SWDVC301 – VERSION CONTROL
DATE: WEDNESDAY,19 JUNE 2024
PERIOD: 08:30AM – 11:30 AM

NESA NATIONAL EXAMINATION AND SCHOOL INSPECTION AUTHORITY

END OF TERM III EXAMINATIONS

SCHOOL YEAR: 2023/2024

MARKING GUIDE

SECTOR: ICT AND MULTIMEDIA

RQF LEVEL: 3

TRADE: SOFTWARE DEVELOPMENT

MARKS: ...../100 **CAMIS:** ...../70

DURATION: 3 HOURS

INSTRUCTIONS TO CANDIDATES:

This Exam paper is composed of Three Sections (A, B, C). Follow the instructions given below and answer the indicated questions for a total of 100 marks.

Section **A**: Seventeen (**17**) questions, all **Compulsory** **55 marks**

Section **B**: Among the five (**5**) questions, attempt any three (3) **30 marks.**

Section **C**: Between the two (**2**) questions, attempt any one (1) **15 marks**

Allowed materials:

- Ruler
- Blue or Black pen
- Non programable calculator

SECTION A: Attempt all questions **(55 marks)**

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01. Write the acronyms below in their full forms: **(2marks)**

a) VCS
b) GIT
c) CMD
d) BASH

Answer:

a) VCS: Version Control System /**0.5 marks**
b) GIT: Global Information Tracker /**0.5 marks**
c) CMD: Command or Command Prompt /**0.5 marks**
d) BASH: Bourne Again Shell /**0.5 marks**

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.1 Definitions of general key terms, page 3, remembering).

02. Define the terms below: **(5marks)**

a) Repository
b) Version control
c) Git
d) GitHub
e) Terminal

Answer:

a) Repository: a Git repository tracks and saves the history of all changes made to the files in a Git project. /**1 mark**

b) Version control: version control is a system that records changes to a file or set of files over time so that you can recall specific versions later**.** /**1 mark**

c) Git is the most commonly used version control system. It tracks the changes you make to files, so you have a record of what has been done, and you can revert to specific versions should you ever need too /**1 mark**

d) GitHub is a Git repository hosting service. GitHub also facilitates with many of its features, such as access control and collaboration. It provides a Web-based graphical interface. /**1 mark**

e) Terminal: is an interface that lets you access the command line Bash and CMD). /**1 mark**

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.2 Introduction to version control, page 3, remembering).

03. From question I up to question VIII, choose the best answer. **(4marks)**

I. Command line environment is used for interacting with git.
   a) git Lab
   b) GitHub
   c) git Boot
   d) git Bash

II. How do you save the current state of your code into the git version control?
   a) Using git stage
   b) Using git commit
   c) Using git push
   d) Using git add

III. Which of the following advantage of using GIT?
   a) Collaboration friendly
   b) Data redundancy and replication
   c) Data redundancy and replication
   d) All of the above

IV. What comes first, staging with git add or committing with git commit?
   a) Committing with git commit
   b) Staging with git add
   c) None of these

V. Identify the correct commit syntax for all changes with a message?
   a) git add -a "I'm coding"

b) git commit -am "I'm coding"

c) git message -am "I'm coding"

d) None of these

VI. Which of the following shortcut to staging all the changes you have?

a) git push -am "Message"

b) git add .

c) git commit add.

d) git commit.

VII. Which of the following command is used to give a message description?

a) Git command –m

b) Git command –d

c) Git command –message

d) None of the mentioned

VIII. Point out the wrong statement:

a) You need GitHub to use Git

b) Github allows you to share repositories with others

c) GitHub allows to access others repositories

d) All of the mentione

Answer:

I. Command line environment is used for interacting with Git
d) Git Bash /0.5 marks

II. How do you save the current state of your code into the Git version control?
b) Using Git commit /0.5 marks

III. Which of the following advantage of using GIT?
d) All of the above /0.5 marks

IV. What comes first, staging with Git add or committing with Git commit?
b) Staging with Git add /0.5 marks

V. Identify the correct commit syntax for all changes with a message?
d) None of these /0.5 marks

VI. Which of the following shortcut to staging all the changes you have?

b) Git add . **/0.5 marks**

VII. Which of the following command is used to give a message description?

a)Git command –m /0.5 marks

VIII. Point out the wrong statement.

a) You need GitHub to use Git /0.5 mark

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.2 Introduction to version control, page 3, remembering).

