BUE The British University In Egypt الجامعة البريطانية في مصر	**Examination Paper Proofing & Printing Confirmation Sheet**

Module Title : **Software Project Management**	Module Code: **14CSCI08I**
Module Leader **Dr.Ghada Hassan**	Semester **One**
Proofed by **Dr. Doaa Elzanfaly**	Date of examination

I hereby confirm:

That this examination paper assesses the ILOs defined in the module specification	*
That appropriate model answers were provided with this examination paper	*
That this examination paper has been proof-read and is approved for printing	*
That this examination paper follows the approved University template	*

Signed (Proof Reader): Dr. Doaa El Zanfaly

Printing instructions & stationery requirements

Number of copies of examination paper to be printed		
Date of examination		
		Number required per student
Stationery Requirement(s)	8 page answer book	
	12 page answer book	
	Graph paper	
	Other	

Signed (Module Leader) Dr. Ghada Hassan

BUE The British University In Egypt الجامعة البريطانية في مصر	**14CSCI08I** **Final Examination,** **2014-2015**
Module Title **Software Project Management**	
Module Leader **Dr. GhadaHassan**	Semester **One**
Equipment allowed (for example calculator)	None

Instructions to Students

- You should answer all FOUR questions
- The exam paper is FIVE pages long
- The approximate allocation of marks is shown in brackets by the questions.

This examination is **Two** hours long.

Answer the following questions [Total marks 100]

Q 1 Answer the following:

a. A university library is considering the implementation of a computer-based system by the university IT department to help manage book archiving, loans, and returns. The system should to be in place by the end of the next academic year.

i. Who are the stakeholders of such a project?

ii. What would be the success criteria of this project?

iii. Out of the top ten software risks list, identify and discuss two possible risks that you think this project is subject to.

iv. For the risks you identified, explain a contingency plan for one of them.

[16 marks, 4 each]

b. Explain what is meant by the following:

i) Maslow hierarchy of needs

ii) Gold plating

iii) Project management activities – Explain, and mention two of these

[9 marks, 3 each]

[Q1 Total: 25 marks]

Q 2 The university library is responsible for preparing a schedule for 2-hours introductory sessions held at the library at the beginning of each year. It is targeted at new students, and new staff members, and it shows who attends which session. The files accessed to create the report are: Staff File, Student File, and Teaching file (the library staff schedule). The reports generated may contain any of the following information based on enquiry type: lecture_name, instructor_name, staff_name, student_name, day_of_week, time, location.

a. Identify the Albrecht function points for this task. (Only of the following types: *External inquiry type* (EI) and *Logical internal file (LI))*.

[6 marks]

b. Given the multiplier of 4 for (EI) function points, and 10 for (LI) function points, and that the coding will be in Java, for which 60 lines of code correspond to one function point. Calculate the Albrecht function points, and accordingly estimate the expected code size?

[5 marks]

c. The COCOMOII method for effort estimation is given by:

EFFORT(PM) = 2.94 (size)^{sf} x (product of effort multipliers)

Where**: sf = 0.91 + 0.01 x ∑{exponent driver ratings)**

Explain what is meant by the scale factor (sf), and why is it an exponent in the effort equation.

[5 marks]

d. Given the table below for the exponent driver ratings:

Driver	Very low	Low	Nominal	High
PREC	6.2	4.95	3.72	2.48
FLEX	5.07	4.05	3.04	2.03
RESL	7.07	5.65	4.24	2.83
TEAM	5.48	4.38	3.29	2.19
PMAT	7.80	6.24	4.68	3.12

Calculate the task effort required, assuming a product of effort multipliers 12.0. The project team members have an intermediate experience, but have worked before together as a team. The project is well defined, but software house is highly informal on its procedures, also, the team is given the freedom of choosing the best way to implement it.

[9 marks]

[Q2 Total: 25 marks]

Q 3 Answer the following:

a. What process model (software development model) will be most suitable to be used to develop each of the following. Explain:

i. A database of projects data in an engineering company

ii. Airline interactive system that allows passengers to follow up on flights status's whether in the terminals or online.

iii. Android game

[15 Marks, 5 each]

b. Planning for risk and executing risk reduction plans is itself an added cost to the project. State and explain the risk reduction leverage equation.

