الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العـالــي والبحث العلمي

اللجنة الوطنية للإشراف ومتابعة تنفيذ برنامج التكوين الأولي لطلبة الدكتوراه الطور الثالث
اللجنة الوطنية البيداغوجية لخبراء مادة أساسيات وتقنيات البرمجة

Subject: Programming Fundamentals and Techniques **المادة: أساسيات وتقنيات البرمجة**

Final Test for HSS

Duration: 01h15 **Academic Year:** 2025/2026 **Mark: 20 pts**

First name		Last name	
Speciality		Department/faculty	

First, you need to fill in the table above. The multiple-choice questionnaire contains 60 questions covering the three mandatory parts of the FTP module. For each question, you must select the correct answer.

Part I : Introduction to Computer Programming

1. A variable is used to:
   - ☐ Repeat instructions
   - ☐ Test a condition
   - ☐ Store a value
   - ☐ Display a message
2. The data type of 3.14 is:
   - ☐ Integer
   - ☐ Float
   - ☐ Boolean
   - ☐ String
3. Which value is Boolean?
   - ☐ "true"
   - ☐ 1
   - ☐ 4 > 2
   - ☐ 'A'
4. A string value is:
   - ☐ 'A'
   - ☐ 12
   - ☐ 5.6
   - ☐ "Hello"
5. In Tab[2], the number 2 represents:
   - ☐ The value
   - ☐ The type
   - ☐ The index
   - ☐ The name

6. Which loop repeats a known number of times?
   - ☐ While
   - ☐ For
   - ☐ If
   - ☐ Else
7. Which data type is best for age?
   - ☐ Float
   - ☐ Boolean
   - ☐ Integer
   - ☐ String
8. An array allows:
   - ☐ One value only
   - ☐ Multiple values
   - ☐ A condition
   - ☐ A loop
9. Tab = [3,5,7,0] → Tab[1] = ?
   - ☐ 0
   - ☐ 3
   - ☐ 5
   - ☐ 7
10. Which loop checks the condition at the beginning?
    - ☐ do...until
    - ☐ for
    - ☐ while
    - ☐ if
11. Blockly is:
    - ☐ A machine language
    - ☐ A textual language
    - ☐ A visual programming language
    - ☐ A compiler
12. A variable can change its value:
    - ☐ Never
    - ☐ Once
    - ☐ Many times
    - ☐ Only at start
13. If age = 16, what is displayed?

```
if age >= 18
  display "Adult"
else
  display "Minor"
```

    - ☐ Adult
    - ☐ Minor
    - ☐ Nothing
    - ☐ Error

14. What is displayed?

```
x = 5
display x + 2
```

- [ ] 52
- [x] 7
- [ ] x+2
- [ ] Error

15. What is the final value of sum?

```
sum = 0
for i from 1 to 3
 sum = sum + i
```

- [ ] 3
- [x] 6
- [ ] 1
- [ ] 0

16. If a while condition is false at the start:

- [ ] Loop runs once
- [x] Loop never runs
- [ ] Error
- [ ] Loop always runs

17. What is the logical error?

```
i = 1
while i <= 5
 display i
```

- [ ] No error
- [x] i never increases
- [ ] Wrong display
- [ ] Wrong condition

18. A type error may cause:

- [x] Logical error
- [ ] Display
- [ ] Loop
- [ ] Input

19. What is the output?

```
i = 1
do
 display i
 i = i + 1
until i > 3
```

- [ ] 1
- [ ] 1 2
- [x] 1 2 3
- [ ] 1 2 3 4

20. A bad condition can cause:

- [ ] Infinite loop
- [ ] Wrong output

- [ ] Incorrect result
- [x] All answers

Part 2: Basic Programming Concepts in Python

21. Python is considered an interpreted language because:

- [ ] It requires compilation before execution
- [x] It runs directly without translation into machine code
- [ ] It only works with bytecode
- [ ] It cannot run on multiple platforms

22. Which of the following is not a feature of Python?

- [ ] Dynamic typing
- [ ] Automatic memory management
- [x] Manual garbage collection
- [ ] Object-oriented support

23. Why is Python considered a "versatile" language?

- [ ] It can only be used for Web Development.
- [ ] It is strictly for Data Science.
- [x] It is used in various fields like AI, web development, data science, and automation.
- [ ] It runs faster than C++.

24. What is the type of a = 2+3j?

- [ ] float
- [ ] int
- [x] complex
- [ ] string

25. Which of the following variables names is valid?

- [ ] 2ndVariable
- [ ] variable-name
- [x] variable_name
- [ ] variable name

26. Which operator has the highest precedence?

- [x] **
- [ ] +
- [ ] -
- [ ] %

27. Which operator is used for exponentiation?

- [ ] ^
- [x] **
- [ ] exp()
- [ ] pow

28. The output of 3*2+5*4-1 is:

- [x] 25
- [ ] 27
- [ ] 21

- [ ] 23

29. What is the output of print("Ali is %d years old" % 10)?
    - [ ] Ali is %d years old
    - [x] Ali is 10 years old
    - [ ] Ali is 10.0 years old
    - [ ] Error

30. What is the output of the following python code:

```
x = 10
if x <= 15:
    y = x + 15
elif x <= 30:
    y = x + 30
else:
    y = x
print(y)
```

