

# **LICENSE EXAM**

***GUIDE TO GRID QUESTIONS FOR THE LICENSE EXAM  
JUNE SESSION 2023 FMV IASI  
With answer***

***ANATOMY  
PHYZIOLOGY  
FIZIOPATOLOGIE  
PHARMACOLOGY  
SEMIOLOGY  
MICROBIOLOGY  
PATHOLOGICAL ANATOMY***

IAȘI - 2023

## I. DISCIPLINE: ANATOMY

### 1. Lymphatic system:

*Topography, afferent and efferent vessels of the lymph nodes of the head, neck, limbs (thoracic and pelvic) and thoracic and abdominal viscera.*

1. Where is the parotid lymph center located?
  - a. in the depth of the parotid gland
  - b. at the caudal edge of the parotid gland, under the atlas wing,
  - c. at the cranial edge of the parotid gland, ventrally to the temporomandibular joint.
  - d. at the origin of the transverse artery of the face
  
2. What are the lymph nodes that collect the primary lymph from the eyes?
  - a. lateral retropharyngeal lymph nodes
  - b. mandibular lymph nodes
  - c. parotid lymph nodes.
  - d. medial retropharyngeal lymph nodes
  
3. What is the lymph center that collects the primary lymph from the temporomandibular joint?
  - a. mandibular lymph center
  - b. parotid lymph center
  - c. the retropharyngeal lymph center
  - d. pterygoid lymph center
  
4. Where are placed the mandibular lymph nodes in cattle?
  - a. in the intermandibular space, at the tip of the mandibular gland
  - b. in the intermandibular space, at the base of the tongue
  - c. on the sides of the larynx.
  - d. in the intermandibular space, along the sublingual artery
  
5. Who collect the primary lymph from the oral and nasal cavity?
  - a. mandibular lymph nodes
  - b. parotid lymph nodes
  - c. lateral retropharyngeal lymph nodes
  - d. pterygoid lymph nodes
  
6. Lateral retropharyngeal lymph nodes are placed:
  - a. under the wing of the atlas, on the occipital artery pathway
  - b. on the sides of the larynx
  - c. under the basal part of the occipital

- d. on the ascending palatin artery (a. palatina ascendens) pathway
7. The medial retropharyngeal lymph nodes are placed:
- dorsally to the larynx
  - dorsally to the pharynx, on the pathway of the ascending palatine artery
  - ventrally to the larynx, in the sagittal plane
  - at the origin of the lingual artery
8. Where are placed the superficial cervical lymph nodes in cattle?
- cranially to the scapulum, in the subcutaneous connective tissue
  - cranially to the scapulum, between the scalenus and the cleidocephalicus muscles
  - medially to the scapulum, at the scapular insertion of the cervical ventral serratus muscle
  - cranially to the scapulum, under the cleidocephalicus muscle, nearby the ascending branch of the superficial cervical artery
9. Where are the cranial mediastinal lymph nodes?
- into the thymic lodge
  - in the precardiac mediastinum, along the brachiocephalic trunk
  - in the precardial mediastinum, ventrally to the cranial cavae vein
  - in the precardial mediastinum, dorsally to trachea
10. Where are placed the middle mediastinal lymph nodes?
- on the right side of the esophagus, dorsally to heart
  - at the bronchial bifurcation
  - between the base of the heart and the pericardial sac.
  - under the aortic club
11. In cattle, the caudal mediastinal lymph nodes are particular through:
- they are developed (10-15 cm long), being located between the mediastinal layers, dorsally to the esophagus
  - they are missing
  - they developed (10-15 cm long), being placd into the ligament of the caudal vena cava
  - they are developed (10-15 cm long), being located between the mediastinal layers, ventrally to the esophagus
12. In cattle, the cranial tracheobronchial lymph nodes are placed:
- at the origin of the tracheal bronchus
  - at the origin of the right cranial lobar bronchus.
  - they are missing.
  - at the origin of the bronchus of the left cranial lobe
13. Own (proper) axillary lymph nodes are located:
- under the humeral insertion of the teres major muscle

- b. under the humeral insertion of the infraspinatus muscle
  - c. at the origin of the ulnar collateral artery
  - d. at the origin of the subscapular artery
14. The lymph nodes of the first rib are found:
- a. at the origin of the subscapular artery
  - b. medially to the shoulder joint, along the suprascapular artery
  - c. they are missing in horses
  - d. on the medial face of the first rib, on the pathway of the internal thoracic artery.
15. Who collect the primary lymph from the thoracic acropodium in cattle?
- a. elbow lymph nodes
  - b. proper axillary lymph nodes
  - c. accessory axillary lymph nodes
  - d. lymph nodes of the first rib
16. What lymph nodes collect the primary lymph from the lateral side of the scapular and arm regions?
- a. proper axillary lymph nodes
  - b. superficial cervical lymph nodes
  - c. deep cervical lymph nodes
  - d. prescapular lymph center
18. In cattle, the mammary lymph nodes are found:
- a. at the caudal border of the caudal quarters of the udder
  - b. at the cranial border of the cranial quarters of the udder
  - c. laterally to the basal plexus of the udder.
  - d. along the external pudental artery.
19. Who collect the primary lymph from the pelvic autopodium in cattle?
- a. popliteal and subiliac lymph nodes
  - b. superficial iliofemoral and inguinal lymph nodes
  - c. popliteal and iliofemoral lymph nodes
  - d. superficial subiliac and inguinal lymph nodes
20. Where are placed the subiliac lymph nodes?
- a. under the external angle of the ilium
  - b. in the middle third, on the inner face of the tensor of fasciae latae muscle
  - c. on the medial face of the stifle joint, in the thickness of the prefemoral fold
  - d. on the descending branch of the deep iliac artery
21. Where are placed the popliteal lymph nodes?
- a. in the femoral trigone, on the femoral artery pathway
  - b. behind the stifle joint, along the popliteal artery

c. between the biceps femoris and the semitendinosus muscle, dorsally to the gastrocnemius muscle insertion

d. between the biceps femoris and the semitendinosus muscles, dorsally to the gastrocnemius muscle insertion, along the caudal femoral artery

22. In cattle, the deep iliofemoral lymph nodes are placed:

a. in the femoral trigone

b. under the femoral ring

c. dorsally to the femoral ring, on the external iliac artery pathway

d. in the pelvic cavity

## 2. Thoracic and abdominal viscera in animals:

*Morphology of the thoracic and abdominal viscera in domestic animals; differentiation criteria; projection areas of the viscera on the walls of the thorax and abdomen; vascular-nervous structures and their distribution in the organs.*

1. Vegetative innervation (Sympathetic and parasympathetic) of the stomach is ensured by:

a. celiac preganglionic fibers,

b. the greater splanchnic nerve,

c. the lesser splanchnic.

