. Why polling is synchronous while interrupt is asynchronous process in OS? **(5 Marks)**
8. Write down a simple programme of I/O with Interrupts with reference to Keyboard as an example **(5 Marks)**

Prepared by Dr. Kisanjara

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Question One (10 Marks)

(a) Draw a flow-chart to find real roots of the equation (3 Marks)

$$ax^2 + bx + c = 0$$

(b) If $Z = z + e$, prove that (2 Marks)

$$\sqrt{Z} - \sqrt{z} \approx \frac{e}{2\sqrt{Z}}$$

c) Evaluate $\Delta^n[\sin(ax + b)]$. (5 Marks)

Question Two (10 Marks)

(a) Estimate the production for 1964 and 1966 from the following data: (5 Marks)

Year	1961	1962	1963	1964	1965	1966	1967
Production	200	220	260	-	350	-	430

(b) The population of a town was as given. Use an appropriate Gregory-Newton's interpolating polynomials to estimate the population for the year 1925. (5 Marks)

Year (x)	1891	1901	1911	1921	1931
Population (in thousands) (y)	46	66	81	93	101

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Question Three (10 Marks)

a) i) Compute the integral

$$I = \sqrt{\frac{2}{\pi}} \int_0^1 e^{-\frac{x^2}{2}} dx$$

using Simpson's $\frac{1}{3}$ rule, taking $h = 0.125$. **(2.5 Marks)**

[ii)] Determine the error bound of the Simpson's third rule estimation. **(2.5 Marks)**

b) Apply Gauss' forward difference formula to obtain $f(32)$ given that: **(5 Marks)**

$f(25) = 0.2707$; $f(35) = 0.3386$; $f(30) = 0.3027$; $f(40) = 0.3794$.

Question Four (10 Marks)

(a) The table given below reveals the velocity 'v' of a body during the time 't' specified.

t :	1.0	1.1	1.2	1.3	1.4
v :	43.1	47.7	52.1	56.4	60.8.

Find its acceleration at $t = 1.1$. **(5 Marks)**

(b) The speed v meters per second of a car, t seconds after it starts is shown in the following table:

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t	0	12	24	36	48	60	72	84	96	108	120
v	0	3.60	10.08	18.90	21.60	18.54	10.26	5.40	4.50	5.40	9.00

Using Simpson's third rule, find the distance travelled by the car in 2 minutes. **(5 Marks)**

Question Five **(10 Marks)**

(a) i) Use the Lagrange method of interpolation to find the unique polynomial $P(x)$ of degree 2 such that: **(4 Marks)**

$$P(1) = 1, \quad P(3) = 27, \quad P(4) = 64$$

ii) Hence determine the value of $f(5.2)$. **(1 Mark)**

b) Use the generalized Newton-Raphson's method to estimate the double root of the equation

$$f(x) = x^3 - 7x^2 + 16x - 12 = 0$$

correct to 4 decimal places.(Hint: use the starting $x_0 = 1$ and in the computation process you should take up to 9 decimal places). **(5 Marks)**

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FACULTY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF MATHEMATICS AND STATISTICS STUDIES (MSS)
MSS 225 (MATHEMATICAL METHODS OF OPERATIONAL RESEARCH)
TEST 2 (15%)

INSTRUCTIONS: **DATE:** Wednesday, July 29, 2020

- Duration is **50** minutes
- Attempt **all two** questions
- Show your work clearly

QUESTION ONE: **(7.5 MARKS)**

(a) Define the term "opportunity cost" as it is used in transportation problems **(2 Marks)**

(b) Solve the following transportation problem and give the minimum cost schedule. Use the North West corner rule. **(5.5 Marks)**

Plant	Warehouse 1	2	3	4	Capacity
A	9	8	12	10	36
B	10	10	12	14	44
C	8	9	11	11	12
D	10	10	11	12	15
Sales requirements	12	30	60	10	

QUESTION TWO: **(7.5 MARKS)**

In a certain bar, four salesmen A, B, C and D are available to four counters 1, 2, 3 and 4. Each salesman can handle any counter. The service (in hours) of each counter when handled/manned by each salesman is given below.

