



Questions &  
Answers in  
Anatomy &  
Physiology

FOR VETERINARY NURSES

THE COLLEGE OF  
ANIMAL WELFARE





# **300 Questions and Answers in Anatomy and Physiology for Veterinary Nurses**

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*The College of Animal Welfare*

**B**UTTERWORTH  
**H**EINEMANN

OXFORD AUCKLAND BOSTON  
JOHANNESBURG MELBOURNE NEW DELHI

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This One



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FOR EVERY TITLE THAT WE PUBLISH, BUTTERWORTH-HEINEMANN  
WILL PAY FOR BCTV TO PLANT AND CARE FOR A TREE.



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# **Introduction**

## **How the book is organized**

This book of anatomy and physiology questions has been produced in response to further requests for more multiple choice questions.

It contains 300 questions covering anatomy and physiology. After the questions is a list of correct answers.

## **How to use the book**

Do your revision first, then select a range of question numbers at random. Do this without looking at the questions in advance. You should be able to complete and finish one multiple choice question per minute, allowing time for a thorough read of the question and the options before selecting the correct answer.



# Questions

- 1) *Which ONE of the following is a function of the periosteum?*
  - a) To give attachment to tendons
  - b) To supply nourishment to the bone
  - c) To increase bone circumference
  - d) To increase bone length
  
- 2) *A constituent of blood that is rich in antibodies is:*
  - a) thromboplastin
  - b) gamma-globulin
  - c) leucocytes
  - d) thrombocytes (platelets)

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- 3) *Which ONE of the following is NOT a function of the blood?*
- a) To provide materials for the manufacture of glandular secretions
  - b) To regulate body temperature
  - c) To cushion the brain and spinal cord
  - d) To arrest haemorrhage through clotting
- 4) *The interior of the heart is lined with:*
- a) pericardium
  - b) endocardium
  - c) myometrium
  - d) endomysium
- 5) *The blood vessels which communicate with the left atrium of the heart are called:*
- a) the pulmonary arteries
  - b) the coronary veins
  - c) the venae cavae
  - d) the pulmonary veins
- 6) *The sino-atrial node (pacemaker of the heart) is situated in the:*
- a) wall of the right atrium
  - b) atrioventricular bundle (bundle of His)
  - c) atrioventricular node
  - d) wall of the right ventricle



- 7) *The function of the lymphatic capillaries is to carry:*
- a) food and oxygen from the bloodstream
  - b) waste products from the cells to the bloodstream
  - c) tissue fluid from the interstitial spaces to the lymphatic vessels
  - d) intracellular fluid from the cells to the bloodstream
- 8) *Absorption of food occurs mainly from the:*
- a) stomach
  - b) duodenum
  - c) jejunum
  - d) colon
- 9) *Haemopoiesis is:*
- a) destruction of red blood cells
  - b) formation of antibodies in the blood
  - c) process of blood clotting
  - d) production of red blood cells
- 10) *Where is the ovum MOST likely to become fertilised?*
- a) Ovary
  - b) Uterine tube (Fallopian tube)
  - c) Uterine horn
  - d) Uterine body

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- 11) *The function of the prostate gland is to:*
- a) produce spermatazoa
  - b) secrete testosterone
  - c) secrete androgens
  - d) secrete lubricant for spermatazoa
- 12) *Which ONE of the following produces spermatazoa?*
- a) Epididymis
  - b) Interstitial cells of the testis
  - c) Seminal vesicle
  - d) Seminiferous tubules
- 13) *Trypsin is formed in the:*
- a) duodenum
  - b) exocrine part of the pancreas
  - c) islets of Langerhans
  - d) stomach
- 14) *A catabolic reaction is:*
- a) the breakdown of starch to glucose with the liberation of energy
  - b) where starch is broken down to glucose and where energy is necessary to bring it about
  - c) the build up of starch from glucose with the liberation of energy
  - d) the build up of starch from glucose and where energy is necessary to bring it about



15) *The dental formula of the kitten is:*

$$\text{a) } \begin{array}{cccc} \underline{I} & \underline{3} & \underline{c} & \underline{1} \\ 3 & 1 & & \end{array} \text{ pm } \begin{array}{cc} \underline{3} & \underline{0} \\ 3 & 0 \end{array} = 28$$

$$\text{b) } \begin{array}{cccc} \underline{I} & \underline{3} & \underline{c} & \underline{1} \\ 3 & 1 & & \end{array} \text{ pm } \begin{array}{cc} \underline{3} & \underline{1} \\ 2 & 1 \end{array} = 30$$

$$\text{c) } \begin{array}{cccc} \underline{I} & \underline{3} & \underline{c} & \underline{1} \\ 3 & 1 & & \end{array} \text{ pm } \begin{array}{cc} \underline{3} & \underline{1} \\ 3 & 1 \end{array} = 30$$

$$\text{d) } \begin{array}{cccc} \underline{I} & \underline{3} & \underline{c} & \underline{1} \\ 3 & 1 & & \end{array} \text{ pm } \begin{array}{cc} \underline{3} & \underline{0} \\ 2 & 0 \end{array} = 26$$

16) *Contraction of the quadriceps muscle produces:*

- a) extension of the hock
- b) extension of the stifle
- c) flexion of the hock
- d) flexion of the stifle

17) *The oestrous cycle of the bitch is divided into 4 stages. In order these are:*

- a) pro oestrus, anoestrus, metoestrus, oestrus
- b) oestrus, anoestrus, metoestrus, pro oestrus
- c) pro oestrus, metoestrus, oestrus, anoestrus
- d) pro oestrus, oestrus, metoestrus, anoestrus

18) *Intramembranous ossification is where:*

- a) the femur develops from a hyaline cartilage model
- b) the femur develops from primitive connective tissue
- c) the frontal bone develops from primitive connective tissue
- d) the parietal bone develops from transitional epithelial tissue

19) *The afferent lymphatic vessels:*

- a) take lymph to the lymph nodes, enter all over its surface and all are narrower in diameter than the corresponding efferent ones
- b) take lymph away from the lymph node, leaving at the hilus and are narrower in diameter than the corresponding efferent ones
- c) take lymph to the lymph node, enter at the hilus and are wider in diameter than the corresponding efferent ones
- d) take lymph away from the lymph node leaving at the hilus and are wider in diameter than the corresponding efferent ones

20) *The allantoic cavity is contained by cells originating from:*

- a) the endoderm
- b) the ectoderm
- c) the mesoderm
- d) the periderm

21) *Interstitial fluid is:*

- a) the fluid filling the spaces between cells
- b) the fluid inside cells
- c) only found in oedema
- d) 60% of body weight

22) *An animal dehydrated up to 5% of its weight loss will show:*

- a) inelastic skin
- b) dry mouth
- c) inelastic skin and dry mouth
- d) no clinical signs

23) *Renin is released from:*

- a) the kidney
- b) the pituitary
- c) the liver
- d) the adrenals

24) *Energy to run the cell's various activities is the result of cell respiration, which occurs in the:*

- a) ribosomes
- b) mitochondria
- c) Golgi bodies
- d) endoplasmic reticulum



- 25) *Which ONE of the following is located in the pelvic bone?*
- a) Foramen magnum
  - b) Obturator foramen
  - c) Supratrochlear foramen
  - d) Intraorbital foramen
- 26) *A tendon connects:*
- a) bone to bone
  - b) muscle to muscle
  - c) muscle to bone
  - d) ligament to bone
- 27) *The bladder is lined with:*
- a) smooth muscle
  - b) elastic connective tissue
  - c) transitional epithelium
  - d) serous membrane
- 28) *The muscle that opens the jaw is the:*
- a) buccinator
  - b) masseter
  - c) digastricus
  - d) temporalis