d. fibers from the coeliac plexus and the parietal gastric plexus

3. Into the layers of the great omentum which anastomosis is formed:

a. between the right gastroepiploic artery and the left gastroepiploic artery,

b. between lienal (splenic) artery and the hepatic artery,

c. between splenic artery and the gastroduodenal artery

d. between the left gastric artery and the right gastric artery

4. The morphological criteria for stomach differentiating in the animal are the following:

a. the shape of the stomach

b. the types of mucosa and the extended area

c. after vascularization

d. after innervation

6. The greater omentum is inserted on:

a. hilum of the spleen

b. the ceiling of the abdominal cavity

c. duodenum

d. jejunum

7. The morphological criteria for differentiating the ascending colon in animals are the following:

- a. the number of longitudinal muscular bands
- b. the aspect of the colon
- c. distribution arteries
- d. the position it occupies in the abdominal cavity

8. Which flexure (curvature) of the ascending colon in horses has the smallest caliber?

- a. sternal curvature,
- b. pelvic flexure,
- c. diaphragmatic curvature.
- d. they have similar caliber

9. The ligaments that fix the liver are the following:

- a. right triangular, left triangular, hepato-renal, hepato-gastric, falciforme, round,
- b. right triangular, left triangular, hepato-gastric, falciforme, round
- c. hepato-renal, hepato-gastric, right triangular, left triangular
- d. round ligament, the greater and the lesser omentum

10. The morphological criteria for differentiating the liver in domestic animal are:

- a. the liver color
- b. interlobar incisions
- c. the aspect of the lobes
- d. number of lobes

11. The large mesentery is shorter at:

- a. cattle
- b. sheep
- c. pigs
- d. dogs

12. The innervation of the anus is performed by:

- a. vegetative fibers from the hypogastric plexus and caudal rectal nerves,
- b. vegetative fibers from the hypogastric plexus and pudendal nerves,
- c. vegetative fibers of the hypogastric plexus, caudal rectal nerves and perineal nerves
- d. fibers from the pudendal nerves

13. In horses, the celiac artery ends with:

- a. pancreatic, gastric and hepatic arteries;
- b. hepatic and splenic arteries;
- c. hepatic, splenic and left gastric arteries
- d. hepatic, splenic, left gastric and pancreato-duodenal arteries

14. The transverse colon is supplied by:

- a. dorsal colic artery (right fascicle);
- b. caudal mesenteric artery;
- c. middle colic artery;
- d. ventral colic artery

16. What are the roots of portal vein in horses?

- a. splenic, gastric, cranial mesenteric and caudal mesenteric veins;
- b. splenic, gastric, jejunal and colic veins,
- c. splenic, cranial mesenteric and caudal mesenteric veins
- d. splenic, gastric, cranial mesenteric, caudal mesenteric and rectal mesenteric veins;

17. In horses, the cranial rectal artery originates from:

- a. the caudal mesenteric artery;
- b. the cranial mesenteric artery;
- c. the internal pudendal artery.
- d. the vaginal (or prostatic) artery

18. The orifice through which the portal vein perforates the diaphragm is located:

- a. between the left and right pillars;
- b. between the left pillar and the left intermediate;
- c. no answer is correct.
- d. at the top of the lateral right pillar

19. The right gastroepiploic artery comes from:

- a. the left gastric artery
- b. the hepatic artery
- c. the gastroduodenal artery
- d. splenic artery

20. The caudal flexure of the duodenum (duodeno-transverse flexure) is placed:

- a. caudally to the origin of caudal mesenteric artery
- b. cranially to the origin of the celiac artery
- c. caudally to the origin of the cranial mesenteric artery
- d. cranially to the origine of the cranial mesenteric artery

21. In horses, the top of th cecum is particular through:

- a. it is placed on the floor of the abdominal cavity
- b. it is not sacculated
- c. it is connected to the ventral colon by the ceco-colic ligament
- d. it is placed on the floor of the abdominal cavity between loops I and II

22. The the intercolic ligament in horses links:

- a. the loops of the ventral colon between them

- b. the loops of the dorsal colon between them
  - c. the ventral colon with the dorsal colon
  - d. the cecum with the ventral colon
25. The hepatic hilum is approached by:
- a. portal vein
  - b. the choledoc canal
  - c. cystic duct
  - d. caudal vena cava
26. The hepatic veins flow into:
- a. portal vein
  - b. caudal vena cava
  - c. gastric vein
  - d. azygos vein
27. The splenic artery emits:
- a. the left gastro-epiploic artery
  - b. the right gastro-epiploic artery
  - c. gastric rami
  - d. pancreatic branches
28. The hepatic artery originates in:
- a. the celiac trunk
  - b. the large mesenteric trunk
  - c. the broncho-esophageal trunk
  - d. the descending aorta
29. The liver of the horse is particular through:
- a. three lobes
  - b. four lobes
  - c. five lobes
  - d. the incised (fringed) quadratus lobe
30. The pancreas sheds its exocrine secretion product into:
- a. duoden
  - b. jejun
  - c. ileon
  - d. pilor
31. The horse's pancreas has a ring through which it passes:
- a. the caudal vena cava
  - b. the cranial vena cava
  - c. the portal vein



- d. the splenic vein
32. In specis, the kidneys are differentiated through:
- a. their color
  - b. the aspect of the cortical area
  - c. vascular drawing
  - d. after the renal pelvis
33. In species, the lungs are differentiated by:
- a. the lobular design
  - b. the tracheal bronchus
  - c. interlobar incisures
  - d. the aspect of the lobes
34. In animals, lungs are not differentiated by:
- a. segmental and subsegmental bronchi
  - b. tracheal bronchus
  - c. interlobar incisure
  - d. the aspect of lung lobules
35. Unde se proiectează cecumul la cal?
- a. pe partea dreaptă, ventral liniei de mijloc a abdomenului
  - b. în flancul drept, ocupând golul flancului, coarda flancului și panta flancului
  - c. în golul flancului drept.
  - d. in golul flancului stâng
36. Where is projected the ascending colon of the horse:
- a. on the right side, below the midline of the abdomen
  - b. on the left side, below the midline of the abdomen
  - c. on the right and left sides, below the midline of the abdomen.
  - d. on the ventral face of the abdomen
37. In horses, on the right side of the abdomen, the liver has the following projecting area:
- a. is not projected
  - b. cranially, is delimited by the diaphragm, ventrally by the middle line of the abdomen and caudally by a line between the base of the 17th rib and the middle of the 15th rib
  - c. cranially is delimited by the diaphragm, ventrally by the midline of the abdomen and caudally by the 10th rib
  - d. the caudal midline, below the diaphragm
38. In horses, the descending colon is projected:
- a. in the whole of the left flank
  - b. on the slope of the right flank
  - c. has no projection area at the level of the abdominal wall