Salesman	Counter 1	2	3	4
A	20	25	22	28
B	15	18	23	17
C	19	17	21	24
D	25	23	24	24

(a) How should the salesmen be allocated appropriate counters so as to minimize the service time? Each salesman must handle only one counter. Use Hungarian method. **(4.5 Marks)**

(b) Write this problem as a linear programming model. **(3 Marks)**

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MZUMBE UNIVERSITY

(CHUO KIKUU MZUMBE)

Faculty of Science and Technology

End of Semester II Examinations: July, 2019

Course Code: MSS 224

Course Title: Numerical Analysis

Programme: BSc - Edu (MICT) II

Duration: 1600 - 1900 Hours

Venue: LT 4

Date: 24/07/2019

Instructions:

1. This paper consists of **FIVE** questions.
2. Answer **ALL** questions.
3. **ALL** questions carry equal weight.
4. All **details** of your work must be **neatly** and **clearly** shown.

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Question One(10 marks)

(a) Write down the merits and demerits of Bisection method in determination of the approximate root of a non-linear equations. **(3marks)**

(b) Show that $f(x) = x^3 + 4x^2 - 10 = 0$ has a root in $[1, 2]$, and use the Bisection method to determine an approximation to the root that is accurate to at least within 10^{-4}. **(7marks)**

Question Two(10 marks)

(a) Determine the values of n and h required to approximate

$$I = \int_0^2 \frac{1}{1+x^2} dx$$

to within 10^{-5} using composite Simpson's rule. **(4marks)**

(b) Compute the approximation in (a) above. **(6marks)**

$n = 10$.

Question Three(10 marks)

a) Given $u_0 = 1, u_1 = 11, u_2 = 21, u_3 = 28, u_4 = 30$. By using forward difference and shift operator relationship, find $\Delta^4 u_0$. **(3marks)**

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b) The table below lists values of a function at various points. Use an appropriate Gregory-Newton's interpolating polynomials of degree 4 to approximate $f(1.1)$. **(7marks)**

x	1.0	1.3	1.6	1.9	2.2
$f(x)$	0.7651977	0.6200860	0.4554022	0.2818186	0.1103623

Question Four(10 marks)

(a) Find the value of $\cos 51°42'$ by Gauss's backward formula. Given that **(5marks)**

x	50°	51°	52°	53°	54°
$\cos x$	0.6428	0.6293	0.6157	0.6018	0.5878

(b) The distance covered by an athlete for the 50 meter race is given in the following table:

Time (sec):	0	1	2	3	4	5	6
Distance (meter):	0	2.5	8.5	15.5	24.5	36.5	50

Determine the speed of the athlete at $t = 5sec.$, correct to two decimals. **(5marks)**

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Question Five(10 marks)

(a) Show that $\Delta \log f(x) = \log\left(1 + \frac{\Delta f(x)}{f(x)}\right)$. **(3marks)**

(b) Evaluate $\Delta(e^x \log bx)$ **(3marks)**

(c) If Δ, δ and μ denote forward difference, central difference, and average operators, in the analysis of data with equal spacing h, prove that **(4marks)**

$$\Delta = \frac{\delta^2}{2} + \delta\sqrt{1 + \frac{\delta^2}{4}}$$

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Faiz Pawna

MZUMBE UNIVERSITY
(CHUO KIKUU MZUMBE)

Faculty of Science and Technology

End of Semester I Examinations: March, 2020

Course Code:	**CSS 211**
Course Title:	**Software Engineering**
Programme:	**BSc. ITS II, ICTB-II & ICTM II**
Date:	**06/03/2020**
Time:	**1400-1700hrs**
Venue:	**LT 1**

INSTRUCTIONS

1. There are **Four (4)** questions in this paper
2. Attempt **All FOUR (4)** Questions

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QUESTION ONE **(25 MARKS)**

a) Why it is necessary to conduct feasibility study and what the contents we contain in feasibility study document? **(5 Marks)**

b) Explain the different phases involved in waterfall life cycle model **(8 Marks)**

c) What are the purposes of Data Flow diagrams and Entity-Relationship diagrams? Give an example in each case **(12 Marks)**

QUESTION TWO **(25 MARKS)**

a) What is requirement elicitation? Why it is important activity in software development **(5 Marks)**

b) Explain (13) steps involves in prototyping for ensuring user centered design **(13 marks)**

c) What is generalization? Using diagram, give an example of generalization **(7 marks)**

QUESTION THREE **(25 MARKS)**

a) What is a Use Case? Why it is important in software development? **(5 Marks)**

b) Identify critically five (5) problems associated with requirement analysis stage **(10 Marks)**

c) Explain five (5) factors of Software Quality? **(10 Marks)**

QUESTION FOUR **(25 MARKS)**

a) What is data modeling? Give five (5) data modeling examples **(5 Marks)**

b) What is the meaning of each of following terminologies as used in software engineering **(@1 marks)**

i. Software Quality
ii. Software Quality Assurance
iii. Software Validation

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iv. Software Verification

c) List and explain different types of testing done during the testing phase. **(15 Marks)**

