



PBK-1603220001030200 Seat No. _____

B. Sc. (Bioinformatics) (Sem. III) (CBCS) Examination
November / December - 2018

BI - 302 : Algorithms in Bioinformatics
(New Course)

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instructions :

- (1) All questions are compulsory.
- (2) The right side figure indicates total marks of the question.

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| 1 | Attempt the following : | 14 |
| (a) | Answer the following short questions :
(all compulsory) | 4 |
| (1) | What is the formula to find the mid position in binary search ? | |
| (2) | 'O' notation is the _____ term of an algorithm. | |
| (3) | What is the best case of binary search ? | |
| (4) | What is the best case, worst case and average case of bubble sort ? | |
| (b) | Answer any one of the following questions : | 2 |
| (1) | Define searching. | |
| (2) | Define Big 'O' Notation. | |
| (c) | Answer any one of the following questions : | 3 |
| (1) | Which are the factors affecting efficiency of an algorithm ? | |
| (2) | Differentiate Quick sort and Bubble sort. | |
| (d) | Answer any one of the following questions : | 5 |
| (1) | Define Quick sort and write an algorithm with example. | |
| (2) | Explain Binary search algorithm with example. | |

- 2** Attempt the following : **14**
- (a) Answer the following short questions : **4**
 (all compulsory)
- (1) Which are the three steps by which inference is carried out recursively ?
 - (2) Abductive inference is based on _____.
 - (3) To diagnose faults in physical activities, such as electronic circuit or electronic motors, it is necessary to _____ the behaviour.
 - (4) Version space is a logical approach to what type of learning ?
- (b) Answer any one of the following questions : **2**
- (1) Probability
 - (2) Supervised learning.
- (c) Answer any one of the following questions : **3**
- (1) Explain steps which are recursively carried out in inferences.
 - (2) Write any few advantages of searching algorithms.
- (d) Answer any one of the following questions : **5**
- (1) Explain Rule induction with example.
 - (2) Explain version space.
- 3** Attempt the following : **14**
- (a) Answer the following short questions : **4**
 (all compulsory)
- (1) Who invented ANN ?
 - (2) Instance-based learning is a kind of _____.
 - (3) Pattern cognition can be implemented by using a _____ neural network.
 - (4) A simple firing rule can be implemented by using _____ technique.

- (b) Answer any one of the following questions : 2
- (1) Applications of nearest neighbour.
 - (2) Semi metric Distance.
- (c) Answer any one of the following questions : 3
- (1) Instance based learning.
 - (2) Explain limitations and advantages of back propagation.
- (d) Answer any one of the following questions : 5
- (1) Define distance matrix and write formula with example.
 - (2) Explain decision tree with example.
- 4 Attempt the following : 14
- (a) Answer the following short questions : 4
- (all compulsory)
- (1) _____ is for the measure of how likely an event.
 - (2) Which type of hypothesis should be accepted as true and which type should be rejected as false in Bayesian inference ?
 - (3) A _____ in concept learning or induction is the subset of all the hypothesis that are consistent with the observed training examples.
 - (4) A Naive based classifier works on which theorem ?
- (b) Answer any one of the following questions : 2
- (1) Conditional Probability.
 - (2) Posterior Probability.
- (c) Answer any one of the following questions : 3
- (1) Short note on prior probability.
 - (2) What is meant by probabilistic expert system ?

- (d) Answer any one of the following questions : **5**
- (1) Explain Naive Bayes Classifier (NBC) with example.
 - (2) Explain Baye's theorem.
- 5** Attempt the following : **14**
- (a) Answer the following short questions : **4**
(all compulsory)
- (1) Who is the inventor of Hopfield net ?
 - (2) The concept of neural networks is highly based on _____.
 - (3) Write any two applications of Graphical models.
 - (4) How many types of Graphical models are present in rule based expert system ?
- (b) Answer any one of the following questions : **2**
- (1) Write any two learning difficulties of rule based expert system.
 - (2) Define Polytrees.
- (c) Answer any one of the following questions : **3**
- (1) Explain directed graphical model and its Bayes's network.
 - (2) What is graphical mode and why we need graphical model ?
- (d) Answer any one of the following questions : **5**
- (1) Write a short note on Hopfield network.
 - (2) Explain pattern recognition in neural networks and how it recognizes patterns ? Give examples.