DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)
Academic Year 2006/2007 – 2nd Year Examination – Semester 4

IT4202: Software Project Management
PART 2 - Structured Question Paper
18th August 2007
(TWO HOURS)

Important Instructions:

- The duration of the paper is **2 (Two) hours**.

- The medium of instruction and questions is English.

- This paper has **3 questions** and **13 pages**.

- **Answer ALL 3 questions**. Question **1** carries **50 marks** and the **other two** questions carry **25 marks each.**

- **Write your answers** in English using the space provided **in this question paper**.

- Do not tear off any part of this answer book.

- Under no circumstances may this book, used or unused, be removed from the Examination Hall by a candidate.

- Note that questions appear on both sides of the paper.
  If a page is not printed, please inform the supervisor immediately.

Questions Answered

Indicate by a cross (✗), e.g ✗ the question numbers of the questions answered.

To be completed by the candidate by marking a cross (✗).	1	2	3	
To be completed by the examiners:				

1) **This question is based on the following case study.**

Case Study

The Ministry of Social Services of the Government has decided to implement a web system called *NeedMatch.* People and institutions which have needs of money, items and services will submit details of their situation and needs to the system. Government officials will then verify these requests and if genuine, will make them accessible on the system for public assistance with urgency ranks for the needs. The donors will then be able to commit money and services for the need requests of their choice. The donors can commit for either total or partial fulfilment of the needs. The commitments would be dynamically updated on the system.

Proposals have been called for by the Ministry for this project. The successful supplier will have to provide the database server hardware and database management system (DBMS) software, the interface software and the business logic software that would link the interface software with the database. The system is **not** required to handle the actual payments at present. The supplier will have to provide user manuals and also training for the staff. The supplier will have to finish the project by 30th November 2007.

The software development company that you work for has decided to send a proposal for this project and you have been appointed the manager for that effort. The company has decided to build the interface and the business logic software in-house and to buy from an external supplier the DBMS software.

(a) List important stakeholders in this project, the criteria which must be met for its success and the deliverables of the project.

(04 marks)

ANSWER IN THIS BOX

Stakeholders:

Ministry of Social Welfare, users, company management, project team

members, related staff in company, subcontractors

Criteria for success:

A quality system that would allow users/institutions to enter needs

correctly

A quality system that would allow officials to verify needs correctly

A quality system that would allow donors to commit funds/services

correctly

Completion by 30th November 2007

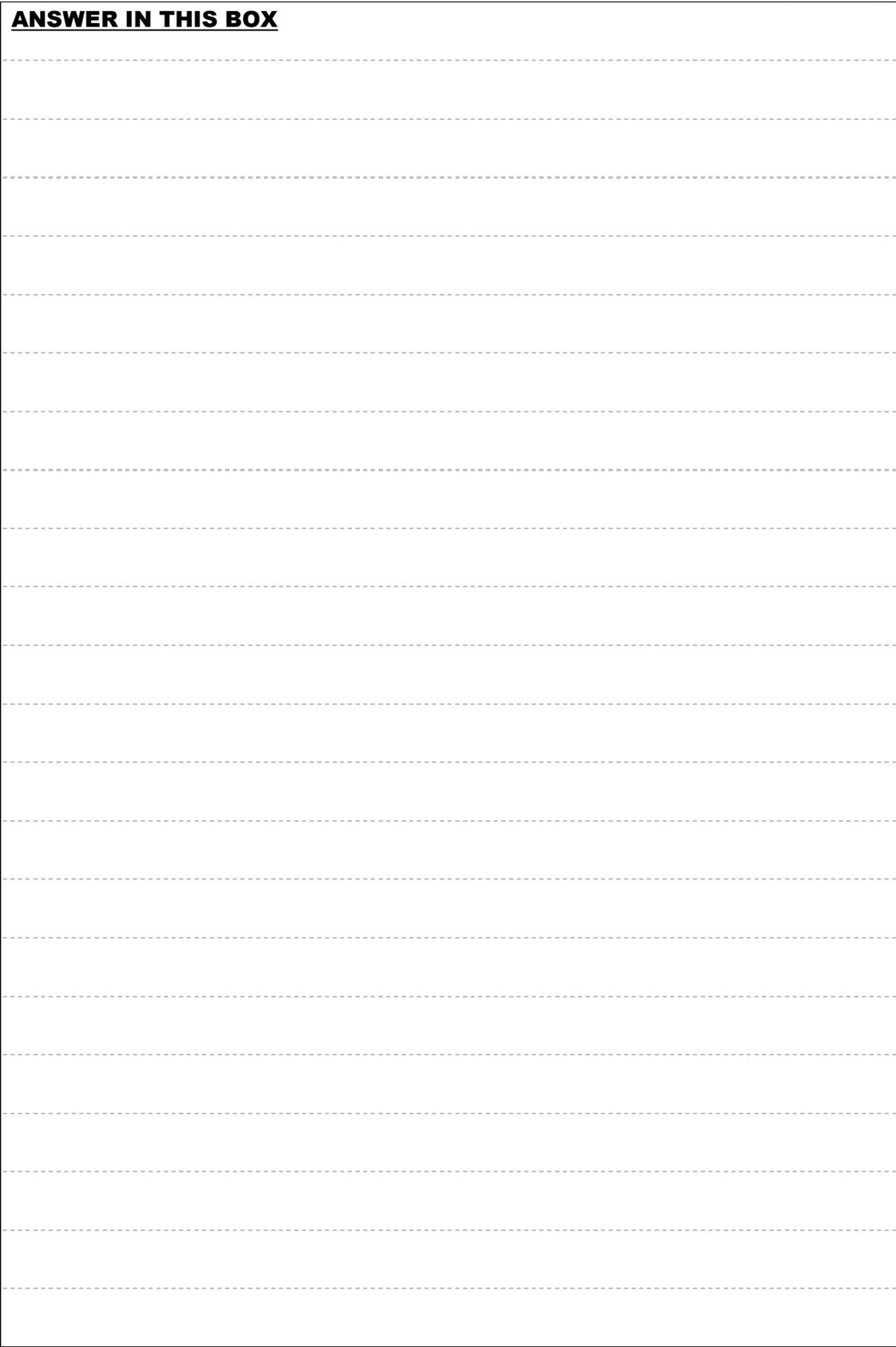**Cost of project not to exceed the estimated cost**