- d. in both sides of the sublumbar region
39. In horses, the jejunum is projected:
- in the diaphragmatic concavity
  - on the left side, corresponding to a band of 10-20 cm, located dorsally to the midline of the abdomen, caudal to the hypochondral arch
  - on the right side, corresponding to a band of 10-20 cm, located dorsally to the midline of the abdomen, caudally to the hypochondral arch
  - at the cavity entrance
40. The projection area of the rumen in ruminants is drawn:
- on the right side of the abdominal cavity
  - on the left side of the abdominal cavity
  - on the floor of the abdominal cavity
  - on the right side from the diaphragm to the entrance to the pelvic cavity
41. In cattle, the projection area of the reticulum is placed:
- is not designed
  - on the left side, between VI-VIII ribs, below the midline
  - on the right side, between the VI-VIII ribs, below the midline.
  - on the left side, between the VI-VIII ribs , dorsally to the midline
42. In cattle, the omasum area of projection is designed:
- has no projection area
  - on the left side, below the midline of the abdomen, between the VI-VIII ribs
  - on the right side, dorsally to abomasum, between the VI-IX ribs
  - on the right side, dorsally to the abomasum
43. In cattle, the gallbladder in cattle is projected:
- on the right side, in the tenth intercostal space, 3 cm below the midline of the abdomen
  - on the left side, in the tenth intercostal space, 3 cm below the midline of the abdomen
  - has no projection area on the wall of the abdominal cavity
  - dorsally to the caudate lobe projection
44. The greater omentum represents:
- the stomach ligament
  - the small intestine ligament
  - the large intestine ligament
  - the liver ligament
47. The lesser splanchnic nerve consists of:

- a. presynaptic sympathetic fibers
- b. postsynaptic sympathetic fibers
- c. postsynaptic parasympathetic fibers
- d. presynaptic parasympathetic fibers

48. The heart's innervation is:

- a. autonomic, achieved by the nodal tissue
- b. sympathetic
- c. parasympathetic
- d. motor

49. The Valsalva sinuses are located:

- a. dorsally to the mitral valve
- b. dorsally to the aortic valve
- c. dorsally to the bicuspid valve
- d. from where the coronary arteries originate

50. The pericardial cavity represents:

- a. the space between the epicardium and the serous pericardium
- b. the space between the visceral pericardium and the parietal pericardium
- c. the space between the pleura and the pericardial sac
- d. the space between the serous pericardium and the fibrous pericardium

51. The fossa ovale represents:

- a. an ovalar depression placed into the interatrial septum
- b. a depression located into the interventricular septum
- c. an remnant of the Botall orifice
- d. an remnant of the Botall canal

### **3. Hypogastric region:**

#### **The inguinal region and testicular puuches**

1. The external pudental artery is discovered as follows:

- a. through the incision of the skin on the side of the prepuce
- b. through an incision of the skin at the level of the caudo-medial commissure of the superficial inguinal ring
- c. through an incision of the skin near the cranio-lateral commissure of the superficial inguinal ring
- d. at the tip of the femoral trigone

2. In boars, the superficial inguinal ring appears as a slit, being placed:

- a. cranially to the pubis and laterally to the white line
- b. in the subanal region

- c. over the ischiadic arch, lateral to the perineal ridge
- d. in the hypogastric region

3. The inguinal canal represents:

- a. the path of the testicular cord in the groin (inguinal) region.
- b. the space between the two inguinal rings
- c. the testicular cord pathway from the origin to the testicle
- d. the space traversed by the testicle during testicular migration

4. In horses, the dorsal artery of the penis comes from:

- a. the symmetrical anastomosis of the pudendal arteries (internal and external)
- b. the anastomosis of the caudal artery of the penis with the median artery of the penis
- c. the anastomosis of the cranial artery of the penis with the median and caudal artery

of the penis

- d. the median artery of the penis.

5. The blocking of the dorsal nerve of the penis is performed:

- a. at the level of the ischiadic arch, lateral to the root of the penis
- b. on the dorsal face of the penis, in the inguinal region.
- c. at the level of the superficial inguinal ring
- d. lateral to the anus, into the paraanal fosse.

6. The preputial diverticulum is found:

- a. at bulls
- b. at dogs
- c. at boars
- d. at rabbits.

7. The testicular cord consists of:

- a. the testicular artery and vein
- b. the artery, the vein and the deferens ductus covered by serosa
- c. the artery, the vein and the deferens ductus, covered by the fibrous layer.
- d. the artery, the vein, the cremaster muscle and deferens ductus, covered by the

serous-fibrous layer.

8. The external cremaster muscle originates from:

- a. the internal oblique muscle of the abdomen
- b. the external oblique muscle of the abdomen
- c. the rectus abdominis muscle
- d. the transverse muscle of the abdomen

10. The vaginal process includes:

- a. the superficial and the deep fascia of the trunk
- b. the fibrous-serous layer

- c. the tunica flava of the abdomen.
- d. the parietal peritoneum

11. In dogs, the testicular pouches are supplied by:

- a. the internal pudendal artery
- b. the external pudendal artery and the internal pudendal artery
- c. the obturator artery.
- d. the iliohypogastric artery

12. The testicular mediastinum represents:

- a. fibrous extension along the long axis of the testis
- b. the place where the rete testis is located
- c. is thick and centrally placed in boars
- d. is found at the cranial pole of the testicle at the stallion

13. The pampiniform plexus:

- a. it is formed by the testicular vein
- b. it is placed at the cranial pole of the testicle
- c. it is formed by the epididymal canal
- d. it is placed in the tail of the epididymis

#### **4. Regions of the thoracic and pelvic autopodium in horses and cattle**

1. Who sensory innervates the skin of the dorsal face of the carpus in horses?

- a. the dorsal carpal nerve
- b. the cranial antebrachial cutaneous nerve and the dorsal carpal nerve
- c. sensory branches of the palmar nerves.
- d. the superficial branch of the radial nerve.

2. What are the vascular-nervous structures that pass through the superficial layer of the carpal flexor retinaculum (palmar anular carpal ligament)?

- a. the palmar artery and the medial palmar nerve
- b. palmar artery, palmar vein and palmar nerves
- c. the radial and the ulnar arteries, the radial and the ulnar veins and the lateral palmar nerve.
- d. the radial and the ulnar arteries, the radial and the ulnar veins, the tendon of the flexor carpi-radialis muscle and the lateral palmar nerve.

3. What are the structures that pass through the deep layer of the carpal flexor retinaculum (palmar anular carpal ligament)?

