

Department of Computing
PDM300
SLIIT Mid-semester Test

Max time: 50 min

Max Marks 45

Name: _____ Student Number: _____

Write your answers for all questions in the space provided on this paper. Use of a simple pocket calculator (nonprogrammable) is allowed. Switch off all your mobile devices.

Question 1:

- (a) How does the use of PSP help a software developer to avoid making unrealistic time commitments at the beginning of a project and during the execution of the project? [4 marks]

- (b) Describe three ways in which a software developer can use the data recorded in a PSP defect log. [6 marks]

SAMPLE

Question 2:

(a) Student X used the PSP0 process to develop a program of 150 LOC and recorded the time and defect data. After the first compilation of the program, while correcting syntax errors, she found a design error that had to be corrected by adding 20 LOC of new code. On testing the modified program, she found a logical error in the lines of code she had added to correct the above design error. To correct this logical error, she had to add 5 new LOC before recompiling the program.

i. In which phase was the logical error injected? [1 mark]

ii. In which phase did Student X add the new code to correct the logical error? [1 mark]

(b) Describe the purpose of using a coding standard and a counting standard in PSP. [4 marks]

Question 3:

- (a) Programmer X developed a new program starting with an existing program of 500 LOC as follows: She deleted 100 LOC, modified 80 LOC, and added 200 LOC. She reused 150 LOC from a source code library and also added 100 LOC of reusable code to the library. What is the size of the new program? If the productivity of Y for this program was 40 LOC per hour, how long did she take to develop the new program? Show all the steps in your calculations. [5 marks]

- (b) Programmer X has an estimating accuracy of $\pm 10\%$ for development time. He is developing a new program that has 3 modules and estimates the time for each module as follows:

Module A: 30 hours
Module B: 50 hours
Module C: 70 hours

What is the combined estimate of development time for the program (assuming it consists of only these three modules)? Assuming an estimating accuracy of $\pm 10\%$ for each module, what would be the estimated range of development time for the new program? Show all the steps in your calculations. [7 marks]

Question 4:

The table below shows the LOC for relative sizes of methods (items) for different categories of C++ classes.

Type	C++ Class Size Ranges (LOC/item)				
	Very Small	Small	Medium	Large	Very Large
Calculation	2.34	5.13	11.25	24.66	54.04
Data	2.60	4.79	8.84	16.31	30.09
I/O	9.01	12.06	16.15	21.62	28.93
Logic	7.55	10.98	15.98	23.25	33.83
Set-up	3.88	5.04	6.56	8.53	11.09
Text	3.75	8.00	17.07	36.41	77.66

Student Z is planning to develop a new program by modifying her existing C++ program that has 600 LOC. She estimates that 100 LOC will have to be deleted, 120 LOC modified, and LOC of reused parts will be 50. On the LOC to be added, she has the following information:

Parts Additions	Type	Items	Relative size
Array	Data	8	Large
Validation	Logic	5	Medium
Parsing	Text	4	Small

Regression parameters based on her past estimates are as follows:

$$\beta_{0size} = 20, \quad \beta_{0time} = 45, \quad \beta_{1size} = 1.2, \quad \beta_{1time} = 2.1$$

Using the above data, estimate development time for the new program.

[5 marks]

Question 6:

Programmer Y developed text processing methods (functions) in various programs she wrote with size details as follows:

- Program A: five methods, 85 total LOC
- Program B: three methods, 75 total LOC
- Program C: three methods, 96 total LOC
- Program D: two methods, 14 total LOC
- Program E: one method, 18 LOC
- Program F: two methods, 22 total LOC

Find intuitive size ranges of very small, small, medium, large and very large from this data using a simple procedure. Show your steps in full.

[6 marks]