INTRODUCTION TO SOFTWARE SYSTEMS: QUIZ 1 – SET A ANSWER KEY

Max Marks: 80 (20 × 4)

Correct options are highlighted.

1. Which of the following specifies the block of statements in a loop in Bash?
   a) begin, end b) **do, done** c) then, fi d) NOTA

   Explanation:
   - (a) begin, end: Not used in Bash. These keywords are associated with other languages (e.g., Pascal) but have no syntactic meaning in shell scripting.
   - **(b) do, done**: In Bash, loop bodies (such as `for`, `while`, and `until`) are enclosed between `do` and `done`.
   - (c) then, fi: Used for conditional statements (`if-then-fi`) in Bash, not for loops.

2. What will be the output of the following Python code? If $x =$ `'abcd'`

   ```
   for i in range(len(x)): print(i, end=' ')
   ```

   a) a b c d b) 1 2 3 4 c) **0 1 2 3** d) error

   ```
   >>> x = 'abcd'
   >>> for i in range(len(x)): print(i, end=' ')
   ...
   0 1 2 3 >>>
   ```

   Explanation: In Python, if a loop or conditional has only a single statement, it can be written on the same line after the colon without indentation. The loop runs over `range(len(x)) = range(4)`, printing the indices.

3. What happens to `file1` if the following command is executed from the shell?

   ```
   touch file1
   ```

   a) Is deleted b) Becomes empty c) **Date is modified** d) NOTA

   Explanation: `touch` updates the access and modification timestamps of an existing file; file contents remain unchanged.

4. In Bash, the type of a variable input using a `read` statement is?
   a) int b) string c) float d) **Can vary**

   Explanation: The `read` command reads input as text and stores it as text, but Bash variables are untyped. This text is not a typed *string*; its interpretation (numeric or textual) depends entirely on how the variable is used.

```
read x
echo $x          # treated as string
echo $((x + 1))  # treated as integer
```

5. If `A=[[1,2,3],[4,5,6],[7,8,9]]`, which of the following results in a value of 6?
   a) **A[1][-1]** b) A[3][2] c) A[2][3] d) A[2][1]

   Explanation: Python uses zero-based indexing. `A[1]` selects the second row `[4,5,6]`, and index `-1` selects the last element, which is `6`.
   - `A[3][2]`: Out of bounds.
   - `A[2][3]`: Out of bounds.
   - `A[2][1]`: Refers to value `8`, not `6`.

6. When executing a command in shell, we can redirect the error messages to a file using:
   a) `>>` b) `>` c) **2>** d) NOTA

   Explanation: In the shell, file descriptor `2` corresponds to standard error (`stderr`). The operator `2>` redirects error messages to a file.
   - `>`: Redirects standard output (`stdout`) to a file, overwriting it.
   - `>>`: Appends standard output (`stdout`) to a file.
   - `2>`: Redirects standard error (`stderr`) to a file.

7. In Python, the value of

```
print("xyyzxyzxzxyy".count('yy'))
```

   is: a) 1 b) error c) 0 d) **2**

```
>>> print("xyyzxyzxzxyy".count('yy'))
2
```

8. Which of the following is a Python list?
   a) `1, 2, 3` b) **[1, 2, 3]** c) `(1, 2, 3)` d) `{1, 2, 3}`

   Explanation: Square brackets `[ ]` denote lists in Python; commas alone form a tuple, parentheses form a tuple, and braces form a set.

9. Which of the following concepts is NOT a part of Python?
   a) Lists b) Dynamic Types c) Modules d) **Pointers**

   Explanation: Python abstracts memory management and does not provide pointer operations, unlike C or C++. In contrast, lists are built-in data structures, dynamic typing is a core language feature, and modules are fundamental to Python's program organization.

10. What will be the value of the following Python expression? $4 + 3$
    a) 2 b) 4 c) 1 d) **7**

    Explanation: bro 😭
    This is an arithmetic expression, so it evaluates to a number, not a boolean value.

