

National Board of Examinations

Question Paper Name : DNB Biochemistry Paper3
Subject Name : DNB Biochemistry Paper3
Duration : 180
Total Marks : 100
Display Marks: No

Maximum Instruction Time : 0

Question Number : 1 Question Id : 32718733354 Consider As Subjective : Yes

Please write your answers in the answer booklet within the allotted pages as follows:-

Question Number	Answer to be attempted within	Question Number	Answer to be attempted within
Q. 1	Page 1-5	Q. 6	Page 26-30
Q. 2	Page 6-10	Q. 7	Page 31-35
Q. 3	Page 11-15	Q. 8	Page 36-40
Q. 4	Page 16-20	Q. 9	Page 41-45
Q. 5	Page 21-25	Q. 10	Page 46-50

1. a) Discuss the types of damage to DNA and mechanisms of DNA repair. [6]
b) Write about diseases associated with defective DNA repair mechanisms. [4]

Question Number : 2 Question Id : 32718733355 Consider As Subjective : Yes

Describe the regulation of eukaryotic gene expression by:

- a) Si (small interfering) RNAs. [5]
b) Epigenetic mechanism. [5]

Question Number : 3 Question Id : 32718733356 Consider As Subjective : Yes

- a) How does B-cells produce diverse number of antibodies although their genes producing immunoglobulins are limited? [6]
b) Write the molecular mechanism(s) and signal(s) required for class switching of immunoglobulins. [4]

Question Number : 4 Question Id : 32718733357 Consider As Subjective : Yes

With the help of a labelled diagram, depict the structure of major histocompatibility complex I (MHC-I). Explain the genetic organization of MHC class I and MHC class II molecules and their functions. Define MHC restriction. [3+5+2]

Question Number : 5 Question Id : 32718733358 Consider As Subjective : Yes

- a) List different types of hypersensitivity reactions of immune system and mention in brief the major immunological defect involved in each type of hypersensitivity. [5]
- b) Explain the immunological basis of positive tuberculin reaction and quantiferon TB gold test. [5]

Question Number : 6 Question Id : 32718733359 Consider As Subjective : Yes

- a) Minimum how many high energy phosphate(s) is/are used to incorporate one amino acid during the process of protein synthesis. Mention the reaction/step which utilizes the high energy phosphates during translation process. [5]
- b) Write the features of genetic code and define wobbles hypothesis. [5]

Question Number : 7 Question Id : 32718733360 Consider As Subjective : Yes

- a) Mention the function of telomerase. Why is it considered as a potential target for cancer therapy? [5]
- b) Explain why p53 is called as guardian of the genome. [5]

Question Number : 8 Question Id : 32718733361 Consider As Subjective : Yes

- a) Describe the major differences between the prokaryotic and eukaryotic transcription machineries. [5]
- b) List the vectors used in recombinant DNA technology for expressing DNA of different size. Write the limitations of using plasmid as a vector. [5]

Question Number : 9 Question Id : 32718733362 Consider As Subjective : Yes

- a) Sources of big data in molecular diagnostics and various databanks. [5]
- b) Role of genomics and machine learning in personalized medicine. [5]

Question Number : 10 Question Id : 32718733363 Consider As Subjective : Yes

- a) Transgenic animals. [2.5]
- b) Ubiquitin: Its structure and functions. [2.5]
- c) RNA editing. [2.5]
- d) Alternative splicing. [2.5]