UNIVERSITY OF BENIN
DEPARTMENT OF COMPUTER SCIENCE

TEST

COURSE TITLE: SOFTWARE ENGINEERING
COURSE CODE: CSC 421

INSTRUCTIONS

Answer ALL questions. All questions carry equal marks.
TIME: 1 Hour

Question 1
(a) Define software engineering [4]
(b) What are the attributes of software product.[2]
(c) Describe one software development model and comment on its visibility and the suitable areas of application . [4]

Question 2
(a) Provide a high level form of a use case diagram of a library system. [5]

Question 3
(a) Explain the principles of agile method and show that Extreme Programming is a form of agile method. [4]

Question 4
(a) Explain why testing can only detect the presence of errors and not their absence [3]
(b) Show how you will carry out back-to-back testing. [3]

→ continous testing being broken down to iterations and prototyping is a useful tool in the case

Question 5
(a) Give some of the size-oriented metrics using lines of code as base line [3]

Question 6
(a) What are the 3 categories of software maintenance? [3]
(b) With the help of a diagram show the category that consumes maximum effort and why. [3]

6a
Corrective
Adaptive
Perspective

3a
Embrace Change
Customer involvement
People not process
Increment the usage
Maintaine Simplicity

Extreme programming is a form of agile method because it practices includes simple design

DEPARTMENT OF COMPUTER SCIENCE
FACULTY OF PHYSICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY

COURSE CODE: CSC421 (B.SC PART-TIME)
COURSE TITLE: INTRODUCTION TO SOFTWARE ENGINEERING **SESSION:** 2019/2020
INSTRUCTION: ANSWER ANY THREE QUESTIONS **TIME:** 2 Hours

Question One

a) What is Software and how is it different from a program? [7mks]
b) With the aid of illustrative diagram, describe Software Development Life Cycle. [12mks]
c) Highlight the fundamental types of software products. [6mks]

Question Two

a) What is software Engineering? [6mks]
b) Expose the similarity and contrast between software engineering and other engineering products. [6mks]
c) Briefly explain what necessitated the birth of Software Engineering. [6mks]
d) Highlight the key challenges facing software engineering in the 21st century [7mks]

Question Three

Describe any five of the following software process models with a view to exposing their features, merits, demerits and area of applicability.

i) Classical waterfall model
ii) Spiral model
iii) Prototype model
iv) evolutionary model
v) incremental model
vi) MULTIPARL model

[25mks]

Question Four

a) Define a software process and highlight the fundamental process activities? [8mks]
b) What is software process model? [4mks]
c) Most software process models are based on one of the three general models or paradigms of software development, describe these three general models with examples of a model in each of the general models. [13mks]

Question Five

Describe any five of the following software engineering methodologies:

i) Structured
ii) Object Oriented
iii) Service Oriented
iv) Agile approach
v) Component based
vi) Open source

[25mks]

Department of Computer Science
Faculty of Physical Sciences
University of Benin, Benin City

Semester: Second **Session: 2020/2021** **Course Code: CSC422**
Course Title: Concepts of Programming Languages **Time: 2Hrs 30mins**
INSTRUCTIONS: **(1) Answer Question one and any other three questions**
(2) Use of digital or electronic device(s) is strictly prohibited
(3) Cross out all unused spaces and pages of your booklet

Question One

(a) Programming language syntax is specified using BNF or EBNF.
(i) Explain why this is usually done? [3mks]
(ii) Highlight their notations [2mks]
(iii) Convert the following EBNF to BNF:
<pass_CSC422> → <take_exam> [(<pass_exam> | <CAT1> | <CAT2> | <CAT3>)] <CAT4><Group_CAT> [2mks]

(b) Make a sharp contrast between the following concepts pairs in programming languages:
(i) pass by value and pass by reference (ii) error and exception (iii) semantics and pragmatics (iv) method and function (v) coroutine and subroutine (vi) heap memory and stack memory (vii) scope and lifetime (viii) object and class (ix) coercion and casting (x) simplicity and uniformity
[10mks]

(c) Briefly discuss any two benefits of concepts of programming languages to the advancement of computing [2mk]

Question Two

(a) Highlight any ten characteristics of Object Oriented Programming (OOP) Languages [6mks]
(b) Using the OOP design issues and the economy of scale, explain why Java is a preferred OOP language to Small-talk. [11mks]

Question Three

Define a variable and describe its attributes and their possible variations using illustrative code example(s) in specified programming language(s) [17mks]

Question Four

Ordinarily, a program executes from top-to-down and left-to-right. Discuss using their design considerations how programming languages enable programmers to exercise control over this restrictive execution flow. [17mks]

