

Rekha V.V.I. Questions for 2022 Examination

*Answers of below mentioned questions are present in your
Rekha Examination Guide Part-II Zoology – III (Hons.)*

Group – A
CELL BIOLOGY

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| 1. Write down the differences between Prokaryotic and Eukaryotic cell. | 7 |
| 2. Describe the different models explaining the molecular organization of plasma membrane.
Or, Give an account of the molecular organization of plasma membrane. V. V. I. | 8 |
| 3. Describe the transport of substances across cell (plasma) membrane through various carriers. | 11 |
| 4. Describe the ultra-structure (molecular structure) of mitochondria and their functions. V. V. I. | 16 |
| 5. Give an account of the structure and functions of golgi body or golgi apparatus. | 19 |
| 6. Describe the structure and function of 70S ribosomes.
Or, Give an account of the structure of 70S ribosome and their role in protein synthesis. V. V. I. | 22 |
| 7. Describe the structure of 80S ribosome and their role in protein synthesis. | 24 |
| 8. Give an account of the ultra structure and functions of chromosomes.
Or, Describe the nucleosome model of chromosome and explain its solenoid structure. | 25 |
| 9. Describe the structure of actin filaments and elaborate their major role. | 30 |
| 10. What are microtubules ? Describe their structure and functions. VVI | 31 |
| 11. What are microfilaments ? Describe the structure, chemistry and function of microfilaments. V. V. I. | 33 |
| 12. What are intermediate filaments ? Describe their assembly and functions. | 35 |
| 13. Discuss the molecular events of Prophase-I of meiotic cell division.
Or, What is Meiosis ? Describe the various stages of Meiosis-I. | 37 |

14. What is Mitosis ? Describe various stages of mitosis in plants with suitable diagram. 41
15. Define senescence. Explain the mechanism, cause and effect of senescence. **V. V. I.** 43

Group – B
GENETICS

1. What is linkage ? Explain the mechanism of complete and incomplete linkage. 47
2. Describe the phenomenon of linkage and explain why it is an exception to Mendel's law of independent assortment.
Or, Explain linkage. Mention how it differs from Mendelian inheritance. Give example of linkage in *Drosophila*. 49
3. What is Crossing over ? Describe the mechanism and significance of Crossing over.
Or, Explain Crossing over. What part does it play in heredity? 51
4. Discuss in detail the procedure of chromosome mapping.
Or, Write a short essay on chromosome mapping and give its significance. **V. V. I.** 55
5. Discuss the modification in dihybrid ratio (9 : 3 : 3 : 1) due to different kinds of interaction of genes and explain these modifications on the basis of Mendel's law of inheritance. **V. V. I.** 57
6. What are multiple alleles ? Describe multiple allelism citing suitable examples.
Or, What are multiple alleles ? Describe in brief the inheritance of any one character determined by multiple alleles in rabbit and *Drosophila*. 58
7. Describe various mechanisms of sex-determination in animals. Give an account of genetically controlled sex-determination mechanism.
Or, Compare the contrast of chromosome theory and genic balance theory of sex-determination. 61
8. Describe the mechanism of sex-determination in *Drosophila* and Man. **V. V. I.** 64
9. What is sex-linked inheritance ? Explain the phenomenon with reference to man giving examples.
Or, Describe the inheritance of sex-linked characters in man. 65
10. Write an essay on non-chromosomal inheritance. **V. V. I.**
Or, Give an account of cytoplasmic inheritance or non-chromosomal inheritance by maternal influence, cell organelles and endosymbionts. 68

11. Give an account of aberrations in chromosome structure and their genetic consequences. **V. V. I.**
Or, What is chromosomal aberration ? Describe various types and its cytological manifestation and significance. 72
12. Describe the molecular basis of gene mutation. Mention its significance in evolution.
Or, Give an account of gene mutation. 76
13. Write short notes on :
- (a) Laws of Heredity 80
 - (b) Law of Purity of Gametes 81
 - (c) Inheritance of Colour blindness in man 82
 - (d) Complementary Genes 83
 - (e) Klinefelter's Syndrome 84
 - (f) Trisomy 84

ZOOLOGY – 3 (Hons.) (2021)

Answer five questions, selecting at least two from each Group.