- 29) *The muscle that MOST completely covers the disto-lateral surface of the femur is the:*
- a) gastrocnemius
  - b) biceps femoris
  - c) adductor
  - d) semitendinosus
- 30) *In the cell, the organelle responsible for storage of digestive enzymes is:*
- a) the lysosome
  - b) the Golgi apparatus
  - c) the endoplasmic reticulum
  - d) the mitochondria
- 31) *How many sternebrae are there in the dog?*
- a) 8
  - b) 9
  - c) 10
  - d) 11

- 32) *The layers of the epidermis are, in order from most superficial:*
- a) stratum germinativum, stratum granulosum, stratum lucidum, stratum corneum
  - b) stratum lucidum, stratum corneum, stratum granulosum, stratum germinativum
  - c) stratum corneum, stratum lucidum, stratum granulosum, stratum germinativum
  - d) stratum granulosum, stratum germinativum, stratum lucidum, stratum corneum
- 33) *Internal respiration is the transfer of gases between:*
- a) the blood and body cells
  - b) the environment and the lungs
  - c) the environment and the lungs and the body cells
  - d) the bronchi and the blood
- 34) *Inspiration is inhibited by:*
- a) blood CO<sub>2</sub> levels
  - b) carbonic acid levels
  - c) diaphragmatic contraction
  - d) lung distension
- 35) *The cells that detect carbonic acid levels are situated in the:*
- a) carotid arteries and aorta
  - b) carotid arteries
  - c) aorta
  - d) venae cavae



- 36) *Which ONE of the following is not a polymorphonuclear leucocyte?*
- a) Granulocyte
  - b) Neutrophil
  - c) Basophil
  - d) Monocyte
- 37) *Three of the following vessels carry deoxygenated blood. Which ONE does NOT?*
- a) Pulmonary artery
  - b) Pulmonary vein
  - c) Coronary vein
  - d) Portal vein
- 38) *Which ONE of the following is NOT a function of the spleen?*
- a) The manufacture of red blood cells
  - b) The manufacture of white blood cells
  - c) The breakdown of red blood cells
  - d) The manufacture of antibodies
- 39) *Erythrocytes are destroyed in:*
- a) the pancreas
  - b) the kidney
  - c) the liver
  - d) the bowel

- 40) *The outer layer of blood vessels is the:*
- a) tunica adventitia
  - b) tunica media
  - c) tunica intima
  - d) squamous epithelial cells
- 41) *Which part of the myocardium is the thickest?*
- a) Right atrium
  - b) Right ventricle
  - c) Left atrium
  - d) Left ventricle
- 42) *Heart muscle contraction is known as:*
- a) systole
  - b) diastole
  - c) emptying
  - d) filling
- 43) *Which ONE of the following is not a superficial lymph node?*
- a) Inguinal
  - b) Mesenteric
  - c) Popliteal
  - d) Axillary

- 44) *An isometric contraction:*
- a) moves a limb
  - b) shortens a muscle
  - c) tenses a muscle
  - d) extends a limb
- 45) *The pectoral muscle is formed from:*
- a) striated muscle fibres
  - b) unstriated muscle fibres
  - c) smooth muscle fibres
  - d) involuntary muscle fibres
- 46) *Which ONE of the following does NOT form part of the Achilles tendon?*
- a) Quadriceps femoris
  - b) Semitendinosus
  - c) Biceps femoris
  - d) Gastrocnemius
- 47) *Which ONE of the following structures does NOT pass through the aortic hiatus?*
- a) Aorta
  - b) Vagal nerve trunk
  - c) Azygos vein
  - d) Thoracic duct



- 48) *The muscles lying dorsally to the transverse processes of the vertebra are:*
- a) crura
  - b) intercostal
  - c) hypaxial
  - d) epaxial
- 49) *The main muscle of respiration is the diaphragm. Where is it located?*
- a) Between the thorax and the abdomen
  - b) Between the ribs
  - c) At the thoracic inlet
  - d) Cranial to the heart
- 50) *The three main muscle types are:*
- a) striped, skeletal and visceral
  - b) smooth, unstriped and visceral
  - c) striated, smooth and cardiac
  - d) striped, skeletal and heart
- 51) *A hip adductor is found on which side of the femur?*
- a) Cranial
  - b) Caudal
  - c) Lateral
  - d) Medial

- 52) *The muscle that flexes the stifle and extends the hock is the:*
- a) gastrocnemius
  - b) biceps brachii
  - c) triceps brachii
  - d) sartorius
- 53) *Which muscle inserts on the olecranon?*
- a) Triceps brachii
  - b) Biceps brachii
  - c) Brachialis
  - d) Teres major
- 54) *Which ONE of the following is not a function of the skin?*
- a) Protection
  - b) Secretes pheromones
  - c) Excretes waste products
  - d) Vitamin A production
- 55) *Meibomian glands are present in the:*
- a) ear
  - b) eyelid
  - c) body skin
  - d) tail gland

56) *Horny nail growth takes place at the:*

- a) claw sole
- b) claw fold
- c) coronary band
- d) the quick

57) *The epidermis is made up of:*

- a) ciliated columnar epithelium
- b) stratified squamous epithelium
- c) transitional epithelium
- d) simple squamous epithelium

58) *Milk does NOT contain:*

- a) protein
- b) lactose
- c) vitamin B
- d) vitamin D

59) *Which ONE of the following is NOT a function of the integument?*

- a) Secretion and excretion
- b) Sensation
- c) Synthesis of vitamin E
- d) Temperature regulation



- 60) *The arrector pili muscles are attached to the:*
- a) guard hairs
  - b) hair beds
  - c) hair clusters
  - d) wool hairs
- 61) *The oil glands of the skin are the:*
- a) anal glands
  - b) mammary glands
  - c) sebaceous glands
  - d) sudoriferous glands
- 62) *Chromosomes are made up of:*
- a) chromic fibres
  - b) cilia
  - c) chromatin fibres
  - d) collagen fibres
- 63) *Genes that can occupy the same gene locus are called:*
- a) similar
  - b) genetic
  - c) chromosomal
  - d) allelomorphic

- 64) *When alleles are identical they are called:*
- a) homozygous
  - b) heterozygous
  - c) autosomal
  - d) homologous
- 65) *The outward appearance of an animal is its:*
- a) genotype
  - b) phenotype
  - c) autosomal
  - d) homologous
- 66) *Which one of the following stages of mitosis is in the correct order?*
- a) Interphase, prophase, anaphase, metaphase, telophase
  - b) Interphase, prophase, metaphase, telophase, anaphase
  - c) Interphase, prophase, metaphase, anaphase, telophase
  - d) Interphase, prophase, telophase, anaphase, metaphase

