

Animal Science Reviewer

By Agriculture Review

1. Which of the following bones belongs to the axial skeleton of an animal?

- (a) Femur
- (b) Scapula
- (c) Skull
- (d) Humerus

2. The 'true stomach' of a ruminant animal, where enzymatic digestion occurs, is the:

- (a) Rumen
- (b) Reticulum
- (c) Omasum
- (d) Abomasum

3. Which hormone is primarily responsible for stimulating milk letdown in lactating dairy cows?

- (a) Prolactin
- (b) Oxytocin
- (c) Estrogen
- (d) Progesterone

4. What is the primary thermoregulatory behavior utilized by swine to cool down during environmental heat stress?

- (a) Sweating profusely
- (b) Panting
- (c) Wallowing in mud or water
- (d) Shedding hair

5. The system responsible for the circulation of blood, delivering oxygen and nutrients to tissues, is the:

- (a) Digestive System
- (b) Respiratory System
- (c) Nervous System
- (d) Cardiovascular System

6. Which class of nutrients provides the most concentrated source of energy per gram?

- (a) Carbohydrates
- (b) Proteins
- (c) Lipids (Fats)
- (d) Vitamins

7. What is the primary end-product of carbohydrate fermentation by microbes in the rumen?

- (a) Glucose
- (b) Volatile Fatty Acids (VFAs)
- (c) Amino Acids
- (d) Triglycerides

8. A feedstuff that contains more than 18% crude fiber on a dry matter basis is generally classified as a:

- (a) Concentrate
- (b) Supplement
- (c) Roughage
- (d) Additive

9. Which vitamin is naturally synthesized by the skin when exposed to ultraviolet (UV) light from the sun?

- (a) Vitamin A
- (b) Vitamin B12
- (c) Vitamin C
- (d) Vitamin D

10. The most critical, yet often neglected, nutrient required for animal survival and production is:

- (a) Protein
- (b) Minerals
- (c) Water
- (d) Fat

11. The observable physical or biochemical characteristics of an animal are collectively referred to as its:

- (a) Genotype
- (b) Phenotype
- (c) Karyotype
- (d) Haplotype

12. The mating of animals that are more closely related than the average of the breed or population is known as:

- (a) Crossbreeding
- (b) Outcrossing
- (c) Inbreeding
- (d) Grading up

13. What is the basic physical and functional unit of heredity?

- (a) Chromosome
- (b) Gene
- (c) Nucleus
- (d) Protein

14. An animal possessing two identical alleles at a given locus for a specific trait is considered:

- (a) Heterozygous
- (b) Homozygous
- (c) Hemizygous
- (d) Polyploid

15. Alternative forms of a gene occupying the same locus on homologous chromosomes are called:

- (a) Chromatids
- (b) Centromeres
- (c) Alleles
- (d) Loci

16. Which type of joint, characterized by a fluid-filled capsule, allows for the greatest range of movement in an animal's body?

- (a) Synarthrosis
- (b) Amphiarthrosis
- (c) Diarthrosis
- (d) Fibrous joint

17. In the avian digestive system, which organ is highly muscular and primarily responsible for the mechanical breakdown of feed grains?

- (a) Crop
- (b) Proventriculus
- (c) Gizzard (Ventriculus)
- (d) Ceca

18. Somatotropin, a hormone that regulates growth and cell reproduction, is secreted by which endocrine gland?

- (a) Thyroid gland
- (b) Adrenal gland
- (c) Posterior pituitary
- (d) Anterior pituitary

19. During severe heat stress, which physiological and behavioral responses are typically observed in cattle?

- (a) Decreased respiration rate and increased feed intake
- (b) Increased respiration rate and decreased feed intake
- (c) Decreased respiration rate and decreased water intake
- (d) Increased heart rate and increased feed intake

20. The fundamental functional unit of the nervous system, responsible for transmitting electrical and chemical signals, is the:

- (a) Glial cell
- (b) Nephron
- (c) Neuron
- (d) Myofibril

21. Which blood vessels possess thick, elastic walls and are responsible for carrying oxygenated blood away from the heart?