[10 marks]

[Q3 Total: 25 Marks]

Q 4 The following table represents the list of project activities, their durations, and dependencies. All tasks can start as soon as possible.

Task	Description	Duration (Working days)	Depends on
A1	Requirement Analysis	10	
A2	Feasibility Study	6	
B1	System Design	15	A1
B2	Modules Design	20	B1
C	Hardware Selection	5	A2, B1
D	Code Modules	20	B2
E	Test Modules	20	D
F	Code Integration	10	E
G	System Installation	10	C, F
H	User Training	5	F
I	Sign off	2	G, H

a. Create the precedence activity network. For each activity nodes, specify earliest start and finish dates, latest start and finish dates, and the total float.

[17 marks]

b. Determine the critical path of the project. What is the project's earliest finish date?

[4 marks]

c. Can there be more than one critical path OR no critical path in a project activity network? Explain.

[4 marks]

[Q4 Total: 25 Marks]

Model Answer

BUE The British University In Egypt الجامعة البريطانية في مصر	**14CSCI08I** **Final Examination,** **2014-2015**
Module Title **Software Project Management**	
Module Leader **Dr. GhadaHassan**	Semester **One**
Equipment allowed (for example calculator)	None

Instructions to Students

- You are required to attempt all FOUR questions**.**
- The exam paper is FIVE pages long.
- The approximate allocation of marks is shown in brackets by the questions.

This examination is **Two** hours long.

Model Answer

Q 1 Answer the following:

a. A university library is considering the implementation of a computer-based system by the university IT department to help manage book archiving, loans, and returns. The system should to be in place by the end of the next academic year.

i. Who are the stakeholders of such a project?

Stake holders are: IT department, library staff, students, university staff (+ possibly the general public if they have access to the library)

ii. What would be the success criteria of this project?

This project will be considered a success, if the IT team can deliver the software with functionalities for archiving, loans, and returns to the required level of quality and security by the start of the academic year, and with the budget set.

iii. Out of the top ten software risks list, identify and discuss two possible risks that you think this project is subject to.

Any two of (possibly others, if properly related to project)

1. The deadline set is unrealistic
2. The cost estimate maybe too little (inaccurate)
3. gold plating: asking for too many additional features that are not really necessary
4. short falls in externally supplied components

iv. For the risks you identified, explain a contingency plan for one of them.

2. Multiple estimation techniques, incremental development, analysis of previous projects
3. Same as 1
4. Requirement cleaning/scrubbing and prototypying
5. Formal specifications, contractual agreements, quality assurance procedure at supply

[16 marks,4 each]

b. Explain what is meant by the following:

ii) Maslow hierarchy of needs

Maslow suggested a hierarchy of needs for humans. The theiry is used within the context of motivation for different individuals. He theorised that within the hierarchy of needs, when the lower level of need is stratified, higher level of needs emerge. The hierarchy is (from lower to higher levels): physiological, safety, social, esteem, self actualization

iii) Gold plating

Clients asking for too many additional features that are not really necessary

iv) Project management activities – Explain, and mention two of these

Planning – deciding what to do

Organizing: making arrangements

Staffing: selecting the right people

Directing: giving instructions

Controlling: taking actions when problems occur

Innovation: coming up with new solutions

Representing: liaising wit clients, users, developers and any other stake holder

[9 marks, 3 each]

[Q1 Total: 25 marks]

Q 2 The university library is responsible for preparing a schedule for 2-hours introductory sessions held at the library at the beginning of each year. It is targeted at new students, and new staff members, and it shows who attends which session. The files accessed to create the report are: Staff File, Student File, and Teaching file (the library staff schedule). The reports generated may contain any of the following information based on enquiry type: lecture_name, instructor_name, staff_name, student_name, day_of_week, time, location.

a. Identify the Albrecht function points that this task would generate of the following types: *External inquiry type* (EI) and *Logical internal file (LI)*.

EI → transactions where data is output to use: Enquiries can be made by: lecture name, instructor_name staff name, student name = 4

LI → standing files used by system: staff file, student file, and teaching file = 3

[6 marks]

b. Given the multiplier of 4 for (EI) function points, and 10 for (LI) function points, and that the coding will be in Java, for which 60 lines of code correspond to one function point. Calculate the Albrecht function points, and accordingly estimate the expected code size?