- 67) *If a black Labrador ( $Bb$ ) is mated with a chocolate Labrador ( $bb$ ), what percentage of the litter will be black?*
- a) 100%
  - b) 50%
  - c) 25%
  - d) 0%
- 68) *The gene for the tortoiseshell coat colour in cats is:*
- a) mutation
  - b) epistatic
  - c) sex limiting
  - d) sex linked
- 69) *Which ONE of the following is in the correct sequence?*
- a) Ingestion, digestion, absorption, assimilation
  - b) Digestion, absorption, assimilation, ingestion
  - c) Digestion, ingestion, assimilation, absorption
  - d) Ingestion, assimilation, digestion, absorption
- 70) *Bile is:*
- a) very acidic
  - b) slightly acidic
  - c) neutral
  - d) alkaline



71) *Deamination is:*

- a) the conversion of glucose to glycogen
- b) the conversion of glycogen to glucose
- c) the breakdown of amino acids
- d) the conversion of amino acids

72) *Trypsin is an enzyme that:*

- a) is produced in the stomach
- b) requires an alkaline environment
- c) digests carbohydrates
- d) is the precursor of trypsinogen

73) *Oxyntic cells produce:*

- a) hydrochloric acid
- b) pepsinogen
- c) renin
- d) mucus

74) *Glycerol is the breakdown product of:*

- a) protein
- b) carbohydrates
- c) fats
- d) minerals

- 75) *The cells that detect oxygen levels in the blood are located in:*
- a) the aorta
  - b) the carotid arteries
  - c) the brain stem
  - d) the aorta and the carotid arteries
- 76) *What is the term used to describe the effect which stops the lungs overinflating?*
- a) The Hering-Bruer effect
  - b) The Kelsey effect
  - c) The medulla oblongata
  - d) The rideal effect
- 77) *The nucleus of a cell is an essential part of all body cells except for:*
- a) liver cells
  - b) immature red blood cells
  - c) kidney cells
  - d) mature red blood cells
- 78) *The golden brown pigment found in cells which are connected with haemoglobin breakdown is called:*
- a) melanin
  - b) haemosiderin
  - c) mitochondria
  - d) cytoplasm

- 79) *Oxytocin and vasopressin are released from the:*
- a) adrenal glands
  - b) anterior pituitary
  - c) hypothalamus
  - d) posterior pituitary
- 80) *Which ONE of the following statements is the most accurate? The lacrimal gland:*
- a) is ventral to the eyeball
  - b) secretes fluid that drains from the orbital region into the nasal vestibule
  - c) secretes fluid that enters the anterior chamber of the eye
  - d) secretes fluid that enters the conjunctival sac through the caudal surface of the third eyelid
- 81) *The uveal tract consists of:*
- a) choroid, iris and retina
  - b) choroid, ciliary body and iris
  - c) choroid, ciliary body and lens
  - d) choroid, ciliary body and retina
- 82) *Glucagon is secreted by which type of pancreatic islet cell?*
- a) Alpha cells
  - b) Beta cells
  - c) Gamma cells
  - d) Delta cells

- 83) *Rotary motion of the head is detected by which sensory structure?*
- a) Cochlea
  - b) Organ of Corti
  - c) Semicircular canal
  - d) Vestibule
- 84) *Which ONE of these statement is TRUE?*
- a) Thyroid hormone increases resorption of calcium from bone
  - b) Thyroid hormone raises the metabolic rate of the body
  - c) Thyroid hormone reduces the metabolic rate of the body
  - d) Thyroid hormone reduces the resorption of calcium and phosphorous in the kidney
- 85) *Which cardiac chamber receives blood from the systemic veins?*
- a) Right ventricle
  - b) Right atrium
  - c) Left atrium
  - d) Left ventricle



- 86) *Which vessel normally carries blood with a high level of carbon dioxide?*
- a) Carotid artery
  - b) Pulmonary vein
  - c) Umbilical vein
  - d) Vena cava
- 87) *The average life span of a circulating erythrocyte in mammalian blood is approximately:*
- a) 90 days
  - b) 100 days
  - c) 110 days
  - d) 120 days
- 88) *The coronary arteries are branches of the:*
- a) aorta
  - b) left atrium
  - c) pulmonary trunk
  - d) right atrium
- 89) *The hepatic portal system carries:*
- a) blood from the heart to the liver via the aorta
  - b) blood from the intestines to the liver capillaries
  - c) lymph from the intestines to the heart via the thoracic duct
  - d) lymph from the lacteals to the hepatic vein

- 90) *White blood cells are divided into granulocytes and agranulocytes. Which cell is an agranulocyte?*
- a) Monocyte
  - b) Neutrophil
  - c) Eosinophil
  - d) Basophil
- 91) *The name of the valve that separates the left atrium and left ventricle in the heart is the:*
- a) tricuspid valve
  - b) mitral valve
  - c) pulmonic valve
  - d) aortic valve
- 92) *Which muscle type is under voluntary control?*
- a) Smooth muscle
  - b) Skeletal muscle
  - c) Uterine muscle
  - d) Cardiac muscle
- 93) *A motor unit is made up of:*
- a) a neuron and tendon
  - b) a muscle fibre and tendon
  - c) a neuron and muscle fibre
  - d) a muscle fibre and bone

94) *Epaxial muscles of the vertebrae lie \_\_\_\_\_ to the transverse processes?*

- a) Dorsal
- b) Ventral
- c) Medial
- d) Lateral

95) *The linea alba is the area where which muscles come together?*

- a) Epaxial muscles
- b) Quadriceps femoris muscles
- c) Thoracic muscles
- d) Abdominal muscles

96) *The triceps muscle of the forelimb:*

- a) extends the elbow
- b) flexes the elbow
- c) extends the shoulder
- d) flexes the shoulder

97) *The biceps muscle of the forelimb:*

- a) extends the elbow
- b) flexes the elbow
- c) extends the shoulder
- d) flexes the shoulder

- 98) *Which ONE of the following is NOT part of the gluteal group of muscles?*
- a) Minimus
  - b) Micromus
  - c) Medius
  - d) Maximus
- 99) *The gastrocnemius muscle:*
- a) extends the stifle
  - b) flexes the stifle
  - c) extends the tarsus
  - d) flexes the tarsus
- 100) *The supra spinatus muscle:*
- a) flexes the shoulder joint
  - b) extends the shoulder joint
  - c) flexes the elbow joint
  - d) extends the elbow joint
- 101) *In young growing animals, growth in length of long bones occurs at the:*
- a) epithelium
  - b) periosteum
  - c) diaphysis
  - d) epiphyseal plate



- 102) *The term phagocytosis is used to describe the process whereby cells:*
- a) manufacture protein
  - b) manufacture carbohydrates
  - c) eliminate waste products
  - d) destroy invading bacteria and debris
- 103) *Which is the hardest substance in the animal body?*
- a) cartilage
  - b) bone
  - c) dentine
  - d) enamel
- 104) *Which two structures make up the joint capsule?*
- a) synovial membrane and hyaline cartilage
  - b) synovial membrane and fibrous membrane
  - c) fibrous membrane and hyaline cartilage
  - d) fibrous membrane and capsular ligament
- 105) *The calcaneus is found:*
- a) in the hock
  - b) in the stifle
  - c) in the elbow
  - d) in the carpus

- 106) *Hyaline cartilage is found in:*
- a) intervertebral discs
  - b) the mandibular symphysis
  - c) fibrocartilaginous joints
  - d) synovial joints
- 107) *An intra-articular meniscus:*
- a) is made of elastic cartilage
  - b) is found in the temporo-mandibular joint
  - c) helps to stabilise a joint
  - d) replaces the articular cartilage within a joint
- 108) *Which ONE of the following types of gland secretes directly into the bloodstream?*
- a) Mucous
  - b) Simple
  - c) Compound
  - d) Endocrine
- 109) *Which ONE of the following is an example of an exocrine gland?*
- a) Adrenal
  - b) Salivary
  - c) Pituitary
  - d) Ovary

