| CSM – 70/21 |
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| Zoology |
| Paper – I |

*Time : 3 hours*

*Full Marks : 300*

*The figures in the right-hand margin indicate marks.*

*Candidates should attempt Q. No. 1 from Section – A and Q. No. 5 from Section – B which are compulsory and any* ***three*** *of the remaining questions, selecting at least* ***one*** *from each Section.*

## SECTION – A

1. Answer **all** questions of the following : 15×4 = 60

   (a) Structure and affinities of **Peripatus**

   (b) Water-vascular system in Echinoderms

   (c) Lateral line receptors

   (d) Distribution of flightless birds

2. (a) Parasitic adaptations in Helminthes 30

   (b) Metamerism 30

3. (a) Comparative account of integumentary system in different chordate classes. 30

   (b) Scale in fishes. 30

4. Write notes on the following : 15×4 = 60

   (a) Mouth parts of insects

   (b) Parental care in amphibia

   (c) Special feature of Urochordata

   (d) Migration in birds

## SECTION – B

5. Answer **all** of the following : 15×4 = 60

   (a) Calculate percent total and dominance rank among the species in a community :

| Species | No. of individuals per species | Percent total | Dominance rank |
|---|---|---|---|
| A | 5 | | |
| B | 10 | | |
| C | 5 | | |
| D | 30 | | |
| E | 20 | | |
| F | 5 | | |
| G | 1 | | |

(b) Ex situ and In situ conservation mechanisms.

(c) Drug resistant tuberculosis (TB).

(d) If you throw a six-sided die and then flip a coin, what is the probability that you will get either a 6 on the die or a head on the coin flip (or both) ?

6. (a) Calculate the following for a community given in the table : 10×3 = 30

| Species | Number (n) | n (n–1) |
|---|---|---|
| Woodrush | 2 | 2 |
| Holly (seedlings) | 8 | 56 |
| Bramble | 1 | 0 |
| Yorkshire Fog | 1 | 0 |
| Sedge | 3 | 6 |

(i) Simpson's index

(ii) Simpson's index of diversity

(iii) Simpson's index reciprocal index

(b) Find the slope and intercept of the following straight lines : 10×3 = 30

(i) $y = 1.5x - 2.5$

(ii) $y = 3.0 - 2.5x$

(iii) $16x - 32y + 8 = 0$

7. (a) Calculate the Standard Deviation for the following data : $30 \times 2 = 60$

15-17, 18-20, 21-23, 24-26, 27-29, 30-32, 33-35, 36-38, 39-41.

(b) Hormonal regulation of behaviour.

8. (a) Air-pollution by Particulate Matters (PM). 30

(b) Ten plants of **Pisum Sativum** are chosen from a population at random whose heights in centimeters (cm) are 52, 55, 57, 61, 64, 65, 67, 68, 70, 71. Population mean is 60cm. Calculate if the difference in variation is significant or not. 30