Total number of printed pages–4

4 SEM BCA (CBCS) SCMS 4

2019

(June)

COMPUTER APPLICATION

Paper : 4·4

(Scientific Computing using Mathematical Software)

Full Marks : 30

Time : Two hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions : ***(any five)*** 2×5=10

(i) Find the output of the following Matlab code :

```
a=3;
b=5;
c=-3;
x=b-a/(b+(b+a)/(c*a));
```

Contd.

(ii) State True **or** False :

"If $y(x)$ is polynomial of nth degree then $\Delta^{n+1}y_0$ and other higher differences will be zero."

(iii) How to specify line style and colours in a graph in Matlab ?

(iv) Mention *any two* output commands of Matlab.

(v) Distinguish between break and continue statements in Matlab.

(vi) Write the purpose of round function.

(vii) What is linear interpolation ?

2. (a) Discuss about the relational operators of Matlab. 3

OR

(b) Explain how to access elements of an array. 3

3. (a) Discuss the procedure to set up input to a mathematical function in Matlab. 4

OR

(b) Compute the differences up to third order for $y = x^3 - 2x^2 + 1$ in the interval $0 \le x \le 1$ and $h = 0 \cdot 2$. 4

4. (a) Prove that $\Delta^3 y_0 = y_3 - 3y_2 + 3y_1 - y_0$. 2

(b) Find a root of the following equation by bisection method :

$$x^3 + x^2 - 1 = 0$$ 6

OR

(c) Find the root of $2x^3 = 3x + 6$ by Newton-Raphson method. 6

5. (a) If $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$

then write the Matlab commands for the following : 5

(i) To display transpose of A

(ii) To display size of A

(iii) To extract the diagonal of A

(iv) To find determinant of A

(v) To delete a row of A

OR

(b) Write the Matlab code to calculate the sum of the series of the form

$\sum_{j=1}^{N} j^p, p \in N.$ 5