

OBJECTIVES**[COURSE NO: ASDS -242 COURSE TITLE: LIVESTOCK BREEDING AND NUTRITION]**

1.	Animal cell size ranges in mm in diameter	
	I. 0.01 to 0.1	ii. 0.05to0.05
	iii. 1.0 to 2.0	iv. .001 to .005
2.	Number of genes present in the population is termed as.....	
	i. gene population	ii. gene pool
	iii. genotype frequency	iv. gene frequency
3.	Proportion of genotypes present in a population of livestock is.	
	i. genotype frequencies	ii. gene population
	iii. gene pool	iv. gene frequency
4.	Alternative form of a gene, locate at the same part on each of pair of chromosome are called as-----	
	i. genetic pairs	ii. chromosomal pair
	iii. allelic pairs	iv. none of these
5.	Heritability is a ratio of additive genetic variance to variance.	
	i. total phenotypic	ii. both i and iii.
	iii. total genotypic	iv. total additive
6.	Fraction of the total phenotypic variance which is due to genetic and permanent environment difference is called-----	
	i. heritability	ii. mutation
	iii. co-relation	iv. repeatability
7.	The correlation of traits ranges between.....	
	i. 0 to 1	ii. 1 to 10
	iii.+1 to -1	iv.less than 1
8.	Correlation between the phenotypic values of two traits is called.....	
	i. Phenotypic correlation	ii. repeatability
	iii. genotypic co-relation	iv.variaton
9.	Correlation between the breeding values of two quantitative traits is termed as	
	i. phenotypic correlation	ii. genetic correlation
	iii.genotypic correlation	iv. somatic correlation

10.	The between two variable is equal to the covariance difference between two variables divided by square root of the product of variance of two variables.	
	i. variance	ii. correlation
	iii. regression	iv. heterosis
11.	An estimate of genetic superiority of an individual over the average of the group from which it was selected is called -----	
	i.actual breeding value	ii.total breeding value
	Iii .probable breeding value	iv.none of these
12.	Evaluation of genetic worth of bull is termed as	
	i. heterosis	ii. regress
	iii. correlation	iv. sire index
13.	Sire index denotes for both genetic worth of individual andability.	
	i.transmitting	ii. phenotypic
	iii. receiving	iv. sire
14.	The daughters half in between the production level of the dam and sire is called.-- --	
	i. average parent index	ii. equal daughter index
	iii. equal parent index	iv. daughters average index
15.	Regression index is average of equal parent index and breed average.	
	i. daughter average	ii. parent average
	iii. breed average.	iv. equal daughter index
16.	Regression index - is average of equal parent index and breed average.	
	i. regression index	ii. total index
	iii. correlation	iv.sire index
17.	Functional relationship between two traits is called as regression coefficient	
	i. regression coefficient	ii. correlation coefficient
	iii. variance	iv.sire index
18.	Inbreeding depression is opposite to heterosis	
	i. outbreeding	ii. outcrossing
	iii. inbreeding	iv. heterosis
19.	Active interaction of dominance and recessive gene is termed as dominance theory of heterosis.	
	i. recessive	ii. dominance

	iii. dependent	iv.independent
20.	A record of history of ancestors of an individual is called as pedigree	
	i. ancestral character	ii. nomenclature
	iii. classification	iv. pedigree
21.	Robert backwell English scientist in eighteenth century is remembered as setting the pattern of modern animal breeding.	
	i. Robert brown	ii. Robert hook
	iii. Robert backwell	iv.Camilo Golgi
22.	In Animal cell organelles . lysosomes Contains most of the active enzymes removes unneeded material from cell.	
	i. lysosomes	ii. mitochondria
	iii. peroxisomes	iv. ribosome
23.	In meiosis cell division daughter nuclei produce half the number of chromosomes.	
	i. mitosis	ii. equational division
	iii. meiosis	iv. none of these
24.	Mitosis & Meiosis type of division of cell takes place in gonads and proceeds in Gametogenesis.	
	i. mitosis	ii. meiosis
	iii. reductional division	iv. both ii. & iii.
25.	Mitosis division chromosome number remain same as that of original parent nucleolus	
	i. meiosis	ii. reductional division
	iii. mitosis	iv. all of these
26.	Mitosis division of somatic cell and two daughter nuclei are formed	
	i. meiosis	ii mitosis
	iii. mitosis	iv. both ii. & iii.
27.	In meiosis division of animal cell at -----Stage genetic recombination take place	
	i. zygotene	ii. dikinesis
	iii.leptotene	iv. pachytene
28.	Exchange of genetic material in pachytenic stage is termed as crossing over	
	i. crossing over	ii. transmission
	iii. chiasma formation	iv. mitosis
29.	Genetics is a branch of biological science which deals with heredity and variation among	