- 110) *Body tissues are all classified into four types:*
- a) epithelial, glandular, connective, bone
  - b) nervous, squamous, nervous, skeletal
  - c) epithelial, glandular, nervous, skeletal
  - d) epithelial, connective, muscular, nervous
- 111) *The predominant type of connective tissue in tendons and ligaments is:*
- a) areolar connective tissue
  - b) dense fibrous connective tissue
  - c) elastic connective tissue
  - d) fibrocartilage
- 112) *A muscle that increases the angle between two bones is known as:*
- a) an abductor
  - b) an adductor
  - c) an extensor
  - d) a flexor
- 113) *The femur is an example of a:*
- a) long bone
  - b) short bone
  - c) flat bone
  - d) irregular bone

- 114) *The scapula is an example of a:*
- a) long bone
  - b) short bone
  - c) flat bone
  - d) irregular bone
- 115) *The manubrium is found:*
- a) in the lower jaw
  - b) in the pelvis
  - c) between the two pelvic bones
  - d) in the sternum
- 116) *During endochondral ossification, the primary centre of ossification develops:*
- a) in the epiphysis
  - b) in the diaphysis
  - c) at the epiphyseal plate
  - d) in the growth cartilage
- 117) *Secondary centres of ossification then develop:*
- a) in the epiphysis
  - b) in the diaphysis
  - c) at the epiphyseal plate
  - d) in the growth cartilage



- 118) *Which ONE of the following bones is NOT part of the axial skeleton?*
- a) The mandible
  - b) The sternbrae
  - c) The sacrum
  - d) The phalanges
- 119) *Which ONE of the following bones is NOT part of the appendicular skeleton?*
- a) The fibula
  - b) The calcaneus
  - c) The scapula
  - d) The sacrum
- 120) *An example of a condylar joint is:*
- a) the hip
  - b) the shoulder
  - c) the elbow
  - d) the carpus
- 121) *An example of a hinge joint is:*
- a) an intervertebral joint
  - b) the stifle joint
  - c) the hip joint
  - d) the sacroiliac joint

- 122) *Simple cuboidal epithelium is found:*
- a) in the bronchi of the respiratory tract
  - b) lining the kidney tubules
  - c) lining body cavities
  - d) in the small intestine
- 123) *Simple columnar epithelium is found:*
- a) in the bronchi of the respiratory tract
  - b) lining the kidney tubules
  - c) lining body cavities
  - d) in the small intestine
- 124) *Simple squamous epithelium is found:*
- a) in the bronchi of the respiratory tract
  - b) lining the kidney tubules
  - c) lining body cavities
  - d) in the small intestine
- 125) *The alveoli are lined with:*
- a) simple squamous epithelium
  - b) ciliated mucous epithelium
  - c) stratified squamous epithelium
  - d) transitional epithelium

- 126) *The following are all types of connective tissue:*
- a) loose connective tissue, fibrous connective tissue, muscle, blood
  - b) areolar tissue, adipose tissue, cartilage, nerve
  - c) bone, cartilage, skin, blood
  - d) cartilage, dense connective tissue, bone, blood
- 127) *Which ONE of the following muscle types has branching cells within its structure?*
- a) Skeletal muscle
  - b) Striated muscle
  - c) Smooth muscle
  - d) Cardiac muscle
- 128) *Which ONE of the following muscle types is found in the wall of the intestine?*
- a) Skeletal muscle
  - b) Striated muscle
  - c) Smooth muscle
  - d) Cardiac muscle
- 129) *Which ONE of the following is NOT a function of skin?*
- a) Temperature regulation
  - b) Protection against micro-organisms
  - c) Vitamin manufacture
  - d) Antibody production

- 130) *Which ONE of the following breeds of dog does not moult?*
- a) The Standard poodle
  - b) The Bichon Frise
  - c) The Bedlington terrier
  - d) All of the above
- 131) *Which ONE of the following structures is NOT associated with the hair follicles on the dorsum (back) of the normal dog?*
- a) Sebaceous gland
  - b) Sweat gland
  - c) Arrector pili muscle
  - d) Wool hairs
- 132) *Inspired air consists of:*
- a) 29% nitrogen
  - b) 79% nitrogen
  - c) 89% nitrogen
  - d) 21% nitrogen
- 133) *Which ONE of the following is least accurate?*
- a) Nitrogen is unchanged in expired air
  - b) Oxygen levels in expired air are lower
  - c) Water vapour is slightly higher in inspired air
  - d) Carbon dioxide levels are lower in inspired air



- 134) *Which ONE of the following is least accurate?*
- a) The trachea is a permanently open tube
  - b) The oesophagus lies above the trachea
  - c) The trachea cartilages are open on the dorsal aspect
  - d) The tracheal cartilages are open on the ventral aspect
- 135) *Which ONE of the following sequences is correct with regard to what happens when the trachea splits into two?*
- a) Trachea, bronchi, bronchioles, alveolar duct, alveolar sac
  - b) Trachea, bronchi, bronchioles, alveolar sac, alveolar duct
  - c) Trachea, bronchioles, bronchi, alveolar sac, alveolar duct
  - d) Trachea, bronchioles, bronchi, alveolar duct, alveolar sac
- 136) *Which structure does NOT lie within the mediastinum?*
- a) Heart
  - b) Oesophagus
  - c) Trachea
  - d) Lungs

- 137) *Which is NOT a feature of the larynx?*
- a) It produces sound
  - b) It is shared by the digestive and respiratory tracts
  - c) It plays a role in swallowing
  - d) It forms the opening into the trachea
- 138) *Which ONE of the following would NOT cause a decreased respiratory rate?*
- a) Pyrexia
  - b) Sleep
  - c) Anaesthesia
  - d) Inactivity
- 139) *The epithelium found lining the GI tract is known as:*
- a) Stratified squamous epithelium
  - b) Simple columnar epithelium
  - c) Ciliated columnar epithelium
  - d) Simple squamous epithelium
- 140) *Which ONE of the following is NOT an exocrine gland?*
- a) Sebaceous gland
  - b) Anal gland
  - c) Salivary gland
  - d) Thyroid gland

- 141) *Which ONE of the following is a type of connective tissue?*
- a) Fibrocartilage
  - b) Compact bone
  - c) Adipose tissue
  - d) All of the above
- 142) *Which organ is NOT part of the upper urinary tract?*
- a) Bladder
  - b) Kidney
  - c) Urethra
  - d) Ureter
- 143) *Which structure does NOT enter or leave the hilus of the kidney?*
- a) Blood vessels
  - b) Nerves
  - c) Renal pelvis
  - d) Uterus
- 144) *The outer portion of the kidney is:*
- a) medulla
  - b) hilus
  - c) renal pelvis
  - d) cortex

- 145) *Which part of the nephron is NOT found in the cortex of the kidney?*
- a) Glomerulus
  - b) Loop of Henle
  - c) PCT
  - d) DCT
- 146) *Blood enters the glomerulus via:*
- a) afferent arteriole
  - b) efferent arteriole
  - c) renal artery
  - d) afferent venule
- 147) *Which part of the nephron is found in the medulla of the kidney?*
- a) PCT
  - b) DCT
  - c) Bowman's capsule
  - d) Loop of Henle
- 148) *Which hormone is NOT produced by the kidney?*
- a) Erythropoietin
  - b) Renin
  - c) Anti-diuretic hormone
  - d) Fhyroxine