Question Five

(a) Briefly, discuss the evolution of any one of the following programming languages: FORTRAN, Java, C++, and Python. [10mks]
(b) Expose the features, merits and demerits of the five basic parameter passing methods of subprograms [7mks]

Department of Computer Science, University of Benin, Benin City
Second Semester B.Sc Examinations 2018/2019 Session
COURSE CODE: CSC421
COURSE TITLE: Software Engineering
INSTRUCTION: Answer Question One and any other three Questions
TIME ALLOWED: 2 Hours 45 Minutes

Question One

Software Development beingbroad and multidisciplinary usually involves specialists who include: Analyst, Architect/Designers, Programmers, Testers, and Maintenance specialist.Discuss the skill set, activities, and any two tools usually employed by each of these specialists in the discharge of their duties.(25 Marks)

Question Two

(a): Give for each of the following pairs of software engineering terms/concepts, a sharp similarity and contrast:(i) MultiParl model and evolutionary model (ii) program and software (iii) design and specification (iv) analysis and design (v) ethics and principles(5 Marks)

(b): What is Software Engineering? How is it different from other engineering? (5 Marks)

(c): Describe the software crisis. Do you think the crisis still persists? Explain (5 Marks)

(d): Highlight any six basic Software Engineering principles (3 Marks)

(e): Highlight any four fundamental Software Engineering ethics (2 Marks)

Question Three

(a) (i): What is Software? Highlight with examples the types of software (5 Marks)

(ii): Identify four similarities and four differences between software and other engineering product (4 Marks)

(iii): List the phases of Software Life-Cycle (2 Marks)

(b): Briefly, highlight any sixsoftware quality attributes (4 Marks)

(c): What is cohesion? Highlight any five type of cohesion (5 Marks)

Question Four

Describe any five of the following software process models(4 Marks each): (i) Waterfall model(ii) Incremental model (iii) MultiParl Model (iv) Spiral model (v) Evolutionary model (vi) Rapid Prototyping model

Question Five

Describe any five of the following software development methodologies (4 Marks): (i) Agile (ii) Object Orientation (iii) Structured Programming (iv) Open Source (v) Component Based (vi) Service Orientation

Examiner: Prof. Godspower O. Ekuobase, PhD

DEPARTMENT OF COMPUTER SCIENCE
UNIVERSITY OF BENIN
BENIN CITY.

2018/2019 SESSION
SECOND SEMESTER FULL-TIME B.SC. (HONS) COMPUTER SCIENCE DEGREE EXAMINATIONS

COURSE CODE: CSC 422 **COURSE TITLE: CONCEPTS OF PROGRAMMING LANGUAGES**

CREDIT: 3 **EXAM POINTS: 70** **CA POINTS: 30**
TIME ALLOWED: 2 ½ HOURS
GENERAL INSTRUCTION
ANSWER TWO QUESTIONS FROM SECTION A AND ANOTHER TWO QUESTIONS FROM QUESTION B

SECTION A
(QUESTION ONE IS COMPULSORY)

QUESTION ONE(20 MARKS)

a) In the departmental meeting , some professors suggested that this course "Concept of Programming Language (CSC422)" should be made an elective course. They argued that not all students who studied computer science will end up being programmers. What is your opinion on this issue. (5marks)

b) What is the potential danger of implicit variable declaration (2 marks)

c) What are the design issues for variable names? Discuss these issues using C++, Fortran and Basic (10 marks)

d) Define syntax and semantics (1 mark)

e) Distinguish between static and dynamic semantics (2 marks)

QUESTION TWO (15 MARKS)

a) Computers have been applied to a myriad of different areas, from controlling nuclear power plants to providing video games in mobile phones. Because of this great diversity in computer use, programming languages with very different goals have been developed. Briefly discuss a few of the areas of computer applications and their associated languages. (5marks)

b) Explain how these characteristics (**readability writability reliability**) affects the following language evaluation criteria: simplicity, orthogonality, data types, syntax design, support for abstraction, expressivity, type checking, exception handling and restricted aliasing. (10 marks)

QUESTION THREE (15 MARKS)

a) Ada and Cobol invented most programming language concepts 50 years ago. To what extent is this statement true or false? Provide evidence for both, keeping in mind developments in hardware and architecture (5 marks)

b) Some programming languages, for example, Pascal have used the semicolon to separate statements, while Java uses it to terminate statements. Which of these in your opinion, is most natural and least likely to result in syntax errors? Support your answer. (5 marks)

c) What is the disadvantage of having too many features in a language (5 marks)