- (a) Veins
- (b) Capillaries
- (c) Venules
- (d) Arteries

22. In typical corn and soybean meal-based diets for swine, which essential amino acid is usually the first-limiting?

- (a) Methionine
- (b) Tryptophan
- (c) Lysine
- (d) Threonine

23. Which of the following Volatile Fatty Acids (VFAs) produced in the rumen is highly glucogenic and vital for lactose synthesis in dairy cows?

- (a) Acetate
- (b) Butyrate
- (c) Propionate
- (d) Valerate

24. The primary site of enzymatic digestion and nutrient absorption in monogastric animals is the:

- (a) Stomach
- (b) Small intestine
- (c) Cecum
- (d) Large intestine

25. Which mineral deficiency is the primary cause of 'grass tetany' in beef cattle grazing on lush, spring pastures?

- (a) Calcium
- (b) Phosphorus
- (c) Magnesium
- (d) Potassium

26. When using the Pearson Square method for feed formulation, what does the value placed in the center of the square represent?

- (a) The cost of the feed ingredients
- (b) The protein content of the basal feed
- (c) The desired nutrient concentration of the final mixture
- (d) The ratio of concentrate to roughage

27. In pasture management, rotational grazing is favored over continuous grazing primarily because it:

- (a) Increases selective grazing by the animals
- (b) Allows forage plants time to replenish root reserves and regrow
- (c) Eliminates the need for fencing and water source management
- (d) Reduces the total dry matter yield of the pasture

28. In a complete dominance inheritance model, if a homozygous dominant sire (BB) is crossed with a homozygous recessive dam (bb), what proportion of the F1 offspring will exhibit the dominant phenotype?

- (a) 25%
- (b) 50%
- (c) 75%
- (d) 100%

29. Which biometric parameter estimates the proportion of total phenotypic variation in a trait that is attributable to additive genetic variation?

- (a) Repeatability
- (b) Heritability
- (c) Selection differential
- (d) Genetic correlation

30. Heterosis, or hybrid vigor, is mathematically expressed as the performance of crossbred progeny compared to the:

- (a) Performance of the superior parent
- (b) Average performance of the purebred parents
- (c) Performance of the inferior parent
- (d) Performance of the general breed population

31. Economically important quantitative traits in livestock, such as milk yield and growth rate, are typically governed by:

- (a) A single gene locus
- (b) Maternal inheritance only
- (c) Polygenic inheritance
- (d) Sex-linked genes only

32. For highly heritable traits (e.g., backfat thickness in swine), which method of selection yields the most rapid genetic progress?

- (a) Pedigree selection
- (b) Progeny testing
- (c) Family selection
- (d) Individual (mass) selection

33. In animal breeding statistics, what measure is used to evaluate the strength and direction of the linear relationship between two different quantitative traits?

- (a) Variance
- (b) Standard deviation
- (c) Correlation coefficient
- (d) Mean

34. Which component of the respiratory system acts as a specialized valve to prevent the aspiration of food or liquid into the trachea during swallowing?

- (a) Pharynx
- (b) Larynx
- (c) Epiglottis
- (d) Bronchioles

35. The phenomenon where a single gene influences multiple, seemingly unrelated phenotypic traits is known as:

- (a) Epistasis
- (b) Pleiotropy
- (c) Codominance
- (d) Incomplete dominance

36. In osteology, the Haversian system (osteon) serves as the fundamental functional and structural unit of which specific type of bone tissue?

- (a) Cancellous (spongy) bone
- (b) Compact (cortical) bone
- (c) Woven bone
- (d) Endochondral bone

37. The countercurrent heat exchange mechanism vital for maintaining proper testicular temperature in bulls is facilitated by a specialized vascular network called the:

- (a) Circle of Willis
- (b) Hepatic portal system
- (c) Pampiniform plexus
- (d) Corpus cavernosum

38. Which specific histological zone of the adrenal cortex is responsible for synthesizing and secreting mineralocorticoids such as aldosterone?