    - [x] 25
    - [ ] 40
    - [ ] 10
    - [ ] Error

31. Which loop is best for indefinite repetition?
    - [ ] for
    - [x] while
    - [ ] match
    - [ ] if

32. What is the output of the following Python code:

```
for x in range(4,0,-1):
    print(x)
```

    - [x] 4 3 2 1
    - [ ] 0 1 2 3 4
    - [ ] 4 3 2
    - [ ] Error

33. Which method removes an element by index?
    - [x] pop()
    - [ ] remove()
    - [ ] delete()
    - [ ] discard()

34. Which method counts occurrences of an element in a list?
    - [ ] index()
    - [x] count()
    - [ ] find()
    - [ ] len()

35. Which of the following is immutable?
    - [ ] list
    - [x] tuple
    - [ ] set
    - [ ] dict

36. Which data structure does not allow duplicates?
    - [ ] list
    - [ ] tuple
    - [x] set
    - [ ] array

37. Which operator swaps values without a buffer?
    - [ ] swap()
    - [x] a,b = b,a
    - [ ] exchange()
    - [ ] reverse()

38. Which formatting specifier forces 2 digits after decimal?
    - [x] %.2f
    - [ ] %d
    - [ ] %s
    - [ ] %.02d

39. How do you access the value associated with key 'two' in dic = {'one': 1, 'two': 2}?
    - [ ] dic[1]
    - [ ] dic.two
    - [ ] dic(2)
    - [x] dic['two']

40. If A1 = np.array([10, 20, 30, 40]), what does A1[1:3] return?
    - [ ] array([10, 20])
    - [x] array([20, 30])
    - [ ] array([20, 30, 40])
    - [ ] array([10, 20, 30])

Part 3: File and Database Handling

41. Which function is used to check whether a file exists in Python?
    - [ ] file.exists()
    - [ ] os.isfile()
    - [x] os.path.exists()
    - [ ] check.file()

42. What does the `seek(0)` method do on an open file object?
    - [ ] Moves the cursor to the end of the file
    - [ ] Deletes the file content
    - [x] Moves the cursor to the beginning of the file
    - [ ] Closes the file

43. What will happen if you open a file in `'x'` mode and the file already exists?
    - [x] An exception is raised
    - [ ] The file is appended
    - [ ] The file is overwritten
    - [ ] The file is opened normally

44. Which statement correctly opens a file named `log.txt` in binary read mode?

- [ ] open('log.txt', 'rbin')
- [ ] open('log.txt', 'br')
- [ ] open('log.txt', 'binary')
- [x] open('log.txt', 'rb')

45. Which of the following is valid JSON?
- [ ] {'name': 'Ahmed', 'age': 40}
- [x] {"name": "Ahmed", "age": 40}
- [ ] {name: "Ahmed", age: 40}
- [ ] name: "Ahmed", age: 40

46. Which Python function converts a Python dictionary into a JSON string?
- [ ] json.load()
- [ ] json.loads()
- [ ] json.dump()
- [x] json.dumps()

47. What will len(open('data.txt').read()) return?
- [ ] Number of lines in the file
- [x] Number of characters in the file
- [ ] Number of words in the file
- [ ] File size in kilobytes

48. Which file mode should be used to **read and append** to an existing file?
- [ ] a
- [ ] r+
- [x] a+
- [ ] w+

49. What does the `csv.DictReader()` class return for each row?
- [x] A dictionary
- [ ] A tuple
- [ ] A list
- [ ] A string

50. Which pandas function is used to save a DataFrame to a CSV file?
- [ ] pd.save_csv()
- [x] df.to_csv()
- [ ] df.export_csv()
- [ ] pd.write_csv()

51. What is the main advantage of NoSQL databases like MongoDB over SQL databases?
- [ ] They are always faster
- [x] They have a flexible schema that can change without redefining structure
- [ ] They don't need any setup
- [ ] They can only store text data

52. In MongoDB, what is a collection?
- [ ] A single document
- [ ] A group of databases
- [x] A group of documents, similar to a table in SQL
- [ ] A type of index

53. Which MongoDB command is used to add a new document to a collection?
- [ ] add()
- [ ] insertDocument()
- [x] insertOne()
- [ ] create()

54. What format does MongoDB use to store documents?
- [ ] XML
- [ ] CSV
- [x] JSON-like (BSON)
- [ ] Plain text

55. Which MongoDB command retrieves documents from a collection?
- [ ] select()
- [ ] get()
- [x] find()
- [ ] retrieve()

56. What is the MongoDB equivalent of a SQL row?
- [ ] A collection
- [ ] A database
- [x] A document
- [ ] A field

57. Which command deletes a single document from a MongoDB collection?
- [ ] deleteSingle()
- [x] deleteOne()
- [ ] drop()
- [ ] erase()

58. In MongoDB, what is the purpose of the _id field?
- [ ] To store the document creation date
- [x] To uniquely identify each document
- [ ] To link documents together
- [ ] To count documents

59. Which Python library is used to connect to MongoDB?
- [ ] mongolib
- [x] pymongo
- [ ] mongodb-connector
- [ ] flask-mongo

60. What does the *$set* operator do in MongoDB update operations?
- [ ] Deletes a field
- [ ] Creates a new collection
- [x] Updates or adds a field value
- [ ] Finds matching documents