SECTION B

(QUESTION ONE IS COMPULSORY)

QUESTION FOUR (20 MARKS)

(a) i)Define the following concepts:

(1) Functional programming

(2) Event-driven programming

(3) Object Oriented programming (6 Marks)

ii)List the various data parameter passing conventions that you have studied. (5 Marks)

(b) Outline any three features of :

(1) Functional programming

(2) Event-driven programming

(3) Object Oriented programming (9Marks)

QUESTION Five (15 MARKS)

(a) Show that communication by global variables contributes to the non referential transparency of imperative programming languages (10 Marks)

(b) List the three main classes of statement level control structures and hence give respectively an example from any two of them. (5 Marks)

QUESTION Six (15 MARKS)

(a) i) What is storage allocation? (3 Marks)

ii) In the context of program structure and storage administration, briefly compare static and dynamic storage allocation techniques. (4 Marks)

(b) In the context of call by reference, show that Aliases can affect the semantics of an imperative programming language program. (8 Marks)

UNIVERSITY OF BENIN
DEPARTMENT OF COMPUTER SCIENCE

SECOND SEMESTER EXAMINATION 2017/2018 SESSION

COURSE TITLE: SOFTWARE ENGINEERING
COURSE CODE: CSC 421

INSTRUCTIONS

Answer any **four** questions. All questions carry equal marks.
TIME: 2Hrs 30minutes

Question 1

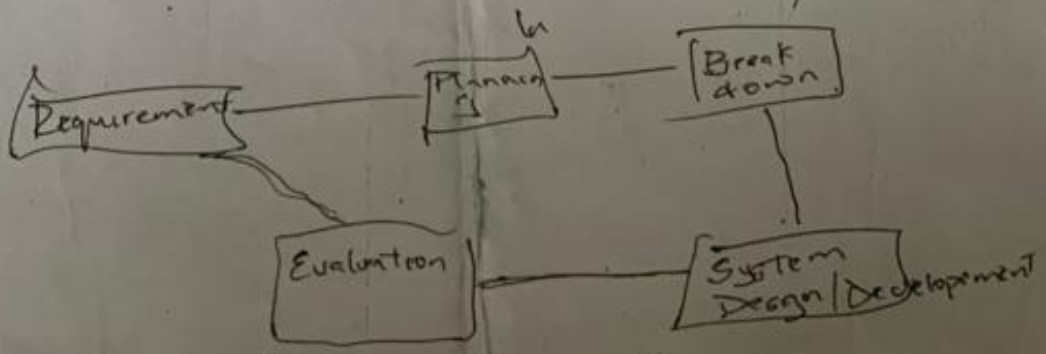
(a) What are the aims of software engineering? [4]
(b) What are the attributes of software product and characteristics of software process.[4]
(c) Describe two software development models and comment on their visibilities and the suitable areas of application [8]
(d) How is software engineering process different from traditional Engineering? [4]

Question 2

(a) Provide architectural design for the following:
(i)An automated ticket –issuing system used by passengers at a railway station
(ii) A computer controlled video conferencing system that allows video, audio and computer data to be visible to several participants at the same.
(iii)Invoice processing system. [9]
(b) Using examples describe one control style. [2]
(c) Consider the following requirement definition 'software to assist a clerk in an airline to book flights, cancel flights and provide boarding pass'. You are to transform the user requirements to system specification using detailed use case approach. [9]

Question 3

(a) Explain the principles of agile method and show that Extreme Programming is a form of agile method. [4]
(b) What are the advantages and disadvantages of incremental development? [4]
(c) When is it appropriate to use agile methods? [4]
(d) Explain the XP release cycle [4]
(e) Extreme programming expresses user requirements as stories, with each story written on a card. Discuss the advantages and disadvantages of this approach to requirements description. [4]



UNIVERSITY OF BENIN
DEPARTMENT OF COMPUTER SCIENCE

TEST

Question 4

(a) Describe the testing process [5]
(b) Explain why testing can only detect the presence of errors and not their absence [3]
(c) Explain why interface testing is necessary even when individual components have been extensively validated through component testing and program inspection. [3]
(d) Show how you will carry out the following:
(i)Stress testing (ii) component testing (iii) back-to-back testing. [9]

Question 5

(a) Give reasons why we measure. [3]
(b) What are the advantages and issues arising from using lines of code as a measure in software? [3]
(c) Give some of the size-oriented metrics using lines of code as base line [3]
(d) Why is the use of function points better than lines of code? [3]
(e) Using an example, show how you will compute the unadjusted function point (UFP) of given software. [8]

