

BOWEN UNIVERSITY, IWO
COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE
MATHEMATICS PROGRAMME
B.Sc DEGREE 2022/2023 SECOND SEMESTER EXAMINATION

COURSE CODE: MAT 232

COURSE TITLE: MATHEMATICAL COMPUTING I

DATE: 22/06/2023

TIME ALLOWED: 2 HOURS **CREDITS:** 2

INSTRUCTIONS: Answer all the questions in SECTION A. Each question carries 1 mark

SECTION A

1. indicates end of statement in MATLAB.
 - A. Percentage
 - B. Semicolon
 - C. Comma
 - D. Full stop
2. Row vectors are created by enclosing the set of the elements in square bracket using
 - A. Semicolon
 - B. Space or comma
 - C. Percentage
 - D. Exclamation
3. There is no at the end of lines containing if, else, end statement.
 - A. Point
 - B. Comma
 - C. Space
 - D. Question mark
4. The following are MATLAB control flow structure except
 - A. the while loop
 - B. no answer
 - C. the for loop
 - D. script file
5. Given that $A = [45; 50; 65]$. What is the size of A in MATLAB?
 - A. 3 1
 - B. 1 3
 - C. 3 2
 - D. 2 3

6. To obtain the inverse of a matrix A in MATLAB, we use the command
- A. `inverse(A)`
 - B. `inver(A)`
 - C. `inv(A)`
 - D. None of the above
7. Which command deletes all the variables from the memory in MATLAB?
- A. `delete`
 - B. `clean`
 - C. `clc`
 - D. `clear`
8. Given that $A = [1, 2, 3, 4, 5; 2, 3, 4, 5, 6; 3, 4, 5, 6, 7]$. What is the value of $A(2, 5)$?
- A. 6
 - B. 8
 - C. 7
 - D. 5
9. The MATLAB command used in creating arrays of zero is ?
- A. `eye()`
 - B. `what()`
 - C. `zeros()`
 - D. `ones()`
10. What is the commands that generates labels along x -axis and y -axis?
- A. `lines` and `scaling`
 - B. `xlabel` and `ylabel`
 - C. `equal` and `square`
 - D. all of the above
11. Which statement terminates execution of `for` and `while` loops?
- A. `breaks`
 - B. `while loop`
 - C. `continue`
 - D. `blocking`
12. A `for` loop can have multiple index value
- A. False
 - B. True
 - C. No idea

D. I don't read that part

13. Which command is used to create an identity matrix in MATLAB?

- A. ones()
- B. zeros()
- C. size()
- D. eye()

14. repeats a statement or group of statements while a given condition is true

- A. while loop
- B. nested loop
- C. loop
- D. for loop

15. The meaning of ans in MATLAB is?

- A. answer not showing
- B. no answer at all
- C. most recent answer
- D. answer and solution

16. Which MATLAB command rerun command that are entered at the command line?

- A. command history
- B. command prompt
- C. command window
- D. workspace

17. Character in MATLAB are represented as

- A. string
- B. decimal
- C. array
- D. ASCII

18. The main area where commands can be entered at the command line in MATLAB is called?

- A. command room
- B. command window
- C. command prompt
- D. current window

19. The clc command in MATLAB is used to

- A. clear all commands in the workspace

- B. clean the window
 - C. clear the command window
 - D. save the workspace
20. The command `num2str` in MATLAB is used to
- A. concatenates numbers to strings
 - B. convert strings to numbers
 - C. convert numbers to string
 - D. concatenates strings
21. A row vector is converted to a column vector by using the
- A. transpose operator
 - B. semi-colon operator
 - C. bracket operator
 - D. back space operator
22. The command that keep tracks of everything done during the MATLAB session is ?
- A. track
 - B. diary
 - C. session
 - D. no idea
23. To type a matrix in MATLAB, we begin with
- A. a colon
 - B. percentage
 - C. square bracket
 - D. comma
24. The row vector $d = 1, 3, 5, 7$ is created in MATLAB by
- A. $d = [1; 3; 5; 7]$
 - B. $d = 1, 3, 5, 7$
 - C. $d = 1\ 3\ 5\ 7$
 - D. $d = [1\ 3\ 5\ 7]$
25. If j is a row vector with number 1, 8, 9, 15, 16, 24, the first four elements of j will be accessed in MATLAB by
- A. $j(1, 2, 3, 4)$
 - B. $j(1 : 2 : 3 : 4)$
 - C. $j(1 : 4)$
 - D. $j(1; 4)$

