Sample questions-Descriptive (AEB)

1. Describe the theories of cell aging. Describe the Na-K ATPase pump with diagram. Describe the process of clathrin formation. (6+7+5)
2. Comment on Danielli-Davson model. Explain facilited diffusion with example. Give the biosynthesis of Glycine. What is Decarboxylation? Give the features of Transmethylation. (5+3+5+2+3)
3. Define substitution mutation with sub types. Draw a diagram of Okazaki fragment formation. Comment on role of dnaA & dnaB protein in DNA replication. Define Mutation & mutagenic agent. Comment on pyrimidine dimer formation. (6+3+3+2+4)
4. Explain the different properties of genetic code. Explain the function of tRNA, mRNA and rRNA. Give an account of elongation process of translation. Write a note on transcription. (4+3+5+6)
5. Describe the detail mechanism of Lac operon. Comment on importance of Catabolite activator protein in lac operon functioning. Explain repression & induction mechanism of Lac operon. Describe in detail regulation of Lac operon. (6+4+4+4)
6. Give the classification of the enzymes with suitable examples. Explain the enzyme-substrate complex reaction. What is optical specificity and the substrate specificity? Explain feed back inhibition? (6+4+4+4)
7. What are the intermediary steps of converting galactose to glucose 6 phosphate in Leloir pathway? State the beta oxidation of fatty acid pathway. Name the enzyme responsible for Cori's disease. Why arsenic is poisonous for citric acid cycle?
8. Write in brief about the impacts of pesticides on biotic environment. Extensive use of chemical fertilizers deteriorates the soil environment. Justify the statement with your answer.
9. What is grasshopper effect? Provide an example. What is temperature inversion? How does it affect air pollution? What are acute and chronic health effects of air pollution??
10. What is receptor modeling? How is it different from dispersion modeling? What is radiative forcing? Distinguish between positive and negative radiative forcing.
11. What are important trace elements influencing crop productivity? Write in short the deficiency symptoms of boron and molybdenum and suggest possible corrective measure.
12. What are the major kinds of soil pollutants? What are the major sources of water pollution? Describe diagrammatically nitrogen cycle in nature.
13. (a) Consider a set of 10 observations such that the sum of squares of all the observations is 100. The minimum of the set is 1 and the maximum is 40. When these two observations are removed, the mean of the new set remains the same. Examine what happens to the following measures:

    (i) median

    (ii) standard deviation

    (b) Consider the following bivariate data on (X, Y)

X	0	-1	-1	2	-2
Y	0	-1	-1	-4	-4

Calculate the correlation coefficient between X and Y. Comment on the nature of relationship between X and Y

14. For any positive number a, show that the mean and the standard deviation of the numbers 0 and a are equal. What will be the results if a is a negative number?
15. In order to study the relationship between temperature and rainfall, data were collected on the average temperature in the Celsius scale (x) and rainfall (y) for 30 consecutive days. The standard deviation of x was 5^{o} C and the correlation between x and y was 0.35. Suppose the temperatures are converted to the Fahrenheit scale (z). Find:
    a) the variance of z.
    b) the correlation between x and z.
    c) the correlation between y and z.