Question 6

(a) What is software maintenance? [2]
(b) Discuss the three categories of software maintenance. [12]
(c) With the help of a diagram show the category that consumes maximum effort and why. [3]
(d) What should we do during software development in order to make the job of maintenance easy? [2]

UNIVERSITY OF BENIN, BENIN-CITY, DEPARTMENT OF COMPUTER SCIENCE
BSC. COMPUTER SCIENCE DEGREE EXAMINATION, SECOND SEMESTER 2020/2021 SESSION
COURSE: CSC 427 (DATA COMMUNICATION AND NETWORKING)

TIME ALLOWED: 2HRS, 30 MINS

INSTRUCTION: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE (COMPULSORY) (30 MKS)

(a) (i) Nigerian Communication Satellite (NICOMSAT) limited is a company under the Federal Ministry of Communication Technology with a mission to be the leading communication satellite operator and service provider in Africa, for the provision of fixed satellite services. Their mission is to "manage and exploit the commercial viability of the NICOMSAT for the social economic benefits of the nation". NICOMSAT, recently said it was collaborating with China Great Wall Industry Cooperation (CGWIC) to launch two additional satellites which will be deployed in the next 24-36 months (or thereabout). The first Nigerian Communication Satellite, NICOMSAT-1, was originally launched in 2007, but had issues and was later de-orbited. The satellite was later re-launched in 2011 as NICOMSAT-IR and has been in orbit since then.

Required: a(i) How was NICOMSAT-1 launched and what satellite technology was it based on? (3mks)

(ii) Who were the operators of this satellite and what was the expected coverage? (3mks)

(iii) What were the issues that led to the de-orbiting of NICOMSA-1? (3mks)

b(i) Discuss the (satellite) technology NICOMSAT-IR is based on and the coverage area (16mks)

(ii) What are the basic features of NICOMSAT-IR? (3mks)

(iii) What is the expected impact of NICOMSAT-IR in national development? (1mk)

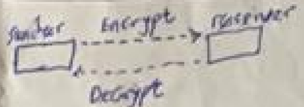
c. What were the reasons proffered by the Nigerian government for the two (2) additional satellites to be launched? (1mk)

QUESTION TWO (25MKS)

a. The Student Union Government (SUG) of the University of Benin is implementing an electronic voting (e-voting) system to elect their executives. Only bonafide students of the faculties/colleges are allowed to vote at a voting website that the university's ICT/CRPU department is implementing. Discuss the security attributes that need to be considered for the e-voting system (10mks)

b. (i) The OSI model is sort of a standard of standards. What does this mean? (2mks)
(ii) What is the basic function of the OSI model and how can the model be of assistance to network managers, computer programmer and technology vendors (8mks)
(iii) Briefly (in tabular form), contrast the OSI model with the TCP/IP model (5mks)

3c(i) Man-in-the-middle attack (or request hijacking) where the attacker sniffs or intercepts requests from a user(s) of the network. Data like password and credit card information can be compromised. This compromises the confidentiality of the network



3c(ii) DDoS (distributed denial of service attack). An attacker, exploits and floods the network with requests more than it can handle, thereby causing a denial of service to other users. This affects the network's availability

QUESTION THREE (25MKS)

a(i) What is cryptography? (1mk)

(ii) By means of a diagram, describe the components involved in cryptography (5mks)

b (i) Briefly, distinguish between the following traditional algorithms in symmetric-key cryptography: shift cipher and transposition cipher. (6mks)

(ii) The following shows the key (in traditional cypher) using a block of four characters.

We group the message in group of 4 and remove the empty spaces, where Z is a dummy Alphabet

Plaintext: 3 1 4 2 "PLEA SESE EMEZ"

Ciphertext: 1 2 3 4 "EPAL SSEE EEZM"

Encrpt the message: " PLEASE SEE ME" using the key above.

c. Confidentiality, Integrity and availability are core attributes in security. Identify any three (3) threats to a wireless network that could compromise security and state the security attribute(s) that is compromised by each threat.(10mks)

(3c(iii)) An attacker can intercept and alter the content of a message before it gets to the sender. This compromises the integrity of the wireless network.

