



**UNIVERSITY OF NORTH BENGAL**

B.Sc. Honours 6th Semester Examination, 2021

**DSE4-COMPUTER SCIENCE (64)**

Full Marks: 40

**ASSIGNMENT**

*The figures in the margin indicate full marks.*

**The question paper contains DSE64-E1 and 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**

**Answer any *two* questions**

20×2 = 40

1. (a) What is Machine Learning? Discuss with example why machine learning is important. 6
- (b) What is the trade-off between bias and variance? Explain type I and type II error with examples. 7
- (c) Differentiate between Supervised and Unsupervised learning. 7
2. (a) Explain the multi-layer perceptron model. 6
- (b) What is the difference between classification and regression? How to ensure that your model is not overfitting? 7
- (c) Explain the difference between K-Nearest Neighbours and *K* means clustering. 7
3. (a) How do Artificial Intelligence, Machine Learning and Deep Learning differ from each other? 6
- (b) Describe in detail all the steps involved in designing a learning system. Explain with an example the 'Training Set' and 'Test Set'. 7
- (c) Explain parametric and non-parametric model. What is classifier in machine learning? 7
4. (a) Elaborate on Statistical learning. 6
- (b) Explain Naive Bayes classifier with an example. Discuss with example some useful applications of machine learning. 7
- (c) Differentiate between Gradient Descent vs. Perceptron Training. 7

**DSE64-E2**

**SYSTEM PROGRAMMING**

**Answer any two questions**

20×2 = 40

1. (a) Describe the logic flow of a two pass Assembler. 8  
 (b) What is the bootstrap loader? Where does this loader reside? 2  
 (c) What are the different code optimization techniques? 8  
 (d) Differentiate between a compiler and an interpreter. 2
2. (a) How does the symbol table manager work in the different phases of the compiler? 3  
 (b) Define grammar. What are the categories of grammar, describe with examples? 7  
 (c) What is dynamic binding and overlay? 2  
 (d) Write a short note on Syntax directed translation schemes, mentioning the rules for translation. 8
3. (a) What are Macros? 3  
 (b) Discuss the flow of control and lexical substitution during macro expansion. 7  
 (c) Differentiate between a top down and a bottom-up parse. 10
4. (a) Explain the SLR parser with its parsing algorithm. 10  
 (b) What is a token? Give examples. 2  
 (c) Give the database specification of pass I and pass 2 of a two-pass assembler. 8

**DSE64-E3**

**CLOUD COMPUTING**

**Answer any two questions**

20×2 = 40

1. (a) What is Cloud Computing? What are its characteristics? 6  
 (b) Differentiate between different types of virtualization. 6  
 (c) Explain IaaS, PaaS and SaaS. 8
2. (a) Explain different cloud service deployment models. 7  
 (b) Discuss the traditional vs the cloud-based approach of computing. 6  
 (c) What are the types of risk in cloud computing? 5  
 (d) List five public cloud offerings of PaaS. 2
3. (a) Explain the architecture of Cloud computing in detail. 7  
 (b) What are the security advantages and disadvantages in cloud computing? 6  
 (c) Draw two level architecture of resource allocation in cloud. 5  
 (d) What is pre-cloud computing? 2
4. Write short notes in each of the following: 5×4 = 20  
 (a) Google App Engine  
 (b) Microsoft Azure  
 (c) Amazon EC2  
 (d) Eucalyptus.

—x—