- 149) *Which part of the nephron acts as a filter of plasma?*
- a) PCT
  - b) Glomerulus
  - c) DCT
  - d) Loop of Henle
- 150) *Which hormone is responsible for increasing reabsorption of sodium?*
- a) Aldosterone
  - b) Vitamin D
  - c) Renin
  - d) Erythropoietin
- 151) *Which ONE of the following is NOT a function of oestrogen?*
- a) Development of mammary glands
  - b) Thickening of endometrium
  - c) Maintains pregnancy
  - d) Increases receptiveness during oestrus
- 152) *Which muscles help contribute to the tie ?*
- a) Vaginal
  - b) Cervix
  - c) Vulval
  - d) Vestibular

- 157) *The layer of peritoneum covering the testes is known as:*
- a) tunica externa
  - b) tunica vasculosa
  - c) tunica vaginalis
  - d) tunica spermatica
- 158) *The sertoli cells produce:*
- a) oestrogen
  - b) testosterone
  - c) progesterone
  - d) sperm
- 159) *Testosterone is NOT responsible for:*
- a) male behaviour
  - b) development of the prostate
  - c) descent of the testes
  - d) nutrition for spermatozoa
- 160) *Sperm leaves the epididymis in:*
- a) afferent ducts
  - b) efferent ducts
  - c) vas deferens
  - d) seminiferous tubules

- 161) *The glans-penis consists of the:*
- a) corpus spongiosum
  - b) corpus cavernosum
  - c) erectile tissue
  - d) none of the above
- 162) *Which ONE of the following is the LEAST accurate?*
- a) The dog's penis points cranially
  - b) The dog's scrotum lies between the hind limbs
  - c) The dog's prostate lies near to the os-penis
  - d) The dog's os-penis lies dorsal to the urethra
- 163) *Another name for the interstitial cells of the testis is:*
- a) accessory cells
  - b) Leydig cells
  - c) seminiferous cells
  - d) Sertoli cells
- 164) *Spermatogenesis takes place in the:*
- a) epididymis
  - b) seminal vesicles
  - c) seminiferous tubules
  - d) vas deferens

- 165) *Which ONE of the following has two uteri?*
- a) Snake
  - b) Guinea pig
  - c) Tortoise
  - d) Rabbit
- 166) *Which ONE of the following is not a function of the spleen?*
- a) Phagocytosis
  - b) Storage of red blood cells
  - c) Absorption of nutrients
  - d) Destruction of red blood cells
- 167) *Which ONE is not an example of lymphoid tissue?*
- a) Tonsils
  - b) Thymus
  - c) Spleen
  - d) Villus
- 168) *A lacteal is what?*
- a) Lymphatic capillary
  - b) Lymphatic duct
  - c) Lymphatic vessel
  - d) Lymph node



- 169) *Which ONE of the following structures produces lymphocytes?*
- a) Lymph nodes
  - b) Spleen
  - c) Thymus
  - d) All of the above
- 170) *What do lymphocytes produce?*
- a) Tissue fluid
  - b) Lymph
  - c) Antibodies
  - d) Antigens
- 171) *Where is the thymus found?*
- a) Throat
  - b) Abdomen
  - c) Thorax
  - d) Stomach
- 172) *The portion of the lymphatic duct in the abdomen is called:*
- a) thoracic duct
  - b) abdominal duct
  - c) afferent duct
  - d) cisterna chyli

- 173) *Which ONE of the following lymph nodes could be palpated in the groin of the dog?*
- a) Superficial inguinal
  - b) Axillary
  - c) Prescapular
  - d) Popliteal
- 174) *Which ONE of the following is NOT usually indicative of hypothyroidism?*
- a) Hypothermia
  - b) Weight loss
  - c) Reduced appetite
  - d) Low exercise tolerance
- 175) *Which ONE of the following statements is true?*
- a) Parathormone reduces calcium resorption in the kidney
  - b) Parathormone in reduced quantities may cause hyperthyroidism
  - c) Parathormone decreases calcium reabsorption from the bone
  - d) Parathormone increases calcium absorption from the gut

- 176) *Hormones produced by this gland regulate metabolism, water balance and some sex steroids. It is the:*
- a) thyroid
  - b) ovaries
  - c) adrenal cortex
  - d) adrenal medulla
- 177) *The adrenal medulla secretes:*
- a) adrenaline
  - b) epinephrine
  - c) norepinephrine
  - d) all of the above
- 178) *Anti-diuretic hormone is produced by:*
- a) anterior pituitary gland
  - b) posterior pituitary gland
  - c) kidney
  - d) adrenal glands
- 179) *Which ONE of the following hormones is NOT produced by the anterior pituitary gland?*
- a) Relaxin
  - b) Adrenocorticotrophic hormone
  - c) Follicle stimulating hormone
  - d) Interstitial cell stimulating hormone

- 180) *Which TWO hormones are produced by the pituitary gland and have a direct effect on the ovary?*
- a) Follicle-stimulating hormone and progesterone
  - b) Progesterone and luteinising hormone
  - c) Follicle-stimulating hormone and luteinising hormone
  - d) Progesterone and oestrogen
- 181) *Which ONE of the salivary glands secretes ptyalin (amylase)?*
- a) Parotid
  - b) Submandibular
  - c) Sublingual
  - d) Zygomatic
- 182) *Trypsin digests:*
- a) complex carbohydrates
  - b) proteins
  - c) sucrose
  - d) unsaturated fatty acids
- 183) *The stomach of the dog produces hydrochloric acid, mucus and:*
- a) amylase
  - b) bile salts
  - c) pepsin
  - d) trypsin



- 184) *The stomach of the dog is divided into three parts, which from the entrance of the oesophagus are termed:*
- a) cardia, fundus and pylorus
  - b) fundus, cardia and pylorus
  - c) fundus, pylorus and cardia
  - d) pylorus, cardia and fundus
- 185) *The major site for water absorption in the gut is the:*
- a) colon
  - b) rectum
  - c) small intestine
  - d) stomach
- 186) *The function of ptyalin is:*
- a) to maintain an alkaline pH
  - b) to start the digestion of carbohydrate
  - c) to stimulate the release of mucus by the gland
  - d) to stimulate the secretion of bicarbonate
- 187) *Which ONE of the following statements is INCORRECT?*
- a) The pH of pancreatic juice is acidic
  - b) The wall of the small intestine contains smooth muscle
  - c) Bile is produced in the liver
  - d) Bile enters the small intestine at the duodenum

- 188) *The exocrine pancreas assists in the process of digestion by producing:*
- a) amylase, bile acids, bile salts and trypsin
  - b) amylase, bile acids, pepsin and bicarbonate ions
  - c) amylase, lipase, trypsin and bicarbonate ions
  - d) amylase, lipase, trypsin and gastrin
- 189) *The enzyme pepsin is produced in the:*
- a) intestinal juice and breaks down carbohydrate
  - b) pancreatic juice and breaks down protein
  - c) stomach and breaks down carbohydrate
  - d) stomach and breaks down protein
- 190) *Fats that are digested and absorbed into lacteals are then carried almost directly into the:*
- a) cisterna chyli
  - b) hepatic vein
  - c) portal vein
  - d) right azygos vein
- 191) *Which ONE of the following statements is INCORRECT?*
- a) Bile contains enzymes to aid fat digestion
  - b) Bile contains pigments which are waste products of haemoglobin breakdown
  - c) Bile is produced in the liver
  - d) Bile contains bicarbonate and electrolytes