	related organism.	
	i. breeding	ii. biotechnology
	iii genetics	iv. both i. & iii.
30.	Heredity means transmission of traits /character from parents to offspring.	
	i. variation	ii. outbreeding
	iii. transferring	iv. heredity
31.	A group of animal having common ancestors of possessing certain common character is called as . breed	
	i. species	ii. genus
	iii. breed	iv. family
32.	A cross of unrelated and inbred individuals often results in F ₁ generation which increases vigour much above their of parents is called as hybrid vigor	
	i. outbreeding	ii. hybrid vigour
	iii.outcrossing	iv. cross breeding
33.	Quantitative traits are controlled by Many pairs of gene.	
	i. many	ii. single
	iii. two	iv. both i. & ii.
34.	Qualitative traits are controlled by single Pairs of gene.	
	i. many	ii. single
	iii. two	iv. both i. & ii.
35.	Epistasis is called genetic effect due to interaction among two or more pairs of non-allelic gene.	
	i. hypostatis	ii. heterosis
	iii. Epistasis	iv. hybrid vigour
36.	Gene / Genes masking the effect of new allelic gene Epistatic .	
	i. Epistatic	ii. heterosis
	iii. hypostatic	iv. hybrid vigour
37.	Genes which are masked is called Hypostatic	
	i. Hypostatic	ii. dominant
	iii. epistatic	iv. heterosis
38.	Ability of an individual to stamp a given set of characteristics on its offspring is called	

	Prepotency	
	i. Totipotency	iii. Perpetuation
	ii. Prepotency	iv. None of these
39.	autosomes are the chromosomes other than sex chromosomes	
	i. autosomes	ii. alosomes
	iii. both i. & ii.	iv. none of above
40.	A group of animals which possess similar genotypes is called as species	
	i. species	ii. genus
	iii. breed	iv. family
41	60 number of chromosomes(2n) are present in in <i>Boss indicus (Indian)</i> species of cattle	
	i. 54	ii. 58
	iii. 72	iv. 60
42.	Alteration in the chemical structure of gene is called. -mutation	
	i. deletion	ii. inversion
	iii. mutation	iv. alteration
43.	Inverse occurrence of segment of chromosome breaks off and rejoin the opposite end from original is called as inversion	
	i. inversion	ii. duplication
	iii. deletion	iv. translocation
44.	In Hardy and Weinberg law frequency of heterozygosity is not greater than. - 50%	
	i. 50%	ii. 100%
	iii. 87.5%	iv. both iii. & iv.
45.	To bring homozygosity and maintaining purity is followed in inbreeding type of systems of breeding.	
	i.outbreeding	ii. inbreeding
	iii. species hybridization	iv. criss crossing
46.	Inbreeding system increases inbreeding to infection.	
	i. susceptibility	ii. resistance
	iii. both i. & ii.	iv. none of above
47.	In out breeding type of systems of breeding mating of individuals who have no common ancestor for four to six generation.	
	i. out breeding	ii. close breeding

	iii. both i. & ii.	iv. line breeding.
48.	Production of new breed formed by cross breeding System of breeding.	
	i. cross breeding	ii. close breeding
	iii. both i. & ii.	iv. line breeding.
49.	Three breeds of same species crossed in rotational manner is called as criss crossing	
	i. triple crossing	ii. criss crossing
	iii. back crossing	iv. cross breeding.
50.	back crossing type of crossing is mating of a crossbred animals back to one of pure bred parent	
	i. rotational crossing	ii. back crossing
	iii. two breed crossing	iv. three breed crossing
51.	Dr. Ian Wilmut at Roslin Institute, Edinburgh, created a sheep in laboratory named- Dolly	
	i. Garima	ii. Dolly
	iii. wilmut	iv. non of these.
52	Water present in embryo stage is 95 % of total body of cattle	
	i. 95	ii. 75-80
	iii. 40-65	iv. 10-20
53	Water present at birth stage is 75-80. % of total body of cattle	
	i. 95	ii. 75-80
	iii. 40-65	iv. 10-20
54	Water present at adult stage is 40-65 % of total body of cattle	
	i. 95	ii. 75-80
	iii. 40-65	iv. 10-20
55	Carbohydrates present in animal body is less than 1. %	
	i. 95	ii. 75-80
	iii. 1	iv. 10-20
56	Carbohydrate nutrient stored in animal body in liver in the form of glycogen	
	i. glucose	ii. fructose
	iii. galactose	iv. glycogen
57	The scientist Stohmann and Hennberg put forth method of feed analysis called as Weende's method feed analysis.	