- a. the palmar artery and the medial palmar nerve
- b. the palmar artery, the palmar vein and the palmar nerves
- c. the radial and the ulnar arteries, the radial and the ulnar veins and the lateral palmar nerve.

d. palmar artery, medial palmar nerve and tendons of the deep and the superficial digital flexor muscles

5. What is the anatomical basis of the metacarposamophalangeal joint in horses?
- a. the metacarpal bones, the first phalanx and the greater sesamoids
  - b. the distal extremity of the third metacarpal, the proximal extremity of the phalanx I and the great sesamoids.
  - c. the body of the second phalanx
  - d. the distal extremity of the third and the secondary metacarpals, the proximal extremity of the first phalanx and the greater sesamoids.
7. In horses, the vascular-nervous structures of the fetlock region are highlighted:
- a. through an incision about 3 cm long placed on the sides
  - b. through an incision about 3 cm long, placed laterally to the greater sesamoids
  - c. through a long incision on the palmary face of the fetlock
  - d. through an incision on the dorsal face of the fetlock
8. The place for blocking of the digital nerve is:
- a. dorsally of the fetlock joint
  - b. dorsally to the ligament of the ergot
  - c. cranially to the digital artery
  - d. ventrally to the ligament of the ergot.
9. The vascular-nervous structures of the pastern region are dorso-palmary ordered as following:
- a. nerve, vein, nerve, artery, nerve
  - b. nerve, artery, nerve, vein, nerve
  - c. artery, vein, nerve
  - d. artery, vein, nerve, tendon
10. Which structures belong to the hoof cushioning system?
- a. the coffin and the frog
  - b. the frog and the heel bulbs
  - c. cartilages of the hoof and the frog
  - d. cartilages of the hoof, tubular layer of the coffin and the frog.
11. Which structure delimits the osteo-ligamentous and vascular-nervous tissues from the hoof capsule on the solar face of the hoof?
- a. the cuticula
  - b. the white line
  - c. the central groove

d. the frog bars

12. In horses, where anastomose the digital arteries?

- a. through the terminal arch, located in the solear duct
- b. through the circumflex artery of the foot, located at the edge of the third phalanx
- c. into the coronary groove
- d. they do not anastomose

13. Which innervates the hoof cushion and the sole in horses?

- a. the caudal digital nerve
- b. the caudal and the middle digital nerve
- c. deep palmar nerve
- d. the middle digital nerve

14. Digital veins in horses originate from:

- a. the solear veins
- b. the internal and external venous plexuses of the hoof cartilages
- c. the anastomose between solear and coronary veins.
- d. in the venous network of the corium of the frog and bulbs of the heel

15. What are the structures that increase the length of the hoof capsule?

- a. internal layer (lamellar) of the hoof
- b. external layer (cuticula) and middle layer of the hoof
- c. the corium of the sole and frog
- d. papillae of the coronary corium that produce the horny tubules

16. In horses, the common digital artery II is the main vessel of the metacarpal region being found in:

- a. parallel to the flexor tendons on the lateral face of the region
- b. parallel to the flexor tendons on the medial face of th region
- c. on the dorso-medial face of the metacarpus, passing over the metacarpal fascia
- d. parallel to the flexor tendons, on the medial face, covered by the metacarpal fascia

17. Indicate the dorso-palmary succession of the tendons on the palmar (caudal) face of the metacarpal region in horses:

- a. the interosseous, the deep flexor and the superficial flexor muscles
- b. the superficial flexor, the interosseous and the deep flexor muscles
- c. the interosseous, the deep flexor, the superficial flexor and lateral digital extensor muscles
- d. the intermediate tendon, the sural triceps tendon and the tendon of the superficial flexor muscle.

19. The deep plantar nerve has following characteristics:
- a. it originates from the lateral plantar nerve
  - b. it locates on the medial face of the long plantar ligament
  - c. it innervates the median interosseous muscle
  - d. it innervates the deep plantar flexor muscle
20. Through the deep carpal canal pass the following structures:
- a. the superficial flexor muscle
  - b. the deep flexor muscle
  - c. the palmar artery
  - d. the medial palmar nerve
  - e. the lateral palmar nerve

## II. Discipline Physiology

### Physiology of the vegetative nervous system (VNS):

#### Questions with only one correct answer:

1. It is considered vegetative brain:
- a. the cerebellum
  - b. limbic system
  - c. hypothalamus
  - d. cerebral cortex
2. Specify which of the following brainstem centres have a parasympathetic function:
- a. cardioaccelerator centre
  - b. cardiomodulator centre
  - c. pupillary dilator centre
  - d. vasomotor centre
4. Specify which of the following brainstem centres have orthosympathetic function:
- a. salivary centre
  - b. vasomotor centre
  - c. centre of sexual reflexes
  - d. cardiomodulator centre
4. One of the following nerves has no vegetative function:
- b. vagus nerve (X),
  - b. accessory of the vagus nerve (XI)
  - c. common oculomotor nerve (III)



d. facial nerve (VII)

