B.V.Sc. & A.H. (Second Professional) Examination – 2024
Animal Genetics and Breeding Paper -I

Time: Three Hours **Maximum Marks: 100**
Weightage: 20

Unit-1 (Biostatistics and Computer Application)
Unit-2 (Principles of Animal and Population Genetics)

Instructions:

1) Attempt all questions
2) Answer of all questions is to be written in the space provided along with the question in question-booklet.
3) Overwriting is not allowed in the objective type question.

Q.1 Fill in the blanks. **(20x0.5 = 10)**

1.1 Father of Bio-statistics is .....

1.2 One dimensional diagrams are also called .....

1.3 In .....distribution Mean and Median are same.

1.4 EPROM stand for .....

1.5 In Chi-square test for independence of attributes, the frequencies are presented in a two-way classification called.....

1.6 The second moment about the arithmetic mean is used as a measure of .....

1.7 The .....between two variables X and Y is the geometric mean of the two regression coefficients b_{yx} and b_{xy}.

1.8 When n is large and p is small such that np is constant, the binomial distribution tends to become a .....

1.9 Null hypothesis is denoted by .....

1.10 One Kilobyte will be equal to.....bytes.

1.11 Genic balance theory of sex determination was proposed by .....

1.12 The most abundant type of RNA in a cell is .....

1.13 The entire set of gene in an organism is known as .....

1.14 Polytene chromosomes are found in salivary glands of .....

1.15 Semi conservative mode of DNA replication was given by.....

1.16 The cell division can be arrested at a particular stage by the use of .....chemical.

1.17 Genetics correlation between total milk yield and total fat yield is .....

1.18 Repeatability is the..... limit of heritability.

1.19 The diploid number of chromosomes in a merino ewe is.....

1.20 When the gene frequencies are equal in male and females, ...generation of random mating is required to approach the H- W equilibrium.

Q.2 Choose the most suitable answer and write the number of the correct answer 1 or 2 or 3 or 4 in the space given against each sub question:

(20x0.5 = 10)

2.1 'Statistics' may be called the science of counting is the definition given by ( )

1. Croxton
2. Bowley
3. Boddington
4. Webster

2.2 Raw data means ( )

1. Primary data
2. Secondary data
3. Investigative data
4. Well classified data

2.3 The most important and widely used measure of dispersion is ( )

1. Standard deviation
2. Range
3. Coefficient of variation
4. All the above

2.4 Median can be located graphically with the help of ( )

1. Histogram
2. Ogive
3. Bar diagram
4. Scatter diagram

2.5 In case of calculation of correlation, degrees of freedom would be ( )

1. n-1
2. n-2
3. $(n_1-1)(n_2-1)$
4. None

2.6 The scale of probability value ranges from ( )

1. -1 to + 1
2. 0 to -1
3. 0 to 1
4. None

2.7 t-test used under the following conditions ( )
1. To compare the means
2. To compare the variance
3. Three samples
4. More than three samples

2.8 MS-Windows is a ( )
1. Application software
2. Compiler
3. Operating system
4. Statistical software

2.9 Two-way ANOVA is used in the following experimental design ( )
1. CRD
2. LSD
3. RBD
4. All

2.10 An interpreter converts ( )
1. High level language to assembly language
2. High level language to Tool language
3. High level language to another high level language
4. High level language to Machine language

2.11 The gene responsible for coiling in Limnaea is located in ( )
1. Nucleus
2. Cytoplasm
3. Protoplasm
4. Mitochrondria

2.12 Crossing over is the exchange of genetic material between ( )
1. Non-homologous segments of non sister chromatids of homologous chromosomes
2. Homologous segments of sister chromatids of homologous chromosomes
3. Homologous segments of non-sister chromatids of non-homologous chromosomes
4. Homologous segments of non-sister chromatids of homologous chromosomes

2.13 Which of the following distinguishes DNA from RNA? ( )
1. Presence of 3' deoxyribose in DNA, ribose in RNA
2. Presence of uracil in RNA in place of thymidine in DNA
3. Occurrence of base pairing in DNA but not RNA
4. Presence of 5' phosphate in DNA but not RNA

2.14 The anti-codon sequence is found on which of the following? ( )
1. Messenger RNA
2. Ribosomal RNA
3. transfer RNA
4. Small nuclear RNA

2.15 Ratio for duplicate genes with interaction is ( )
1. 9: 6 :1
2. 9:3: 4
3. 9 :3: 3: 1
4. 6: 3: 3: 3: 1

2.16 If the frequencies of A, B and O genes controlling A B O blood group system in humans are p, q and r respectively, then the expected frequency of blood group 'AB' is ( )

1. $p^2+ 2pr$
2. $q^2+ 2pr$
3. $2pq$
4. r^2

2.17 The karyotype designation 47, XX + 13 designates which of the following ( )

1. A female with trisomy 13
2. A female with 13 extra chromosomes
3. A female with an enlarge copy of chromosome 13
4. A female with extra material on chromosomes 13