	i. Morison method	ii. Weende's method
	iii. Modified Morrison	iv. Kellner's method
58	Crude protein. Indicates the total amount of protein in to the feedstuff.	
	i. Crude protein	ii. True protein
	iii. NPN	iv. non of above
59	Crude protein includes true protein as well as NPN (Non Protein Nitrogen)	
	i. protein	ii. NPN
	iii. fat	iv. CHO
60	Crude fiber - includes less digestible carbohydrates like pectin, cellulose, hemicelluloses, and lignin.	
	i. NFE	ii. crude protein
	iii. EE	iv. Crude fiber
61	NFE - includes more digestible carbohydrates like starch, sugar cellulose, hemicelluloses in minor quantity.	
	i. NFE	ii. crude protein
	iii. EE	iv. Crude fiber
62	EE (Ether Extract) represents lipid portion of feed stuff in proximate analysis.	
	i. NFE	ii. C. P.
	iii. EE	iv. C. F.
63	Total Ash represents inorganic portion of feed stuff in proximate analysis.	
	i. NFE	ii. Total Ash
	iii. EE	iv. C F
64	Urea - used as special feed source of Non protein nitrogen substance for ruminant animals.	
	i. Urea	ii. Molasses
	iii. Vegetable oils	iv. Animal fat
65	Mineral & Vitamin supplements are the compounds improve value of basal feed and take care any deficiency.	
	i. Feed	ii. Mineral
	iii. Vitamin	iv. All of above
66	Roughages are bulky feeds containing more than 18% crude fiber and less than 60% TDN on air dry matter basis	

	i. Roughages	ii. concentrates
	iii. vitamins	iv. minerals
67	Concentrates - are feeds containing less than 18% crude fiber and more than 60% TDN on air dry matter basis.	
	i. Roughages	ii. concentrates
	iii. vitamins	iv. minerals
68	Succulent roughages contain moisture from 60%-90% .	
	i. 60%,90%	ii. 10%,30%
	iii. 0%,5%	iv. 30%,40%
69	Dry roughages contain moisture from 15%,20%	
	i.60%,90%	ii. 15%,20%
	iii. 0%,5%	iv.70%,100%
70	The high yielding cows or buffaloes may suffer from a disease Milk fever due to fall in level of blood calcium.	
	i. Milk fever	ii. grass titany
	iii.beri-beri	iv.ricket
71	The high yielding cows or buffaloes may suffer from a disease milk fever due to fall in level of blood calcium	
	i. calcium	ii. Potash
	iii. sulfur	iv. iron
72	Metabolic water . type of water produced inside the body by metabolic process of body.	
	i. free water	ii. metabolic water
	iii. bound water	iv.non of above
73	Bound water type of water differs from free water, combined with constituent of protoplasm of animal cell.	
	i. bound water	ii. metabolic water
	iii.bothi.&ii.	iv.non of above.
74	Water is food constituent that nourishes the body of animal.	
	i. Protein	ii. Water
	iii.Carbohydrate	iv. Nutrient
75	Daily dry matter requirement for adult crossbred cattle is 2.5 %	
	i. 2.5 %	ii. 4.5 %

	iii. 3.5 %	iv. 1.5 %
76	The chief energy source of cattle feed ration is Carbohydrate	
	i. Carbohydrate	ii. Protein
	ii. Vitamins	iv. minerals
77	Percent crude protein = Percent N ₂ x 6.25	
	i) 6.25	ii. 6.46
	iii. 11.25	iv. 16
78	Urea can replace protein satisfactorily total protein in ration for matured ruminants and lactating cows up to 30 %	
	i. 30 %	ii. 40%
	iii. 50%	iv. 10 %
79	Energy value of milk fat per gram is 9.3 food calories	
	i. 9.3 food calories	ii. 8.3 food calories
	iii. 8.0 food calories	iv. 7.0 food calories
80	Water helps in excretion of waste product in the form of urine ,faeces and perspiration.	
	i. Carbohydrate	ii. Protein
	ii. Vitamins	iv. water

81	Lactose- is made up of one molecules of glucose and one molecules of galactose.	
	i. fructose	ii. maltose
	ii.lactose .	iv. sucrose
82	Starch is a mixture of amylase and amylopectin.	
	i. Starch	ii. Glycogen
	ii. Cellulose .	iv. Glucose
83	Glycogen is called animal starch.	
	i. Starch	ii. Glycogen
	ii. Cellulose .	iv. Glucose
84	The ruminant contains rumen micro-organism in the digestive tract they digest	
	i. lignin	ii. tannin
	ii. Cellulose .	iv.non of above.
85	At 5 th generation of ancestors parents population expression will be . (2) ⁵	
	i. (2)⁵	ii. (2) ⁶
	ii. (2) ⁴	iv. (2) ⁷
86	Straw of wheat, barley, rice and oat DCP contains proportionally is . nil	
	i. nil	ii. high
	iii. medium	iv.bothii.&iii. answer
87	Carbohydrates nutrient are received from milk in the form of lactose	
	i. fructose	ii. maltose
	ii.lactose .	iv. sucrose
88	Fats are esters of glycerol that are liquid at room temperature.	
	i. liquid	ii..solid
	iii.bothi.&ii.	iv.non of above.
89	Vitamins A,D,K,E are in fat soluble absorbed in to blood of livestock.	
	i. fat	ii. water
	iii. acid	iv. alkali
90	Lysine, Arginine, Histidine are essential type of amino acids present in protein in livestock.	
	i. non-essential	ii. essential
	iii.bothi.&ii.	iv.non of above.
91	Protein nutrient helps in formation wool, hairs, and nails of animal.	
	i. Carbohydrate	ii. Protein