5. Myosis and mydriasis are vegetative activities in the category:

a. antagonistic

b. apparently antagonistic

c. synergistic

d. voluntary motor activities

6. Nicotinic Receptor Stimulator/Inhibitor is:

a. Nicotine/Muscarine

b. Nicotine/Atropine

c. Acetylcholine/Nicotine

d. Acetylcholine/Atropine

7. Muscarinic Receptor Stimulator/Inhibitor is:

a. Acetylcholine/Atropine

b. Muscarine/Nicotine

c. Adrenaline/Noradrenaline

d. Noradrenaline/Muscarine

8. Alpha1 receptors have predominant localization in \_\_\_/and effect of\_\_\_.

a. cardiac musculature/cardioacceleration

b. smooth muscle of blood vessels/vasoconstriction

c. skeletal musculature/increased postural tone

d. digestive sphincter muscles/relaxation

9. Beta1 adrenergic receptors have localization in \_\_\_/and effect of\_\_\_.

a. cardiac musculature/cardioacceleration

b. smooth muscle of blood vessels/vasoconstriction

c. smooth muscle of blood vessels/vasodilation

d. bronchial muscles/bronchoconstriction

10. Beta2 adrenergic receptors have localization in \_\_\_/and effect of\_\_\_.

a. smooth muscle of cutaneous blood vessels/vasoconstriction

b. coronary vessel smooth muscle/vasodilation

c. cardiac muscle/cardioinhibition

d. digestive wall musculature/contraction

### **Multiple choice questions:**

1. Specify which of the following centres have parasympathetic function:

a. the cardioaccelerator centre and the pupilodilator centre

b. cardiomoderator centre and pupilloconstrictor centre

c. micturition centre and defecation centre

- d. medullary vasoconstrictor centres
2. The second neuron in the orthosympathetic efferent pathway could be located in:
- a. walls of the organs served
  - b. paravertebral ganglionic chain
  - c. sphenopalatine, otic or lingual ganglion
  - d. celiac and mesenteric ganglion
3. The second neuron in the parasympathetic efferent pathway could be located in:
- a. walls of the organs served
  - b. paravertebral ganglionic chain
  - c. celiac, cranial mesenteric or caudal mesenteric ganglion
  - d. ciliary, otic, sphenopalatine ganglion
4. Cranial nerves with vegetative function are:
- a. common oculomotor nerve (III)
  - b. facial nerve (VII)
  - c. glossopharyngeal nerve (IX)
  - d. vagus nerve (X)
5. The explanation of the referred pain is:
- a. summation of nociceptive stimuli from a visceral area and the adjacent cutaneous area.
  - b. convergence of visceral and somatic afferent fibers to the same dorsal horn neuron in the spinal cord.
  - c. projecting the source of skin pain to an internal organ.
  - d. incorrect projection of the pain source to a specific cutaneous region, due to the common conduction pathway of visceral and cutaneous pain.
6. The general effects produced by stimulation of **parasympathetic** vegetative centres are:
- a. stimulation of anabolic processes
  - b. growth promotion
  - c. decrease in all functions except digestion which is accelerated
  - d. acceleration of all functions except digestion which is slowed down
7. The general effects produced by stimulation of the **orthosympathetic** vegetative centres are:
- a. stimulation of catabolic processes and promotion of energy consumption
  - b. stimulating anabolic processes and promoting growth
  - c. acceleration of all functions except digestion which is slowed down
  - d. decrease in all functions except digestion which is accelerated

8. The differences between somatic and vegetative efferent pathways are: (\_\_\_ in the somatic pathway / \_\_\_ in the vegetative pathway)
- single neuron/2 neurons
  - myelinated nerve fibres/myelinated and myelinated nerve fibres
  - chemical mediator: adrenaline/noradrenaline
  - effector: skeletal muscle/cardiac muscle, smooth muscle, glands
9. Beta2 adrenergic receptors are predominantly localized in \_\_\_/ and have a \_\_\_ effect:
- heart muscle/reduced heart contraction force
  - smooth muscle of some blood vessels /vasodilation
  - bronchial smooth muscle/bronchodilatation
  - digestive sphincter muscles/relaxation
10. alpha2 adrenergic receptors are:
- presynaptic receptors of vascular neuroeffective synapses
  - postsynaptic receptors of vascular and cardiac neuroeffective synapses
  - norepinephrine release inhibitors
  - autoregulators of the vasoconstriction phenomenon

### **Vestibular, acoustic and visual sensorial organs:**

#### **Questions with only one correct answer:**

- Vestibular sensitivity, according to the receptors involved, is a type of sensitivity:
  - interoceptive
  - exteroceptive
  - proprioceptive
  - exteroceptive and proprioceptive
- What is the bidirectional response of the vestibular receptors?
  - the two cerebral hemispheres receive binaural information.
  - depolarization or hyperpolarization as the stereocilium tilts towards the kinetocil or vice versa.
  - excitation in the case of otolith action on sensory cell cilia and inhibition in the case of tilting of sensory cell cilia.
  - different response to antero-posterior and lateral head tilts respectively.
- The vestibular pathway protonator is located in:
  - Scarpa's ganglion on the path of nerve VIII
  - spinal ganglion on the dorsal root of the spinal nerve
  - spiral ganglion of Corti on the path of nerve VIII
  - vestibular nuclei in the medulla oblongata

4. The acoustic pathway protonator is located in:
- Scarpa's ganglion on the path of nerve VIII
  - spinal ganglion on the dorsal root of the spinal nerve
  - spiral ganglion of Corti on the path of nerve VIII
  - cochlear nuclei in the medulla oblongata
5. Deuteronuron of the vestibular canal is located in:
- dorsal horn of the spinal cord
  - medulla oblongata
  - thalamus
  - caudal quadrigeminal tubercle
6. Deuteronuron of the auditory canal is located in:
- dorsal horn of the spinal cord
  - medulla oblongata
  - thalamus
  - caudal quadrigeminal tubercle
7. The tritoneuron of the vestibular pathway is located in:
- anterior quadrigeminal tubercle
  - posterior quadrigeminal tubercle
  - thalamus
  - temporal lobe of the cerebral cortex
8. The auditory pathway tritoneuron is located in:
- anterior quadrigeminal tubercle
  - posterior quadrigeminal tubercle
  - medial geniculate body of the thalamus
  - temporal lobe of the cerebral cortex
9. To achieve nystagmus, the vestibular nuclei make connections with the following nerve formations:
- motor neurons in the spinal cord
  - vestibulocerebellar and paleocerebellar
  - oculomotor nerve nuclei in the brainstem
  - upper olive in medulla oblongata
10. The frequency limits of sound waves perceived by humans and most animal species are:
- 20 Hz-20 KHz
  - 1000-4000 Hz
  - 20-40 kHz
  - 40-100 kHz

11. The sound wave receiving apparatus is represented by:
- a. external ear pavilion
  - b. organ of Corti in the cochlear duct
  - c. eardrum
  - d. middle ear ossicles
12. The middle ear is represented by\_\_\_/has the role of\_\_\_:
- a. semi-circular channels/balance
  - b. malleus, incus, and stapes/attenuation or amplification of sounds
  - c. cochlear membrane/sound wave reception
  - d. vestibul membrane/balance
13. Corti's organ is housed in?
- a. vestibular ramp of the cochlea
  - b. tympanic ramps of the cochlea
  - c. median cochlea ramp
  - d. semicircular canals of the inner ear
14. High frequency sounds cause vibration:
- a. base of cochlea
  - b. end of cochlea
  - c. otoliths in the utricle and saccule
  - d. endolymph of lateral semicircular canals
15. Low frequency sounds cause vibration:
- a. base of cochlea
  - b. end of cochlea
  - c. otoliths in the utricle and saccule
  - d. endolymph of lateral semicircular canals
16. The auditory ascending pathway is included in:
- a. medial lemniscus, homolateral and heterolateral to the ear of origin
  - b. lateral lemniscus, homolateral and heterolateral to the ear of origin
  - d. Gowers fascicle, heterolateral to the ear of origin
  - e. Flechsig fascicle. Homolateral to the ear of origin
17. The central segment of the hearing analyser is located in:
- a. superior temporal gyrus
  - b. ascending parietal circumvolution
  - c. occipital lobe, posterior to the vestibular area.
  - d. frontal lobe