04. Apart from Git and GitHub version control systems, list other eight (8) version control systems you know. **(4marks)**

Answer:

- CVS (Concurrent Version System) **/0.5 marks**
- Mercurial **/0.5 marks**
- SVN (subversion) **/0.5 marks**
- GitLab **/0.5 marks**
- AWS(Amazon Web Service) Code Commit **/0.5 marks**
- Perforce **/0.5 marks**
- Beanstalk **/0.5 marks**
- Team Foundation Server **/0.5 marks**
- Bitbucket **/0.5 marks**

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.3 description of Git, page 3, remembering.

05. What are four (4) benefits of using version control systems? **(4marks)**

Answer:

- Help in managing and protecting the source code **/1 mark**
- Keep track of all the modifications made to the code **/1 mark**
- Comparing earlier versions of the code **/1 mark**
- Supports developer's workflow and not any rigid way of working **/ 1 mark**

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.2 Introduction to version control, page 3, remembering)

06. Define the following GIT commands: **(5marks)**

a) git init
b) git add
c) git config
d) git checkout
e) git remote

Answer:

a) Git init: this command turns a directory into an empty Git repository. This is the first step in creating a repository. **/1 mark**
b) Git add: adds files in the staging area for Git. **/1 mark**
c) Git config : used to configure configurations and settings **/1 mark**
d) Git checkout: to start working in a different branch, use Git checkout to switch branches. **/1 mark**
e) Git remote: to connect a local repository with a remote repository. **/1 mark**

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.4 Use of GitHub, page 3, remembering).

07. Name four (4) benefits of using GitHub. **(4marks)**

Answer: (consider four (4))

- It is easy to contribute to open-source projects via GitHub. **/1 mark**
- It helps to create an excellent document. **/1 mark**
- You can attract recruiter by showing off your work. If you have a profile on GitHub, you will have a higher chance of being recruited. **/1 mark**
- It allows your work to get out there in front of the public. **/1 mark**
- You can track changes in your code across versions. **/1 mark**

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.4 Use of GitHub, page 3, remembering).

08. Explain the following types of version control systems: local, centralized and distributed version control systems. **(3marks)**

Answer:

- A local version control system is a local database located on your local computer, in which every file change is stored as a patch. **/1 mark**
- With centralized version control systems, you have a single "central" copy of your project on a server and commit your changes to this central copy.

  A centralized version control system offers software development teams a way to collaborate using a central server. In a centralized version control system (CVCS), a server acts as the main repository which stores every version of code. **/1 mark**
- With distributed version control systems (DVCS), you don't rely on a central server to store all the versions of a project's files. Instead, you clone a copy of a repository locally so that you have the full history of the project.

A distributed version control system (DVCS) is a type of version control where the complete codebase — including its full version history — is mirrored on every developer's computer. It's abbreviated DVCS. Changes to files are tracked between computers. **/1 mark**

Reference: (curriculum 2022, learning outcome 2: Manipulate files, indicative content: 2.1. Definition of general key terms, page 3, understanding).

09. Differentiate bare repositories from non-bare repositories**.** **(3marks)**

Answer:

Bare Repositories

Software development teams use **bare repositories** to share changes made by team members. Individual users aren't allowed to modify or create new versions of the repository. **Whereas /1 mark**

With **non-bare repositories**, users can modify the existing repository and create new versions. **/1 mark**

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.1 Definitions of general key terms, page 3, understanding).

10. Outline four (4) problems that may be presented without the existence of version control systems. **(4marks)**

Answer:

- Lack of collaboration **/1 mark**
- Problem in storing versions **/1 mark**
- Problem in restoring previous version once needed **/1 mark**
- Problem of backup **/1 mark**

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.2 Introduction to version control, page 3, understanding).

11. Relate steps to follow for creating new branch in GitHub **(3marks)**

Answer: (consider 6 steps)
Creating a new branch in GitHub involves the following steps.

