



SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

**Higher National Diploma in Information Technology
Second Year, 2nd Semester Examination – 2017
HNDIT 2412, Software Configuration Management (FT/PT)**

Marking Scheme

Question 1

- I. What do you mean by Software Configuration Management? (02 marks)

Configuration management is unique identification, controlled storage, change control, and status reporting of selected intermediate work products, product components, and products during the life of a system.

- II. Define the term "Configuration Item" and give three (03) example for that. (04 marks)

It is a single entity in the configuration management process. As well as an item which is produced in several versions.----(01 marks)

- *Source programs----(01 marks)*
- *Executable codes----(01 marks)*
- *Documents------(01 marks)*
- *Data -----(01 marks)--- (only 03 among them)*

- III. Define the three (03) types of SCM libraries. (06 marks)

- *Controlled library / configuration management library----(01 marks)*
It is where configuration items are stored. It may be divided into a number of physical libraries such as documents, source code,etc----(01 marks)

- *Dynamic library/development library-----(01 marks)*
It is where items are kept while they are being produced this will be in the producer's own area-----(01 marks)
- *Static Library/user library-----(01 marks)*
It is where items are used while being used in the static library, items must not be changed. -----(01 marks)

IV. List out all the main activities in SCM and briefly explain them. (08 marks)

- *Identification----- (01 marks)*
The purpose of the identification activity is to determine the metadata for a configuration item. Using meta data CI can be identified.----- (01 marks)
- *Storage----- (01 marks)*
The purpose of storage is to ensure that a configuration item will not disappear or be damaged and that a record is kept to indicate who has been given the item or a copy of it. ----- (01 marks)
- *Change control----- (01 marks)*
Change control is a set of processes and approval stages required to change a configuration item's attributes. ----- (01 marks)
- *Status reporting*
Status reporting makes available, in a useful and readable way, the information necessary to effectively manage a product's development and maintenance.

Question 2

I. Define the term "Version Control System" and give four (04) example of Version

Version Control is tracking and controlling changes to documents, computer programs, large web sites, and other collections of information. ----(02 marks)

- 1. Subversion----(01 marks)*
- 2. Git----(01 marks)*
- 3. CVS----(01 marks)*
- 4. Visual Source Safe----(01 marks)*

II. List out Four (04) usages of Version Control System.
marks)

(04

- It automates the process of keeping revisions----(01 marks)*
- It includes tools to compare and merge different versions----(01 marks)*
- It supports for multiple users----(01 marks)*
- It allows you to separate permanent changes from trial work using branches----(01 marks)*
- It keeps descriptions of your changes to make it easier to find the version you need----(01 marks) --- (only 04 among them)*

III. Define the terms “Working copy” and “Repository”.

(04 marks)

Working copy:

A working copy is the copy you have checked out to your working area. It doesn't matter if it is a branch or from the trunk. It's what you are working on. ----(02 marks)

Repository:

SVN repository (or Subversion repository) is a collection of files and directories,

bundled together in a special database that also records a complete history of all the changes that have ever been made to these files. ----(02 marks)

IV. Write short notes for the following terms.

(06 marks)

Commit:

Send changes from your working copy to the repository.

Eg. svn commit -m "added a new file." ----(02 marks)

Update:

***svn update** brings changes from the repository into your working copy. If no revision is given, it brings your working copy up to date with the HEAD revision.*

Eg. svn update----(02 marks)

Check out:

By checking out files from a Subversion repository, you obtain a local working copy of the repository, which you can edit.

Eg. svn checkout http://svn.server.com/svn/project_repo --username=tom----(02 marks)

Question 3

I. Explain the situation "conflict".

(04 marks)

Conflict occurs when two or more developers have changed the same few lines of a file. For an example, user1 edits few lines of a file and he check out the changes, as well as the user2 edits same few lines of the same file and he tries to check out, that time svn does not allow to check out. This situation is called conflict. ----(04 marks)

II. How to solve the conflict problem? (02 marks)

Uses the resolve command to inform Subversion about the conflict resolution.

