

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

SEMESTER FINAL EXAMINATION**SUMMER SEMESTER, 2014-2015****TIME: 3 Hours****FULL MARKS: 150****CSE 4601: Software Engineering and Object Oriented Design****Programmable calculators are not allowed. Do not write anything on the question paper.**There are **8 (eight)** questions. Answer any **6 (six)** of them.

Figures in the right margin indicate marks.

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|--|----|
| a) Briefly describe Waterfall process model. Which types of software projects use Waterfall model? | 10 |
| b) Explain the equation $RE = P * C$ in assessing the risk impact with necessary figure. | 7 |
| c) The following code block of Apache web server, version 2.0.48 has a serious bug which cannot be detected in regular unit testing approach but can be found by static analysis. What is the problem with the code? How can you fix the bug? What are the consequences of the bug if it goes undetected? | 8 |
| <pre>static void ssl_io_filter_disable(ap_filter_t *f) { bio_filter_in_ctx_t *inctx = f->ctx; inctx->ssl = NULL; inctx->filter_ctx->pssl = NULL; }</pre> | |
| a) What is TDD? How does XP agile process model use TDD? | 6 |
| b) Briefly describe façade design pattern with an example. | 7 |
| c) Define Cross-Site Scripting (XSS). | 6 |
| d) Briefly describe activity diagram. | 6 |
| a) Briefly describe CMM. | 10 |
| b) Prepare the Risk Information Sheet (RIS) for the risk “ 50% of the code is supposed to be developed by freelancers and the code must be integrateable”. The company has a history that 50% of the code are always developed by the freelancers without any problem. There is 80% probability that the rest 50% code developed by freelancers may go wrong and may need to be redeveloped. Each line of code costs 02 cents and the project size is 1 million LOC. | 8 |
| c) Briefly describe factory pattern with an example. | 7 |
| a) Write the differences between system testing and integration testing. | 8 |
| b) Usability is one of the keys for a software to be successful. How can you increase the usability of a software? Can QFD help to improve the usability of software? | 7 |
| c) Suppose you are asked to develop a mobile based software ‘Easy Salat’ that will pronounce athan five times a day. As there are variations in prayer times, the software will download the timing chart from the server online. The software should have other features like task reminder, recitation of few surahs etc. Provide a SCRUM iteration plan for the software ‘Easy Salat’. You are free to propose innovative features in the software and thus add them in your iteration plan. Explain the development plan for each iteration with proper justification. | 10 |

5. a) Suppose, three software companies (A, B and C) have released 3G communication software for smart phones. Initially they could grab market shares of 30%, 50% and 20% respectively where the market size is 1000. The market is growing double every year. The companies are improving their products and maintaining their SQA activities. However 95% of company A's customers are happy; company B has 80% satisfied customers; but 100% customers of company C are happy with their software. If the situation continues, what will be the market shares for companies A, B and C after 2(two) years? 8.
- b) Mention three test metrics and three quality metrics that you have measured or acquainted with.
- c) Big-bang testing means "Test only after integrating all modules". What are the benefits and drawbacks of this testing approach?
6. a) What is the integration testing strategy taken in the following Figure 1. Justify your answer.

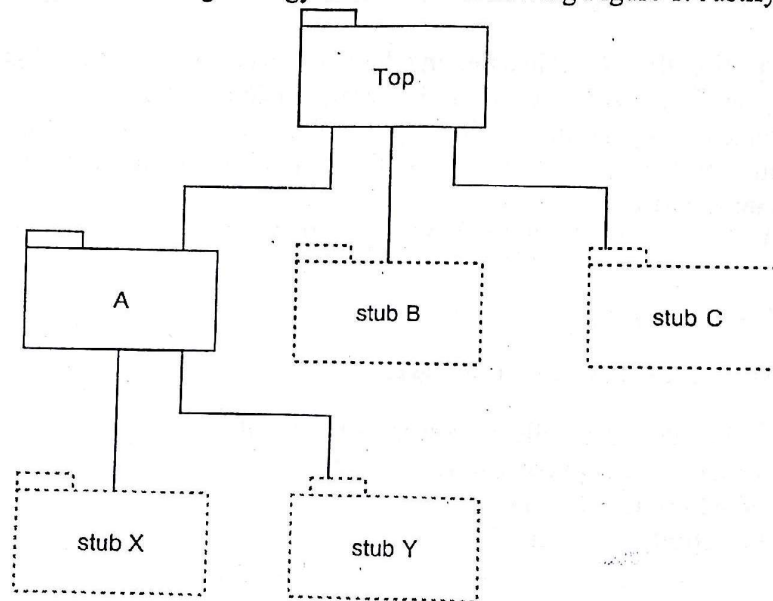


Figure 1.

- b) Education board allows education institutes to query about a student's GPA if his roll number is given. Use Service Oriented Architecture (SOA) i.e. design a web service that will return a student's GPA as response if a request is send to the web service with the roll number. [Pictorial design of the SOA will be accepted as the answer.]
- c) What is FURPS? What testing and other QA efforts can help in achieving satisfactory FURPS?
7. a) Testing is expensive and still never ending. Deciding an optimal testing strategy that suites the project time and budget is very crucial. Cyclomatic complexity and 80-20 rule can help in this respect. Explain. Can you suggest any other strategy for optimizing the test effort?
- b) Briefly discuss on FTR procedure.
- c) List the project management activites for a typical software project.
- d) ISO 9001 does not provide any techical details or constraints about the testing or quality measurement procedures. Explain why.

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8. a) Table 1 shows the activities, their precedence relationship and projected completion times. Calculate the Expected Time for the activities using PERT. Take floor in case of fraction. 10

Table 1

Activity	Precedence	Optimistic Time	Pessimistic Time	Most Likely Time
A	-	5	10	8
B	-	6	12	10
C	-	4	8	8
D	B	12	20	20
E	C	8	12	12
F	A	14	16	15
G	A	14	19	17
H	F	7	10	9
I	G	5	9	8
J	D,E	12	16	14

- b) Use the activities and their Expected Time (floor) to construct a network for CPM and determine the critical path. 15