



'সমানো মন্ত্র: সমিতি: সমানী'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 6th Semester Examination, 2023

DSE-P4-COMPUTER SCIENCE (64)

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

**The question paper contains DSE64-E1, DSE64-E2 and DSE64-E3.
The candidates are required to answer any *one* from *three* courses.
Candidates should mention it clearly on the Answer Book.**

DSE64-E1

MACHINE LEARNING

GROUP-A

Answer any *five* questions from the following

1×5 = 5

1. What is unsupervised learning?
2. What is a Vector?
3. What is gradient?
4. What is logistic regression?
5. Mention one application of Machine learning.
6. In what type of problems vectorization is used?
7. Give an application of linear regression.
8. What is overfitting?

GROUP-B

Answer any *three* questions from the following

5×3 = 15

9. Write a short note on logistic regression.
10. Explain different Key elements of machine learning.
11. Discuss supervised learning with the help of an example.
12. Write a short note on support vector machines.
13. Explain bias variance decomposition of classification error in ensemble method.

GROUP-C

Answer any *two* questions from the following

10×2 = 20

14. Explain vectorization with the help of one program code as an example.
15. Explain perceptron learning with the help of a suitable example.

16. Explain classification using logistic regression with the help of suitable examples.
17. Explain backpropagation algorithm with the help of an example.

DSE64-E2

SYSTEM PROGRAMMING

GROUP-A

Answer any *five* questions

1×5 = 5

1. Define compile time loading.
2. What is meant by macro call?
3. What is loader?
4. What is meant by lexical analysis?
5. What is linker?
6. Define symbol table.
7. What is LR parser?
8. What is code optimization?

GROUP-B

Answer any *three* questions

5×3 = 15

9. What are the databases used by P1 of two pass assembler? Discuss its purpose of use.
10. Draw the block diagram of general loading scheme and explain.
11. What are the rules for converting an arithmetic statement into a parse tree? Explain with an example.
12. Draw and explain the detailed pass I flowchart of an assembler.
13. Give a comparative analysis between compiler and interpreter.

GROUP-C

Answer any *two* questions

10×2 = 20

14. Draw and explain the block diagram of the structure of a compiler.
15. Explain different optimization techniques used in the compiler.
16. Consider the context-free grammar:

$$S \rightarrow aX$$

$$X \rightarrow bX \mid bY$$

$$Y \rightarrow c$$

The symbols S, X, Y are non-terminals and S is the start symbol while a, b and c are terminal symbols.

- (i) Give the canonical collections of LR(0) items for this grammar.
- (ii) Is this grammar SLR? Prove by constructing SLR parsing table.
17. What do you mean by token? Discuss on specification and recognition of tokens.

DSE64-E3

CLOUD COMPUTING

GROUP-A

Answer any *five* questions from the following

1×5 = 5

1. Define Grid Computing.
2. What is private cloud?
3. Give an example of cluster computing.
4. Name one cloud service provider.
5. What is community cloud?
6. Expand SLA.
7. What is scaling?
8. How is authentication provided in cloud computing?

GROUP-B

Answer any *three* questions from the following

5×3 = 15

9. Explain the limitations of cloud computing.
10. Discuss packaging of hybrid cloud.
11. Discuss different basic components of cloud computing.
12. Write a short note on Amazon Web Services.
13. Discuss different characteristics of cloud computing.

GROUP-C

Answer any *two* questions from the following

10×2 = 20

14. Explain the operational and economic benefits of SaaS.
15. Explain in detail the various aspects for the need of virtualization in cloud.
16. Explain Network level security, Host level security and Application Level Security in cloud computing.
17. Discuss different challenges of cloud computing. Explain the fundamental advantages of cloud computing in scientific applications.

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