11. Which of the following is NOT a core data type in Python programming?
    a) List b) Complex c) Float d) **Array**

    Explanation: Python's core built-in data types include lists, complex numbers, and floats. Arrays are not a core data type; they are provided by external modules.

```
x = [1, 2, 3]    # List
y = 3.14         # Float
z = 2 + 3j       # Complex
```

12. What will be the result of the following Python expression? `"a"+"bc"`
    a) **abc** b) a c) bca d) bc

```
>>> "a" + "bc"
'abc'
```

13. After executing `C="IIIT H"` in Python, which of the following will correct it to `"IIITH"`?
    a) `C[3:4]='T'` b) `C[3:3]='T'` c) `C.insert('T', 3)` d) **NOTA**

    Explanation: Strings in Python are immutable, meaning their contents cannot be modified in place.
    - `C[3:4] = 'T'`: Invalid because slice assignment is not allowed on strings.
    - `C[3:3] = 'T'`: Also invalid for the same reason; strings do not support item or slice assignment.
    - `C.insert('T', 3)`: Invalid because `insert` is a list method, not a string method.

14. What arithmetic operators CANNOT be used with strings in Python?
    a) `*` b) **`-`** c) `+` d) All of the above

    Explanation: Python allows some arithmetic-like operators on strings, but not all.
    - `*`: Can be used to repeat strings, e.g., `"ab" * 3` gives `"ababab"`.
    - `-`: Cannot be used with strings; subtraction is undefined for string objects.
    - `+`: Can be used to concatenate strings, e.g., `"a" + "bc"` gives `"abc"`.

15. If $x = 2$, what will be the value of x after the following Python code?

    ```
    x << 2
    ```

    a) 8 b) 4 c) **2** d) 1

    Explanation: TRICK QUESTION! The expression `x << 2` is evaluated, but its result is not assigned back to `x`. The value of `x` changes only if the result is explicitly reassigned, e.g., `x = x << 2`.

16. In a bash script, we can access the first command line argument using:
    a) **$1** b) $args[0] c) $args[1] d) $#

    Explanation: Bash provides positional parameters to access command-line arguments, where `$1` refers to the first argument.
    - `$1`: Correct. Refers to the first command-line argument passed to the script.
    - `$args[0]`: Invalid in Bash; this syntax is used in other languages, not in shell scripting.
    - `$args[1]`: Also invalid for the same reason; Bash does not have an `args` array by default.
    - `$#`: Refers to the total number of command-line arguments, not an individual argument.

17. Which command creates a copy of an existing git repository?
    a) **git clone** b) `git replace` c) `git move` d) `git copy`

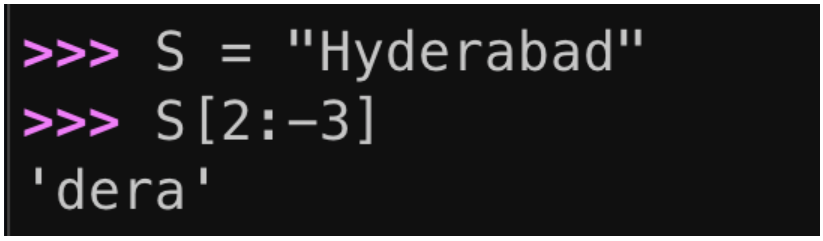
    Explanation:
    - **`git clone`**: Correct. Creates a new local copy of an existing repository, including its history, branches, and configuration.
    - `git replace`: Used to replace objects in the Git object database for advanced history rewriting; it does not copy repositories.
    - `git move`: Not a Git command; Git uses `git mv` to rename or move files within a repository.
    - `git copy`: Not a valid Git command.

18. Which of the following character is not used for comments in C, Python or Bash?
    a) # b) **!** c) /* d) //

    Explanation:
    - `#`: Used for comments in Python and Bash.
    - `/*`: Used for block comments in C.
    - `//`: Used for single-line comments in C.
    - `!`: Not used for comments in any of these languages; in Bash, it is used for history expansion or in the shebang line.

19. If $S =$ `"Hyderabad"` in Python, the value of `S[2:-3]` will be:
    a) **dera** b) era c) der d) NOTA

    Explanation: Python slicing follows the form `S[start:end]`, where the start index is inclusive and the end index is exclusive. Negative indices count from the end of the string. Thus, characters from index `2` up to (but not including) index `-3` are selected, resulting in `"dera"`.



20. `git fetch + git merge` is equal to?
    a) `git branch` b) **git pull** c) `git push` d) NOTA

    Explanation: `git fetch` downloads updates from the remote repository and updates the remote-tracking branches without modifying the current branch. `git merge` then integrates those fetched changes into the current branch.
    - **`git pull`**: Correct. It performs a `git fetch` followed by a `git merge` in a single command.
    - `git branch`: Used to create, list, or delete branches; it does not retrieve or integrate remote changes.
    - `git push`: Sends local commits to a remote repository; it does not fetch or merge remote updates.