

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086
(For candidates admitted during the academic year 2019 – 2020 & thereafter)
B.Sc. DEGREE EXAMINATION, NOVEMBER 2023
BRANCH I – MATHEMATICS
FIFTH SEMESTER

COURSE : INTERDISCIPLINARY CORE
PAPER : MATHEMATICS THROUGH SCIENTIFIC SOFTWARE
SUBJECT CODE : 19ID/IC/MS55
TIME : 3 HOURS

MAX. MARKS: 100

SECTION –A

ANSWER ALL THE QUESTIONS: (20×1=20)

1. In **MATHCAD** the range variables are defined by typing _____ between the first value and last value.

a) colon (:)	c) semi colon (;)
b) comma (,)	d) period (.)
2. To view the built-in functions in **MATHCAD**, select Functions from _____ menu.

a) FILE	c) EDIT
b) INSERT	d) MATH
3. In **MATHCAD**, part of a name can be a subscript by pressing _____.

a) comma (,)	c) period (.)
b) underscore (_)	d) none
4. In **MATHCAD**, the middle placeholders on each of the axes are to hold _____.

a) range values	c) $f(x)$
b) numeric values	d) arguments
5. In Box plot *notch* is a _____ value.

a) numeric value	c) logical value
b) character value	d) None of the above
6. In **R**, the *hist()* function takes _____ as the primary input.

a) variable	c) value
b) vector	d) None of the above
7. In **R**, the members must all be vectors of equal length for _____.

a) List	c) Factors
b) Arrays	d) Data frame
8. In **R**, the command $B \leftarrow \text{matrix}(c(1,2,3,4,5))$ will produce _____.

a) one column	c) one row
b) warning message	d) error message
9. The _____ is also called as the 50th percentile.

a) mean	c) median
b) mode	d) All of the above

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086
(For candidates admitted during the academic year 2019 – 20 & thereafter)

B.Sc. DEGREE EXAMINATION, NOVEMBER 2022
BRANCH I – MATHEMATICS
FIFTH SEMESTER

COURSE : INTERDISCIPLINARY CORE
PAPER : MATHEMATICS THROUGH SCIENTIFIC SOFTWARE
SUBJECT CODE : 19ID/IC/MS55
TIME : 3 HOURS **MAX.MARKS: 100**

SECTION –B

ANSWER ANY FOUR QUESTIONS **(4×20=80)**

1. a) Draw the multiple $x - y$ plot for the functions $f(x) = 2x + 1$, $g(x) = \sin(x)$. **(5 marks)**
b) Solve the given system of linear equations **(5 marks)**
$$10x + 2y + z = 9$$
$$x + 10y - z = -22$$
$$-2x + 3y + 10z = 22$$

c) Use symbolic computation to find the inverse, transpose and determinant for the
matrix $\begin{pmatrix} A & B & C \\ D & E & F \\ G & H & I \end{pmatrix}$ **(4 marks)**
d) Solve $x \sin(x) - e^x + \log x = 0$, $\prod_{n=1}^{10} a \cdot k^n$, $\sum_{i=3}^{10} \frac{(-1)^{i+1}}{i}$ **(6 marks)**

2. a) In \mathbf{R} , create a 5×3 matrix representing the marks of 3 students in 5 subjects and depict it using a multiple bar diagram. **(5 marks)**
b) Create a data frame for the number of students who are campus recruited in the four IT companies – IBM, Cognizant, TCS and Infosys in the last 7 years and represent it by a multiple line plot using different colours, give labels, heading and a key. **(10 marks)**
c) In \mathbf{R} , create a numeric vector with values ranging from 50 to 90 using the sequence operator, identify the number which are divisible by 5 and print the results. **(5 marks)**

3. a) Analyze the following pairs of data sets, such as its mean, variance, correlation (between X_i and Y_i , $i = 1,2$), scatter plot (X_i versus Y_i , $i = 1,2$) and infer the relationship between the two variables.

X_1	Y_1	X_2	Y_2
10	8.04	10	9.14
8	6.95	8	8.14
13	7.58	13	8.74
9	8.81	9	8.77
11	8.33	11	9.26
14	9.96	14	8.1
6	7.24	6	6.13
4	4.26	4	3.1
12	10.84	12	9.13
7	4.82	7	7.26
5	5.68	5	4.78

(15 marks)

b) Illustrate the application of $dbinom()$ and $pbinom()$ using suitable values in R .

(5 marks)

4. Create an excel sheet that contains 15 students record with the data fields Consumer No, Name, Jewels, No of grams, Wastage, Net amount. (10 marks)
 Select Jewels from the list (Chain, Bangles, Ring, Stud).
 Wastage = 10% from the grams purchased.
 The gold rate /gram is assumed to be Rs. 5000.

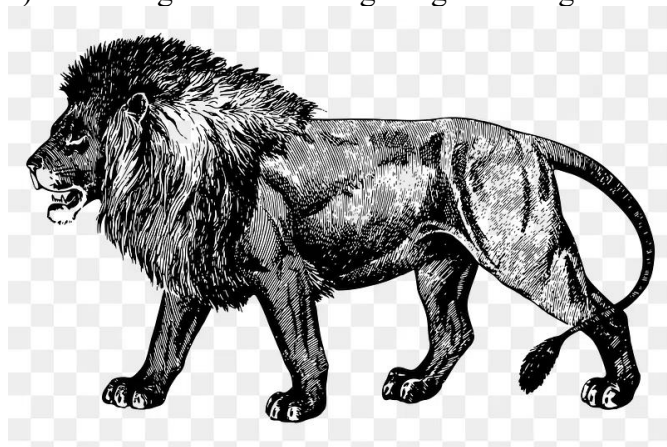
a) Calculate Subtotal = No_of_grams * gold rate + Wastage (10 marks)

b) Calculate Netamount = 10% GST + Subtotal

c) Filter the Bangles record alone

d) Compare various jewels purchased by the customers using Bar chart.

5. a) Create logo "Stella" using the given image. (10 marks)



b) Create an image on your own and animate the image (10 marks)
