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SEMESTER END THEORY EXAMINATION
B.Sc. (Hons.) Agriculture

Semester	**:**	**IV (NEW)**	**Term**	**:**	**II**	**Academic Year**	**:**	**2020-21**
Course No.	**:**	**AHDS-242**	**Title**	**:**	**Livestock Breeding and Nutrition**			
Credits	**:**	**(1+1)**						
Day & Date	**:**	**26.11.2021**	**Time**	**:**		**Total Marks**	**:**	**40**

NOTE : 1) Solve ANY FOUR questions from SECTION-A
2) Solve ANY SIX questions from SECTION –B
3) All questions from SECTION-C are compulsory
4) Send the PDF file of answer sheet to the email ID of respective course teacher

MODEL ANSWER PAPER (Guideline for evaluation of answer book)

SECTION "A"

Q.1. Enlist the basis and methods of selection and give advantages and limitations of pedigree selection. (Marks -1 +1+1+1=4)

Answer :

There are three basis of selection –

1) Individual selection, 2) Pedigree selection, 3) Progeny selection.

The different methods of selection are –

1) Tandem method, 2) Independence culling method, 3) Selection index method

Advantages of pedigree selection methods are as fallows,

1) It provides the information when performance test can not be applied.
2) Allows selection of very young age particularly for the traits which are expressed by only one sex.
3) Allow the selection of both sexes for limited traits like milk production and maternal ability.
4) It is presumed that 87% characters, contribution is from the transmission of previous three generation, hence study of previous records give base for accurate selection for genetic potentialities.
5) Help for future planning.
6) Errors in body confirmation is minimize as there possibilities of individual mistake in selection for genetic value.

Limitations

1) Each parent would transmit 50% characters, but practically no body know, whether this is happen or not.
2) Record of pedigree is not available on large scale population.
3) Breeding value of individual animal is lost in pedigree.

Continue to page number 2…

Q. 2 Differentiate between Mitosis and Meiosis.(Any four) (4)

Answer: Minimum four differences are expected from followings.

Sr.No	Mitosis	Meiosis
1	An equal division separating sister chromatids.	A reduction division. The first stage is a reductional division which separates homologous chromosomes at first anaphase. Sister chromatids separate in an equational division at second anaphase.
2	Only one division per cycle that is, one cytoplasmic division (cytokinesis) per equational chromosomal division.	Two division per cycle i.e. two cytoplasic divisions, one following the reductional chromosomal division and the other following equational division.
3	Chromosomes fail to synapse and no chiasmata formation.	Chromosomes synapse and form chiasmata.
4	Genetic exchange between homologous chromosomes does not occur.	Genetic exchange occurs between homologous chromosomes.
5	Two daughter cells produced	Four daughter cells are produced.
6	Genetic contents of daughter cells are identical.	Genetic contents of daughter cells are different.
7	Chromosome number of daughter cells is the same as that of mother cell.	Chromosome number of daughter cells is the half as that of mother cell
8	Daughter cells are capable of undergoing additional mitotic division.	Daughter cells are not capable of undergoing additional meiotic division although they may undergo mitotic division.
9	Normally occurs in all somatic cells.	Occurs only in specialized germ cells.
10	Begins at the zygote stage and continuous throughout the life of the organism.	Occurs only after puberty, in higher organisms. But occurs in the zygote algae and fungi.

Q. 3. Give the classification of feed- stuffs with suitable examples (4)

Answer :- The feed stuffs are classified as fallows-

A) Roughages – a) Dry Roughages – straw ,hay ,kadbi and kutar

b)Green / succulent Roughages- Pastures, cultivated fodders, tree leaves, root crops and silage

B) Concentrates- a) Energy rich – Cereal grains& by products, roots & tubers.

b) Protein rich – Oilseed cakes, pulse chuni, etc.

C) Feed supplements – vitamin and minerals like A,E,D,K,B, & I, Cu,P, etc.