Deliverables: **Software (interface, business logic, database), server hardware,**

manuals, training

(b) Complete the following table for the project. In the **Activity** column, list the level-1 Work-breakdown-structure activities. In the **Duration** column, list the activity duration in **days**. In the **Precedents** column indicate the other activities which must be performed before the corresponding activity on the row can start. (Assume that the project starts on 3rd September 2007. Thus there are **62 working days** till 30th November 2007. Note that your answer may or may not use all the rows in the table.)

(11 marks)

ANSWER IN THIS BOX

Activity	Duration	Precedents
A. Design architecture	1	-
B. Get server hardware	25	A
C. Get DBMS software	30	A
D. Make interface and business logic software	15	A
E. Test	25	B,C,D
F. Prepare user manuals	5	B,C,D
G. Training	5	E,F

3

(c) Draw an activity network diagram for this project.

(10 marks)

ANSWER IN THIS BOX

(d) Describe the method to find the critical path of the diagram that you drew for (c) above.

(03 marks)

> **ANSWER IN THIS BOX**
>
> **Do a forward pass through the network to compute the earliest dates at which activities and the project can be completed. Then do a backward pass to calculate the latest date at which each activity may be started without delaying the end date of the project. The path through the network that defines the duration of the project is the critical path.**

(e) Assuming that the development software platform is available at your company, list the **other** resources which will be required for the **interface and business logic software development work of this project** along with the expected level of demand and cost for each resource.

(07 marks)

> **ANSWER IN THIS BOX**
>
> **Human Resources:**
>
> **1. Programmer to design, code, test and train the users; 1 no. for 60 days; salary for 60 days Rs. 60,000**
>
> **2. User Manual Developer to develop the user manual; 1 no for 5 days; salary Rs. 5000**
>
> **Hardware Resources:**
>
> **Two computers for development and user manual development at Rs. 1000 rent per day for 20 days (Total cost Rs. 20000)**
>
> **Other Resources:**
>
> **Stationery**

(f) Estimate the total cost for the **interface and business logic software development work** of this
project using your answer for (e) above.

(03 marks)

> **ANSWER IN THIS BOX**
>
> **Add the costs given for (e) above to get the total cost. Before giving the final cost**
>
> **estimate, it is usually recommended to add some extra amount as compensation**
>
> **costs to cover unexpected situations, staff overtime, etc.**

(g) Describe a way to make a budget for this project.

(03 marks)

> **ANSWER IN THIS BOX**
>
> **Allocate the project cost estimate to individual work items. These work items are**
>
> **based on the work breakdown structure for the project. Cost accounts can be**
>
> **maintained for each of them to track the money movement with respect to that**
>
> **work item.**

(h) List critical risks of this project and their management strategies.