18. To correctly locate the sound source, auditory signals from the right ear are transmitted to the cerebral cortex:
- homolateral, in the right auditory area
  - heterolateral, in the left auditory area
  - bilaterally, in the auditory areas of the two cerebral hemispheres
  - in the occipital and temporal lobe of the right cerebral hemisphere
19. In order to correctly judge the distance of sound, auditory signals from the left ear are transmitted to the cerebral cortex:
- homolateral, in the left auditory area
  - heterolateral, in the right auditory area
  - bilaterally, in the auditory areas of both cerebral hemispheres
  - in the occipital and temporal lobe of the left cerebral hemisphere
20. Choose the false statement about macular receptors in the utricle and sacculus:
- macular receptors are mechanically stimulated by otoliths
  - macular receptors detect angular acceleration and deceleration
  - macular receptors discharge impulses through head tilts
  - macular receptors are stimulated by linear acceleration motion
21. The following statements are true with one exception:
- the membranous vestibule consists of 2 membranous cavities: the utricle and the saccule
  - in the utricle and saccule there are macules formed by sensory cells responsible for static balance
  - the cilia of the vestibular sensory cells are embedded in a gelatinous structure (otolith membrane) containing calcium carbonate granules called otoliths;
  - vestibular receptors are found in the macula lutea and in the ampullary ridges of the membranous labyrinth.
22. The middle tunic of the eyeball **does not** include:
- coroida
  - ciliary muscles and ciliary processes
  - iris
  - cornea
23. The optical apparatus of the eye consists of the following components, with one exception:
- cornea
  - sclerotica
  - aquos humour
  - crystalline
  - vitreous body

24. The ocular dioptric apparatus consists of:

- a. cornea and aqueous humour
- b. lens and vitreous body
- c. cornea (with a refractive power of about 43 dioptries) and crystalline lens (with a refractive power of 13- 26 dioptries)
- d. sclera and cornea

25. Identify the false statement:

- a. when the eye looks into the distance, the ciliary muscle is relaxed and the Zinn zonule is tense, compressing the lens
- b. sympathetic efference originates in the pupillary centers of the first two segments of the thoracic cord;
- c. the retina is sensitive to electromagnetic radiation of wavelengths between 390 and 760 nm
- d. at the level of the primary visual area, the most extensive representation is given by the fovea centralis, which occupies the posterior region of the parietal lobe

26. Glaucoma is:

- a. corneal opacification
- b. lens opacification
- c. increased intraocular pressure
- d. insufficient secretion of aqueous humor inside the eyeball

27. Which of the following cranial nerves does not innervate the eyeball muscles?

- a. pathetic nerve
- b. optic nerve
- c. common oculomotor nerve
- d. abducens nerve

28. The part of the eye that shows maximum visual acuity is:

- a. optic disc of the retina
- b. the nodal point in the centre of the lens where the light rays cross
- c. macula lutea of the retina containing the fovea centralis
- d. the place in the retina where ganglion cell axons associate to form the optic nerve

29. Identify the correct statement:

- a. all animal species, like man, have dioptric accommodation for near and far vision
- b. in the horse, the ramped retina allows the view of close objects at a point on the retina above the blind spot, by simply changing the position of the head, without bulging the lens
- c. in cats, pupillary constriction during the day prevents vision due to the positioning of the blind spot in the centre of the retina

d. the cat has few cone photoreceptor cells, has a bichromatic visual system and perceives colours poorly

30. The visual system of diurnal birds is adapted to:

a. twilight vision, as they have sufficient rod photoreceptor cells

b. tetrachromatic vision, because they have numerous photoreceptor cells with cones

c. monochromatic vision because they have no cone photoreceptor cells and perceive only shades of grey

d. binocular vision, due to partial decussation of optic nerve fibres

### **Multiple choice questions**

1a. Vestibular receptors are named\_\_\_/ are located in\_\_\_/respond to the following stimuli:

a. kinesthetic/muscle/closing the joint angle and lengthening the extensor muscles

b. otoliths/ utricula and sacula/ anterior, posterior and lateral tilt of the head

c. maculae/macula lutea/linear acceleration and deceleration

d. ampullae/ semicircular canals in the inner ear/acceleration and deceleration of angular motion

1b. Vestibular receptors are named\_\_\_/ are located in\_\_\_/respond to the following stimuli:

a. otoliths/ utricula and sacula/ anterior, posterior and lateral head tilt, linear acceleration and deceleration

b. maculae/macula lutea/linear acceleration and deceleration

c. ampullae/ semicircular canals in the inner ear/acceleration and deceleration of angular motion

d. proprioceptors/internal joint/ changes in head position and linear and rotational movement.

2. To adjust muscle tone, the vestibular nuclei make connections with the following nerve formations:

a. vestibulocerebellum

b. reticulated brainstem formation

c. nuclei of origin of the oculomotor nerves

d. motor neurons in the spinal cord

3. A dog with rightward head deviation and rightward circling movements shows an asymmetric discharge of impulses, the predominant discharge being in:

a. vestibular nerve of the left ear

b. vestibular nerve of the right ear

c. motor nerves of the right half of the body

d. motor nerves of the left half of the body

4. The sound wave conducting apparatus is represented by:



- a. middle ear ossicles
  - b. oval window membrane and inner ear fluids
  - c. 8th pair of cranial nerves, acoustic branch
  - d. external auditory canal and eardrum
5. The ear cavities filled with perilymph are:
- a. tympanic ramp of the cochlea
  - b. vestibular ramp of the cochlea
  - c. semicircular channels
  - d. cochlear duct
6. The ear cavities filled with endolymph are:
- a. tympanic ramps of the cochlea
  - b. cochlear duct
  - c. vestibular ramp of the cochlea
  - d. semicircular channels
7. The explanation of basilar membrane tonotopy is:
- a. travelling wave theory
  - b. low-frequency waves travel the furthest, reaching maximum amplitude in the broadest area of the basilar membrane
  - c. waves with a frequency above 8000 cycles/second travel to the tip of the cochlea
  - d. high-frequency waves travel least, in the narrowest area of the basilar membrane
8. The auditory ascending pathway makes connections with:
- a. anterior quadrigeminal tubercle
  - b. caudal quadrigeminal tubercle
  - c. oculomotor nerve nuclei
  - d. trapezoid body nuclei
9. In deafness associated with skin depigmentation in Dalmatian dogs:
- a. only bone propagated sounds are perceived
  - b. neither airborne nor bone-borne sounds are heard
  - c. auditory evoked potentials transmitted through the brainstem are absent
  - d. the auditory cortical area receives only auditory potentials evoked as a result of applying sounds directly to the cochlea
10. Aqueous moisture is found in:
- a. anterior chamber of the eye
  - b. posterior chamber of the eye
  - c. in the space between the cornea and the lens
  - d. behind the lens