D) Feed additives – like Terramycin , Flavomycin, Ziac bacitracin, etc.

E) Unconventional feed stuffs- Babul tree leaves & pods, bagasse, sea weed, salseed cake, neemseed cake etc.

Continue to page number.3….

Q. 4. Describe in short functions of various organs of cattle digestive system? (4)

Answer :-

Various organs of cattle digestive system are-

1. Mouth, 2. Oesophagus, 3. Stomach (Reticulum, Rumen, Omasum, Abomasum),
4. Small intestine, 5. Large intestine 6. Liver 7. Pancreas.

Place and Functions of various organs: answer is expected as below,

1.Mouth : is a organ of prehension, mastication, insalivations and regurgitation. Saliva assists mastication and swallowing by acting lubricants.

2. Oesophagus: Oesophagus has diameter 1 to 2 inches, it act as passage for food and is stretchable.

3. Stomach : In ruminant stomach is divided into 04 parts as

   a. Reticulum - 5 to 10 % area of stomach, Reticulum and rumen joined by reticulo, rumen - folds of tissues, capacity is about 10 lits. , helps in regurgitation of food bolus to mouth for rechewing and secondary eruction of digestive gases in rumen.
   b. Rumen – occupy 70 to 80% area of stomach, capacity 40 to 50 gallons or 250 to 300 lbs., it act as storage place, reduce size of food, efficient action of microorganisms and digestive saliva, muscular contraction, mixing of food, rumination and eruction, provide place for microbial activity.
   c. Omasum – occupy 10 to 15% space of stomach, absorption of water and further grinding of feed particles for appropriate action of digestive enzymes in the abomasums and small intestine.
   d. Abomasums- occupy 13% space, secretes gastric juices which contains HCL and enzymes like pepsin and rennin, HCL reduces pH of the digesta 6 to 2.3 to enhance activity of pepsin because it can act only in acid medium.

4. Small intestine- 1 to 2 in diameter and 135 ft in length in adult cows. Consist three parts as Duodenum, Jesunum, Ileum. The wall of this are covered with finger like projections called villi. Digestion of various nutrients takes place with pancreatic & intestinal juices it is a chief site for absorption, bile acid , pancreatic secretion, etc

5. Large intestine- it divided into three parts i.e. Cacum, Colon and the rectum. Microbial fermentation, subsequent digestion, secretion and absorption of various nutrients is major function.

   a. Cocum -is a blind sac analogues to human appendix, loaded near the juncture of small and large intestine it has capacity 1 to 2 gallons in mature animal.
   b. Colon is a tube approximately 3 to 5 inches in diameter and 35 to 40 ft. long.
   c. Rectum is the last part which several feet length and passes undigested material out of the body.

6. Liver: Liver is a large functional glands situated on the left side in the abdominal cavity, at its center gall bladder with bile acid is present. Digestion with various juices secretion like bile acid, digestion and absorption is main function.

7. Pancreas: Second main accessory digestive gland, Long and flat in shape pancreas is a branched, glandular structure. It is yellow in colour, situated between the curvature of duodenum and stomach. Secretion of various pancreatic juices like enzymes, insulin, pH maintenance, etc for digestion.

Continue to page number.4….

Q. 5. Write down short notes on (2+2=4)

a) Variance: Refers to the observable or measurable differences in the individual for particular traits. The individuals differ in their metric characters. The amount of variation is measured and expressed as the variance. Corresponding to the partition of phenotypic value into genotypic value and environmental deviation, P=G=E, the phenotypic variance (V_P) is partitioned into genotypic (V_G) and environmental variances (V_E).

$$V_P = V_G + V_E$$

The genotypic variance is the variance of genotypic value and the environmental variance is the variance of environmental deviations. The total variance is the phenotypic variance. The components of variance and the values whose variance they measure are listed below,

Variance components	symbol	Value whose variance is measured
Phenotypic	V_P	Phenotypic value
Genotypic	V_G	Genotypic value
Additive	V_A	Additive value
Dominance	V_D	Dominance deviation
Interaction	V_I	Interaction deviation
Environmental	V_E	Environmental deviation.