(09 marks)

ANSWER IN THIS BOX

Risk	Management Strategy
Shortfalls in DBMS software	Formal specifications, contractual agreements, quality assurance procedures
Delays in DBMS software delivery	Contractual agreements
Shortfalls in hardware	Contractual agreements, Formal specifications, Inspections
Performance shortfalls	Good system design, quality assurance
Requirement changes	User involvement, prototyping, incremental development, good change control procedures
Incompatible DBMS	Formal specifications, good communication with the external DBMS developers

2) (a) Explain ways to achieve each of the good qualities, namely, *efficiency, maintainability* and *portability* in a software product.

(06 marks)

ANSWER IN THIS BOX

Efficiency:

This could be achieved using good algorithms which are

efficient in execution and storage.

Maintainability:

This could be achieved through programs which are simple and modular and

have an adequate number of comments which make them self-descriptive.

Portability:

This could be achieved through modular programs which are self-descriptive

and machine independent.

(b) *Efficiency, maintainability and portability* are three qualities which are desirable in a software product. Discuss **four (04)** other qualities which you consider to be **important** in a software product.

(05 marks)

ANSWER IN THIS BOX

Four of the following
1. Correctness: This is very important. The software has to correctly work according to its specification that was agreed with the stakeholders.

2. Usability: This is also very important. The program should be highly usable so that people will use it.

3. Integrity: Software should be protective against unauthorized access and manipulation.

4. Reliability: The program should be reliable in its working.

5. …

(c) Software projects generally follow several **sequential** stages such as analysis, design, coding and testing. It is recommended that errors be removed by careful examination of the deliverables at each stage **before** they are passed to the next. Discuss.

(04 marks)

ANSWER IN THIS BOX

Yes this is true. Errors which creep in at early stages are more expensive to correct at later stages for two reasons. One is that the later the error is found, the more rework at more stages of development will be needed. The second is that each successive stage of development is more detailed and less able to absorb change.

(d) List typical items which should be brought under configuration control in a project and list duties that a project manager would assign to a *configuration librarian*.

(10 marks)

ANSWER IN THIS BOX

Typical items which should be brought under configuration control

Any item that undergoes change in a software project should be preferably brought under configuration control. Two typical items are software programs and documentation.

Duties of a configuration librarian

Control of changes and documentation are the responsibility of a configuration librarian. His duties are;

- **the identification of all items which are subject to change control;**
- **the establishment and maintenance of a central repository of the master copies of all project documentation and software products;**
- **the setting up and running of a formal set of procedures to deal with changes;**
- **the maintenance of records of who has access to which library items and the status of each library item (e.g., whether they are in the development stage, under test or released).**

3)   (a) *Making everybody a winner* is a good concept to follow in software project management. As a project manager of a software development company, explain how you would make your employer and your team members all win.

(05 marks)

<u>**ANSWER IN THIS BOX**</u>

Employer:

By finishing the project successfully

Team members:

By keeping them motivated and satisfied; by making them contribute to the

successful completion of the project

(b) Do you recommend staff to regularly work overtime to finish projects? Discuss.

(04 marks)

<u>**ANSWER IN THIS BOX**</u>

No. Usually many software developers are expected to work overtime for no

additional payment. Sometimes it is necessary to work overtime on projects to

finish work on the set deadlines, but staff regularly working overtime could

cause long term problems. Good project management can reduce the

reliance on overtime by the more realistic assessment of effort and time

needed.

(c) Give the key points in a typical communication management plan.

(09 marks)

ANSWER IN THIS BOX

- **A description of a collection and filing structure for gathering and storing various types of information**
- **A distribution structure describing what information goes to whom, when and how: For example, are all status reports written or oral? Does every stakeholder receive every master schedule update? Do different people receive different formats of status reports?**
- **a format for communicating key project information: Is there a template for project team members to follow in preparing written and oral status reports? Is there a master list of all acronyms and definitions?**
- **a production schedule for producing the information: For example, do stakeholders know when to expect different information and when they need to attend key meetings? Has time been allowed for review and approval of key project documentation?**
- **access methods for obtaining the information: Can everyone access all project documentation? Who can attend what meetings?**

(d) Assume that your firm has decided to get a supplier to provide a piece of application software that you require for your project. Outline the stages which you would follow in the contract placement process from the decision to outsource to the actual selection.

(07 marks)

<u>**ANSWER IN THIS BOX**</u>

The stages that I would follow in contract placement are:

- **Requirement analysis: We need to have a clear set of requirements of the stuff needed.**

- **Evaluation plan: We need to draw up a plan of how the proposals which are submitted are to be evaluated.**

- **Invitation to tender: We have to issue the invitation to tender to prospective suppliers.**

- **Evaluation of proposals: This involves scrutiny of the proposed documents, interviewing suppliers' representatives, demonstrations, site visits and practical tests.**

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