- (a) Zona reticularis
- (b) Zona fasciculata
- (c) Zona glomerulosa
- (d) Adrenal medulla

39. During the sliding filament mechanism of skeletal muscle contraction, the binding of calcium ions to which specific regulatory protein triggers the conformational change that exposes myosin-binding sites on actin?

- (a) Tropomyosin
- (b) Troponin
- (c) Titin
- (d) Nebulin

40. The vagus nerve (Cranial Nerve X) provides crucial parasympathetic innervation to the thoracic and abdominal viscera. From which anatomical region of the brainstem does it originate?

- (a) Midbrain
- (b) Pons
- (c) Medulla oblongata
- (d) Cerebellum

41. When calculating Total Digestible Nutrients (TDN) in feedstuff analysis, the digestible ether extract fraction is multiplied by a specific factor to account for its higher caloric density. What is this factor?

- (a) 1.25
- (b) 1.75
- (c) 2.25
- (d) 2.75

42. In the avian proventriculus, which specialized type of epithelial cell synthesizes and secretes BOTH hydrochloric acid and pepsinogen?

- (a) Parietal cells
- (b) Chief cells
- (c) Oxynticopeptic cells
- (d) Goblet cells

43. Phytic acid in plant-based feed ingredients forms indigestible complexes with which crucial mineral, necessitating the addition of exogenous enzymes to non-ruminant diets?

- (a) Sodium
- (b) Chlorine
- (c) Phosphorus
- (d) Selenium

44. Which specific cyanogenic glycoside is naturally present in young sorghum and Sudan grass, potentially causing lethal prussic acid (cyanide) poisoning in grazing ruminants?

- (a) Gossypol
- (b) Dhurrin
- (c) Mimosine
- (d) Ricin

45. In the hierarchical system of energy partitioning in animal nutrition, Net Energy (NE) is calculated by subtracting which value from Metabolizable Energy (ME)?

- (a) Fecal energy
- (b) Urinary and gaseous energy
- (c) Heat increment
- (d) Basal metabolic rate

46. White muscle disease (Nutritional Muscular Dystrophy) in neonatal calves is pathognomonic for a concurrent dietary deficiency of Vitamin E and which essential trace mineral?

- (a) Copper
- (b) Zinc
- (c) Manganese
- (d) Selenium

47. Which precise mode of non-additive gene action is theorized to be the primary genetic mechanism driving the phenomenon of overdominance-based heterosis in livestock crossbreeding?

- (a) Heterozygote advantage at specific loci
- (b) Additive allele accumulation
- (c) Recessive epistasis
- (d) Incomplete penetrance

48. In the fundamental equation for predicting genetic progress or response to selection ($R = h^2 \times S$), the variable 'S' represents the Selection Differential. How is 'S' mathematically defined?

- (a) The genetic variance divided by phenotypic variance
- (b) The phenotypic superiority of selected parents over the population mean
- (c) The correlation between genotype and environment
- (d) The inbreeding coefficient of the progeny

49. In classical Mendelian genetics, a dihybrid cross exhibiting recessive epistasis (where the homozygous recessive genotype at one locus masks the expression at a second locus) produces which modified phenotypic ratio?

- (a) 9:3:3:1
- (b) 12:3:1
- (c) 9:3:4
- (d) 15:1

50. Modern genetic evaluation systems utilize Best Linear Unbiased Prediction (BLUP) to estimate Estimated Breeding Values (EBVs). A distinct advantage of BLUP is its simultaneous adjustment for environmental effects and its integration of:

- (a) Epigenetic DNA methylation patterns
- (b) The numerator relationship matrix of all animals in the pedigree
- (c) Mitochondrial inheritance pathways
- (d) Non-additive genetic variance only

Answer Key

1. c	14. b	27. b	40. c
2. d	15. c	28. d	41. c
3. b	16. c	29. b	42. c
4. c	17. c	30. b	43. c
5. d	18. d	31. c	44. b
6. c	19. b	32. d	45. c
7. b	20. c	33. c	46. d
8. c	21. d	34. c	47. a
9. d	22. c	35. b	48. b
10. c	23. c	36. b	49. c
11. b	24. b	37. c	50. b
12. c	25. c	38. c	
13. b	26. c	39. b	