The total variance is then sum of these components.

b) Feeding Standards:

Feeding standards are the table values indicating the quantities of nutrients to be fed to various classes of livestock for different physiological functions.

Advantages of feeding standards :-

1. They serve as best general guide for feeding of livestock & poultry.
2. They are useful for practical feeding purpose.
3. They give an idea about total feed and nutrients requirements of every species for specific physiological functions.
4. They are useful in planning the experiments and interpreting the results depending on the nature and objective of the investigation.
5. They are useful for calculations of total feed requirement of herd and thus helps in planning of feeding schedule for future.
6. They are flexible and can be modified as per demand, availability and cost of feedstuffs.

c) **Spermatogenesis-**

During the period of sexual maturity in animals, the spermatozoa are formed in the testis from reproductive cells, the spermatogonia. The final spermatogonial division results in cells known as primary spermatocytes. Which in preparation for meiosis enter upon a period of growth.

In short it is a process of cytoplasmic differentiation to become sperm through various phases as below.

Spermatogorium→ Primary spermoatocyte → I Division of Meiosis → Secondary Spermatocytes→ II Division of Meiosis→ Spermatid →Metamorphosis → Sperms.

Continue to page number..5….

SECTION –B		
(Write the answer in one sentence only. Each question carries 2 marks)		
Q.6	**Write down true or false**	
	a) Individuals with one common parent are known as half sib. **-True**	
	b) Chromosomal number of buffalo is 78.**- False**	
	c) Mating of full brother and full sister is known as close breeding**-True**	
	d) Dr. V. Kurian is known as father of genetics. **- False**	
	e) Carbohydrates are present in the milk in the form of lactose. **-True**	
	f) Vitamin B deficiency causes sterility in animals. **- False**	
	g) Milk fever is cause due to deficiency of calcium. **-True**	

SECTION -C		
(Choose the Correct Option. Each question carry 1 mark)		
Q. 7	1) _____ is known as sites for protein synthesis in animal cell	
	a) Nucleus	b) Cytoplasm
	c) Golgi bodies	**d) Ribosome**
	2) Sudden change in the gene is known as____	
	a) Mutation	b) Selection
	c) Migration	d) Correlation
	3) Sex cell gamete contains half the number of chromosome sets found in somatic cells, which are referred to as _____.	
	a) Haploid cells	b) Diploid cells
	c) Ploidy Cells	d) None of these
	4) _____ is an example of qualitative traits in animal breeding.	
	a) Milk yield	b) Egg yield
	c) Wool colour	d) Weight gain
	5) _____ is known as basic properties of Hardy- Weinberg law	
	a) Random mating	b) Absence of migration, mutation and selection
	c) Large population	**d) All of these**
	6) Choosing of the parent for next generation is known as_____	
	a) Selection	b) Migration
	c) Mutation	d) All of these
	7) Preservation of green fodder in an anaerobic condition is known as_____	
	a) Hay	b) Roughages
	c) Silage	d) None of these
	8) Gross Energy – Energy lost in faeces = _____	
	a) Digestible Energy	b) Metabolizable Energy
	c) Net Energy	d) None of these
	9) _____ is an important food ingredient which forms muscles and tissues of the body	
	a) Protein	b) Fat
	c) Minerals	d) Carbohydrates
	10) Production of fodder without soil is termed as _____	
	a) Perennial	**b) Hydroponic**
	c) Silage	d) Seasonal
		Continue to page number..6….

	11) Characteristics of good ration is_____	
	a) Free from dust and moulds	b) Soft, pliable and digestive
	c) Free from toxic elements	**d) All of these**
	12) UMMB stand for_____	
	a) Un Metabolized Mineral Block	**b) Urea Molasses Mineral Block**
	c) Urea Meat Molasses Blocks	d) None of these
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