- Navigate to the Repository **/0.5 marks.**
- Go to the Branch Dropdown **/0.5 marks.**
- Click on the Branch Dropdown **/0.5 marks.**
- Type New Branch Name **/0.5 marks.**
- Press Enter or Click on "Create Branch" **/0.5 marks.**
- Confirmation **/0.5 marks**
- Start Working on the New Branch **/0.5 marks.**

Reference:(curriculum 2022, learning outcome 1: setup repository, indicative content: 1.4 Use of GitHub repository, page 3, understanding).

12. Outline steps to follow for deleting existing repository in GitHub **(3marks)**

Answer:
To delete an existing repository in GitHub, follow these steps:
1. Navigate to the Repository:
- Log in to your GitHub account and navigate to the repository you want to delete. **/0.5 marks**

2. Go to Repository Settings:

- In the repository's navigation menu, click on the "Settings" tab located towards the right side of the repository page. **/0.5 marks**

3. Scroll Down to Danger Zone:
   - Scroll down to the bottom of the Settings page. You'll find a section titled "Danger Zone." **/0.5 marks**

4. Click on "Delete this repository":
   - Within the "Danger Zone" section, there's a button labeled "Delete this repository." Click on it. **/0.5 marks**

5. Confirm Repository Name:
   - GitHub will prompt you to confirm the name of the repository you're about to delete. Enter the name of the repository to confirm. **0.5 marks**

6. Confirm Deletion:
   - GitHub will display a final confirmation message, informing you that this action cannot be undone. Review the information carefully. **/0.5 marks**

7. Type Repository Name to Confirm:
   - In the confirmation dialog box, type the name of the repository again to confirm that you indeed want to delete it. **/0.5 marks**

8. Click on "I understand the consequences, delete this repository":
   - After typing the repository name, check the box next to "I understand the consequences, delete this repository." **/0.5 marks**

9. Click on "Delete":
   - Once you've confirmed the deletion, the "Delete" button will become clickable. Click on it to confirm the deletion of the repository. **/0.5 marks**

10. Verify Deletion:
   - GitHub will delete the repository and display a confirmation message. Verify that the repository has been successfully deleted. **/0.5 marks**

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.4 Use of GitHub repository, page 3, understanding).

13. Explain the following terms: **(3marks)**

a) Staging area

b) Working directory

c) Remote repository

Answer:

a) Staging area

The term "staging area" in the context of version control systems like Git refers to an intermediate area where changes to files are prepared before they are committed to the repository. It's also known as the "index" in Git. **/1 mark**

b) Working directory

The term "working directory" in the context of version control systems like Git refers to the directory on your local machine where you are actively working on your project files. It contains all the files and directories that make up your project. **/1 mark**

c) Remote repository

A remote repository, in the context of version control systems like Git, is a repository that is hosted on a remote server rather than on your local machine. It serves as a central location where multiple developers can collaborate on a project by sharing and syncing their changes. **/1 mark**

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.4 Use of GitHub repository, page 2, understanding).

14. Match the version control terminology in column A to its description in column B by writing number with its corresponding. **(3marks)**

Answer	Column A	Column B
	1. pull	A. will list branches
	2. push	B. it is used to record the changes in the repository
	3. branch	C. used to upload local repository contents to a remote repository
	4. commit	D. used to fetch and download contents from a remote repository and immediately update the local repository to match that content

	5. fetch	E. downloads changes from a remote repository without modifying the local repository
	6. clone	F. Creates a local copy of a project that already exists remotely.

Answer:

Answer	Column A	Column B	
1....D	7. pull	G. will list branches	**/0.5 marks**
2....C	8. push	H. it is used to record the changes in the repository	**/0.5 marks**
3....A	9. branch	I. used to upload local repository contents to a remote repository	**/0.5 marks**
4.....B	10. commit	J. used to fetch and download contents from a remote repository and immediately update the local repository to match that content	**/0.5 marks**
5....E	11.fetch	K. downloads changes from a remote repository without modifying the local repository	**/0.5 marks**
6.....F	12. clone	L. Creates a local copy of a project that already exists remotely.	**/0.5 marks**

Reference: (curriculum 2022, learning outcome 3: ship codes, indicative content: 1.1 Definition of general key terms, page 7, applying).

15. Rewrite sentences below and complete them with the following words: **(2marks)**

CMD, computer, push and remote.