- 192) *Chyme is:*
- a) the mix of food, mucus and gastric secretions produced in the stomach
  - b) the milky fluid contained within the thoracic duct
  - c) the enzyme used to break down fats
  - d) the exocrine secretion produced by the pancreas
- 193) *The small intestine is divided into three sections. In which order does food pass through them?*
- a) Duodenum, ileum, jejunum
  - b) Jejunum, ileum, duodenum
  - c) Ileum, duodenum, jejunum
  - d) Duodenum, jejunum, ileum
- 194) *In which part of the intestinal tract would you find villi?*
- a) Stomach
  - b) Small intestine
  - c) Rectum
  - d) Colon
- 195) *Which ONE of the following is the correct formulae for the dog's permanent teeth?*
- a) I 3/3 C 1/1 PM 3/3 M 2/3
  - b) I 3/3 C 1/1 PM 3/3 M 3/2
  - c) I 3/3 C 1/1 PM 4/4 M 3/2
  - d) I 3/3 C 1/1 PM 4/4 M 2/3

- 196) *In the dog the carnassial tooth is:*
- a) M1 lower jaw
  - b) PM3 upper jaw
  - c) PM4 upper jaw
  - d) M1 upper jaw
- 197) *Vessels returning blood to the heart are generally:*
- a) capillaries
  - b) veins
  - c) arteries
  - d) arterioles
- 198) *The vessels which transport blood to the capillaries are the:*
- a) venules
  - b) veins
  - c) arteries
  - d) arterioles
- 199) *Erythrocytes are:*
- a) white blood cells
  - b) red blood cells
  - c) platelets
  - d) both a + b



- 204) *The right atrioventricular valve is also known as:*
- a) the bicuspid valve
  - b) the mitral valve
  - c) the tricuspid valve
  - d) the pulmonary valve
- 205) *Which blood vessel carries blood from the small intestine to the liver?*
- a) Hepatic vein
  - b) Hepatic artery
  - c) Aorta
  - d) Hepatic portal vein
- 206) *Which ONE of the following is INCORRECT?*
- a) Blood leaving the left ventricle is oxygenated
  - b) Blood in the pulmonary vein is deoxygenated
  - c) Blood leaving the liver is deoxygenated
  - d) Blood entering the right atrium is deoxygenated
- 207) *Oxygen forms approximately what percentage of normal inspired air?*
- a) 20%
  - b) 40%
  - c) 60%
  - d) 80%

- 208) *Accommodation for near and far vision is accomplished by contraction or relaxation of the muscles in the:*
- a) ciliary body
  - b) conjunctiva
  - c) iris
  - d) limbus
- 209) *The vitreous body of the canine eye:*
- a) is formed by the ciliary body
  - b) is located within the posterior chamber of the eye
  - c) is firmly attached to the caudal part of the eye
  - d) forms the tapetum lucidum
- 210) *The tissue found lining the pleural cavity is:*
- a) simple squamous epithelium
  - b) simple cuboidal epithelium
  - c) simple columnar epithelium
  - d) ciliated columnar epithelium
- 211) *The cell body of the sensory neuron within a simple reflex arc is placed:*
- a) in the dorsal horn
  - b) in the ventral horn
  - c) in the dorsal root ganglion
  - d) in the ventral root ganglion

212) *The zygomatic arch is:*

- a) on the side of the skull
- b) attached to the pelvis
- c) the curve of the caudal border of the ribcage
- d) on the base of the skull

213) *An electron:*

- a) carries a positive charge
- b) carries a negative charge
- c) has an atomic weight of 1
- d) lies within the nucleus of the atom

214) *The nucleus of the atom is made up of:*

- a) protons and electrons
- b) electrons and neutrons
- c) protons and neutrons
- d) protons, neutrons and electrons

215) *Isotopes of an element have:*

- a) the same atomic number and the same atomic weight
- b) the same atomic number and different atomic weight
- c) the same atomic weight but a different atomic number
- d) different atomic number and weight from one another

- 216) *Which group of vertebrae have, on average, the longest dorsal spines?*
- a) Cervical
  - b) Thoracic
  - c) Lumbar
  - d) Sacral
- 217) *The thoracic cavity is lined with a serous membrane called the:*
- a) peritoneum
  - b) perineum
  - c) pleura
  - d) mediastinum
- 218) *The chemical used by the mitochondria within the cells as a means of storing energy is:*
- a) adenosine triphosphate
  - b) phospholipid
  - c) calcium phosphate
  - d) mucopolysaccharide
- 219) *Which term means a decrease in the white blood cell count?*
- a) Lymphocytosis
  - b) Leucocytosis
  - c) Leucopaenia
  - d) Anaemia



- 220) *Cornified stratified squamous epithelium is found:*
- a) on the skin surface
  - b) lining the respiratory tract
  - c) lining the major blood vessels
  - d) on the surface of the eye
- 221) *If the Achilles tendon is torn, the animal loses most of its ability to:*
- a) extend the stifle
  - b) extend the hip
  - c) extend the hock
  - d) flex the hock
- 222) *The patella is normally:*
- a) within the tendon of the gastrocnemius muscle
  - b) attached to the medial meniscus of the stifle joint
  - c) within the tendon of insertion of biceps femoris
  - d) positioned proximal to the femoro-tibial joint space
- 223) *There are a number of foramina or hiati that pass through the diaphragm. Which of them passes through the central tendinous area?*
- a) The post-caval foramen
  - b) The oesophageal hiatus
  - c) The aortic hiatus
  - d) The azygal foramen

- 228) *How many pairs of mammary glands are MOST common in the bitch ?*
- a) 3
  - b) 4
  - c) 5
  - d) 6
- 229) *Which type of joint movement decreases the angle between two bones?*
- a) Abduction
  - b) Adduction
  - c) Extension
  - d) Flexion
- 230) *The second heart sound is produced by closure of which heart valves?*
- a) Aortic and mitral
  - b) Mitral and pulmonary
  - c) Pulmonary and aortic
  - d) Pulmonary and tricuspid
- 231) *The first heart sound is produced by closure of which heart valves?*
- a) Aortic and mitral
  - b) Mitral and pulmonary
  - c) Mitral and tricuspid
  - d) Pulmonary and aortic

- 236) *Stimulation of the parasympathetic portion of the autonomic nervous system causes:*
- a) dilation of airways in the lung
  - b) dilation of the pupil of the eye
  - c) increased gastrointestinal function
  - d) increased blood pressure
- 237) *Stimulation of the sympathetic portion of the autonomic nervous system causes all of the following except:*
- a) dilation of the pupil of the eye
  - b) increased gastrointestinal function
  - c) increased heart rate
  - d) piloerection
- 238) *The part of the central nervous system that initiates conscious movements of the body is the:*
- a) brachial plexus
  - b) brain stem
  - c) cerebellum
  - d) spinal cord
- 239) *Concerning neurons, which statement is least accurate?*
- a) They cannot replicate themselves
  - b) They cannot regenerate damaged processes
  - c) They contain no blood vessels
  - d) They have a very high oxygen requirement