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MZUMBE UNIVERSITY
(CHUO KIKUU MZUMBE)

Faculty of Science and Technology

End of Semester I Examinations: March, 2019

Course Code:	ICT 211
Course Title:	SYSTEMS AND SOFTWARE ENGINEERING
Programme:	BSc. ICTM II, BSc. ITs II, BSc. ICTB II, and BSc. MICT-EDU II.
Date:	13/03/2019
Time:	1200-1500hrs
Venue:	LT 1

INSTRUCTIONS

1. There are **FOUR (4)** questions in this paper
2. Attempt **ALL FOUR (4)** Questions
3. For the **Multiple choice** and **TRUE/ FALSE** Questions, erasing an answer and re-writing more than once will lead to **No Score**.
4. Be neat and Stick to Key Points only.

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QUESTION ONE **[25 Marks]**

a) **For each of the following Multiple Choice Questions, Choose and write the letter representing the most correct answer.** **(@ Item 1 Mark)**

i) Which one of the following is not a step of requirement engineering?
A) Requirement elicitation B) Requirement analysis
C) Requirement design D) Requirement documentation

ii) Testing of software with actual data and in actual environment is called
A) Alpha testing B) Beta testing
C) Regression testing D) Integration Testing

iii) Which process model is also called as classic life cycle model?
A) Waterfall model B) RAD model C) Prototyping model D) Incremental model

iv) Module design is used to maximize cohesion and minimize coupling. Which of the following is the key to implement this rule?
A) Inheritance B) Polymorphism C) Encapsulation
D) Abstraction

v) Requirements prioritization and negotiation belongs to :
A) Requirements validation B) Requirements elicitation
C) Feasibility study D) Requirements reviews

vi) Which of the following is not a White box testing method:
A) Statement coverage B) Error guessing
C) Path coverage D) Condition Coverage

vii) In software testing, how the error, fault and failure are related to each other?
A) Error leads to failure but fault is not related to error and failure

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xiii Context models show how a system that is being modeled is positioned in an environment with other systems and processes.

xiv Refactoring, making small program changes that preserve functionality, can be thought of as preventative maintenance.

xv When developing software, you should always consider the possibility of reusing existing software, either as components, services, or complete systems.

QUESTION TWO **[25 Marks]**

a) What are basic/ desirable characteristics of the well-written Software Requirements Specifications (SRS). **[5 Marks]**

b) An activity is started by Commuter actor who needs to buy a ticket. Ticket vending machine will request trip information from Commuter. Based on the info machine will calculate payment due and request payment options. After payment is complete, ticket is dispensed to the Commuter. (Assume money paid are fixed and no due balance will be dispensed). Present a Purchase Ticket UML activity diagram for a ticket vending machine. **(10 Marks)**

c) Read the following Case study then answer the questions that follow:

Chato Hospital Management System is a large system including several subsystems or modules providing variety of functions. Hospital Reception subsystem or module supports some of the many job duties of hospital receptionist. Receptionist schedules patient's appointments and admission to the hospital, collects information from patient upon patient's arrival and/or by phone. For the patient that will stay in the hospital ("inpatient") she or he should have a bed allotted in a ward. Receptionists might also receive patient's payments, record them in a database and provide receipts, file insurance claims and

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medical reports. Describe major services (functionality) provided by a hospital's reception using a use case UML diagram. **(10 Marks)**

QUESTION THREE **[25 Marks]**

a) How is feasibility study related to the software development project? **(15 Marks)**

b) Reviews and Inspections is normally done by a group of people who should read and analyze requirements, look for potential problems, meet to discuss the problems, and agree on a list of action items needed to address these problems.

(i) Outline different types of reviews that could be performed with varying degrees of formality exist. **(5 Marks)**

(ii) Pictorial, portray a typical System Review / Inspection Steps.**(5 Marks)**

QUESTIONS FOUR **[25 Marks]**

a) A software life cycle is a process, such a process involve activities, constraints and resources that produce an intended output. What are the key questions that should be asked in the process for Identifying Software Development Activities. **(5 Marks)**

b) User Manual Development is among the key document to be delivered together with the system software. What are the key information that a system user manual should contain?