[5 marks]

Function points = 4*4 + 3*10 = 16+30 = 44

Lines of code = 44*60 = 2640

c. The COCOMOII method for effort estimation is given by:

EFFORT(PM) = 2.94 (size)^{sf} x (product of effort multipliers)

Where**: sf = 0.91 + 0.01 x ∑{exponent driver ratings)**

Explain what is meant be the scale factor (sf), and why is it an exponent in the effort equation.

[5 marks]

The scale factor adjusts the estimate to take into account the various productivity factors. It is put in the equation as an exponent of the size, to reflect the fact that with larger project, the effort required may increase exponentially due to increase in management, communication and integration efforts required.

d. Given the table below for exponent driver ratings:

Driver	Very low	Low	Nominal	High
PREC	6.2	4.95	3.72	2.48

FLEX	5.07	4.05	3.04	2.03
RESL	7.07	5.65	4.24	2.83
TEAM	5.48	4.38	3.29	2.19
PMAT	7.80	6.24	4.68	3.12

Calculate the task effort required, assuming a product of effort multipliers of 12.0. The project team members have an intermediate experience, but have worked before together as a team. The project is well defined, but software house is highly informal on its procedures, the team is given the freedom of choosing the best way to implement it.

[9 marks]

EFFORT(PM) = 2.94 (size)^{sf} x (product of effort multipliers)

sf = 0.91 + 0.01 x ∑3.75 + 2.03+2.19+ 7.80 = 1.096

Effort = 2.94(2640)$^{1.096}$ x 12.0 Person-Months

[Q2 Total: 25 marks]

Q 3 Answer the following:

a. What process model (software development model) will be most suitable to be used to develop each of the following, explain your answer:

i. A database of previous projects data in an engineering company

Waterfall model/ spiral model : It is a traditional information system

ii. Airline interactive system that allows passengers to follow up on flights status's whether in the terminals or online.

Incremental/ evolutionary model: The system is real time/ embedded within other software systems already in place (possibly)

iii. Android game

Agile methods/ extreme programming/ evolutionary model : The game is an object oriented system, highly interactive, and its requirements may not very clear in the beginning, hence high interaction within team and with clients plus frequent demos can help speed up development.

[15 Marks, 5 each]

b. Planning for risk and executing risk reduction plans is itself an added cost to the project. State and explain the risk reduction leverage equation. **[10 marks]**

The risk reduction plan adds cost to the project. The risk leverage equation measures the cost effectiveness of a risk reduction action. It is given by:

$$\text{RRL} = \frac{\text{RE}_{\text{before}} - \text{RE}_{\text{after}}}{\text{risk reduction cost}}$$

Where RE is the risk exposure. An RRL above 1.00 indicates that the reduction in risk exposure achieved by a measure is greater than its cost.

[Q3 Total: 25 Marks]