Group-A

1. Describe the active transport mechanism of transport of substances across cell - membrane. 11
2. Give an account of ultrastructure of chromosomes with reference to nucleosomes remodeling. 23
3. What are Cytoskeletons ? Describe the process of formation of active filaments. Add a note on their functions. 19
4. Describe the ultrastructure and functions of Golgi body. 19

Group-B

5. What is linkage ? Describe the phenomenon of complete and incomplete linkage with suitable examples. 47
6. What is Sex-linked inheritance? Explain the phenomenon of Sex-linked inheritance in man giving examples. 65
7. What is multiple allelomorphism ? Describe the phenomenon of multiple allelism with suitable examples. 58
8. Describe the mechanism of substitution type of gene mutation with examples. 76

ZOOLOGY – 3 (Hons.) (2020)

Answer five questions, selecting at least two from each Group.

Group-A

1. Give an account of the molecular organization of Plasma membrane. 8
 2. Describe the ultrastructure of mitochondria. 16
 3. Explain the structure and functions of 70S ribosomes. 22
 4. Describe the structure and functions of micro-filaments. 33
- OR, What are microtubules ? Explain the mechanism of their formation. 31

Group-B

5. Discuss the modifications in Mendelian dihybrid ratio 9:3:3:1 due to the different kinds of interaction of genes. 57
- OR, Describe, in detail, the procedure employed in chromosome mapping. 55
6. Describe the mechanism of sex-determination in Drosophila. 64
 7. Give an account of aberrations in chromosome structure and their genetic consequences. 72
 8. Write an essay on non-chromosomal inheritance. 68

ZOOLOGY - 3 (Hons.) (2019)

Answer five questions, selecting at least two from each Group.

Group - A

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|---|-------|-----------|
| 1. Describe the ultrastructure and functions of Golgi body. | | 19 |
| 2. Give an account of the ultrastructure of chromosome. | | 25 |
| 3. What are stem cells ? What are its different classes ? Add a note on its importance. | | |
| 4. Define senescence. Explain-the mechanism of senescence. | ..... | 43 |

Group-B

- | | | |
|---|-------|-----------|
| 5. Describe the 'inheritance of sex-linked characters in man. | ..... | 65 |
| 6. What is linkage ? Explain the mechanism of complete and incomplete linkage. | ..... | 47 |
| 7. What do you mean by multiple alleles? Describe the phenomenon of multiple allelism with suitable examples. | ..... | 58 |
| 8. Give an account of gene mutation. | ..... | 76 |

ZOOLOGY - 3 (Hons.) (2018)

Answer five questions, selecting at least two from each Group.

Group-A

- | | | |
|---|-------|-----------|
| 1. Describe the different models explaining the molecular organization of plasma membrane. | ..... | 8 |
| 2. Describe the ultrastructure of mitochondria and their functions. | ..... | 16 |
| Or, Give an account of the structure of 70s ribosomes and their role in protein synthesis. | ..... | 22 |
|  | ..... | 33 |
| 3. Discuss the molecular events of Prophase I of meiotic cell-division. | ..... | 31 |
| 4. Describe the structure of actin filaments and elaborate their major roles. | ..... | 57 |

Group-B

- | | | |
|--|-------|-----------|
| 5. Discuss the modifications in dihybrid ratio 9 : 3 : 3 : 1 due to different kinds of interaction of genes. | ..... | 55 |
| 6. Explain the mechanism of sex-determination in Drosophila. | ..... | 64 |
| 7. Discuss, in detail, the procedure of chromosome mapping. | ..... | 72 |
| 8. Write an essay on non-chromosomal inheritance. | ..... | 68 |

Rekha V.V.I. Questions for 2022 Examination

*Answers of below mentioned questions are present in your
Rekha Examination Guide Part-II Zoology – IV (Hons.)*

Group – A

REPRODUCTIVE BIOLOGY

1. Give an account of histo-physiology of mammalian ovary.
Or, Describe the structure and functions of mammalian ovary. 7
2. Describe the reproductive cycle of any vertebrate studied by you.
Or, Describe the reproductive cycle in Vertebrates. 13
3. What are estrogens and androgens ? What are their functions ? 15
4. Describe the male reproductive cycle of birds. **V. V. I.** 17
5. Give an account of female reproductive cycle in a freshwater fish studied by you. **V. V. I.** 18
6. Give an account of menstrual cycle and its hormonal regulation. **V. V. I.** 20
7. Give an account of parturition and add a note on its regulation.
Or, What is parturition ? Describe the process of regulation of parturition.
Or, What is parturition ? Describe the stages of parturition in any mammal studied by you and explain its hormonal regulation. **V. V. I.** 23
8. Discuss role of foetal hormones in parturition. 26
9. Describe the structure of mammary gland and add a note on the hormonal control of lactation.
Or, Explain the structure, position and development of mammary gland. 28
10. Describe the histo-physiology of mammalian testis.
Or, Describe the structure and functions of the mammalian testis. **V. V. I.** 30
11. Describe the bio-chemistry of Semen. 34
12. Define in-vitro fertilization. Mention the procedure of embryo transfer. **V. V. I.**