QUESTION FOUR (25MKS)

a(i) What do you understand by digital forensic techniques in Information Technology? (2mks)

(ii) What are the forensic techniques needed for Information Security? (6mks)

(iii) What are the ethical issues of Information Security? (3mks)

b. By means of an appropriate diagram, describe the four step process of applying digital forensics techniques? (9mks)

(3a) Cryptography is the transformation of message to protect their integrity, confidentiality and protect them from attack.

c .(i) What do you understand by zero trust security? (1mk)

(ii) Briefly, explain any four categories of zero trust (4mks)

QUESTION FIVE (25MKS)

Fully integrated Nigeria Telecommunication company, Globacom, entered into agreement recently with china Huawei Technologies company limited for laying another Trans-Atlantis submarine (undersea) cable, GLO2 (to compliment GLO1) that will provide high speed internet to oil platforms in the country's Niger Delta region. The second submarine cable is expected to consolidate Globacoms ambitious plan to comprehensively transform Nigeria's ICT landscape by significantly increasing broadband penetration in the country, thereby bringing a new era of digitization to Nigeria's economy.

a(i) Briefly, discuss the connectivity of GLO2 (4mks)

(ii) Give comprehensive details of the cables to be laid (15mks)

b. What are the economic benefits of this facility (to Nigeria) (6mks)

(5B(ii)) We group the message in group of 4 and remove the empty spaces, where Z is a dummy alphabet

" PLEA SESE EMEZ"

" EPAL SSEE EEZM"

(i) Was a Nigeria communication satellite which is the 3rd Nigerian satellite was launched in China by Nasdra on the 13th May 2007 (ii) The operators of the NICOMSAT satellite were the Nigerian communication satellite (NICOMSAT) limited a company under the federal ministry of communication Technology

Department Of Computer Science

University Of Benin

Benin City.

Full-Time B.Sc.(Hons.) Computer Science, Second Semester Examination For 2017/2018 Session

Course Code: CSC422 **Title:** Concepts of Programming Languages

Credit: 3 **Time allowed:** 2½ hours Exam PTs: 80 CA PTs:20

Instructions:

Answer Question 1 and any other three questions.

QUESTION 1 (20 MARKS)

(a) i) Define the term: Programming Languages. (2 marks)

ii) Give one strong reason why it is important to study programming languages in a computer science class. (2 marks)

iii) Outline the classes of programming languages according to run-time behaviour. (6 marks)

(b) i) With relevant supporting illustrative example(s), explain the term: concrete syntax. (6 marks)

ii)Distinguish between interpretation and compilation (2 marks)

iii) Represent the infix arithmetic expression (A+ (B+C*D)) in Quadruple. (2 marks)

QUESTION 2 (20 MARKS)

(a) i)With an appropriate progra[illegible] can affect the referential transparency of a program written in a conventional programming language. (10 marks)

(b) In the context of program structure and storage administration, compare static and dynamic storage allocation techniques. (10 marks)

QUESTION 3 (20 MARKS)

(a) i) What is a coroutine? (4 marks)

ii) Give the general form of the SIMULA 67 coroutine. (4 marks)

iii) Define the term: unit instance. (2 marks)

iv) How is a SIMULA 67 coroutine instantiated. (3 marks)

(b) Define the term functional programming language and hence write a LISP recursive program to evaluate the factorial of x. (7 marks)

QUESTION 4 (20 MARKS)

(a) i) Briefly comment on the binding that occurs between a variable and its type in a FORTRAN program. (5 marks)

ii) List the various data parameter passing conventions that you have studied. (5 marks)

(b) i) With relevant illustration(s), explain the term: "scope of a variable". (5 marks)

ii) In the context of definition and characteristics, what is a data type? (5 marks)

QUESTION 5 (20 MARKS)

(a) Outline any five characteristics of a good programming language. (10 marks)

(b) i) In the context of aliases, explain with an appropriate program segment example, how call by reference can affect the semantics of a program. (5 marks)

ii) Pascal lacks orthogonality. Briefly explain this claim. (5 marks)

QUESTION 6 (20 MARKS)

(a) i) Outline the central issues handled by exception handling schemes. (5 marks)

ii) What are semaphores? P = pause, V = continue [sub ~~semaphores~~ concurrency] (5 marks)

(b) i) With an appropriate example in each case, distinguish between a command and a definition. (4 marks)

ii) List the different types of statement level control structures and give an example of each of them in any programming language of choice. (6 marks)

Efficiency.

Orthogonality → general USP

Reliability

Expressiveness

Modularity

Simplicity

Ignor default values like a non-instantiated one look like an instantiated value but cannot be read.

Support call by value 2 file
Constant variable cannot be assigned to a record
file cannot be copied by value

call by reference

```
begin
flag boolean;
if (true) c:1
else
if (false) c:2
else
c:not true
end
begin
```

2 variables ~~programs~~ reference same memory such that a change in 1 is changed in the other.