Eg. svn resolve --accept=working file name. ----(02 marks)

III. Why do we use "svn add" command? (02 marks)

Schedule files, directories, or symbolic links in your working copy for addition to the repository. They will be uploaded and added to the repository on your next commit.----- (02 marks)

IV. Consider a situation that a team is going to develop a software project. The software manager is creating the main repository in the remote server. Write the svn command for the following processes.

(12 marks)

- a) Manager creates an empty directory in the c:\ drive and then tells the Subversion to create a new repository in the directory, and add "index.html" file to the repository. ----(03 marks)
- b) User1 checks out the project from the repository to his local machine directory prj1_working. And then he is adding some more line into the "index.html" file and add the file to the repository.
- c) User 2 is doing the same work in his local machine directory prj2_working what the User1 has done, and check the status.
- d) User2 is trying to upload the changes to the repository, that time the svn does not allow them to upload the changes. Explain the reason.
- e) Then the User2 is identifying the changes of the version.

a) *mkdir c:\repository----(01 marks)*

svnadmin create c:\repository----(01 marks)

svn import file:///c:/repository -m "initial import" ----(01 marks)

b) *svn co file:///c:/repository prj1_working----(01 marks)*

svn commit -m "initial commit"----(01 marks)

c) svn co file:///c:/repository prj2_working----(01 marks)

svn status index.html----(01 marks)

d) svn commit -m "first commit"----(01 marks)

The reason is, the repository and the working copy of the User2 are different because of the work done by user1. So without updating the working copy of User2, the SVN does not allow the User to do in repository. ----(03 marks)

e) svn diff index.html----(01 marks)

Question 4

- I. A software company have three software engineer Tom, Jerry, and Chin and a Software manager kenny. They planned to use Version Control System to manage the software development. Write the svn command to the following processes.

(16 marks)

- a) Kenny creates an empty directory in the c:\ drive and then tells the Subversion to create a new repository NewRepository in the directory r and add two java files MainPros.java and DataStore.java.
- b) Tom, Jerry, and Chin create directories respectively prTom, prJerry, and prChin in their local machine and importing the project from the repository.
- c) Tom adds a methods with four lines of statements to the DataStore.java file and save the changes to the local directory, and then check the svn status of the file. Finally check the file into the repository.
- d) Jerry deletes some unwanted lines of code from the MainPros.java and

add two new lines of code, and then check the status of the file. Finally, he try to commit the changes to the repository.

- e) The system does not allow Jerry to check the file into the repository, then Jerry check the status and update, and finally he checks the different between Jerry's working copy and the repository using 'svn diff -rHEAD'.
- f) Jerry update his local directory, and then he check his changes to the repository.
- g) At the same time Chin delete the same lines of code what Jerry has deleted, and he adds two news line of code to the MainPros.java. Finally he try to check the file to the repository, and then he try to update the local directory but he got the conflict message.
- h) Then Chin resolve the conflict.

a) mkdir c:\NewRepository----(01 marks)

svna dmin create c:\ NewRepository ----(01 marks)

svn import file:///c:/ NewRepository -m "initial import" ----(01 marks)

b) mkdir c:\prTom

mkdir c:\prJerry

mkdir c:\prChin ----(01 marks)

svn co file:///c:/repository prTom

svn co file:///c:/repository prJerry

svn co file:///c:/repository prChin ----(01 marks)

- c) *svn status DataStore.java*----(01 marks)
svn commit -m "new method is added"----(01 marks)
- d) *svn status MainPros.java* ----(01 marks)
svn commit -m "The file is modified"----(01 marks)
- e) *svn status --show-updates*----(01 marks)
svn diff -rHEAD MainPros.java----(01 marks)
- f) *svn update*----(01 marks)
svn commit -m "The file is modified"----(01 marks)
- g) *svn commit -m "The file is modified"*----(01 marks)
svn update----(01 marks)
- h) *svn resolved MainPros.java*----(01 marks)

II. Briefly define the following terms. (04 marks)

- a) Atomic Commit
- b) Revision Tag.