Answer:

Git can be installed on **computer.** Once running Git commands, you can use **CMD** or Git bash. We can use different Git commands in order to perform different tasks such as create a repository, clone a repository, **push** local repository to **remote** VC and others. **/2 marks**

Reference: (curriculum 2022, learning outcome 1: setup repository, indicative content: 1.3 description of Git, page 3, applying).

16. Identify the meaning of pull request. **(2marks)**

Answer:

Pull Request: is a request made by one developer to another developer to merge their branch into the target branch.

It allows developers to review and discuss changes before merging them into the main branch. **/2 marks**

Reference:(curriculum 2022, learning outcome 3: Ship codes, indicative content: 3.1. Definition of general key terms, page 9, applying).

17. Utilize the correct syntax to show how to perform the following actions in git: **(2marks)**

a) To unstage a file in git.
b) Edit commit message.
c) To rename a branch in git
d) delete the created branch in git.

Answer:

a) To unstage a file in Git.
   Git reset HEAD <file> **/0.5 marks**
   Example: Git reset HEAD example.txt
b) Edit commit message
   Git commit --amend -m "New commit message" **/0.5 marks.**
c) To rename a branch in Git
   Git branch -m <old-branch-name> <new-branch-name> **/0.5 marks**
d) delete the created branch in Git
   Git branch -D <branch-name> **/0.5 marks**

Reference: (curriculum 2022, learning outcome 2: manipulate files, indicative content: 1.2 add file change to staging area, page 5, applying)

Section B: Attempt any three (3) questions **(30 marks)**

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18. When working on Git, there may happen conflict. Answer the questions below related to conflict in Git: **(10marks)**

(i) Define clearly the meaning of conflict in Git.

(ii) List the steps for resolving conflict in Git

Answer:

i. Identify the meaning of conflict in Git

Conflict in Git occurs when two or more developers have made changes to the same part of a file, and those changes can't be automatically merged. When this happens, Git will mark the file as conflicted and leave it up to the developers to resolve the conflict. **/4 marks**

Answer:

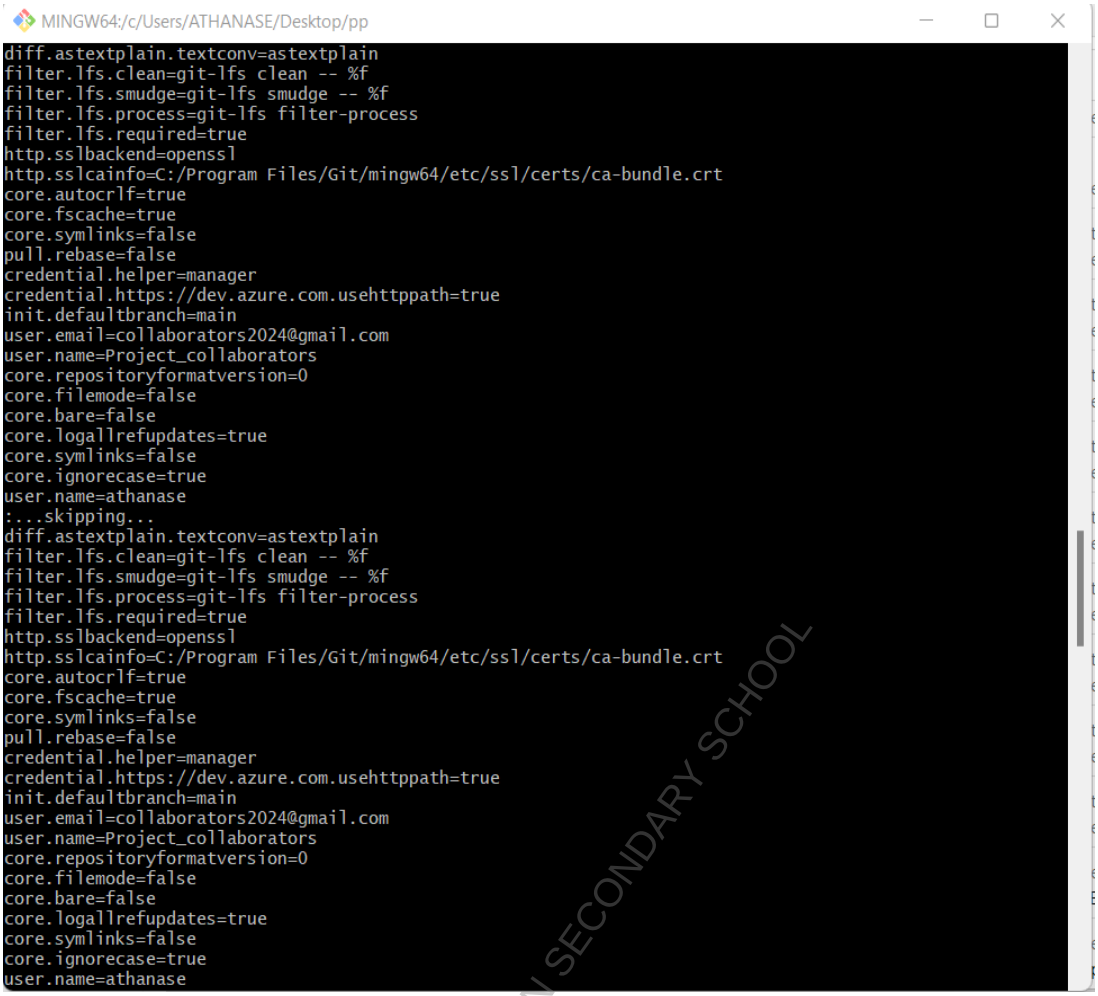
ii. List the steps for resolving conflict in Git