- Or,** Write an essay on in-vitro fertilization and embryo transfer.
- Or,** What do you mean by in-vitro fertilization ? Describe the process of in-vitro fertilization. 37
13. Describe in detail the procedure of amniocentesis. 41
14. Write short notes on the following :
- (i) Lactation and its hormonal control 42
 - (ii) Semen Biochemistry 43
 - (iii) Luteinizing hormone (LH) 44
 - (iv) Twins 44
 - (v) Corpus Luteum 44
 - (vi) Testosterone 45
 - (vii) Progesterone 46
 - (viii) Negative feed back mechanism of hormonal control 46
 - (ix) Mammalian Oocytes and its type 47
 - (x) Amniocentesis 47
 - (xi) Embryo transfer 47
 - (xii) Role of gonadotropic hormones in vertebrates 48
 - (xiii) Ovulation 48
 - (xiv) Functions of ovary 49
 - (xv) Menstrual cycle 49
 - (xvi) Physiology of Leydig's cells 50
 - (xvii) Hormonal control of physiology of testis 51
 - (xviii) Functions of testis 51
 - (xix) Applications of Embryo Transfer Technology 52
 - (xx) Functions of Estrogens 53

Group – B
BIOMETRY

1. How will you calculate arithmetic mean for individual data, discrete series and continuous series ? 54
2. Define median. Describe the methods of its calculation in odd and even numbered observations with suitable examples.
Or, Define median. Describe various methods of its calculation with suitable examples. Also, describe various properties of median. 55
3. Define mode. Calculate the modal length of fishes from the following data : 56

Length of fish (cm)	5	7	9	10	12
Frequency (<i>f</i>)	10	15	8	7	10

4. Define mode. Compute mode in continuous series by taking suitable example. Explain the merits and demerits of mode.
Or, Explain mode. Describe the relationship between mean, median and mode. **V. V. I.** 57

5. What is standard deviation (σ) ? Calculate the standard deviation of the data given below :

Weight of fish (in gram)	8	10	11	12	14	15.5	16.5	17
Frequency	4	8	6	9	8	5	6	4

- Or**, Explain standard deviation. Describe different methods of computation of standard deviation. 59
6. What is standard error ? How is standard error of mean calculated ? Explain with examples. 61
7. What do you mean by analysis of variance (ANOVA) ? Explain analysis of variance for one-way classification data. **V. V. I.** 63
8. Describe analysis of variance (ANOVA) in two-way classification (two-factor classification) data. 65
9. Define probability. Describe the multiplication and binomial laws of probability with suitable examples. 67
10. Describe normal probability distribution. What are its properties ? Explain normal distribution curve. **V. V. I.** 69
11. What is binomial distribution ? What are its properties and assumptions ? Determine the probability of occurrence of any event in binomial expansion with the help of suitable examples. **V. V. I.** 70
12. Define chi-square test and describe chi-square test for goodness of fit with the help of suitable examples.
Or, Explain chi-square test with example. **V. V. I.** 72
13. What do you mean by 't' test ? Describe 't' test for paired samples with suitable examples. 75
14. Describe student 't' test for unpaired sample with suitable example. 77
15. What do you mean by correlation and coefficient of correlation ? Describe different methods of studying correlation.
Or, What do you mean by correlation ? Describe Karl Pearson's coefficient of correlation giving example. **V. V. I.** 79
16. What is regression and regression coefficient ? Compute regression coefficient of Y on X by taking suitable data or example. **V. V. I.** 81

17. What is regression and regression line ? Describe the regression equation of X on Y 83
18. Write short notes on the following :
- (a) Biostatistics 84
 - (b) Merits and demerits of arithmetic mean 85
 - (c) Geometric mean (GM) 85
 - (d) Median in Discrete Series 85
 - (e) Standard Deviation 86
 - (f) Normal Distribution 87
 - (g) Null Hypothesis 87
 - (h) Test for Goodness of Fit (Pearsonian – χ^2) 87
 - (i) 't' test 88

ZOOLOGY – 4 (Hons.) (2021)

Group-A

1. Describe the structure and functions of mammalian ovary. 7
2. Give an account of the structure of mammary gland. Add a note on hormonal control of lactation. 28
3. What do you mean by reproductive cycle? Explain the process of reproductive cycle in any vertebrate studied by you. 13
4. Write short notes on any three of the following : 42
 - (a) Amino centesis
 - (b) Estrous cycle
 - (c) Menopause
 - (d) Placenta
 - (e) Spermatogenesis