	ii. fat	iv. vitamins
92	Ascorbic acid vitamins is good example of Water soluble of.	
	i. fat	ii. water
	iii. acid	iv. alkali
93	Ascorbic acid contains type- C vitamins.	
	i. A	ii. B
	iii. C	iv. D
94	Osteoporosis -Disease observe in cattle due to deficiency of calcium mineral.	
	i. Osteosporasis	ii. Ricket
	iii. Grass titany	iv. Oedema
95	Pica - disease observe in cattle due to deficiency of phosphorus mineral.	
	i. Osteosporasis	ii. Ricket
	iii. Grass titany	iv. Pica
96	Grass titany - disease observe in cattle due to deficiency of magnesium mineral.	
	i. Osteosporasis	ii. Ricket
	iii. Grass titany	iv. Pica
97	Oedema - disease observe in cattle due to deficiency of chlorine mineral.	
	i. Osteosporasis	ii. Ricket
	iii. Grass titany	iv. Oedema
98	Anemia -disease observe in cattle due to deficiency of Iron mineral.	
	i. Osteosporasis	ii. Anemia
	iii. Grass titany	iv. Oedema
99	Enzootic ataxia disease observe in lambs due to deficiency of copper mineral.	
	i. Enzootic ataxia	ii. Anemia
	iii. Grass titany	iv. Oedema
100	Goiter -disease observe in livestock due to deficiency of iodine mineral.	
	i. Osteosporasis	ii. goiter
	iii. Grass titany	iv. Oedema
101	Reproductive failure . Symptom observe in livestock due to deficiency of cobalt mineral.	
	i. Osteosporasis	ii. goiter

	iii. Reproductive failure	iv. Oedema
102	Night blindness .symptom observe in livestock due to deficiency of vitamin A	
	i. Night blindness	ii. Rickets
	iii. Reproductive failure	iv. Beri-beri
103	Rickets symptom observe in livestock due to deficiency of vitamin D	
	i. Night blindness	ii. Rickets
	iii. Reproductive failure	iv. Beri-beri
104	Reproductive failure symptom observe in livestock due to deficiency of vitamin E	
	i. Night blindness	ii. Rickets
	iii. Reproductive failure	iv. Beri-beri
105	Beriberi symptom observe in livestock due to deficiency of vitamin B	
	i. Night blindness	ii. Rickets
	iii. Reproductive failure	iv. Beri-beri
106	Scurvy symptom observe in livestock due to deficiency of vitamin C	
	i. Scurvy	ii. Rickets
	iii. Reproductive failure	iv. Beri-beri
107	prolonged blood clotting symptom observe in livestock due to deficiency of vitamin K	
	i. Night blindness	ii. Rickets
	iii. prolonged blood clotting	iv. Beri-beri
108	Amount of feed given at time or portion at interval to the animal during 24 hours is called . ration	
	i. complete ration	ii. balance ration
	iii. production ration	iv. ration
109	A ration which provides all essential nutrient for nourishment during 24 hours without excess or deficit is called balance ration	
	i. complete ration	ii. balance ration
	iii. production ration	iv. ration
110	A feed required to maintain body without gain or loss in weight under resting period is called maintainans ration	

	i. complete ration	ii. balance ration
	iii. production ration	iv. maintains ration
111	A feed required to addition to maintenance is called production ration	
	i. complete ration	ii. balance ration
	iii. production ration	iv. maintains ration
112	A ration which provides all essential nutrient require to satisfy the appetite is called -- complete ration	
	i. complete ration	ii. balance ration
	iii. production ration	iv. maintains ration
113	For crude protein estimate by proximate analysis method 5 gm. of digestible mixture contain sulfate of potassium &cobalt chemicals.	
	i. sulfate of potassium &cobalt	ii. sulfate of calcium &copper
	iii. sulfate of copper &cobalt	iv. none of above
114	For crude protein estimate by proximate analysis method 5 gm. of digestible mixture with feed sample adds 20ml.of . sulfuric acid	
	i.sulfer dioxide.	ii. citric acid
	iii. sodium chloride	iv. sulfuric acid
115	In proximate analysis method the nutrient ether extract estimation is carried by soxhlet apparatus.	
	i.Kjeldhal's flask	ii.soxhlet
	iii.bothi.&ii.	iv. none of above
116	For crude protein estimate N element is estimated.	
	i. C	ii. H
	iii. O	iv. N
117	In Crude fiber estimation gives idea of cellulose hemicelluloses and lignin.	
	i.Crude fiber	ii.Crude protein
	iii.Ether extract	iv.Ash
118	Ratio of digestible crude protein and digestible crude non-nitrogenous nutrients called as nutritive ratio	
	i. starch equivalent	ii. nutritive ratio
	iii. gross energy	iv. digestible energy

