PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2022
(Fourth Semester)

Branch – **ZOOLOGY**

BIOSTATISTICS AND RESEARCH METHODOLOGY

Time: Three Hours   Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks   (10 x 1 = 10)

1   Which of the following is a secondary data?
(i) Questionnaire   (ii) field study
(iii) direct oral investigation   (iv) Reports taken from data bank

2   Which of the following is Not a commonly used measure of dispersion?
(i)   Arithmetic mean   (ii) Median
(iii) Geometric Mean   (iv) Standard deviation

3   What is the probability of the event that an even number appears when tossing a fair dice?
(i)   1/2   (ii) 1/6   (iii) 2/3   (iv) 1/4

4   What is the fixed cut-off based on the sample size for applying a Student 't' test?
(i)   30   (ii) 60   (iii)15   (iv) 20

5   What are primary electrons in electron microscopy?
(i)   electron emitted from sample   (ii) backscattered electrons
(iii) electrons ejected from electron beam   (iv) reflected electrons from surface

6   Which of the following chemical is used for histochemical localization of proteins?
(i)   Sudan black   (ii) Periodic acid Schiff's reagent
(iii) Iodine potassium iodide solution   (iv) Mercuric bromophenol blue

7   How the distance between the centers of the peak of doublet is called?
(i)   spin constant   (ii) coupling constant
(iii) chemical shift   (iv) spin -spin coupling

8   What is the highest limit of absorption value in spectrophotometer?
(i)   1 or above   (ii) 0.5 or above
(iii) 10 or above   (iv) 0.1 or above

9   What is DOI?
(i)   Digital Online Identifier   (ii) Digital Object Identifier
(iii) Data Online Index   (iv) Data Object Index

10   What is h -index?
(i)   Statistical software   (ii) to count the number of citation of the journal
(iii) Mathematical tool   (iv) to measure researcher impact/calibration

SECTION - B (35 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

11 a   Give a brief note on frequency distribution.
OR
   b   Illustrate any Three types of graphical representation of data.

12 a In a clinical treatment, the patients were tested to see the effect of a potential hypersensitive drug. 50 patients were assigned to receive active drug and other 50 as placebo at random. Their response to treatment was categorized as favourable or unfavourable. The data is given in the table below:

S.No.	Treatment	Response		Total
		Unfavourable	Favourable	
1.	Placebo	41	9	50
2.	Drug	16	34	50
	Total	57	43	100

Test whether the drug has a significant effect or not at $p_{0.05} = 3.84$

OR

b Highlight the significance of DMRT in analyzing the biological data.

13 a How ultracentrifugation plays a key role in biological sample preparation.

OR

b Describe the process of tissue fixation for histological analysis.

14 a Analyze the application of X-ray crystallography in biological research.

OR

b Highlight the principle and applications of NMR Spectroscopy.

15 a How will you prepare the index cards?

OR

b Illustrate the role of slide preparation for data presentation.

SECTION - C (30 Marks)
Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Compute the mean, median and standard deviation for the following data:

S.No	Cholesterol level	Frequency
1.	60-100	32
2.	100-140	96
3.	140-180	172
4.	180-220	121
5.	220-260	73
6.	260-300	36
7.	300-340	17

17 Find the coefficient of rank correlation from the data given below showing the ranks of 10 students according to their performance in Microbiology and Statistics:

Rank in Microbiology	8	3	9	2	7	10	4	6	1	5
Rank in Statistics	9	5	10	1	8	7	3	4	2	6

18 Describe the principle and application of Transmission Electron Microscope.

19 Enumerate the principle and application of Visible spectroscopy.

20 Design the method of preparation of scientific paper for publication in a journal.