

M. Sc. DEGREE EXAMINATION, APRIL 2017
BIOINFORMATICS
FOURTH SEMESTER

COURSE : CORE
PAPER : ADVANCES IN BIOINFORMATICS
TIME : 3 HOURS

MAX. MARKS: 100

SECTION – A

ANSWER ALL QUESTIONS

(20 X 1=20)

1. Which of the following statements are not true - The function of genes can be determined by
i. Gene inactivation ii. Homology search iii. Exon trapping iv. Zoo-blotting
a. i and ii correct b. ii and iii correct c. i and iii correct d. ii and iv correct
2. Which of the following statements are not true - Microarrays Are used for analysis of
i. transcriptomes ii. Contain RNA sequences
iii. Contain DNA sequences iv. Are smaller than DNA chips
a. i and ii correct b. ii and iii correct c. i and iii correct d. ii and iv correct
3. Which of the following statements are not true - ORF scanning
i. Is used to find exons ii. Is used to find intergenic sequences
iii. Is used to find gene homologies iv. Is used to find protein-coding genes
a. i correct b. ii correct c. iii correct d. iv correct
4. Expand SMILES
5. Choose the correct chemical structure drawing packages
a. Rasmol b. chem Draw c. Pharma GKB d. Pubchem
6. Which of these projects would be best suited for Next Generation Sequencing?
a. To determine if a tumour sample contains a common missense mutation
b. To find the transcriptome of a tumour sample
c. To genotype ten genomic DNA samples for a known single nucleotide polymorphism
d. All of the above.
7. Automated DNA sequencing is an improvement of Sanger's method where
a) ddNTPS are used for chain termination
b) PCR is used for making sequencing templates
c) Fluorescently labelled dNTPs are used for chain termination
d) Fluorescently labelled ddNTPs are used for chain termination
8. MAML stands for _____
9. Comment on oligonucleotide.
10. The intensity of the pharmacological action of a drug mostly depends on the
a. Concentration of drug at the receptor site
b. Minimum toxic concentration of the drug
c. Minimum effective concentration of the drug
d. Elimination half life of the drug
11. Personalised medicine has the potential to yield plenty of health and economic benefits. Which of the following would not be a benefit of personalised medicine?
a. Increased number of medical jobs b. Improved medical decision making
c. Delivery of most effective therapies d. Optimise disease prevention strategies

12. Mention a few database for toxicogenomics.
13. Which of the following is not true regarding pharmacogenomics?
 - a. The goal is to minimize drug toxicity
 - b. It focuses on individual candidate genes to identify markers that affect drug metabolism and drug effect
 - c. Drug-food interactions and drug-drug interactions are unimportant in pharmacogenomics
 - d. There is no variation of drug dose between patients
14. The most commonly occurring variant in the human genome is
 - a. tandem-repeat polymorphism.
 - b. premature stop codon.
 - c. nucleotide base insertion.
 - d. single-nucleotide polymorphism.
15. CYP2D6 polymorphism can affect:
 - a. drug efficacy.
 - b. drug toxicity.
 - c. drug interaction potential.
 - d. a, b, and c.
16. Genetic variations in drug targets may contribute to which drug property?
 - a. Bioavailability
 - b. Half-life
 - c. Racial differences in response
 - d. Peak-dose area under the curve
17. Potential outcomes of pharmacogenetic research include all the following except
 - a. lower incidence of adverse drug effects.
 - b. higher health care costs.
 - c. improved treatment outcomes.
 - d. pretreatment screening for polymorphisms.
18. The R package which contains the bioinformatics modules is _____
 - a. NumR
 - b. Bioconductor
 - c. Bio R
 - d. String R
19. What will be the output of following code snippet?

```
> paste("a", "b", sep = ":")
```

 - a. "a+b"
 - b. "a=b"
 - c. "a:b"
 - d. None of the mentioned
20. R Package was developed by_____.

SECTION – B

ANSWER ANY FOUR QUESTIONS. EACH ANSWER SHOULD NOT EXCEED 500 WORDS. ALL QUESTIONS CARRY EQUAL MARKS. DRAW DIAGRAMS WHEREVER NECESSARY (4 X 10 = 40)

21. What you mean safety metabolism?
22. Define the term preclinical toxicology
23. Briefly explain the tools used for construction of 2D structure
24. Explain the types of Next generation sequencing used of DNA
25. Briefly describe the History of DNA sequencing
26. Illustrate the term GEO
27. R is a Deluxe calculator - justify

SECTION – C

ANSWER ANY TWO QUESTIONS. EACH ANSWER SHOULD NOT EXCEED 1200 WORDS. ALL QUESTIONS CARRY EQUAL MARKS. DRAW DIAGRAMS WHEREVER NECESSARY (2 X 20 = 40)

28. Describe the in details about the tools used microarray data analysis. What are the processes involved in visualizing microarray data?
29. Write the salient features involved in the Graphics in the R programming.
30. Explain the run types and analysis of data from the Next generation sequencing.
31. Find out the relationship between pharmacokinetics and metabolism with suitable example.