119	Young and growing animals , ratio between 1:1to 1:4 generally advocated called as narrow ratio	
	i. Wide	ii. medium
	iii. narrow	iv. none of above
120	Milch animals , nutritive ratio(N) between 1:4 to 1:6 generally advocated and called as medium ratio	
	i. Wide	ii. medium
	iii. narrow	iv. none of above
121	Working animals , ratio between 1:6 and above generally advocated and called as Wide ratio.	
	i. Wide	ii. medium
	iii. narrow	iv. none of above
122	Gross energy value of feed is determined by using an instrument bomb calorimeter.	
	i. Net	ii. Metabolic
	iii.Digestible	iv. Gross
123	Digestible energy value of feed is determined by loss of energy through feces from gross energy.	
	i. Net	ii. Metabolic
	iii.Digestible	iv. Gross
124	Metabolic energy value of feed is determined by loss of energy through urine and gas from digestible energy.	
	i. Net	ii. Metabolic
	iii.Digestible	iv. Gross
125	Net Energy value of feed is used to maintenance and production .	
	i. Net	ii. Metabolic
	iii.Digestible	iv. Gross

**COURSE NO.-AHDS-242 COURSE TITLE- LIVESTOCK BREEDING
AND NUTRITION CREDIT-1+1**

NOTES- THESE ARE PROBABLE OBJECTIVES. WHILE DOING STUDY OF THESE OBJECTIVES ALSO REFER COMPLETE NOTES.

Probable Objectives of Theory

1. **Leonardo a Vinci** revealed the fact that the male and female parents contribute equally to the heredity of offspring.
2. **Wright** discovered firstly mutation in male lamb which had short legs.
3. According to **Charles Darwin**, every cell of organs produce minute particle known as PANGENESIS.
4. **Gregor Johann Mendel an Australian monk** has been called the “Father of Genetics”.
5. **Hugo Devries , a Dutchman** , proposed r theory known as “Mutation Theory”.
6. **Robert Hooke** of England applied the term Cell in **1665**.
7. Most cells range in diameter from about **10 to 100 micra**.
8. Animal cells are **eukaryotic** cells.
9. Cell membrane shows the **lipid bi-layer model** of the plasma membrane.
10. Cell membrane is made up of **phospholipids** which has polar(hydrophilic) heads and non- polar (hydrophobic) tails.
11. **Cell membrane** provides shape and rigidity of the cells.
12. **Cytoplasm** contain dissolve protein, electrolytes, glucose and small quantities of phospholipids, cholesterol and esterified fatty acids.
13. **Nucleus** is the house for most of the cells genetic material- the **DNA and RNA**.
14. The **RNA** helps in protein synthesis through transcription process.
15. **Nucleus** regulates synthesis of protein of cell.
16. **Mitochondria** is the main **energy** source of the cell.
17. **Mitochondria** are called the **power house** of the cell because energy.
18. **Mitochondria** produce energy for cell by the process of **cellular respiration**.
19. **ER (Endoplasmic reticulum)** is the transport system of the cell.
20. **Golgi bodies** are the packaging center of the cell.
21. **Ribosomes** is the site for protein synthesis.

22. **Lysosomes** is the digestive system of the cell.
23. **Centrosomes** and is known as the 'microtubule organizing center' of the cell.
24. Through **Mitosis** each daughter cell is genetically identical to the parent cell.
25. Through Meiosis the number of chromosomes in the daughter cells is reduced by half to produce haploid gametes.
26. Mitosis is sometimes called an ” **Identical Reproduction of Cells**”.
27. Division of **nucleus** is call as **Karyokinesis**.
28. Division of **cytoplasm** is called as **Cytokinesis**.
29. **Mitosis** helps the cell in maintaining its proper size.
30. **Mitosis** helps the organisms in the asexual reproduction.
31. The term meiosis was coined by **J.S. Farmer in 1905**.
32. By reducing the number of chromosomes of the diploid germ cells into the haploid gametes the meiosis maintains a constant number of the chromosomes in the species. Thus, meiosis division also known as **Reduction Division**.
33. **Prophase I** is the longest phase of meiosis.
34. **Crossing over** takes place in **Pachynema** of **Prophase I** in meiosis I.
35. **Chiasmata** is a location /place where crossing over takes place.
36. **Meiosis II** is also known as **equational division**.
37. Production of haploid gametes from diploid mother cells is known as **gametogenesis**.
38. The synthesis of sperms in the testis of male reproductive system of animals is known as **spermatogenesis**.
39. **Testosterone** and **follicle-stimulating hormone (FSH)** are hormones play major role in spermatogenesis.
40. **Spermatogonia** the diploid stem cells of male.
41. Process of production of primary spermatocytes is known as **spermatocytogenesis**.
42. Process of Production of secondary spermatocytes (spermatids) is known as **spermatidogenesis**.
43. Spermatids differentiate into functional sperm by **spermiogenesis**.
44. **Oogenesis** is the process of synthesis of ova or egg in ovaries.
45. The process of production of diploid primary oocytes, is known as **oocytogenesis**.
46. Primary oocytes gets arrested at **prophase I**, and cells called as **dictyate**.
47. A **gene** is the basic physical and functional unit of heredity.
48. In 1905, **Wilhelm Johannsen** introduced the term ‘**Gene**’.
49. **Gene action** refers to the way in which certain genes exert their effects on the body.