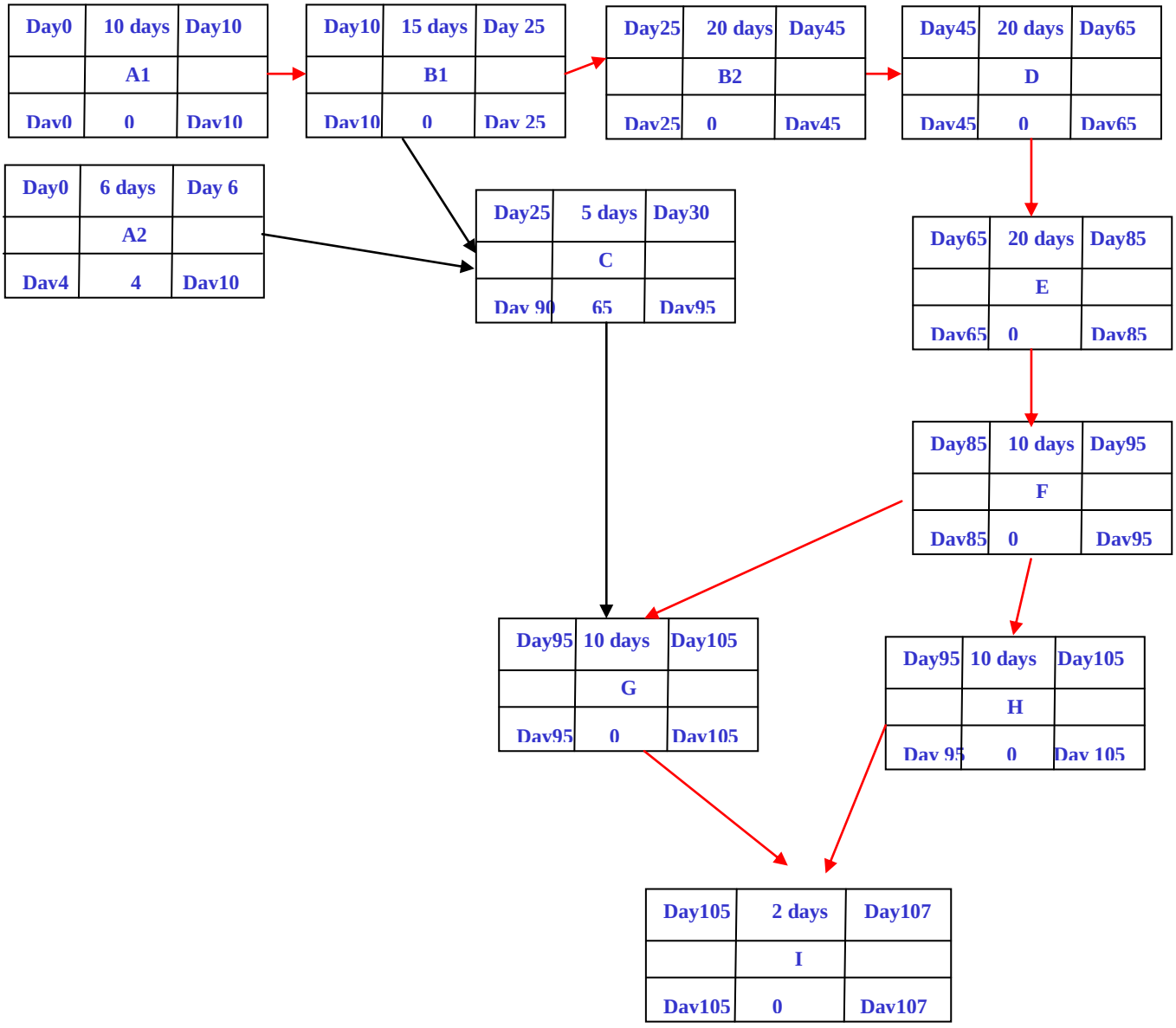
Q 4 The following table represents the list of project activities, their durations, and dependencies. All tasks can start as soon as possible.

Task	Description	Duration (Working days)	Depends on
A1	Requirement Analysis	10	
A2	Feasibility Study	6	
B1	System Design	15	A1
B2	Modules Design	20	B1
C	Hardware Selection	5	A2, B1
D	Code Modules	20	B2
E	Test Modules	20	D
F	Code Integration	10	E
G	System Installation	10	C, F
H	User Training	5	F
I	Sign off	2	G, H

a. Create the precedence activity network. For each activity nodes, specify earliest start and finish dates, latest start and finish dates, and the total float.

[17 marks]

Earliest Start	Duratio	Earliest Finish
	Activity	
Latest Start	Total float	Latest Finish



b. Determine the critical path of the project. What is the project's earliest finish date?

[4 marks]

The critical path is: **A1, B1, B2, D, E, F, H, I – AND**

The critical path is: **A1, B1, B2, D, E, F, G, I –**

Project earliest finish date is day 107

c. Can there be more than one critical path OR no critical path in a project activity network? Explain.

[4 marks]

There can be more than one critical path. There can be no critical path is the project finish date is imposed (by client or by software company) and it is more than the number of days the project will take.

[Q4 Total: 25 Marks]

Module Code: 13CSCI08I	**Title:** Software Project Management
Modular weight: 10	**Examination weighting:** 60%
Prerequisite modules: CSSE01C	
Reassessment: No restriction.	
Module Leader: Dr. Ghada Hassan	
Semester taught: 1	
Key words: IT Projects, Software Development Projects and Issues. Project Life-Cycle, Project Management, Project Planning, Risk Management Issues	
Date of latest revision: Aug. 2013	

Aims

The aim of the model is to provide an understanding of the considerations and issues particular to software development projects, and provide knowledge and hands-on experience with the techniques and tools that may be used to manage such projects. The module further aims to build basic project management skills with emphasise on the issues associated with software development and develop an appreciation of the role of good management in the successful and timely delivery of software projects.