26. If j is a row vector with number 1, 8, 9, 15, 16, 24, the third elements of j through the last will be accessed in MATLAB by
- $j(3, end)$
 - $j(3 : end)$
 - $j(3; end)$
 - $j(3.end;)$
27. If V is a row vector with numbers 10, 80, 90, 15, 16, the column vector can be gotten in MATLAB by
- $V(;)$
 - $V(:)$
 - $V(,)$
 - $V()$
28. Which of the following creates $A = \begin{pmatrix} 1 & 5 & 6 \\ 8 & 10 & 15 \\ 18 & 34 & 23 \end{pmatrix}$ in MATLAB?
- $A = [1 \ 5 \ 6; 8 \ 10 \ 15; 18 \ 34 \ 23]$
 - $A = [1 \ 5 \ 6, 8 \ 10 \ 15, 18 \ 34 \ 23]$
 - $A = [1 \ 5 \ 6 : 8 \ 10 \ 15 : 18 \ 34 \ 23]$
 - $A = [1 \ 8 \ 18; 5 \ 10 \ 34; 6 \ 15 \ 23]$
29. To single out the element on the third row and second column in matrix $A = \begin{pmatrix} 1 & 5 & 6 \\ 8 & 10 & 15 \\ 18 & 34 & 23 \end{pmatrix}$ in MATLAB, we write
- $A(2, 3)$
 - $A(3, 2)$
 - $A(3; 2)$
 - $A(2; 3)$
30. The value of $A(1, 3)$ in matrix $A = \begin{pmatrix} 1 & 5 & 6 \\ 8 & 10 & 15 \\ 18 & 34 & 23 \end{pmatrix}$ in MATLAB is given as
- 18
 - 15
 - 6
 - 23
31. Tolu entered the values of the element of matrix P to have $P = \begin{pmatrix} 3 & 5 & 6 \\ 8 & 1 & 5 \\ 28 & 4 & 2 \end{pmatrix}$. She later discovered she had input the wrong value for the element in the third row, first column. How will she correct this, if the correct value is 7 ?

A. $P(1, 3) = 7$

B. $P(3 : 1) = 7$

C. $P(3; 1) = 7$

D. $P(3, 1) = 7$

32. Tolu wish to delete the third column of the matrix $P = \begin{pmatrix} 3 & 5 & 6 \\ 8 & 1 & 5 \\ 28 & 4 & 2 \end{pmatrix}$. How will she write it in MATLAB ?

A. $P(:, 3) = []$

B. $P(; 3) = []$

C. $P(:, 3) = []$

D. $P(:, 3) = []$

33. To transpose a matrix, the operator to be used in MATLAB is

A. apostrophe operator

B. colon operator

C. semi-colon operator

D. comma operator

34. The standard deviation of a set of data is obtained in MATLAB using

A. stand(x)

B. std(x)

C. standard(x)

D. st(x)

35. The variance of a set of data is obtained in MATLAB using

A. mean(x)

B. variance(x)

C. var(x)

D. rand(x)

36. The word MATLAB stands for

37. The symbol that precedes all comments in MATLAB is

38. The MATLAB command that is used to see if two elements are equal is

39. What is a script file?

40. List the four control flow structures of MATLAB.

SECTION B

INSTRUCTION: Answer question 1 and any other two questions.

- 1a. Tolu buys three mangoes, a dozen bananas, and one orange for 250 dollars . Bolu buys a dozen mangoes and two oranges for 500 dollars. Tope buys two bananas and three oranges for 200 dollars. How much do single pieces of each fruit cost? (4 marks)

- 1b. Write a MATLAB codes to create the following matrices (i) $A = \begin{pmatrix} 30 & 50 & 60 \\ 80 & 10 & 50 \\ 28 & 40 & 20 \end{pmatrix}$

(ii) Extract a sub-matrix B from matrix A that contains row 1, 2, and 3 and columns 1 and 2 (iii) Delete third row of matrix A and replace it by 90,200,0. (iv) Find the determinant, inverse, and dimension of matrix A . (14 marks)

- 1c. State two differences between scripts and functions. (2 marks)

2. Write a MATLAB code for solving the following system of linear equations. (5 marks)

$$2x + y + 3z = -5$$

$$x + 2y - 4z = 1$$

$$-x + 4y - z = 3.$$

3. Write the code to plot the curve $g(x,y) = (\frac{x}{5})^2 + (\frac{y}{2})^2 - 6xy$ for $-5 \leq x \leq 5$ and $-5 \leq y \leq 5$. Using the surf function, write the codes to label the axes and give the title, remove the grid and colour the curve in yellow. (5 marks)

4. Write MATLAB code to : (i) plot on the same sheet the two functions $f(x) = -0.5 \sin(x) + 20 \tan(x) - 3x^2 + 5$ and $g(x) = 2x \cos(x) + 5 \sin(2x) + 10$ where the independent variable varies from 0 to 10 with step 0.5 (ii) Draw the function $f(x)$ in blue and function $g(x)$ in pink (iii) Give the title of the graph and label the axis. (5 marks)