50. **Gene frequency** refers to the proportion of a population that carries one type of allele, at a locus.
51. Gene frequency is also known as **allele frequency**.
52. **Genotype** refers to the genetic makeup of an organism.
53. **Genotype frequency** is a proportion or ratio of a particular genotype amongst all the individuals in a population.
54. **Gene expression** is the process by which information from a **gene** is used in the synthesis of a functional **gene** product.
55. **Mutation** is a sudden discrete and heritable change in genotype of an organism is called Mutation.
56. **Gene Mutation** is also called as **Point Mutation**.
57. Chance or probability of the simultaneous occurrence of two or more independent events equal to the product of the probability that each will occur separately is a **Law of Probabilities**.
58. Alleles segregate or separate from each other during gamete formation and pass on to different gametes in equal number, without their admixture in the hybrid is a **Law of Segregation**.
59. When two pairs of gene enter in F1 combination, both of them have their independent dominant effect. These genes segregate when gametes are formed, but the assortment occurs randomly and quite freely is **Law of Independent Assortment**.
60. Relative frequencies of various kinds of genes in a large and randomly mating population tend to remain constant from generation to generation in the absence of mutation and natural selection is a **Hardy Weinberg Law**.
61. **Chromosome** is a dark staining rod like or rounded bodies visible under microscope.
62. **Chromosomes** are the compact bundle of deoxyribonucleic acid molecule, portion of which represents gene.
63. **Chromosome Number Of Animals-**

Species	2n (Diploid)	N (Haploid)
1. Chicken	78	39
2. Cattle	60	30
3. Goat	60	30
4. Sheep	54	27
5. Buffalo-(swamp)	48	24
(water)	50	25
6. Horse	60	30
7. Ass	58	29
8. Human	46	23
9. Pig	38	19

64. Sometimes one or more pairs of homologous chromosomes fail to separate during gamete formation is known as **Non Disjunction**.
65. **Deletion** results when a broken segment fails to rejoin the segment containing the centromere.
66. **Inversion** occurs when the segment of chromosome breaks off and rejoins the opposite ends from the original arrangement.
67. A part of one chromosome breaks and the broken part gets attached to the homologous pair is a **Duplication**.
68. a piece of chromosome becomes broken off affected to another chromosome, usually of another pair is a **Translocation**.
69. **Variation** is a structural or functional difference between closely related individual within species.
70. **Hereditary variations** are defined as the variation or difference in composite genotypes in individual animals.
71. **Recombination** is a new combinations of existing genes, which occur through gamete formation, crossing over and fertilization.
72. **Polyploidy** is a occasional increase in the number of chromosomes adding or subtracting a part of whole set of haploid complements.
73. **Temperature, Light, Food, Soil** are the source of Non Hereditary Variation.
74. The traits are controlled by anyone or very few genes, with almost no environmental effect to modify the gene effect called **qualitative traits**.
75. Horned or hornless condition of cattle, .Black and white colour of guinea pig are examples of **qualitative traits**.
76. The traits which cannot be grouped into distinct types or classes, they are called **quantitative or metric traits**.
77. Single Colour of cow ,colour of man are examples of **quantitative traits**.
78. **Inbreeding** is a mating of related animals.
79. **Outbreeding** is a mating of Unrelated animals.
80. **Close breeding** is mating of more closely related individuals.
81. **Line breeding** mating of more distantly related individuals.
82. Examples of Close Inbreeding- **Dam X Son, Daughter X Sire , Full Brother X Full Sister**
83. Examples of Line Inbreeding- **Half Brother Half Sister (Cousin mating), Grand Son X Grand Mother, Grand Daughter X Grand Father**
84. **Inbreeding** increases homozygosity.
85. **Out crossing** is a mating of unrelated animals within the same (pure) breeds.