Intended Learning Outcomes

Upon successful completion of this module students should demonstrate understanding and/or ability in:

Knowledge and understanding

1. The scope of “software project management”, the usual stages of projects involving IT and the considerations and key concepts and issues particular to such projects; [3]

Subject-specific skills

2. Appreciate the need for careful planning, monitoring and control in the successful and timely delivery of projects and their affect of the quality of the final product; [12]

3. The use and value of tools and techniques employed by software project managers. [14]

4. Effectively analyse requirements for a range of systems using appropriate techniques and identify the resources required for a project to produce a work plan and resource activity schedule; [8]

5. Monitor and report project progress and assess the risk of slippage, revising targets and/or schedules;[11]

6. Use project management tools to construct, organise, monitor and manage timelines, critical paths and milestones for a project (e.g. MS Project); [13]

Key/transferable skills

7. Develop interpersonal skills through working, communicating, and collaborating in a team on assigned projects as well as planning and managing personal time. [19]

Contents

Part 1 Software Projects and Project Management

Distinguishing between software and other types of development projects; overview of software engineering - software development paradigms, software lifecycle, systems analysis and design - requirements elicitation, interviewing, functional vs. non-functional requirements, prototyping, a reference to Unified Modelling Language (UML), developing a system specification, defining the scope of software project management.

Part 2 Project Management Concepts and Methodologies

Project planning and control – WBS, Gantt charts, precedence networks: PERT diagrams, documentation, reporting structure; evaluating risks involved and selecting appropriate strategies for minimising potential costs; selecting an appropriate process model, reducing risks by implementing the projects incrementally; software effort estimation, software estimation techniques; activity planning; resource allocation; software quality and control.

Project management tools and techniques – project monitoring and control; critical path analysis; PRINCE; DSDM; configuration management, risk management: team organisation, software measurement and metrics, cost estimation, risk analysis; understanding the importance of software quality standards to ensure meeting the project requirements; implementation and integration methods. Audit of information systems - audit techniques; performance standards; quality assurance; post-implementation review; project evaluation: project evaluation against strategic, technical and budget criteria; software testing - testing strategies and methods, quality assurance and management, verification and validation. Problems in project management - priorities; change control; contractual issues; identifying some of the factors that influence people's behaviour in a project environment.

Methods of Learning, Teaching and Assessment

Total student effort for the module is 100 hours on average.

Learning and Teaching

1. 12, 2h lectures, informing learning outcomes 1- 3.
2. 12, 1h workshops/labs, informing learning outcomes 4- 7.
3. 12, 1 hour board meetings (a substantial amount of student effort is expected outside of the formal sessions and progress will be monitored

and guided through the board meetings). This method will inform learning outcomes 4- 7.

4. 52 h private study (approx), informing learning outcomes 1-7.

Assessment

1. A technical development group project assessed by demonstrations and reports, which are expected to include detailed analysis of the process, management and issues arising throughout the project life-cycle. This includes 2 interim reports each of which is of (600-700) words, and a final presentation of at least 10 slides and project management report of (1800-2000) words accompanied by the developed system. Assessment is given for individual performance, teamwork performance and project technical achievements. This method carries 40% of the total mark and aims to develop and assess learning outcomes 4-7.

2. One 2-hour unseen written final examination carrying 60% of the total mark to assess learning outcomes 1-3.

Feedback given to students in response to assessed work

- Comments on the e-learning for the project phases
- Address the common mistakes during teaching sessions
- Face to face feedback during board meetings

Developmental feedback generated through teaching activities

Dialogue between students and staff in workshops and Labs.

Reading List

- Hughes, B. and Cotterell, M., "*Software Project Management*", 4th Edition, McGraw Hill, ISBN: 0-07-710989-9 (2006).
- Practical guide lines from the Software Program Manager's Network. (http://www.spmn.com).
- The ITtoolbox Project Management Knowledge Base (http://projectmanagement.ittoolbox.com/).