Group-B

5. What is standard deviation? Explain standard deviation with suitable examples. 59
6. Define Student's "t" test. Describe the Student's "t" test with reference to variables giving suitable examples. 75
7. Give an account of regression, citing its application in data analysis. 77
8. Write notes on any three of the following: 84
 - (a) Standard error
 - (b) Mode
 - (c) Variance
 - (d) Definition and applications of biostatistics
 - (e) Chi-square test

ZOOLOGY – 4 (Hons.) (2020)

Answer five questions, selecting at least two from each Group.

Group - A

1. Describe the structure and functions of mammalian testes. 30
2. What is parturition ? Describe the stages of parturition in any mammal studied by you and explain its hormonal regulation. 23
3. What do you mean by in Vitro fertilization? Describe the process of in vitro fertilization. 37
4. Write short notes on any three of the following:
 (a) Corpus luteum-44, (b) Embryo transfer-47
 (c) Biochemistry of Semen-43, (d) Twins (e) Hormonal control of Lactation-42

Group - B

5. Define Chi-square test and describe Chi-square test for goodness of fit with the help of suitable examples. 72
6. What is binomial distribution? What are its properties and assumptions? Determine the probability of occurrence of any event in binomial expansion with the help of suitable examples. 70
7. Describe the Karl Pearsonian coefficient of correlation by taking suitable example. 79
8. Write notes on any three of the following:
 (a) Standard Deviation-86 (b) Geometric Mean-85 (c) Students't-test-88, (d) Median in discrete series-85, (e) Merits and Demerits of Arithmetic Mean-85
OR, Explain Analysis of Variance (ANOVA) for two-way classification data. 65

ZOOLOGY - 4 (Hons.) (2019)

Answer five questions, selecting at least two from each Group.

Group-A

1. Describe the structure and functions of mammalian ovary. 7
2. Explain the structure of mammary gland. 28
3. Give an account of female reproductive cycle in a freshwater fish studied by you. 18
Or, Describe the male reproductive cycle of birds. 17
4. Give an account of menstrual cycle and its hormonal regulation. 20

Group - B

5. Define mode. Compute mode in continuous series by taking suitable example. Explain the merits and demerits of mode. 57
6. Describe normal probability distribution and its properties. 69
7. What is regression and regression coefficient? Compute regression coefficient of Y on X by taking suitable data or example. 81
8. What do you mean by analysis of variance? Explain analysis of variance for one-way classification data. 63

ZOOLOGY - 4 (Hons.) (2018)

Answer five questions, selecting at least two from each Group.

Group-A

1. What is parturition ? Describe the process of regulation of parturition. 23
2. Describe the structure and function of a mammalian testis. 30
3. Give an account of vitro fertilization and embryo transfer. 37
4. Write short notes on any two of the following :
 - (a) Biochemistry of semen—43, (b) Aminocentosis—47
 - (c) Twins—44, (d) Hormonal control of lactation—42

Group-B

5. How will you calculate arithmetic mean for individual data, discrete series and continuous series ? 54
6. What do you mean by correlation and coefficient of correlation ? Describe different methods of studying correlation. 79
7. Explain Chi-square test with examples. 72
8. What is standard error ? How is standard error of mean calculated ? Explain with examples. 61

ZOOLOGY - 4 (Hons.) (2017)

Answer five questions, selecting at least two from each Group.

Group-A

1. Give an account of histo-physiology of mammalian ovary. 7
2. Describe the structure of mammary gland and add a note on the hormonal control of lactation. 28
3. Describe the reproductive cycle of any vertebrate studied by you. 13
4. Write short notes on any three of the following :
 - (a) Testosterone—45 (b) Progesterone—46 (c) Types of mammalian oocytes—47 (d) Negative feed back mechanism of hormonal control—46 (e) Role of gonadotropins in fish reproductive cycle—48.

Group-B

5. Describe analysis of variance in two way classification (Two-factor analysis). 65
6. Define mode. Calculate the modal length of fishes from the following data : 56

Length of fish (cm)	5	7	9	10	12
Frequency (f)	10	15	8	7	10
7. What do you mean by 't'-test of significance. Describe 't'-test for paired samples with suitable examples. 75
8. Describe normal probability distribution. What are its properties. Explain normal distribution curves ? 69

Or, What is regression ? Describe the regression equation of X on Y only by taking suitable example. 83

