

BOWEN UNIVERSITY, IWO. OSUN STATE. NIGERIA
COLLEGE OF AGRICULTURE, ENGINEERING, AND SCIENCES

PHYSICS PROGRAMME

FIRST SEMESTER EXAMINATION 2022/2023 SESSION

PHY 207: COMPUTATIONAL SCIENCE II (2 CREDITS)

DATE: TUESDAY, 21ST FEBRUARY 2023

TIME: 2 HOURS

INSTRUCTION: ATTEMPT ANY THREE QUESTIONS.

QUESTION 1

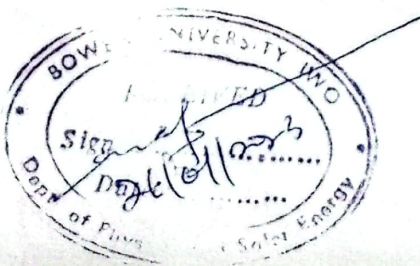
- (a) What are the functions of the following Matlab functions (i) `char(x)` (ii) `ones(x)` (iii) `eye(x)` (iv) `zeros(x)` (v) `rand(x)` (vi) `round(x)` (vii) `randperm(x)` (viii) `size(x)` (ix) `find(x)` (x) `repmat` (10marks)
- (b) If variable $a = [1 \ 2 \ 5]$, $b = [4 \ -5 \ 1]$ and $c = [1 \ 2; \ 3 \ 4]$. What will MATLAB return for the followings (i) $a+b$ (ii) $a * b$ (iii) a/b (iv) $a \setminus b$ (v) a^2 (vi) $[c, c^2, c.^2, c*c]$ (15marks)

QUESTION 2

- (a) Define the following terms: (i) Script file (ii) Scalar variable (iii) Row vector (iv) Transpose operator (v) Strings (10marks)
- (b) Write two ways to display the matrix below in Matlab command window.
- (i)
$$A = \begin{bmatrix} 3 & 4 & 5 & 6 & 7 \\ 13 & 14 & 15 & 16 & 17 \end{bmatrix}$$
 (2marks)
- (ii) What will MATLAB return for the command line $A(1,1)+A(2,2)$. (3marks)
- (c) Interpret the following matrix functions (i) $A(:,n)$ (ii) $A(n,:)$ (iii) $A(:,m:n)$ (iv) $A(m:n,:)$ (v) $A(m:n,p:q)$. (10marks)

QUESTION 3

- (a) Define the following MATLAB functions (i) `ones` (ii) `zeros` (iii) `repmat` (iv) `linspace` (v) `eye` (5marks)
- (b) If variable $A = [1 \ 2 \ 3 \ 4; \ 2 \ 0 \ 5 \ 6; \ 0 \ 8 \ 7 \ 9]$. Solve for the following by accessing the element in the matrix (i) $A(1,1)$ (ii) $A(2,3)$ (iii) $A(:,2)$ (iv) $A(3,:)$ (v) $A(:,:)$ (10marks)
- (c) $x = [2.1, 2.8, -3.1, -3.5, 4.5]$. Solve for $[fix(x); floor(x); ceil(x); round(x)]$ (10marks)



QUESTION 4

(a) Write a MATLAB code to solve this linear system

$$2x_1 + 8x_2 - x_3 + 4x_4 = 23$$

$$1x_1 + 1x_2 + 3x_3 + 5x_4 = 11$$

$$7x_1 + x_2 + 3x_3 + 4x_4 = 12$$

$$5x_1 + 4x_2 + 3x_3 - 11x_4 = 14$$

(15marks)

(b) Write a script using the information below to plot (i)horizontal bar chart (ii)stacked bar chart

$$y = [2 \ 2 \ 3; 2 \ 5 \ 6; 2 \ 8 \ 9; 2 \ 11 \ 12];$$

(10marks)

26/01/2023