Candiates are required to give their answer in their own words as far as practicable.
The figures in the margin indicate full marks.

Immunology, Toxicology and Public Health

Group - A

Answer any *three* questions :   12×3=36

1. (i) Define innate immunity.

   (ii) Write the difference between active and passive immunity.

   (iii) Write the types of humoral immunity.   2+6+4

2. (i) Briefly discuss the sources and functions of different types of immunoglobulins.

   (ii) Differentiate between TH1 and TH2 lymphocytes   8+4

3. (i) Differentiate between biomagnifications and bioaccumulation of food toxicants.

   (ii) Briefly discuss about the aquatic toxicology.

   (iii) Write the mechanism of arsenic toxicity.   5+3+4

4. (i) Write name of two inflammatory markers.

   (ii) What is xenobiotic ? Give example.

   (iii) Write the health hazards of lead toxicity.   2+3+1+6

5. (i) Write the mechanism of action of organophosphates.

   (ii) Write helath hazards noted in due to pesticides exposure.   5+4+3

   (iii) Write about DDT.   5+4+3

6. (i) How does movement of toxic cpompound take place in food chain ?

   (ii) Define B.O.D and C.O.D

   (iii) Write the significnace of ecotoxicology.   5+3+4

Group - B

Answer any *two* questions :   2×2=4

7. What is cytotoxic T-cells ?

8. What is cell mediate immunity ?

9. What is phagocytosis ?

10. What is memory cell in immune system ?

Or,

Group A

Biostatistics and Bioinformatics

Answer any *three* questions : 12×3=36

1. Write down the principle, features and types of BLAST. Write down the applications of 'Bioinformatics'. 3+3+3+3

2. What are 'Nutrient data bases' ? How do nucleic acid and protein data bases work ? Mention the significance of Multiple Sequence Alignments. Describe Polygenetic tree.

    2+4+3+3

3. What is the importance of Primary data ? Describe the sources of Secondary data. Mention the applications of 'Health informatics.' 3+2+7

4. Calculate Mean, Median and Mode from the following data : 4+4+4

calss intervals	Freequency
30 – 39	2
40 – 49	3
50 – 59	11
60 – 69	20
70 – 79	32
80 – 89	25
90 – 99	7

5. Write down the assumptions of 't test'. Compute the t-value for paired observation from the following data of 10 individuals. Find out whether or not the mean pulse rate of before exercise in significantly lower than that of after exercise.

Sl No	Pulse rate (beats/min) [Before exercise]	Pulse rate (beats/min) [After exercise]
1	84	120
2	78	110
3	72	112
4	78	114
5	68	98
6	76	106
7	80	104
8	82	116
9	74	118
10	78	112

$(Given, t_{0.05(9)}) = 1.833, \ t_{0.01(9)} = 2.821, \ t_{0.001(9)} = 3.250$

2+8+2

6. What is 'Chi-Square test' ? Explain the term Yate's correction. In a survey of 200 boys, of which intelligent 115 boys have skilled father while 85 of the unintelligent boys had unskilled fathers. Do these figures support the hypothesis that skilled fathers have intelligent boys ? Use Chi-square test. Value of Chi-square for 1 d.f. at 5% level is 3.84.   2+4+6

Group B

Answer any *two* questions :   2×2=4

7. Explain the term ANOVA.

8. What do you mean by 'Dispersion of Data' ?

9. Differentiate between null hypothesis and alternative hypothesis.

10. Calculate Median from the following data : 12, 03, 21, 18, 10, 09, 11, 07

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