35.3

DHARMSINH DESAI UNIVERSITY, NADIAD
MCA Department, Faculty of Technology

SEMESTER-III Examination
Sub: System Design Engineering
Max marks : 60
Hours: 3

Exam Seat No: _____
Date: 5/12/2007
Day: Wednesday
Time: 10 to 1

Instructions:
1. **Answer each SECTION in separate answer book.**
2. **Figures in the right indicate maximum marks for the question.**
3. **Write down the options only not the answer where options are given**
4. **While answering "match the following questions" answer as shown e.g. (a) – (i), (b) – (ii) etc.**
5. **The length of the answers depends upon the marks for that question**

SECTION - I

1 Answer the following **10**

A The following questions are of multiple choice. Select the most appropriate one and justify your answer: **(4 × 2 = 8)**

(i) Which of the following is the most important principle of input design?
(a) capture input electronically as close to the source as possible (b) minimize keystrokes
© never use on-line processing (d) use on-line processing when appropriate

(ii) Black-box testing attempts to find errors in which of the following categories
(a) incorrect or missing functions (b) interface errors © performance errors
(d) all of the above (e) none of the above

(iii) Which of the following is not a typical project milestone?
(a) Completion of design (b) Production of a prototype © Time for project member vacations
(d) Completed testing of the prototype (e) Approval of a pilot run

(iv) During implementation, the project team:
(a) concentrates on the business aspects of the system and tends to be oriented to a high level of specificity
(b) studies the organization's current procedures and the information systems used to perform organizational tasks
(c) determines the scope of the proposed systems and produces a specific plan for the proposed project
(d) codes, tests, and installs the new system

B The following questions are true or false. Marks will be given for justification **(2 × 1 = 2)**

(i) The focus of validation testing is to uncover places that a user will be able to observe failure of the software to conform to its requirements

(ii) The goal of the output mechanism is to simply and easily capture accurate information for the system, typically by using on-line or batch processing, capturing data at the source, and minimizing keystrokes

2	**Answer the following**		**10**
A	Name three types of faults that might be found by an inspection check and give an example to illustrate each		**(3)**
B	Explain the differences between verification and validation. Do you agree with some purists that formal verification should completely replace dynamic techniques in the verification and validation process? Justify your answer		**(2)**
C	What controls are needed on data transfer during conversion? Explain them in brief		**(2)**
D	Discuss the difference between black-box and white-box testing. Can we use them together in the defect testing process? Justify your answer.		**(3)**
	OR		
2	**Answer the following**		**10**
A	Explain why program inspections are an effective technique for discovering errors in a program.		**(2)**
B	What is systems conversion? What methods are used for systems conversion? Briefly explain each.		**(4)**
C	It is a testing whose basic technique is to repeat entire testing process after every change, however small. Name and explain it		**(2)**
D	What are the differences between statistical testing and defect testing?		**(2)**
3	**Answer the following**		**10**
A	What is system reliability? Discuss the approaches to system reliability pointing out the advantages and disadvantages of each.		**(3)**
B	What is the difference between Alpha and Beta testing? Explain why these forms of testing are particularly valuable		**(2)**
C	Describe in brief N-version programming approach		**(3)**
D	Compare and contrast equivalence partitioning and boundary value analysis of defect testing		**(2)**
	OR		
3	**Answer the following**		**10**
A	Describe briefly the four aspects of fault tolerance and also describe the two comparable approaches. From which model they were derived?		**(4)**
B	What is the difference between a test stub and a test driver?		**(2)**
C	Are SW faults and SW failures same? Justify your answer		**(1)**
D	Reliability in a software system can be achieved using three complementary strategies. Name and explain them.		**(3)**

SECTION - II

SECTION - II

4 Answer the following **10**

A The following questions are of multiple choice. Select the most appropriate one and justify your answer: **(4 × 2 = 8)**

(i) Which of the following can be elements of computer-based systems?
(a) documentation (b) software © people (d) hardware
(e) (b), (c) & (d) (f) all of the above

(ii) Which of the following fact-finding techniques is preferred when the validity of data collected through other methods is in question, or when the complexity of certain aspects of the system prevents a clear explanation by the knowledge workers?
(a) sampling (b) observation (c) questionnaires (d) interviews (e) research and site visits

(iii) Which design model is analogous to a set of detailed drawings for each room in a house?
(a) Architectural design (b) Component-level design © Data design (d) Database design

(iv) The spiral model of software development
(a) ends with the delivery of the software product
(b) is more chaotic than the incremental model
(c) includes project risks evaluation during each iteration
(d) All of the above

B The following questions are filling up the blanks, choose the most appropriate word(s) (2 × 1 = 2)

(i) _____ questions require a response to express a viewpoint, but _____ questions require a direct answer from the interviewee, and _____ is a question that follows to verify the answer of an earlier one

(ii) _____ refers to the strength of the relationship between modules and _____ refers to the number of sub-ordinate modules controlled by a calling module.

5 Answer the following **10**

A What do you think happens when requirements validation uncovers an error? Who is involved in correcting the error? **(2)**

B What is the importance of preliminary investigation? What are the main activities in preliminary investigation? **(2)**

C Consider the traditional Waterfall model of system development and Prototyping, your task is to provide a analytical review of the two (include the advantages and disadvantages also). Can you identify the ideal situations for the two methodologies to be applied? **(3)**

D Explain the difference between a structured and an unstructured interview. When is each type of interview appropriately used? **(3)**

OR

5 Answer the following **10**

A What are software requirements? What are the concept of user requirements and system requirements? Why these requirements are explained using various notations and not by natural English? Are there any differences between functional and non-functional requirements? **(5)**

B If a prototype is developed and utilized, and the decision is later made to abandon the application altogether, was the investment in the prototype a waste of time and resources? Explain the reason for your answer. **(3)**

C Mr. Shah is a newly hired systems analyst with ABC Company with your group where you are chief systems analyst. Mr. Shah has always felt that questionnaires are a waste. Now that you will be doing a systems project for Jaipur Golden Transport Company, a national transport firm with branches and employees in more than 100 cities and towns in India, you want to use a questionnaire to elicit some options about the current and proposed systems.
(i) Based on what you know about Mr. Shah and Jaipur Golden Transport Company, give four persuasive reasons why he should use a questionnaire for this study. **(2)**

6 Answer the following **10**

A What is a black hole? What is a miracle? Explain them with illustration **(3)**

B What are the three construct used in structured programming. Briefly explain each of them **(3)**

C Are there any differences between the designs of input for online and batch processing systems? **(2)**

D What is output? What are the objectives in designing outputs layout? **(2)**

OR

6 Answer the following **10**

A What is the relation of data items and structures to a data flows, processes, and data stores? Explain them with diagrams **(3)**

B What is structured chart? What are its purposes? Is there any relation between data flow diagrams and structured charts? Justify your answer **(3)**

C What are coding methods? What purpose do they serve? Discuss the different types? **(4)**