- 240) *Damage to which part of the nervous system is MOST likely to cause instant death in an animal?*
- a) Brachial plexus
  - b) Brain stem
  - c) Cerebellum
  - d) Cerebrum
- 241) *Which structure is the MOST important direct link between the nervous and endocrine systems?*
- a) Hypothalamus
  - b) Parathyroid gland
  - c) Pituitary gland
  - d) Thalamus
- 242) *Which hormone is produced by the anterior pituitary gland?*
- a) Antidiuretic hormone
  - b) Calcitonin
  - c) Luteinising hormone
  - d) Oxytocin
- 243) *Which hormone is released by the posterior pituitary gland?*
- a) Adrenocorticotrophic hormone
  - b) Calcitonin
  - c) Luteinising hormone
  - d) Oxytocin



- 244) *Which hormone is produced by the corpus luteum of the ovary?*
- a) Oestrogen
  - b) Luteinising hormone
  - c) Oxytocin
  - d) Progesterone
- 245) *The hormone necessary for maintenance of pregnancy is:*
- a) oestrogen
  - b) oxytocin
  - c) progesterone
  - d) prolactin
- 246) *Which hormone is produced by a developing follicle in the ovary?*
- a) Oestrogen
  - b) Follicle-stimulating hormone
  - c) Luteinising hormone
  - d) Progesterone
- 247) *Which endocrine gland releases the hormone that causes milk letdown from the mammary gland?*
- a) Adrenal cortex
  - b) Anterior pituitary gland
  - c) Ovary
  - d) Posterior pituitary gland

- 248) *Hormones of the adrenal medulla are released under the influence of:*
- a) adrenomedullotrophic hormone
  - b) the parasympathetic nervous system
  - c) the somatic nervous system
  - d) the sympathetic nervous system
- 249) *The kidney helps control water balance in the body under the influence of:*
- a) adrenocorticotrophic hormone
  - b) antidiuretic hormone
  - c) calcitonin
  - d) oxytocin
- 250) *In dogs, seminal fluid is produced by the:*
- a) prostate gland, seminal vesicles and bulbourethral glands
  - b) prostate gland and seminal vesicles
  - c) prostate gland
  - d) seminal vesicles
- 251) *After spermatogenesis, spermatozoa are stored until ejaculation in the:*
- a) epididymis
  - b) seminal vesicles
  - c) seminiferous tubules
  - d) vas deferens

- 252) *During which stage of the oestrous cycle do bitches allow dogs to copulate?*
- a) Anoestrus
  - b) Dioestrus
  - c) Oestrus
  - d) Metoestrus
- 253) *Fertilisation of an ovum by a spermatozoon normally occurs in the:*
- a) cervix
  - b) oviduct
  - c) uterus
  - d) vagina
- 254) *The process of capacitation of spermatozoa normally occurs in the:*
- a) cervix
  - b) epididymis
  - c) oviduct
  - d) testes
- 255) *Milk letdown in the mammary gland is stimulated by:*
- a) growth hormone
  - b) oxytocin
  - c) progesterone
  - d) prolactin

- 256) *Which anterior pituitary hormone stimulates spermatogenesis in males?*
- a) Follicle-stimulating hormone
  - b) Growth hormone
  - c) Luteinising hormone
  - d) Prolactin
- 257) *Which hormone is responsible for the signs of heat in a female animal?*
- a) Oestrogen
  - b) Follicle-stimulating hormone
  - c) Oxytocin
  - d) Progesterone
- 258) *Which ONE of the following statements concerning blood is TRUE?*
- a) Contains cells and plasma
  - b) Is not important for CO<sub>2</sub> transport
  - c) Consists of cells and serum
  - d) Has no excretory function
- 259) *The major determinant of blood viscosity is the:*
- a) specific gravity of plasma
  - b) plasma protein concentration
  - c) lipoprotein concentration
  - d) haematocrit



- 260) *Circulating blood volume is regulated primarily by control of:*
- a) total body water volume
  - b) intracellular water volume
  - c) systemic arterial blood pressure
  - d) plasma protein concentration
- 261) *The proportion of body weight represented by total body water content in an extremely obese animal is:*
- a) about 60%
  - b) greater than 60%
  - c) as much as 75%
  - d) as low as 40%
- 262) *Blood in the canine ejaculate may be associated with any of the following EXCEPT:*
- a) prostatitis
  - b) seminal vasculitis
  - c) orchitis
  - d) ruptured blood vessel on the surface of the penis
- 263) *Semen is most often collected from dogs by:*
- a) electroejaculation
  - b) rectal massage
  - c) penile massage
  - d) prostatic stimulation

- 264) *In transvaginal artificial insemination in the bitch, using fresh semen, it should be deposited into the:*
- a) uterus
  - b) vestibule
  - c) cervical body
  - d) cranial vagina
- 265) *An initial rise in plasma progesterone levels in a bitch indicates that:*
- a) ovulation has occurred and it is too late to breed the bitch
  - b) ovulation is imminent and the bitch should be mated in the next few days
  - c) the bitch is pregnant
  - d) the bitch is due to whelp within 3 days
- 266) *In most bitches, the entire oestrous cycle spans:*
- a) 4–7 months
  - b) 21 days
  - c) 7 days
  - d) 28 days
- 267) *In dogs, gestation lasts approximately:*
- a) 21 days
  - b) 30 days
  - c) 63 days
  - d) 90 days

- 268) *In a vaginal smear of a bitch in oestrus, what is the predominant epithelial cell type?*
- a) Parabasal cell
  - b) Non-cornified small intermediate and superficial cell
  - c) Cornified, large intermediate and superficial cell
  - d) Red blood cell
- 269) *Which ONE of the following is NOT an indication for caesarean section in a queen?*
- a) Period of more than 4 hours since delivery of the previous kitten
  - b) Foul smelling, haemorrhagic vulvar discharge
  - c) Constant straining to deliver kitten
  - d) Non-odoriferous, brownish vulvar discharge after delivery of the second kitten
- 270) *Concerning reproduction in cats, which statement is LEAST accurate?*
- a) In the Northern Hemisphere, cats are polyestrous from late January to fall
  - b) In a non-pregnant cat, the corpus luteum produces progesterone for 10 days between heats
  - c) Cats that have been bred but that are not pregnant may develop pseudopregnancy and show signs of pregnancy
  - d) Cats that have been bred but that are not pregnant cease cycling for several months

- 271) *In cats, classic signs of oestrus include all of the following with the EXCEPTION of:*
- a) vocalisation, rear-leg treading
  - b) mounting of the male by the female
  - c) rubbing and rolling
  - d) elevated hindquarters (lordosis), tail deflected
- 272) *In cats, NORMAL signs of copulation, but not necessarily conception, include all of the following with the EXCEPTION of:*
- a) the male biting queen's neck while holding the queen between his front legs
  - b) the queen rolling and licking her vulva in a frenzied manner
  - c) the queen rejecting the tom for 20–60 minutes
  - d) draining of white blood-flecked mucus from the queen's vulva
- 273) *In queens, pregnancy lasts approximately:*
- a) 21 days
  - b) 65 days
  - c) 90 days
  - d) 120 days
- 274) *The function of the lens is to:*
- a) transmit visual impulses to the brain
  - b) enable light rays to focus on the retina
  - c) provide nourishment to the eye
  - d) dilate and contract according to the light intensity