- a) *An Atomic Commit is an operation in which a set of distinct changes is applied as a single operation. If the changes are applied then the atomic commit is said to have succeeded. If there is a failure before the atomic commit can be completed then all of the changes completed in the atomic commit are reversed.*
----- (02 marks)

- b) *A Revision Tag is the term often used to define a textual label that can be associated with a specific revision of a project maintained by a revision control system. This allows the user to define a meaningful name to be given to a particular state of a project that is under version control. ----(02 marks)*

Question 5

- I. List down all the functions of Version Control System. (05 marks)

VCS stores and retrieves multiple revisions of program and other text----(01 marks)

VCS maintains a complete history of changes----(01 marks)

VCS can merge multiple lines of development----(01 marks)

VCS flags coding conflicts----(01 marks)

VCS provides high-level retrieval functions----(01 marks)

- II. What are the requirements for configuration Management Tool? (04 marks)

Integration with Other Tools----(01 marks)

Scalability----(01 marks)

Usability----(01 marks)

Performance----(01 marks)

- III. What do you mean by Agile Development, and list down common characteristics of Agile Methods? (06 marks)

IV.

Agile software development centers on the following 4 values

Individuals and interactions over processes and tools

- *Working software over comprehensive documentation*

- *Customer collaboration over contract negotiation*
- *Responding to change over following a plan----(02 marks)*

Common characteristics

Incremental development----(01 marks)

Cooperative----(01 marks)

Straightforward----(01 marks)

Adaptive----(01 marks)

- V. Explain the Client-Server and Distributed Model in Revision control. (05 marks)

Client-Server Model

Here server is the central repository for all changes.

Clients only store the current version of files.

Frequent or even constant connection to the server is needed.

Examples include Subversion and TFS. ----(2.5 marks)

Distributed Model

Here each client has a complete copy of all the change history – your own repository.

It can perform most tasks with no connections to external systems.

It shows greater flexibility with whom you share your changes.

Examples include Mercurial and Git. ----(2.5 marks)

Question 6

- I. Why do we use commit command without “-m” option? (02 marks)

If you don't specify the -m option, Subversion will try to open an editor for you to type in a log message. So if you want to type single line of log message you use -m and if you want to type multiple lines of log message you don't use -m. ----(02 marks)

- II. In which situation you use “log” and “Revert” svn command. (04 marks)

Log

svn log shows the log messages for all files and directories inside (and including) the current working directory of your working copy. So if you need to show revision no, user, date & time, comment in the descending order of revision no, you can use log command. ----(02 marks)

Revert

Reverts any local changes to a file or directory and resolves any conflicted states. svn revert will revert not only the contents of an item in your working copy, but also any property changes. ----(02 marks)

- III. What is the different between “Check out” and “Check In” svn command? (02 marks)

Check out (update)

By checking out, a developer can simply get a copy of the latest code from the repository. ----(01 marks)

Check In (commit)

By checking in, the developer adds their changes to the repository. ----(01 marks)

IV. Write a short notes for the following terms in SVM.
marks)

(06

a) Version

The initial release or re-release of a configuration item associated with a complete compilation or recompilation of the item. Different versions have different functionality. ----(02 marks)

b) Trunk

A branch without a parent is referred to as the trunk or the mainline. Trunk refers to the unnamed branch (version) of a file tree under revision control. The trunk is usually meant to be the base of a project on which development progresses. -----(02 marks)

c) Branch

Branching is the duplication of an object under revision control (such as a source code file) so that modifications can happen in parallel along both branches. Branches are also known as trees, streams or code lines. ----(02 marks)

V. When we use some svn command, we will get some short symbol in the result. Briefly explain the following symbol.
(06 marks)

a) "+++" and "---".

Original file is preceded by "---" and the new file is preceded by "+++".-----(02 marks)

b) "M".

"M" is showing us that Subversion recognizes that this file has been modified locally and that these changes have not yet been saved in the repository. ----(02 marks)

c) "G".

'G' means there was a conflict and it has been resolved. ----(02 marks)