Here are the steps that will help you resolve conflicts in Git:

- Identify the files responsible for the conflicts. **/1.5 marks**
- Implement the desired changes to the files **/1.5 marks**
- Add the files using the Git add command. **/1.5 marks**
- The last step is to commit the changes in the file with the help of the Git commit command. **/1.5 marks**

Reference: (curriculum 2022, learning outcome 2: manipulate files, indicative content: 1.2 add file change to staging area, page 5, analyzing).

19. The image below shows git configuration settings. Analyze it carefully and provide answers to questions that follow: **(10marks)**



a) According to information shown on the image, state the email and the user name.

b) According to information shown on the image, state the name of branch.

c) What are git commands to run in order to set email and user name?

d) Analyze how you can unset configuration settings (email and username).

Answer:

a) According to information shown on the image, state the email and the user name

The email is collaborators2024@gmail.com and the user name is Project_collaborators **/3 marks**

b) According to information shown on the image, state the branch

The branch is main **/1 mark**

c) What are Git commands to run in order to set email and user name?

Git commands to run in order to set email and user name are:

$ Git config - -global user.email "collaborators2024@gmail.com"

$ Git config - -global user.name "Project_collaborators" **/3 marks**

d) Analyze how you can unset configuration settings (email and username).

We use the following commands:

$ Git config - -global - -unset user.email

$ Git config - -global - -unset user.name **/3 marks**

Reference:(curriculum 2022, learning outcome 1: setup repository, indicative content: 1.3 description of Git, page 3, analyzing).

20. The picture below is the GitHub's logged in account. Analyze it and answer the questions that follow: **(10marks)**

i. Show where to click for signing out.

ii. Show where to click for creating new repository.

iii. Discover the number of repositories created for this account.

Answer:

i. Show where to click for signing out **/4marks**

For signing out, you click on 1

ii. Show where to click creating new repository. **/4marks**

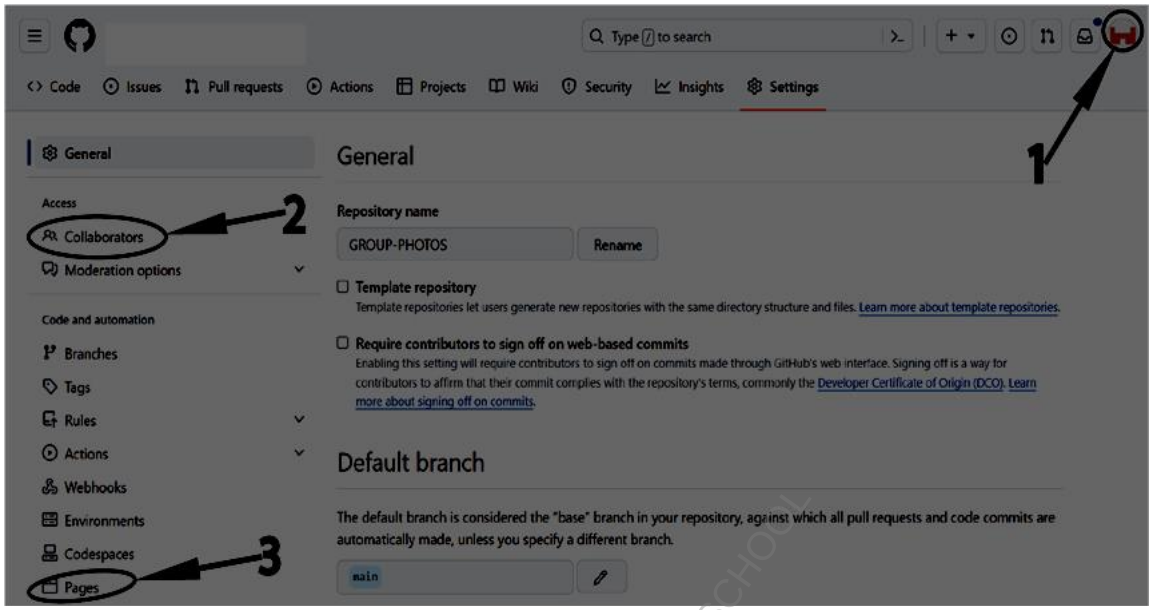
For creating a new repository, you click on 2

iii. How many repositories created for this account? **/2marks**

There are 4 repositories created for this account

Reference:(curriculum 2022, learning outcome 1: setup repository, indicative content: 1.3 use of GitHub repository, page 4, analyzing).

21. examine carefully the picture below and respond to the questions that follow: **(10marks)**



i. Which tab to be used in order to deploy the website to make it visible online to visitors?

ii. On which tab to be clicked in order to invite people?

iii. Demonstrate where to click for adding another account.

iv. determine the name of repository.

22. With the help of table, compare Git pull and Git fetch **(10marks)**

Answer: (consider five (5))

Here's a table comparing **Git pull** and **Git fetch**:

Feature	**Git Pull**	**Git Fetch**
Purpose	Fetches changes from a remote repository and merges	Fetches changes from a remote repository without merging
Operation	Combines a fetch and a merge operation in one command	Separates fetching from merging, requires two commands **/2marks**
Merging	Automatically merges fetched changes into the current branch	Does not merge fetched changes, **/2marks**

		Leaves them in the remote-tracking branches **/2marks**
Local changes	Can potentially lead to conflicts if local changes are not committed or stashed	Safely fetches changes without altering **/2marks** local branches
Branch tracking	Automatically updates the local branch to track the corresponding remote branch	Updates remote-Tracking branches**/2marks,** but local branches are not **/2marks** automatically updated
Usage	Commonly used for quickly updating a local branch with changes from a remote repository	Used when wanting to inspect fetched changes before merging or when **/2marks** updating local branches separately

Reference: (curriculum 2022, learning outcome 3: ship codes, indicative content: 3.1 Definition of general key terms, page 4, analyzing).