(10 Marks)

c) Outline at least five possible sources for the difficulties and Risks in Software Engineering. **(10 Marks)**

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B) Fault leads to failure but error is not related to fault and failure
C) Error leads to fault and fault leads to failure
D) Fault leads to error and error leads to failure

viii) Which one of the following is not a key process area in CMM level 5 ?
A) Defect prevention B) Process change management
C) Software product engineering
D) Technology change management

ix) The quick design of a software that is visible to end users leads to .....
A) iterative model B) prototype model
C) spiral model D) waterfall model

x) Which diagram provides a formal graphic notation for modelling objects, classes and their relationships to one another ?
A) Object diagram B) Class diagram
C) Instance diagram D) Analysis diagram

(b) For each of the following statements below, write , "TRUE" for a true statement and "FALSE" for any false statement. (@ Item 1 Mark)

i There are many different types of systems and each requires appropriate software engineering tools and techniques for their development.

ii A sequence diagram is a two-dimensional diagram in which the objects participating in the interaction are depicted horizontally and the vertical dimension represents time.

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iii. A graphical modeling language such as UML helps in developing, understanding, and communicating the different views.

iv. In use case modeling, the functional requirements of the system are defined in terms of use cases and actors.

v. A software design method is a systematic approach that describes the sequence of steps to follow in order to create a design, given the software requirements of the application.

vi. Software quality assurance is a name given to a set of activities whose goal is to ensure the quality of the software product.

vii. Design and implementation processes are concerned with transforming a requirements specification into an executable software system.

viii. A particular strength of extreme programming is the development of automated tests before a program feature is created.

ix. Software evolution takes place when you change existing software systems to meet new requirements.

x. Unit and integration testing are "white box" testing approaches, requiring knowledge of the internals of the software.

xi. Ethnography is an observational technique that can be used to understand operational processes and help derive support requirements for these processes.

xii. Functional requirements are statements of the services that the system must provide.

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MZUMBE UNIVERSITY

FACULTY OF SCIENCE AND TECHNOLOGY

CSS 221: TEST 1

Instructions

- Answer all questions
- Time allowed 40 MINUTES
- Your question paper is **CATEGORY B**

Section A **(10 Marks)**

In the statements below, write **T** if the statement is True and **F** if otherwise.

1. When you have both internal and external CSS stylesheets in the same HTML document, the browser will give priority to the internal CSS.
2. File is an HTML form input used to enable a user to upload attachments
3. All the meta information of a web page intended for search engines are inserted in the title of the webpage
4. The footer of an HTML webpage comes after the closing tag of the body section, and it may contain information such as the copyright and publication year of the website.
5. An image can be used as a link (an anchor) to another page by enclosing the <img> tag with correctly defined <a> tags.
6. #impreza is a selector for a div with a class called impreza
7. <tr> is used to insert a new table row, while <tc> inserts a new table column
8. Contents of a static webpage do not change regardless of how, when, or by whom the website is being accessed; but can be changed manually by the website developer.
9. In HTML, h6 is the most important heading while h1 is the least important.
10. Without HTML, the effects of a CSS page cannot be displayed by a browser.

Section B **(5 Marks)**

In the following questions, write HTML codes (**Just the elements, not an entire webpage**) to:

1. Create a form input in such a way that if a user clicks it to feed data a calendar is displayed.
2. Create a table with two rows and three columns
3. Link the HTML file to an external CSS file called MyDear.css
4. Insert an image called forester, having a PNG extension, with the height of 350px and the width of 560px.
5. Create an ordered list of the following items: Dog, Donkey, Monkey, Pig

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Mzumbe University

MSS 224: Test 1 Numerical Analysis

Date: Wednesday 1st July, 2020

Duration: 1 Hour

Instructions:

1. Answer **ALL** questions.
2. ALL **details** of your work must be **neatly** and **clearly** shown.

1. Given that, the function f is defined as

$$f(x, y, z) = \frac{5xy^2}{z^3}, \ \Delta x = \Delta y = \Delta z = 0.001, \text{ and } x = y = z = 1$$

Determine the maximum relative error $(E_R)_{\max}$ of the function f. **(2 Marks)**

0'006 or 0.006

2. Determine

(a) the fourth Taylor polynomial for $f(x) = \cos x$ about $x = 0$ and use it to approximate $\cos(0.01)$. **(4 Marks)**

(b) Required to use the fourth Taylor polynomial and its remainder term to approximate **(4 Marks)**

$$I = \int_0^{0.1} \cos x dx$$

0'9995

3. The equation $x^3 - 1.3x^2 + 0.4x - 0.03 = 0$ is known to have a root near $x = 0.7$. By the means of Newton-Raphson technique, determine the root to six significant figures. **(5 Marks)**

2'8

ALL THE BEST

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