



'সমানো মন্ত্র: সমিতি: সমানী'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 6th Semester Examination, 2023

DSE-P3-COMPUTER SCIENCE (63)

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
All symbols are of usual significance.*

**The question paper contains DSE63-E1, DSE63-E2 and DSE63-E3.
The candidates are required to answer any *one* from *three* courses.
Candidates should mention it clearly on the Answer Book.**

DSE63-E1-DIGITAL IMAGE PROCESSING

GROUP-A

Answer any *five* questions

1×5 = 5

1. What do you meant by Gray level?
2. Differentiate photopic and scotopic vision.
3. Define Weber ratio.
4. Write any four applications of DIP.
5. Define Histogram.
6. What is Image Negatives?
7. What is a Median Filter?
8. List the applications of transforms.

GROUP-B

Answer any *three* questions

5×3 = 15

9. Discuss the basic gray level transformations for image Enhancement. 5
10. Discuss the two main types of data compression with example. 5
11. An image is 2400 pixels wide and 1200 pixel high. The image was scanned at 300 dpi. What is the physical size of the image? 5
12. Write a short note on Image differencing. 5
13. Write a short note on sampling and quantization. 5

GROUP-C

Answer any two questions

10×2 = 20

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|-----|--|-------|
| 14. | What is segmentation? Write the applications of segmentation. Discuss any two methods for image segmentation. | 2+2+6 |
| 15. | Define compression ratio. Illustrate the concept of Run length Encoding. Huffman Coding and Arithmetic Coding. | 1+9 |
| 16. | Define edge. Discuss the different types of derivative filters for edge detection. | 1+9 |
| 17. | Discuss the concept of Histogram Equalization, and Bit Plane Slicing. | 5+5 |

DSE63-E2-INTRODUCTION TO DATA SCIENCES

GROUP-A

Answer any five of the following

1×5 = 5

1. Define data science.
2. What is a multiple regression model?
3. What does n -fold cross validation mean?
4. Explain about outliers in a dataset.
5. What do you mean by pre-processing?
6. Discuss the use of heat map in data science.
7. State the difference between data science and big data.
8. What is the use of github in data science?

GROUP-B

Answer any three of the following

5×3 = 15

9. Explain various data types available in R language.
10. Explain any common multivariate statistical technique.
11. Discuss different data cleaning techniques.
12. What are R objects? Discuss.
13. Discuss various stages of development in data science project.

GROUP-C

Answer any *two* of the following

10×2 = 20

14. Write a script in R to find the running total of a list.
15. Make visual representations of data using the base, lattice, and ggplot2 plotting systems in R, apply basic principles of data graphics to create rich analytic graphics from a self-created dataset.
16. Explain different control structures in R.
17. What are missing values? Write an R script to handle missing values in a dataset.

DSE63-E3-DATA MINING

GROUP-A

Answer any *five* questions

1×5 = 5

1. What do you understand by Data mining?
2. What is clustering in Data mining?
3. Write the applications of data mining.
4. Explain metadata in data mining.
5. What is Spatial data mining?
6. Mention suitable Data mining technologies.
7. Explain data cleaning.
8. Differentiate Query tools and Data mining tools.

GROUP-B

Answer any *three* questions

5×3 = 15

9. Explain Motivated data mining in detail.
10. Explain the major issues of Data mining.
11. Discuss the need for processing of data.
12. Write note on Dimensionality reduction methods.
13. With appropriate example discuss the noisy data.

GROUP-C

Answer any *two* questions

10×2 = 20

14. With suitable examples discuss the data mining task primitives.
15. Briefly discuss any four data pre-processing approaches.
16. Discuss the methods of comparing classifiers. Note the characteristics of nearest neighbor classifier.
17. Briefly discuss in your own words: Web content mining and Text mining.

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