86. **Species Hybridization** is a crossing between two different species.
87. **Grading Up** is method of breeding is used when we want to improve non - descript animal.
88. **Crossing breeding** is mating of animals of different breeds.
89. When two breeds are crossed **alternatively** is called as **Criss Crossing** Breeding.
90. When three breeds are crossed in **Rotational** Manner is called as **Triple Crossing or Rotational Crossing**.
91. **Back Crossing** is a mating of crossbred back to one of the pure parents.
92. **Phule Triveni** is a breed of cow achieved through of Triple Crossing which is evolved by MPKV Rahuri.
93. **Sunandini** is a breed of cow achieved through **Grading Up**.
94. **Selection** is the tool in the hand of the breeder to improve the performance of the animal.
95. Selection on the basis of individual phenotypic performance is called **individual selection or performance Testing**.
96. Selection on the basis of performance of the ancestors is called as **pedigree selection**.
97. Selection of the individuals on the basis of average performance of their progeny is called **progeny testing**.
98. A **selection index** is used when the breeder simultaneously selects for several traits.
99. Green succulent fodder contain **70-80%** water.
100. Dry fodder contain **10 -15 %** water.
101. Concentrates contains **8-10 %** water.
102. **Carbohydrates** is the principle constituents of the plant.
103. Cell wall of plant composed of **cellulose**.
104. **Starch** is the major storage of carbohydrates in plant.
105. **Plant seeds** rich in **starch**.
106. **Proteins** are the major **nitrogen** containing compound protein present in plant.
107. **Legume** are always rich in **calcium**.
108. Animal tissues contain **70-90 %** water.
109. Animal embryo contains **95%** water.
110. Adult animal contains **50-60%** water.
111. **Proteins** are known as **building blocks** of animal body.
112. **Proteins** are the constituents of **antibodies, hormones** and **enzymes** of animal body.
113. **Fat** is localized in adipose tissues.
114. Animal body contains **3-5 %** of mineral matter.
115. More than **98%** of calcium is present in teeth and bones as phosphate and hydroxide.
116. **Carbohydrates** is present less than **1%** in animal body.

- 117. Roughages** contain **more than 18 % Crude Fiber (CF)** and **less than 60 % Total Digestible Nutrients (TDN).**
- 118. Concentrates** contain **less than 18 % crude fiber** and **more than 60 % TDN.**
- 119. Roughages** contains high crude fiber / carbohydrates.
- 120. Examples of Succulent Roughages-**
- Pasture - young growing grasses.
 - Cultivated fodder crops
 - Legume – Cowpea, cluster bean, green pea, berseem, lucerne
 - Non Legume- Sorghum, Maize, pearl millets, oat, Sudan grass
 - Tree leaves- babul, neem etc.
 - Silage
 - Root crops- turnips, carrot, mangos, fodder beet
- 121. Examples of Dry Roughages-** Hay , wheat and rice straws, husks, stover
- 122. Examples of Energy Rich Concentrates-**
- Cereal grains- Maize, barley, wheat, oat, sorghum
 - Mill byproducts- Wheat bran, rice bran, , gluten
 - Roots and tubers. – cassava, sugar beets, turnips
- 123. Examples of Protein Rich Concentrates-**
- Plant origin e.g. Oilseed cake, pulse chuni, Brewer's grains and yeast.
 - Animal origin e.g. Fish meal, Meat meal, Blood meal
- 124. Feed supplements** used to improve the nutritional deficiency.
- 125. Vitamins and Minerals** are examples of Feed Supplements.
- 126. Feed additives** are the non-nutritive substances use for to improve feed efficiency and productive performance of the animals.
- Antibiotics e.g. Terramycin, Zinc bacitracin, Flavomycin
 - Enzymes e.g. Amylase, lipase, protease, pepsin
 - Hormones eg. Estrogen, progesterone, hexosterol
 - Thyroprotein e.g. Iodinated casein.
 - Probiotics e.g. Microbial species. Lactobacillus.
 - Biostimulators e.g. Extracts of living organs like liver, ovary, chick embryo
 - Antioxidants e.g. Vitamin E (Tocopherols), BHT (Butylated hydroxy toluene).
 - Mold inhibitors e.g. Propionic acid, acetic acid.
 - Colouring agents
- 127. Hydrolysis** is an important chemical process in digestion and metabolism.

128. **Water** acts as a lubricant to prevent friction and drying in joints pleura, conjunctive.
129. **Proteins** are the complex **nitrogenous** compounds of high molecular weight and they are **colloidal** in nature.
130. Proteins are made up of various combinations of up to **26 amino acids**.
131. **Essential amino acids** are arginine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine.
132. Every day, 3 to 5 percent of the body's proteins are rebuilt.
133. **Insulin** proteins function as hormones and enzymes.
134. Protein supply energy- **1 gm of protein = 4.3 calories**.
135. **Carbohydrates** are compound of **carbon, oxygen and hydrogen**.
136. **Lignin** is classified with carbohydrates but it is **not true carbohydrates** .
137. Carbohydrates oxidized **fat and proteins**.
138. **Examples of Fat soluble vitamins**- Vitamins A, D, E, and K
139. **Examples of Water soluble vitamins**- Vitamin C and the B vitamins.
140. **Lipids** act as electron carriers and stores of energy
141. Lipids include **fatty acids, natural fats, steroids, phosphatides, prostaglandins , cholesterol, triglycerides, chlorophyll fat soluble vitamins**.
142. **Night Blindness** causes due to deficiency of **Vit. A**
143. **Diseases due to Mineral deficiency-**