Section C: Attempt only one (1) question **(15 marks)**

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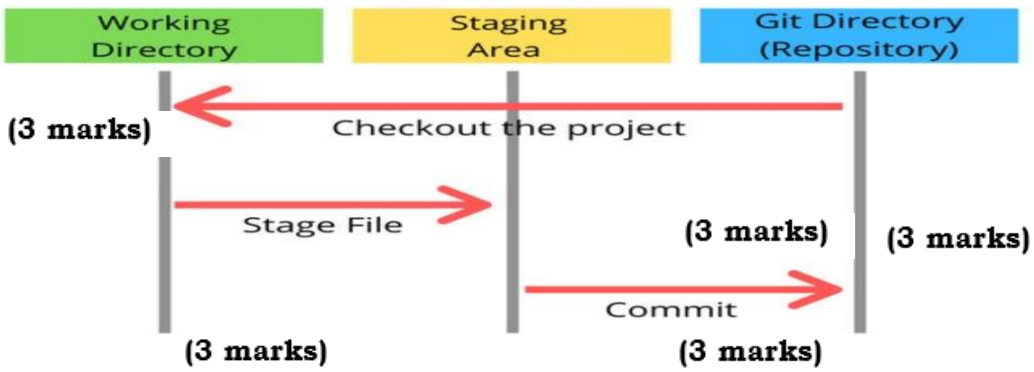
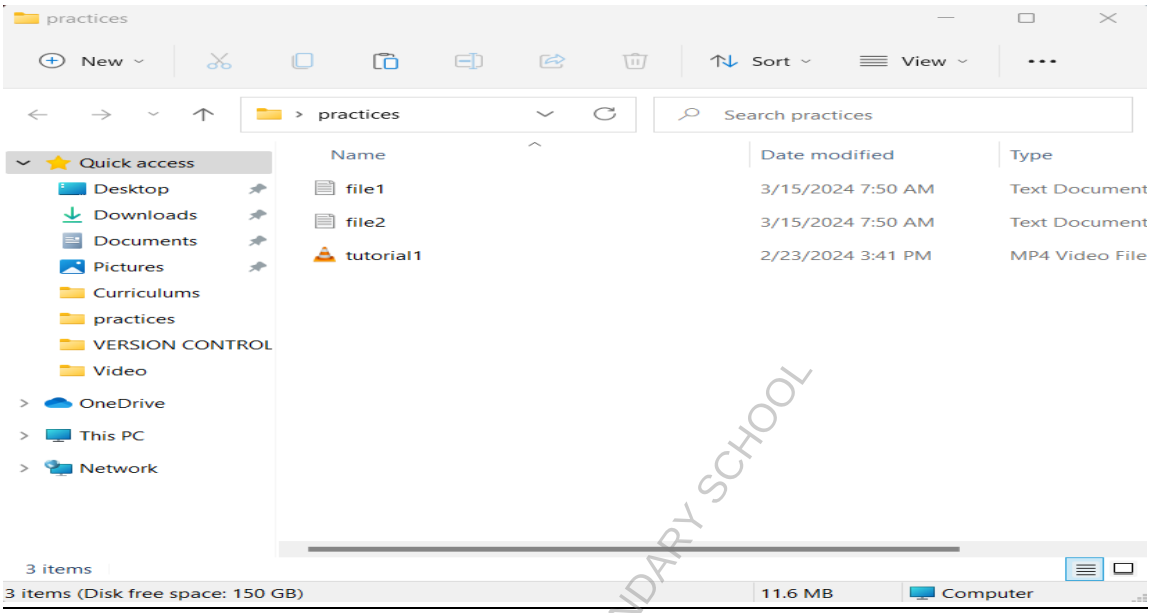
23. Create a diagram of GIT architecture. **(15marks)**

Answer:



Reference: curriculum 2022, learning outcome 1: setup repository, indicative content: 1.3 description of Git, page 3, creating.

24. The picture below is a working directory that contains three files namely: file1, file2 and tutorial1. **(15marks)**



Suppose that file1 and file2 have .txt extension and tutorial1 has .mp4 extension.

a) Create a git command to initialize it. Means to create a git empty repository.

b) Create a git command to add these all files in the staging area.

c) Create a git command for committing changes with the following commit message" save three files"

d) Create a git command to add another branch called "pages".

e) Create a git command to switch to pages branch

Answer:

'eate a Git command to initialize it. Means to create a Git empty
pository.
)mmand to initialize it. Means to create a Git empty repository is:
t init **/ 3 marks**
'eate a Git command to add all these files in the staging area.
t command to add all these files in the staging area is:
t add . **/3 marks**
'eate a Git command for committing changes with the following commit

t command for committing changes with the following commit message"
ve three files" is:
t commit –m"save three files" **/3 marks**
eate a Git command to add another branch called "pages"
t command to add another branch called "pages" is:
t branch pages **/3 marks**
eate a Git command to switch to pages branch
command to switch to pages branch is:
t checkout pages **/3 marks**

Reference: curriculum 2022, learning outcome 2: manipulate files, indicative content: 3.4. Merge branches on remote repository, page 6, creating.

END OF ASSESSMENT