![BUE - The British University In Egypt - الجامعة البريطانية في مصر] Informatics and Computer Science	**xxCSCI08I** **Final Examination,** **20xx-20xx**
Module Title **Software Project Management**	
Module Leader **Prof. Vladimir Geroimenko**	Semester **One**
Equipment allowed	**Calculator**

Instructions to students:

- The exam paper is **3** pages long.

- Answer **all** questions.

- The allocation of marks is shown in brackets by the questions.

- The total mark of the exam is 100 marks.

This examination is **2** hours long.

Q 1   Answer the following questions:

a) Project objectives should be SMART. Explain briefly what is meant by the mnemonic and illustrate whether the following objective for a project is SMART or not: "To implement the software such that it meets the required level of security".

[8 marks]

b) Which software development model will be most suitable to develop: Project 1: A database of students with their personal information, and Project 2: A computer game. Explain why.

[8 marks]

c) What are *estimation by analogy* and *expert judgment* techniques? What are their advantages and disadvantages?

[8 marks]

d) Using a diagram, provide the names and structural organisation of the steps implemented in the Step Wise method of project planning.

[8 marks]

e) Describe PERT and the three estimates used in this technique. Provide the equation that combines these estimates into a single *expected duration*.

[10 marks]

f) Describe four common risk factors that apply to any project.

[8 marks]

[Q1 Total: 50 marks]

Q 2   A software project includes eight activities with the estimated activity durations and precedence requirements specified in the table below.

Activity	Duration (days)	Precedents
A	3	
B	5	
C	4	A, E
D	8	B
E	6	
F	8	D
G	2	
H	10	B, G

a) Create a *precedence activity network* for the project. For each activity node, specify the *forward pass*. Each activity should start as soon as possible. What is the project's earliest possible finish date?

[13 marks]

b) For each activity node, calculate the *backward pass* and the *total float*. Determine the *critical path* of the project.

[12 marks]

[Q2 Total: 25 Marks]

Q 3   A commercial organisation has approached you as the project manager and asked to estimate the effort required by your team to develop a highly specialised information system using C++. The nature and purpose of the system is confidential at this stage and is not known to you. You are required to do the effort estimation based on the information available and using Albrecht Function Point Analysis for size estimation and COCOMO 81 for rough effort estimation. It is known that the system will have the following components:

External input types: 1 with High complexity; 2 with Low complexity.

External output types: 2 with Average complexity; 1 with Low complexity.

Logical internal files: 2 with Average complexity.

External interface types: 3 with High complexity; 1 with Average complexity; 2 with Low complexity.

External inquiry types: 1 with High complexity; 1 with Low complexity.

a) Estimate the size of the system. Use the following data:

Albrecht complexity multipliers			
External use type	**Low**	**Average**	**High**
External input type	3	4	6
External output type	4	5	7
Logical internal file type	7	10	15
External interface file type	5	7	10
External inquiry type	3	4	6

1 Function Point = 50 lines of C++ code.

[12 marks]

b. Estimate the number of months needed for your team of 10 to develop the information system. Use the COCOMO 81 model **effort = c(size)^k** and the following data:

System Type	c	k
Organic	2.4	1.05
Semi-detached	3.0	1.12
Embedded	3.6	1.20

[13 marks]

[Q2 Total: 25 marks]