

CROSS RIVER UNIVERSITY OF TECHNOLOGY, CALABAR
DEPARTMENT OF COMPUTER SCIENCE
FIRST SEMESTER EXAMINATIONS 2018/2019 SESSION

COURSE CODE: CSC 4103

COURSE TITLE: SOFTWARE ENGINEERING

TIME: 2.30 HRS

INSTRUCTION: Answer any four questions.

QUESTION 1

- a. In software development an application has the following components:

14 low external inputs, 20 high external outputs, 30 low internal logical files, 15 high external interface files, 16 average external inquiries, and a value of complexity adjustment factor of 1.10. Using the UFP calculation table shown in **Table 1** compute the unadjusted and adjusted function point counts.

QUESTION 2

- a. Why do software engineers engineer software?
- b. Discuss the areas of software engineering specialty.
- c. Outline the characteristics of software engineering.

QUESTION 3

- a. Distinguish between the Waterfall and Agile Software Development Life Cycle Models
- b. Differentiate between Top-Down Design and Bottom-Up Design of Software
- c. Briefly account for the strategy of design.

QUESTION 4

- a. Account for the good thing about software requirement specification
- b. State any three (3) software failures you have read about
- c. Elucidate the levels of testing

QUESTION 5

- a. What is Software Reliability?
- b. Assume that a program will experience 300 failure in infinite time. It has now experienced 150. The initial failure intensity was 30 failures/CPU hr.
 - (i) Determine the current failure intensity. **[Hint:** Current failure intensity, $\tau(\mu) = \tau_0 \left[1 - \frac{\mu}{V_0}\right]$
 - (ii) Find the decrement of failure intensity per failure. **[Hint:** $\frac{dy}{dx} = \frac{\tau_0}{V_0}$
 - (iii) Calculate the failures experienced and failure intensity after 25 and 100 CPU hrs. of execution. **[Hints:** failures experienced is: $\mu(\tau) = V_0 \left[1 - \exp \frac{\tau_0 \tau}{V_0}\right]$ and failure intensity is: $\tau(\tau) = \tau_0 \exp \left[-\frac{\tau_0 \tau}{V_0}\right]$

Table 1: UFP calculation table

Functional Units	Weighing factors		
	Low	Average	High
External Inputs (EI)	3	4	6
External Output (EO)	4	5	7
External Inquiries (EQ)	3	4	6
External Logical Files (ILF)	7	10	15
External Interface Files (EIF)	5	7	10

QUESTION 6

Software project is identified with the following parameters.

- (i) External Inputs:
 - a. 25 with low complexity
 - b. 30 with average complexity
 - c. 20 with high complexity
- (ii) External Output:
 - a. 12 with low complexity
 - b. 20 with high complexity
- (iii) External inquiries:
 - a. 6 with low complexity
 - b. 6 with average complexity
 - c. 5 high complexity
- (iv) Internal Logical Files:
 - a. 4 with average complexity
 - b. 3 with high complexity
- (v) External Interface Files:
 - a. 11 with low complexity

In addition to above, system requires the complexity adjustment factors to be treated as average. Using the information in **Table 1** and **Figure 1** compute the function point for the software engineering project on the attached **figure 2**.



Figure 1: Unadjusted Function Point Count

NAME:

REGISTRATION

Functional Units	Count		Complexity		Functional Unit Totals
	Complexity		Totals		
External Inputs (EIs)	<input type="text"/>	=	<input type="text"/>		<input type="text"/>
	<input type="text"/>	=	<input type="text"/>	=	
	<input type="text"/>	=	<input type="text"/>		
External Outputs (EOs)	<input type="text"/>	=	<input type="text"/>		<input type="text"/>
	<input type="text"/>	=	<input type="text"/>	=	
	<input type="text"/>	=	<input type="text"/>		
External Outputs (EOs)	<input type="text"/>	=	<input type="text"/>		<input type="text"/>
	<input type="text"/>	=	<input type="text"/>	=	
	<input type="text"/>	=	<input type="text"/>		
External Logical Files (ILFs)	<input type="text"/>	=	<input type="text"/>		<input type="text"/>
	<input type="text"/>	=	<input type="text"/>	=	
	<input type="text"/>	=	<input type="text"/>		
External Interface Files (EIFs)	<input type="text"/>	=	<input type="text"/>		<input type="text"/>
	<input type="text"/>	=	<input type="text"/>	=	
	<input type="text"/>	=	<input type="text"/>		
Total Unadjusted Function Point Count				=	<input type="text"/>

Figure 2: Unadjusted Function Point Count

Note: If attempted this question number, ensure to submit this sheet alongside your answer booklet