

Name: \_\_\_\_\_

**MSWE 609 Midterm  
October 20, 1999**

**Answer all questions in the answer book. Keep each answer relatively short. Not more than a short paragraph is needed for any answer. If you find yourself writing too much, you don't understand the question being asked. All opinions must be backed up with relevant facts. Some of these questions can be answered both by "yes" and "no" depending upon what facts are used to justify your opinion.**

**Each question has the same value, even though some questions are harder than others.**

1. A lines of code metric closely correlates with most other size metrics. If so, why do we need to consider other size metrics? Would a lines of code number be sufficient? Agree or disagree with this argument by giving cogent comments about it.

2. What will the following two graphs approximately look like? Give a short statement to justify each answer.  
(a) Function points in a project versus time (by weeks)

(b) (Source coding errors)/(function points) versus time (by weeks)

3. In a requirements document, the following measure is proposed as a system complexity metric: Number of "e"s in the requirements document. Comment on the applicability of this measure as a complexity measure.

4. What is the cyclomatic complexity of the following program fragments?

(a) IF A=B THEN  
    X := 7;  
    Y := C+D;  
    WHILE X<Y DO  
        X:=X+1;  
        Z:= X+Y  
    END WHILE;  
    X:=Y;  
END IF;

(b) IF A=B THEN  
    X := 7;  
    Y := C+D;  
    X:=Y;  
END IF;  
WHILE X<Y DO  
    X:=X+1;  
    Z:= X+Y  
END WHILE;

Name: \_\_\_\_\_

5. Consider the program code:  
 $A = A+B + C$ 
  - (a) What are the various parameters and the computed size of the program using the software science measures?
  
  - (b) How does it compare with the actual value?
  
6. Comment on the value of the cyclomatic complexity measure as a program complexity measure. (Use problem 4 as a guide.)
  
  
  
  
  
  
  
  
  
  
7. Redwine and Riddle claim that technology maturation can take up to a generation (17 to 25 years) while Zelkowitz in his study of technology transfer at NASA claims that technology infusion can take from 4 to 6 years. Explain the discrepancy in these two time periods.
  
  
  
  
  
  
  
  
  
  
8. Explain what each of the following mean and give an example of each:
  - (a) An in vitro exploratory experiment
  
  
  
  
  
  
  
  
  
  
  - (b) An in vivo confirmatory experiment
  
  
  
  
  
  
  
  
  
  
9. For the COCOMO model:
  - (a) What is its greatest strength and why?
  
  
  
  
  
  
  
  
  
  
  - (b) What is its greatest weakness and why?

Name: \_\_\_\_\_

10. Comment on each of the following:

(a) Software engineering is a science.

(b) Software engineering is engineering.

11. "The CK OO metrics can only be used with a language that supports classes, such as C++. It cannot be used in a non-OO language such as C." Comment on this statement.

Consider the following 4 measures:

- Function points
- Cyclomatic complexity
- Lines of code
- Software science

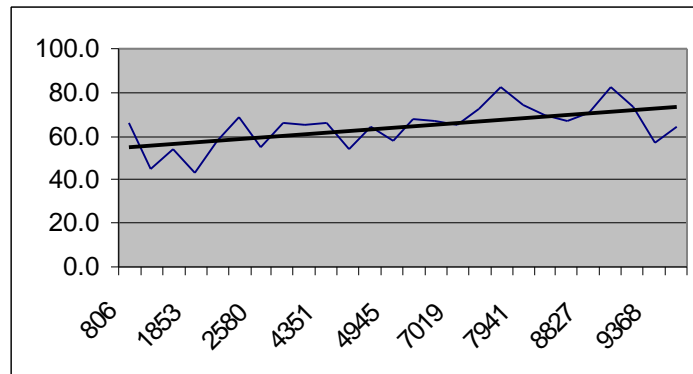
12. Which of the above 4 measures is probably the best predictor of the overall cost of a software development and why?

13. Which of the above 4 measures is probably the best evaluator of the overall cost of a software development and why?

14. Which of the above 4 measures is probably the best predictor of the eventual defect rate in a software development and why?

Name: \_\_\_\_\_

15. Consider the following graph:



- (a) The points on the graph have a .63 correlation with the straight regression line on the graph. What can you say about the regression line being a measure of the raw data?
- (b) It turns out that this is a graph of low order 4 digits of social security numbers versus final class average for a previous CMSC class. What can you now say about the relationship of the regression line and the raw data?

16. Consider the 4 scales: nominal, ordinal, interval, ration. For each of the following, what scale does it represent and why?

- (a) Your grade on this exam (from 0 to 100).
- (b) Your grade in this course (A, B, C, D, F)
- (c) The number of miles from your home to the university
- (d) Your social security number