2.18 An autosomal recessive disorder has a population frequency of 1:40,000. The carrier frequency is therefore ( )

1. 1/400
2. 1/200
3. 1/100
4. 1/50

2.19 Which of the following statement about heritability is true? ( )

1. It is a measure of level of gene linkage
2. It is a measure of proportion of repeated DNA in an organism
3. It is measure of the level of heterozygotes in a population
4. It is a measure of the proportion of variation that is due to genetic causes

2.20 For which of the following trait repeatability cannot be calculated? ( )

1. Service period
2. Lactation milk yield
3. Egg production in poultry
4. Age at maturity

Q.3 Attempt any <u>ten</u> out of the following twelve questions. Answer of each question should be in 2 to 3 lines. (10x2.0= 20)

3.1 Median

3.2 Pie chart

3.3 Kurtosis

3.4 Standard Error

3.5 Level of significance

3.6 Local area network

3.7 m RNA

3.8 Lethal gene

3.9 DNA cloning

3.10 Genetic correlation

3.11 MPPA

3.12 Genetic drift

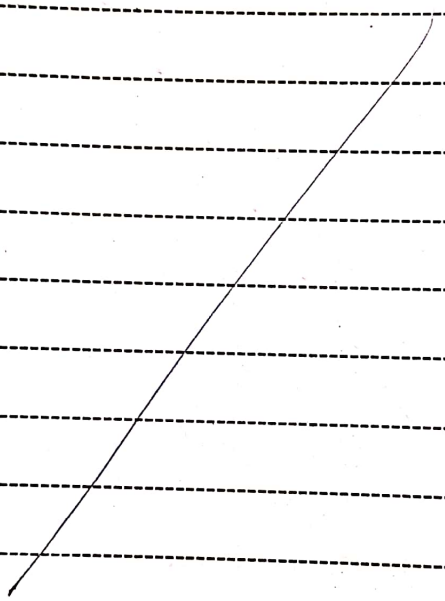
Q.4 Attempt any six out of the following eight questions. Answer of each question should be in 8 to 10 lines. (6 x 6.0 = 36)

4.1 Difference between classification and tabulation

4.2 Explain the law of probability with suitable example

4.3 Define Computer. write down anatomy of computer

4.4 Enumerate merits and demerits of CRD

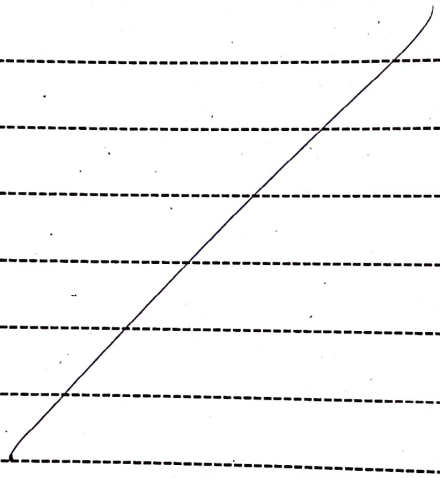


4.5 Explain gene interaction with suitable example

4.6 Define repeatability & its importance

4.7 Explain genotype-environment interaction with example

4.8 How gene frequency change due to mutation



Q.5 Answer the following question in 1-2 pages (attempt any two).

(2x12.0 = 24)

5.1 Define population and sample. Enlist the various sampling methods. Write in detail the types and procedure of simple random sampling. (2+3+7)

5.2 Define Design of Experiments. Explain in detail the method of analysis for Randomized Block Design. (4+8)

5.3 What are chromosomal aberrations? Write in detail the structural and numerical aberrations along with examples. (2+10)

B.V.Sc. & A.H. (Second Professional) Examination – 2024
Animal Genetics and Breeding Paper -II

Time: Three Hours **Maximum Marks: 100**
Weightage: 20

Unit-3 (Principles of Animal Breeding)

Instructions:
1) Attempt all questions
2) Answer of all questions is to be written in the space provided along with the question in question-booklet.
3) Overwriting is not allowed in the objective type question.

Q.1 Fill in the blanks. **(20x0.5 = 10)**

1.1 Osborne index is an example of _____ selection.

1.2 _____ (%) of the genes from each grandparent are passed on to an individual.

1.3 Method of selection which includes the crossing of large number of individuals with a tester line to evaluate the progeny is called _____.

1.4 Name of exotic sheep breed used to produce Avikalin _____.

1.5 _____ is a milder form of inbreeding.

1.6 _____ is a layer poultry breed.

1.7 _____ breeding scheme has the gene flow in two ways.

1.8 _____ and _____ are the exotic fine wool breeds of sheep used to make crosses in India.

1.9 The process of conserving livestock and poultry breeds is known as _____ conservation.

1.10 Mating between phenotypically alike animals is known as _____ mating.

1.11 The selection index method was introduced in animal breeding by _____.

1.12 The ability of an individual to stamp its own characteristics on the offspring is known as _____.

1.13 Inbreeding leads to unmasking of _____ genes.

1.14 Heterosis exploits _____ gene action.

1.15 A pedigree sheet tracks the _____ history of an animal.

1.16 Indian dog breed of kerala which was developed in a hunting dog in Tamilnadu and Karnataka is called as _____.

1.17 _____ is a exotic small breed of goat commonly raised for its high-quality milk.