- 275) *Which ONE of the following hormones is secreted by the posterior pituitary gland?*
- a) Prolactin
  - b) Adrenocorticotrophic hormone
  - c) Anti-diuretic hormone
  - d) Luteinising hormone
- 276) *Which ONE of the following hormones is secreted by the medulla of the adrenal gland?*
- a) Noradrenaline
  - b) Cortisol
  - c) Androgens
  - d) Aldosterone
- 277) *Which ONE of the following hormones is not produced by an endocrine gland?*
- a) Chorionic gonadotrophin
  - b) Insulin
  - c) Somatostatin
  - d) Adrenaline
- 278) *Which ONE of the following is not a function of parathyroid hormone?*
- a) To stimulate osteoclast activity
  - b) To inhibit osteoblast activity
  - c) To increase the urinary excretion of calcium ions
  - d) To stimulate the secretion of calcitriol

- 279) *Which ONE of the following is an example of a steroid hormone?*
- a) Thyroxin
  - b) Follicle-stimulating hormone
  - c) Adrenaline
  - d) Cortisol
- 280) *Which ONE of the following hormones is NOT secreted by the pancreas?*
- a) Insulin
  - b) Glucagon
  - c) Somatostatin
  - d) Calcitriol
- 281) *Which of the following is the layer in the epidermis of the integument where the cells are completely keratinised?*
- a) Stratum granulosum
  - b) Stratum corneum
  - c) Stratum lucidem
  - d) Stratum germinativum
- 282) *Which layer of skin contains the hair follicles, sweat and sebaceous glands?*
- a) Dermis
  - b) Hypodermis
  - c) Epidermis
  - d) Stratum germinativum

- 291) *The epiglottis is composed of:*
- a) elastic cartilage
  - b) hyaline cartilage
  - c) spongy bone
  - d) smooth muscle
- 292) *Which ONE of the following statements is CORRECT?*
- a) The trachea is lined with ciliated epithelium
  - b) The trachea is strengthened by incomplete c-shaped rings of fibrocartilage
  - c) The trachea is formed from striated muscle
  - d) All of the above statements are correct
- 293) *What is the term given to the exchange of gases across the walls of the alveoli?*
- a) Partial pressure
  - b) Osmosis
  - c) Diffusion
  - d) Filtration
- 294) *Which ONE of the following statements is INCORRECT? During inspiration:*
- a) the muscles of the diaphragm relax
  - b) the external intercostal muscles contract
  - c) intrathoracic pressure is decreased
  - d) the volume of the thoracic cavity increases

299) *From which area could you collect a sample of cerebrospinal fluid?*

- a) Dura mater
- b) Arachnoid mater
- c) Pia mater
- d) Subarachnoid

300) *Which one of the cranial nerves carries impulses associated with sight?*

- a) I
- b) II
- c) V
- d) VIII



# Answers

- |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|
| 1)  | b | 23) | a | 45) | a | 67) | b |
| 2)  | b | 24) | b | 46) | a | 68) | d |
| 3)  | c | 25) | b | 47) | b | 69) | a |
| 4)  | b | 26) | c | 48) | d | 70) | d |
| 5)  | d | 27) | c | 49) | a | 71) | c |
| 6)  | a | 28) | c | 50) | c | 72) | b |
| 7)  | c | 29) | b | 51) | d | 73) | a |
| 8)  | c | 30) | a | 52) | a | 74) | c |
| 9)  | d | 31) | a | 53) | a | 75) | d |
| 10) | b | 32) | c | 54) | d | 76) | a |
| 11) | d | 33) | a | 55) | b | 77) | d |
| 12) | d | 34) | d | 56) | c | 78) | b |
| 13) | b | 35) | a | 57) | b | 79) | d |
| 14) | a | 36) | d | 58) | d | 80) | b |
| 15) | d | 37) | b | 59) | c | 81) | b |
| 16) | b | 38) | d | 60) | a | 82) | b |
| 17) | d | 39) | c | 61) | c | 83) | c |
| 18) | c | 40) | a | 62) | c | 84) | b |
| 19) | a | 41) | d | 63) | d | 85) | b |
| 20) | a | 42) | a | 64) | a | 86) | d |
| 21) | a | 43) | b | 65) | b | 87) | a |
| 22) | d | 44) | c | 66) | c | 88) | a |

89)	b	125)	a	161)	a	197)	b
90)	a	126)	d	162)	c	198)	d
91)	b	127)	d	163)	b	199)	b
92)	b	128)	c	164)	c	200)	c
93)	c	129)	d	165)	d	201)	a
94)	a	130)	d	166)	c	202)	b
95)	d	131)	b	167)	d	203)	d
96)	a	132)	b	168)	a	204)	c
97)	b	133)	c	169)	d	205)	d
98)	b	134)	d	170)	c	206)	b
99)	c	135)	a	171)	c	207)	a
100)	b	136)	d	172)	d	208)	a
101)	d	137)	b	173)	a	209)	b
102)	d	138)	a	174)	b	210)	a
103)	d	139)	b	175)	d	211)	c
104)	b	140)	d	176)	c	212)	a
105)	a	141)	d	177)	d	213)	b
106)	d	142)	c	178)	b	214)	c
107)	b	143)	d	179)	a	215)	b
108)	d	144)	d	180)	c	216)	b
109)	b	145)	b	181)	a	217)	c
110)	d	146)	a	182)	b	218)	a
111)	b	147)	d	183)	c	219)	c
112)	c	148)	c	184)	a	220)	a
113)	a	149)	b	185)	a	221)	c
114)	c	150)	a	186)	b	222)	d
115)	d	151)	c	187)	a	223)	a
116)	b	152)	d	188)	c	224)	b
117)	a	153)	c	189)	d	225)	b
118)	d	154)	a	190)	a	226)	d
119)	d	155)	c	191)	a	227)	a
120)	d	156)	d	192)	a	228)	c
121)	b	157)	c	193)	d	229)	d
122)	b	158)	a	194)	b	230)	c
123)	d	159)	d	195)	d	231)	c
124)	c	160)	c	196)	c	232)	b

- |      |   |      |   |      |   |      |   |
|------|---|------|---|------|---|------|---|
| 233) | c | 250) | c | 267) | c | 284) | b |
| 234) | b | 251) | a | 268) | c | 285) | d |
| 235) | c | 252) | c | 269) | d | 286) | a |
| 236) | c | 253) | b | 270) | d | 287) | b |
| 237) | b | 254) | b | 271) | b | 288) | a |
| 238) | c | 255) | b | 272) | d | 289) | b |
| 239) | c | 256) | a | 273) | b | 290) | d |
| 240) | b | 257) | a | 274) | b | 291) | a |
| 241) | a | 258) | a | 275) | c | 292) | a |
| 242) | c | 259) | b | 276) | a | 293) | c |
| 243) | d | 260) | d | 277) | a | 294) | a |
| 244) | d | 261) | d | 278) | c | 295) | d |
| 245) | c | 262) | d | 279) | d | 296) | c |
| 246) | a | 263) | c | 280) | d | 297) | b |
| 247) | d | 264) | d | 281) | b | 298) | d |
| 248) | d | 265) | b | 282) | a | 299) | d |
| 249) | b | 266) | a | 283) | b | 300) | b |



# 300

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