

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

SUBJECT CODE: 19ID/IC/MS55

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

COURSE:	INTERDISCIPLINARY	CORE

PAPER : MATHEMATICS	THROUGH SCIENTIFIC SOFTWARE
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TIME : 3 hours MAXIMUM MARKS: 100

SECTION -A

	<u>BECTION II</u>
Ans	swer ALL the questions (20×1=20)
In Excel, is the	address of the cell in the seventh column of the sixth row.
a) F6	c) G7
b) F7	d) G6
feature displays o	only the data in columns according to specified criteria
a) Formula	c) Sorting
b) Pivot	d) Filtering
shortcut clos	ses the current workbook.
a) Ctrl + W	c) Ctrl + F4
b) Ctrl + C	d) Ctrl + O
tool helps better	for What-If analysis in Excel.
a) Pivot Table	c) Track Change
b) Goal Seek	d) Formula Auditing
A lets to hide/i	reveal parts of a layer.
a) Alpha Channel	c) Layer Mask
b) Layer Mask	d) Light & Shadow Filter
The image loses its quality	by being
a) Merged	c) Scaled
b) Renamed	d) Masked
tool takes colo	r in passing and uses it to mix to the next color it meets.
a) Smudge	c) Patch
b) Heal	d) Dodge
is the shortcut fe	or Text tool.
a) T	c) Ctrl + T
b) Alt + T	d) Shift + T
	ers can be obtained from the Roman equivalent if we press
a) [Ctrl]+G	c) [Ctrl]+R
b) [Ctrl]+E	d) [Ctrl]+S

10.	In MATHCAD there are	regions			
	a) two	c) three			
	b) many	d) four			
11.	The following is a built –in function in MATHCAD				
	a) Trigonometric calculations	c) Statistical Calculations			
	b) Data Analysis	d) All of the above			
12.	In MATHCAD, descriptive text can be placed inside the document.				
	a) only in the beginning of the region	c) anywhere			
	b) after the math region	d) None of the above			
13.	is a measure of how well distributed is the data in a data set.				
	a) Bar chart	c) Pie chart			
	b) Histogram	d) Box plot			
14.	A uses rectangular ba	urs to visualize data.			
	a) Bar chart	c) Pie chart			
	b) Scatter plot	d) None of the above			
15.	In \mathbf{R} , to find the dimension of the matrix, we use the following command				
	a) dim()	c) nrow()			
	b) ncol()	d) All of the above			
16.	In R , the returns the conjugate of a complex number				
	a) Conj()	c) conj()			
	b) Conju()	d) conju()			
17.	The <i>summary</i> command does NOT give the of the data.				
	a) Mean	c) Median			
	b) Mode	d) Quartiles			
18.	The is a particular representation of the average squared distance of each				
	observation when compared to the mean.				
	a) Standard deviation	c) Variance			
	b) Correlation	d) Quartiles			
19.	correlation would mean the data fall precisely on a straight line.				
	a) Positive	c) Negative			
	b) Linear	d) Perfect			
20.	In the function $dnorm(x, mean, sd)$ the default value of mean is				
	a) Zero	c) Unity			
	b) mean of the sample	d) mean of the data			

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SECTION -B

Answer ANY FOUR the questions $(4 \times 20 = 80)$

21. Create an excel sheet that contains 10 customer record with the data fields: Customer_No, Name, Vegetable, Price, Kilogram, Subtotal, Discount, Netamount.

(10 marks)

Select Vegetable from the list (Carrot, Brinjal, Potato, Tomato).

If the vegetable is Carrot, price = Rs.30/kg.

Brinjal, price = Rs.20/kg.

Potato price = Rs.25/kg.

Tomato price = Rs.10/kg.

The user should have not chosen more than 30 kg for each vegetable category.

(10 marks)

- a) Calculate Subtotal = Price * Kilogram.
- b) If the Subtotal is above 300, give 1% discount.
- c) Calculate Netamount = Subtotal Discount.
- d) Sort the records based on max value of Netamount.
- 22. a) Create a Colorful Logo for the conference "ICACT'22" conducted by Department of Computers, Stella Maris College with neat background.

(10 marks)

- b) Create Text mask to display "OCEAN" using the image given (10 marks)
- 23. a) Draw the polar curve for $r = \sqrt{\cos(2t)}$

(5 marks)

b) Solve the given system of linear equations

(5 marks)

$$x + y + z = 6$$

$$3x + 3y + 4z = 20$$

$$2x + y + 3z = 13$$

c) For the matrix $A = \begin{pmatrix} 3 & 4 & 2 \\ 2 & 5 & -2 \\ 3 & 2 & 7 \end{pmatrix}$, find A^2 , $\overline{A^2}$, and inverse of the submatrix of

A obtained by eliminating the first row and last column.

(6 marks)

d) Define the range of x as 1 to 5 in intervals of .5 and hence compute x^3 and $\sin x$.

(4 marks)

24. a) Draw a horizontal bar chart representing the following data – "Sales of Ice cream", label the axis and use colours for the bar chart. (5 marks)

Cone	120
Cup	200
Ball	150
Kulfi	90
Bar	300

b) Draw a pie chart with title, using rainbow color pallet and a key to represent the following data and label the data in the pie chart with their percentages. (8 marks)

Number of People Vaccinated		
Bangalore	20000000	
Chennai	50000000	
Trichy	15000000	
Erode	500000	
Madurai	10000000	

- c) In R, Construct and store a 4×2 matrix that is filled row-wise with the values, 12, -4, 16, 8, 11, -12, 14, 6 in that order. Remove the first row, overwrite the first column with the same column sorted from smallest to largest and store the bottom four elements as a new 2×2 submatrix. (7 marks)
- 25. a) Consider any data set from the *R* environment, use multiple regression with one response variable and four predictor variables, create a relationship mode, get the summary of the relationship model and predict the value. Represent the above graphically. (15 marks)
 - b) Depict the usage of *rnorm()* and draw a histogram to show the distribution of the generated numbers. (5 marks)