1.18 _____ is a technique used to transfer embryos from one female to another.

1.19 The process of improving animals by selecting for combining ability in crossbreeding is known as _____.

1.20 Livestock census is conducted every _____ Years.

Q.2 Choose the most suitable answer and write the number of the correct answer 1 or 2 or 3 or 4 in the space given against each sub question: **(20x0.5 = 10)**

2.1 _____ is not a dual purpose breed of cattle. ( )
1. Rathi
2. Kankrej
3. Tharparkar
4. Ongole

2.2 The individuals are considered to be closely related if they have common ancestor in previous _____ generations. ( )
1. Eight to Nine
2. Four to six
3. Ten to twelve
4. None of above

2.3 Mating system in which attempts are made to concentrate the inheritance of out standing ancestor in the progenies: ( )
1. Inbreeding
2. Line breeding
3. Out breeding
4. Crossbreeding

2.4 Widest form of out crossing is _____. ( )
1. Out breeding
2. Cross breeding
3. Species crossing
4. Criss cross breeding

2.5 _____ is an important breed of horse. ( )
1. Bikaneri
2. Chegu
3. Surti
4. Marwari

2.6 Goat breeds of _____region of India are famous for Pashmina production. ( )
1. Northern arid and semi arid
2. North temperate Himalayan
3. Southern peninsular
4. Eastern

2.7 Individual selection is useful for traits: ( )
1. Having high h^2
2. Having low h^2
3. Sex limited traits
4. All of these

2.8 Genetic improvement of dairy cattle is possible through: ( )
1. ET
2. MOET
3. AI
4. All of above

2.9 _____ is not a genetic disassortative type of mating . ( )
1. Outcrossing
2. Incrossing
3. Top crossing
4. Species crossing

2.10 Avivastra breed of sheep has been developed at: ( )
1. CSWRI
2. GAU
3. NDRI
4. NBAGR

2.11 _____ is an important egg quality trait of layer poultry bird. ( )
1. Yolk height
2. Egg number
3. Egg weight
4. Egg size

2.12 The inbreeding coefficient (Fx) of Full sib mating is _____. ( )
1. 50 %
2. 25 %
3. 62.5 %
4. 12.5 %

2.13 _____ was established to conserve the animal genetic resources of India ( )
1. NDDB
2. NBAGR
3. NDRI
4. MDF

2.14 _____ is also known as 'Mountain cattle'. ( )
1. Mule
2. Mithun
3. Yalk
4. Horse

Donot write across this line

2.15 Reciprocal recurrent selection is generally used for selection in: ( )
1. Cattle
2. Sheep
3. Poultry
4. Goat

2.16 Siamese is the cat breed of which type: ( )
1. Long haired type
2. Short haired type
3. Rex type
4. none of above

2.17 Smallest dog breed of the world: ( )
1. Chow chow
2. Collie
3. Chihuahua
4. Cairn Terrier

2.18 Cornish breed of poultry is well known for: ( )
1. Meat production
2. Egg production
3. Fertility
4. None of the above

2.19 Heritability estimated from response to selection in the base population: ( )
1. Realized heritability
2. Heritability
3. Repeatibility
4. Breeding value

2.20 The best breeding policy to improve Indian buffalos is: ( )
1. Cross breeding
2. Selective breeding
3. Inbreeding
4. Out crossing

Q.3 Attempt any ten out of the following twelve questions. Answer of each question should be in 2 to 3 lines. (10x2.0= 20)

3.1 Define generation interval

3.2 Define heterosis

3.3 Define breed

3.4 Define Rotational cross breeding

3.5 Define Selection differential

3.6 Define Breeding efficiency

3.7 Define Tandem selection

3.8 Define prepotency

3.9 Define selection index

3.10 Define species crossing

3.11 Define coefficient of relationship

3.12 Give full form and name of the centers for following research institutes:

IVRI, CIRB, CIRG and CSWRI

Q.4 Attempt any six out of the following eight questions. Answer of each question should be in 8 to 10 lines. **(6 x 6.0 = 36)**

4.1 Write important economic traits of Indian sheep and goats

4.2 Discuss Cross breeding in dairy cattle in India with suitable examples

4.3 Explain different sire indices used in animal breeding

4.4 Discuss Open Nucleus Breeding Scheme in livestock breeding.

4.5 Discuss Reciprocal Recurrent Selection in poultry breeding

4.6 What do you understand by Grading up in a cattle breeding?

4.7 Discuss station progeny testing in brief.

4.8 Explain inbreeding depression in short.

Q.5 Answer the following question in 1-2 pages (attempt any two).

(2x12.0 = 24)

5.1 Describe in detail objectives and methods of conservation of Animal Genetic Resources in India.

5.2 Enlist various basis of selection. Describe Individual and Pedigree selection in detail with their advantages and disadvantages.

5.3 Explain selection and response for quantitative traits. Also discuss various factors affecting response and suggest measures to increase genetic gain/year.