M.A/M.Sc. Examination 2025
Semester IV
Paper XIX (Group A)
(Human Genetics)

Questions are of value as indicated in the margin.

Answer question No. 7 and <u>any three</u> of the following

Time: Three Hours   **Full marks: 40**

1. What is karyotyping? Discuss about four commonly used banding techniques and their importance in human genetics.   2+8=10
2. Explain the molecular structure of human chromosome.   10
3. What is 'central dogma'? Describe protein synthesis in eukaryotic cell.   3+7=10
4. Discuss on the existing molecular techniques often used in molecular anthropology. 10
5. What do you understand by chromosomal aberration? Illustrate one autosomal numerical and one sex chromosomal structural anomalies in human.   2+4+4=10
6. What is Hardy-Weinberg equilibrium principal? You sampled 2,000 individuals from a large population for the MN blood group, which can easily be determined since co-dominance is involved (i.e., you can detect the heterozygotes). They are typed below accordingly:

Blood Type	Genotype	Number of Individuals	Resulting Frequency
M	MM	980	0.49
MN	MN	840	0.42
N	NN	180	0.09

Using the data provided above, calculate the following:

a) The frequency of each allele in the population.
b) Supporting the matings are random, the frequencies of the mating.
c) The probability of each genotype resulting from each potential cross.   4+6=10

7. Write short note on <u>any two</u> of the followings: 5+5=10
    a) Meiosis
    b) Genetic counseling
    c) Translocation
    d) Genetic drift

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Questions are of value as indicated in the margin.

Answer question No. 7 and <u>any three</u> of the following

Time: Three Hours   **Full marks: 40**

1. Describe inborn error of metabolism. What are the characteristic features of inborn error of metabolism? Briefly discuss the major categories of inborm error of metabolism.

$$2+3+5=10$$

2. Briefly discuss the importance of pedigree method in human genetics, mentioning its advantages and limitations.   10

3. What is ABO blood group? What are the molecular bases of ABO blood group? Discuss briefly the clinical significance of ABO blood group system. $2+4+4=10$

4. What is immune system? Discuss briefly about adaptive immune system in human.

$$2+8=10$$

5. Write a note on kinetic classes of eukaryotic DNA.   10

6. Define mutation. What are the casus of mutation? Briefly discuss the effects of mutation.

$$2+3+5=10$$

7. Write short notes on any two of the following: $5+5=10$
   a) MNS
   b) Fitness
   c) VNTR
   d) G6PD

Questions are of value as indicated in the margin.

Answer question No. 7 and <u>any three</u> of the following

Time: Three Hours   **Full marks: 40**

1. Discuss any two methods to study normal growth and development in man? What do you understand by adolescence growth spurt?   6+4=10

2. Illustrate the physiology of postnatal growth and development in man.   10

3. What do you understand by regional distribution of body fat? Demonstrate four major factors responsible for normal growth and development in human. 2+8=10

4. What is body composition? Discuss any two available methods to study body composition in human.   4+6=10

5. What do you comprehend by senescence? Discuss the existing theories related to normal senescence in eukaryotes.   2+8=10

6. Illustrate with diagram the female reproductive system in man.   10

7. Write short note on any <u>two</u> of the followings: 5+5=10

   a) Scammon's growth curves

   b) Secular trend

   c) Menopause

   d) Principal fat depots in human

M.A/M.Sc. Examination 2025
Semester IV
Paper XXII (Group A)
(Biostatistics & Applications)

Questions are of value as indicated in the margin.

Answer question No. 7 and <u>any three</u> of the following

Time: Three Hours   **Full marks: 40**

1. What is data distribution? Calculate central tendency and standard deviation of a hypothetical distribution.   4+6=10

2. What do you understand by ANOVA? The attack rates of brain stroke among hypertensive and normotensive individuals are given in the table below. Is the Hypertension predisposed individuals to brain stroke?

Group	Attacked	Not attacked
Hypertensive	50	55
Normotensive	35	60

3. What is the difference between ANOVA and ANCOVA? To study the efficacy of anti-diabetic drug Z, the fasting glucose level of twelve individuals was recorded after four hours of administrating the drug Z:

Without using Z (mg%)	120, 125, 116, 115, 112, 110, 108, 106, 100, 128, 126, 130
Four hours of using Z (mg%)	110, 105, 112, 100, 110, 107, 113, 102, 120, 115, 120, 125

Is the anti-diabetic drug Z effective in nature? Explain   3+7=10

4. The birth weight (BW) and maternal weight gain among ten subjects are given below:

BW: (kg)	3.0	3.5	4.0	2.8	2.0	2.4	2.0	4.0	2.5	2.5
Maternal: Weight gain (kg)	2.5	3.5	2.0	4.5	3.5	4.0	2.0	3.0	2.5	4.0

Is BW associated with maternal weight gain? Plot the association with a scatter diagram.

8+2=10

5. What is multiple regression? Consider the data given below where the mass y (in grams) of a chemical is related to the time x (in seconds) for which the chemical reaction has been taking place:

Time x (in seconds)	55	77	12	16	20
Mass y (in grams)	40	120	180	210	240

Find the equation of the straight line that fits the data best.   3+7=10

6. What is sampling? Briefly discuss any four procedures of sampling in a survey research.

2+8=10

7. Write short notes on any <u>two</u> of the following: 5+5=10

   a) Relative risk and odds ratio

   b) MANOVA

   c) Factor analysis

   d) Software in data analysis

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M.A./M.Sc. Examination, 2024
Semester – IV
Anthropology
Paper – XXIII
(Forensic Anthropology)

Time: 3 Hours   Full Marks: 40

Questions are of value as indicated in the margin.
Answer Question No. **7** and *any three* from the rest.

1. Define forensic science and forensic anthropology. Briefly discuss the forensic legal procedures in India. What are the different types of evidences?   2+2+4+2= 10

2. Discuss in brief the importance of skull in determination of age and sex.   10

3. Discuss the role of hair in forensic anthropology.   10

4. What is SNP and STR? Briefly compare the properties of SNPs and STRs. What is RFLP?   2+2+4+2+10

5. Define odontology. What do you mean by bitemark? Briefly discuss the use of bitemark in forensic anthropology.   2+2+6=10

6. What do you mean by lineage markers, discuss with suitable example.   10

7. Write short notes on *any two* of the following: 5+5=10

a. Latent fingerprints

b. Blood as forensic evidence

c. Urine as forensic evidence

d. Human dentition

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