PG/IS/COS/105/24

M.Sc. 1st Semester Examination, 2024

COMPUTER SCIENCE

(*Parallel Computing Lab and Image Processing Lab*)

PAPER – COS-105

Full Marks : 50

Time : 3 hours

Answer **all** questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

GROUP – A

Answer any **one** question : 20×1

1. Write a CUDA C program to add 2 vectors of size 50. Use device to add the numbers.

2. Write a CUDA C program to calculate whether a number is prime or not in an array of 100 numbers. Use device to check the numbers.

3. Write a CUDA C program to multiply two matrices using device.

4. Write a CUDA C program to multiply 12 with each array element in an array of 50 elements. Use device.

Note : For each program block size is 1

Number Distribution :

Coding : 12

Output : 02

Discussion : 06

[Viva : 05 Marks]

(*Continued*)

GROUP – B

Answer any **one** question : 20×1

1. Write a program (in MATLAB) to implement the

   (*a*) Basic Gray Level Transformation

   (*b*) Image Negative

   (*c*) Log Transformation

   (*d*) Power Law Transformation

   (*e*) Piecewise Linear Transformation (Contrast Stretching)

2. Write a program (in MATLAB) to generate Histogram for an Image and plot histogram in various ways (imhist, bar, stem, plot).

3. Write a program (in MATLAB) to perform Histogram Equalization.

4. Write a program (in MATLAB) to implement Arithmetic and Logical operation

   (*a*) Image Subtraction

   (*b*) Image Averaging

5. Write a program (in MATLAB) to implement (Smoothing Spatial Filters)

   (*a*) Linear filter (Standard Average/BOX, Weighted Average)

   (*b*) Ordered Statistic (Median)

6. Write a program (in MATLAB) to implement (Sharpening Spatial Filters)

   (*a*) Laplacian

7. Write a program (in MATLAB) to implement Smoothing (Lowpass) Frequency Domain Filters.

(*Continued*)

8. Write a program (in MATLAB) to implement Sharpening (Highpass) Frequency Domain Filters.

9. Write a program (in MATLAB) to implement Homomorphic filter.

10. Write a program (in MATLAB) to read an image and display its property.

11. Write a program (in MATLAB) to display an image.

12. Write a program (in MATLAB) to write an image variable as image.

13. Write a program (in MATLAB) to enlarge an image to its double size.

14. Write a program (in MATLAB) to rotate an image in clockwise and anticlockwise direction.

15. Write a program (in MATLAB) to convert an rgb image to gray scale image.

[Viva + PNB = 5 Marks]