Minerals	Deficiency
Calcium (Ca)	Rickets (muddus) , milk fever , fragile (weak) bones
Phosphorus (P)	Stiffness of joints (hardness to bend)
Magnesium (Mg)	Convulsions (irregular movement of body),grass tetany (intermittent muscular contraction) hypomagnesaemia in calves
Iodine (I)	Goiter (galgund)
Chlorine	Depress growth

144. Ruminant animal has **4 (Four)** compartment stomach namely Rumen (paunch), Reticulum(honeycomb), omasum (manypiles), Abomasum(true stomach).
145. Stored food is brought back to the mouth for mastication and mixing of food with saliva to make a pasty material which is fit for digestion, this process is known as **Rumination**.

146. The action of bringing swallowed food up again to the mouth., that process is known as **Regurgitation**.
147. Rumen contains microbes which digest **cellulose** contain plant material which is known as **Ruminant digestion**.
148. The heavy or solid objects, which are swallowed by animal, are dropped in **Reticulum**.
149. **Abomasum** is also known as True stomach.
150. The length of small intestine is about **130 feet** in cattle.
151. When carbohydrates reach in rumen, breakdown by enzymes with the production of **Volatile Fatty Acids (VFA)** , **carbon dioxide** and **methane**.
152. Propionic acids after reaching the liver is either oxidized or converted to **glucose**.
153. Animal body can utilize **acetic acid** for milk formation.
154. **Butyric acid** is mostly converted to **ketone** bodies in rumen.
155. Protein available to the ruminant are digested by the process of **proteolysis**.
156. **Ammonia** in rumen liquor is the key intermediate in the microbial degradation and synthesis of proteins.
157. **Urea** is a very common **NPN (Non Protein Nitrogen)** compound.
158. **Crude protein (CP)** given a measure of **total nitrogen** present in feed
159. DCP is determined by **digestibility trial**.
160. **Total Digestible Nutrients (TDN)** sum of all digestible organic nutrients.
161. **TDN** represents the approximate energy value of feed.
162. $TDN = \text{digestible NFE} + \text{digestible CF} + \text{digestible CP} + (\text{digestible EE} \times 2.25)$
163. While estimation of TDN, DEE always multiply by **2.25** because it represents fat fraction of feed which has 2.25 times more energy value as compared to carbohydrates and proteins.
164. **Gross Energy (GE)** is determined by **Bomb's Calorimeter**.
165. **Gross Energy** is expressed as **Kilo- calories** per kilogram of feed.
166. Some energy is lost through feces. When loss of energy if measured and subtracted then we gets **Digestible Energy(DE)**
 $DE = GE - \text{loss of energy through feces.}$
167. Some losses of energy through urine and combustible gases like methane produced by body. When the loss of energy though urine and gases were worked out and subtracted from DE, we get **Metabolizable Energy (ME)**
 $ME = DE - \text{Energy loss through Urine} + \text{Gases}$
168. Losses of energy through **Heat Increment (HI)** like for digestion, chewing, increased work of heart and lungs etc is subtracted from metabolizable energy , the reminder is called Net energy.

$$NE = ME - HI$$

169. **Starch Equivalent(SE)** is the number of kg of starch that would be required to produce the same amount of fat as 100 kg of any particular feed

$$SE = \frac{\text{Wt. of fat stored per unit wt of food}}{\text{Wt. of fat stored per unit wt of starch}} \times 100$$

170. **Nutritive Ration(NR)** is the ratio between **digestible crude protein** and other **digestible non-nitrogenous** constituents.

171. Types of Nutritive Ratio (NR)-

i. **Narrow Nutritive Ratio-** The ratio between **1:1 to 1.4** is called narrow nutritive ratio and generally advocated to the **young growing animals**.

ii. **Medium Nutritive Ratio-** The ratio between **1:4 to 1.6** is called medium nutritive ratio and generally advocated to the **milch animals**.

iii. **Wide Nutritive Ratio-** The ratio between **1:6 and above** is called narrow nutritive ratio and generally advocated to the **working animals**

172. **Feedings Standards (FS)** are the tables, which indicate the quantities of nutrients to be fed to the various classes of livestock for different physiological functions.

173. **Feed processing** usually means altering the physical and chemical nature of feed to optimize utilization by animals.

174. **4%** urea is recommended for treatment of low quality roughages

175. The pH of silage should be maintain at **4**.

176. Silage should be prepare in **Anaerobic** condition.

.....