11. Which of the following statements about the cornea is false?
- a. the surface of the cornea in the cat occupies a greater proportion of the surface of the eyeball than in the dog
  - b. the transparency of the cornea is directly proportional to its degree of hydration
  - c. the cornea has a rich sensory innervation, being an extremely sensitive tissue
  - d. the cornea is highly vascularised, requiring a constant supply of nutrients
12. The constriction of the pupil in the vertical plane in cats provides:
- a. night vision
  - b. daytime vision
  - c. image formation above and below the blind spot
  - d. imaging exactly on the optical disc
13. Diopter accommodation involves:
- a. variation of dioptries in the cornea
  - b. variation of dioptries in the lens
  - c. clear view of both near and far objects
  - d. clear vision in both dim and bright light
14. The stock of cis-retinal (retinal) that ensures rhodopsin resynthesis is replenished:
- a. in the dark
  - b. under the influence of light rays
  - c. in the presence of vitamin A
  - d. in the presence of vitamin D
15. Regarding the consensual pupillary reflex, the following statements are false:
- a. when light acts on the right eye, the pupilloconstrictor reflex is produced in both eyes
  - b. Bilateral pupillary constriction is due to total crossing of the optic nerve fibres at the level of the optic chiasm.
  - c. the consensual reflex does not occur if the eye is blind
  - d. the reflex closes in the Edinger-Westphal parasympathetic nucleus in the midbrain and does not engage the cerebral cortex
16. In the dog, nictitating membrane may become evident in the following circumstances:
- a. strychnine poisoning
  - b. hyperplasia of the lymphatic tissue associated with this membrane
  - c. action of orthosympathetic ganglioplegic substances
  - d. tetanus
17. Pupil dilator reflex:
- a. has its reflex centre in the Edinger-Westphal parasympathetic nucleus in the midbrain
  - b. has the cilio-spinal reflex centre in the orthosympathetic neurons of the intermediate-lateral horns of the thoracic cord T1-T2

- c. has the efferent pathway represented by the common oculomotor nerve and the superior cervical ganglion
- d. has a common afferent pathway with the pupilloconstrictor reflex, represented by the optic nerve

18. In dogs and cats, the adaptation of the eye to darkness is provided by:

- a. myosis reflex
- b. mydriasis reflex
- c. the inner layer of the choroid - tapetum lucidum, which allows light rays to pass back and forth through the photoreceptor cell layer
- d. reduction of photopigment concentration in rod cells

19. The disruption of optic nerve fibres occurs in different proportions in different animal species. Thus:

- a. there are no species with total decussation, only partial decussation
- b. the proportion of crossed fibres is higher in species with laterally placed eyes
- c. the proportion of direct (uncrossed) fibers is higher in primates and other animals with frontally placed eyes
- d. the area of binocular vision, overlapping the two visual fields, is greater in pigeons than in owls

20. Deuteronuron of the visual pathway:

- a. is the ganglion cell in the retina
- b. is the bipolar cell in the retina
- c. connects with the third neuron in the optic colliculi of the midbrain
- d. connects with the third neuron in the lateral geniculate nucleus in the thalamus

### **Endocrine system:**

#### **Questions with only one correct answer:**

1. Paracrine transmission of hormone secretion involves:

- a. the action of a hormone released into the interstitial space directly on secretory cells to regulate their own secretion
- b. the action of a hormone released into the interstitial space on target cells in the same tissue
- c. release into the bloodstream and remote action of a hormone synthesised by endocrine neurons
- d. release into the bloodstream and remote action on peripheral target cells of hormones synthesized by specialized endocrine cells.

2. Autocrine transmission of hormone secretion involves:

- a. the action of a hormone released into the interstitial space directly on secretory cells to regulate their own secretion

- b. the action of a hormone released into the interstitial space on target cells in the same tissue
- c. release into the bloodstream and remote action of a hormone synthesised by endocrine neurons
- d. release into the bloodstream and remote action on peripheral target cells of hormones synthesized by specialized endocrine cells.

3. Endocrine transmission of hormone secretion involves:

- a. the action of a hormone released into the interstitial space directly on secretory cells to regulate their own secretion
- b. the action of a hormone released into the interstitial space on target cells in the same tissue
- c. release into the bloodstream and remote action of a hormone synthesised by endocrine neurons
- d. release into the bloodstream and remote action on peripheral target cells of hormones synthesized by specialized endocrine cells.

4. One of the following molecules is **not** considered a secondary messenger in hormone transmission:

- a. Cyclic AMP
- b. Calcium-calmodulin
- c. Diacylglycerol
- d. Albumin

5. In the hypothalamus-hypophysis-peripheral gland axis, long feed-back involves:

- a. the action of the hormone produced by the peripheral gland on the hypothalamus or pituitary gland
- b. action of the hormone synthesized by the pituitary on the hypothalamus
- c. action of the hormone synthesized by the pituitary and hypothalamus on target cells in the peripheral gland
- d. autocrine action of the hormone produced by the hypothalamus

6. In the hypothalamus-hypophysis-peripheral gland axis, short feed-back involves:

- a. the action of the hormone produced by the peripheral gland on the hypothalamus or pituitary gland
- b. action of the hormone synthesized by the pituitary on the hypothalamus
- c. action of the hormone synthesized by the hypothalamus on the pituitary gland
- d. autocrine action of the hormone produced by the hypothalamus

7. Antidiuretic hormone is produced by \_\_\_\_/ and has as its target organ \_\_\_\_:

- a. adrenal gland/kidneys
- b. hypothalamus/rhini
- c. neurohypophysis/adrenal gland
- d. adenohypophysis/adrenal gland

8. The following statement is true:
- a. ADH and oxytocin are synthesised by the hypothalamus and stored in the adenohypophysis
  - b. ADH is released by the neurohypophysis in dehydration
  - c. oxytocin released by the adenohypophysis during the last period of gestation determines mammary gland development and milk secretion
  - d. oxytocin causes relaxation of the myometrium
9. Increased synthesis of STH is triggered by:
- a. somatostatin
  - b. sleep
  - c. carbohydrate intake
  - d. hypocalcaemia
10. ACTH is produced by \_\_\_/and has as its target organ \_\_\_:
- a. adrenal gland/kidneys
  - b. adenohypophysis/adrenal gland
  - c. neurohypophysis/uterus and mammary gland
  - d. adenohypophysis/phosphate
11. Interstitial cell-stimulating hormone (ICSH) is produced by \_\_\_/ has as target cells \_\_\_ and activates \_\_\_:
- a. adenohypophysis/Sertoli cells/spermatogenesis
  - b. adenohypophysis/Leydig cells/testosterone synthesis
  - c. testis/Leydig cells/testosterone synthesis
  - d. testis/Sertoli cells/spermatogenesis
12. Identify the false statement:
- a. Melatonin is synthesised by the pineal gland during the night
  - b. The pineal gland receives orthosympathetic input from the intermediate-lateral neurons of the spinal cord via the superior cervical ganglion
  - c. Melatonin inhibits reproductive function by direct antiandrogenic effect
  - d. Melatonin induces the concentration of melanin in pigment cells and causes skin colour to open up in lower vertebrates
13. Melatonin is an indole-amine hormone synthesized from:
- a. tryptophan
  - b. tyrosine
  - c. cysteine
  - d. arachidonic acid
14. Thyroid hormones act intracellularly by:

- a. formation of the T4-membrane receptor coupling, then generation of the intracytoplasmic Ca-calmodulin secondary messenger
- b. formation of T3-nuclear receptor coupling, then mRNA generation and transcription of genes involved in protein synthesis
- c. T3 action and cAMP generation
- d. production of somatomedin, intermediates of protein synthases

15. Thyroid hormones are synthesized in higher concentration in the:

- a. winter
- b. summer
- c. night
- d. day

16. Hypercalcaemia generates hormone synthesis:

- a. calcitonin
- b. parathormone
- c. prolactin
- d. STH

17. Identify the false statement:

- a. insulin is produced by the beta cells of the Langerhans islets in the pancreas
- b. insulin stimulates hepatic gluconeogenesis
- c. insulin ensures the uptake of glucose, fatty acids and amino acids from the blood to stimulate anabolic processes and the storage of energy reserves
- d. the release of insulin is caused by an increase in blood glucose concentration immediately after food consumption

18. Identify the hormone with a hypoglycaemic effect:

- a. insulin
- b. glucagon
- c. The STH
- d. cortisol

19. Increased potassium concentration in the blood stimulates the synthesis of:

- a. aldosterone
- b. cortisol
- c. insulin
- d. thyroxine

20. Androgenic hormones and estrogen hormones are synthesized from:

- a. amino acids
- b. arachidonic acid
- c. cholesterol
- d. globulin

### Multiple choice questions

1. The functional connection between the hypothalamus and the pituitary can be achieved by:
  - a. hypothalamic-adenohypophyseal portal-venous system
  - b. hypothalamic-adenohypophyseal nervous tract
  - c. hypothalamo-neurohypophysis portal-venous system
  - d. hypothalamo-neurohypophysis nervous tract
  
2. The stimulatory factors of ADH secretion are:
  - a. hypovolaemia
  - b. hypervolemia
  - c. increased blood osmolarity
  - d. increased blood pressure
  
3. Stimulatory factors of oxytocin secretion are:
  - a. hyperglycemia
  - b. stimulation of the nipple's tactile receptors
  - c. mechanical stimulation of the genital tract
  - d. cold
  
4. Somatostatin represents:
  - a. an STH-releasing hormone
  - b. an STH-inhibiting hormone
  - c. a TSH-inhibiting hormone
  - d. a cell growth intermediate released by the liver
  
5. Identify false statements:
  - a. Hypothalamic gonadoliberein acts directly on the gonads to trigger ovogenesis and spermatogenesis respectively.
  - b. Hypothalamic gonadoliberein acts on the adenohypophysis to release gonadotropic hormones
  - c. TRH acts on the thyroid to produce thyroxine synthesis
  - d. Thyraoliberein causes the release of TSH by the anterior pituitary
  
6. Growth hormone (STH):
  - a. has a general anabolic effect
  - b. acts through cyclic AMP
  - c. acting through somatomedin
  - d. promotes the uptake of glucose into cells and its use as an energy resource
  
7. The release of the hormone triad CRH-ACTH-cortisol is necessary for:
  - a. adaptation of the body to stress
  - b. production of physiological analgesia

- c. regulating the body's water balance
- d. control of protidic, lipid and gluicidic metabolism

8. Identify the correct statements:

- a. after taking synthetic corticosteroids, complete recovery of the hypothalamus-hypophysis-adrenal axis takes about a year
- b. the highest blood level of ACTH is found during the night
- c. circadian rhythm does not influence the concentration of corticoid hormones in the blood
- d. ACTH originates from the proopiomelanocortin molecule synthesised by the adenoypophysis

9. The effects of FSH are:

- a. development of ovarian follicles and secretion of estrogen hormones
- b. formation of the corpus luteum on the ovary and synthesis of progesterone
- c. development of seminiferous tubules and promotion of spermatogenesis
- d. ovulation

10. Melanostimulatory hormone has the following roles:

- a. chromatic adaptation to the environment of lower vertebrates
- b. dissipation of melanin in the pigment cells and darkening of the skin
- c. concentration of melanin in pigment cells and the opening of the skin to colour
- d. rhodopsin resynthesis in photoreceptor cells

11. Prolactin has the following effects:

- a. mammary gland development and milk formation
- b. milk ejection
- c. secretion of a nutrient by the pigeon's gill epithelium
- d. development of the nesting instinct

12. The pineal gland synthesizes the hormone \_\_\_/effect\_\_\_:

- a. androhalone/antiandrogen
- b. melanostimulating hormone/chromatic adaptation to the environment
- c. arginine-vasotocin/GN-RH inhibitor
- d. melatonin/GN-RH inhibitor

13. Identify the true statements:

- a. seasonal breeding activity in some animals depends on the change in photoperiod (day-light in 24 hours)
- b. serotonin is synthesized in pinealocytes during the night and melatonin during the day
- c. melatonin stimulates hormone synthesis in the hypothalamus-pituitary-gonadal axis.
- d. the biological clock that controls the rhythm of epiphyseal hormone secretion is the suprachiasmatic nucleus



14. The hormones synthesized by the thyroid gland are:
- a. thyroxine and triiodothyronine
  - b. TSH
  - c. calcitonin
  - d. STH
15. The thyroid hormones T3 and T4 are involved in:
- a. postnatal growth
  - b. intrauterine fetal growth
  - c. brain development and axon myelination
  - d. calcium regulation
16. Which of the following statements is false?
- a. cold has a stimulatory effect on thyroid hormone synthesis
  - b. the iodine required for thyroid hormone synthesis comes from the diet and is actively taken up by the thyroid gland
  - c. less STH is synthesised in the absence of iodine
  - d. excess thyroid hormones cause weight gain
17. Parathormone has the following effects:
- a. stimulation of osteolysis processes
  - b. stimulation of osteogenesis processes
  - c. hypocalcaemia
  - d. hypercalcaemia
18. Calcitonin has the following effects:
- a. stimulation of osteolysis processes
  - b. stimulation of osteogenesis processes
  - c. hypocalcaemia
  - d. hypercalcaemia
19. Parathormone acts on the kidney, where it has the following effects:
- a. calcium reabsorption
  - b. phosphate reabsorption
  - c. vitamin D activation
  - d. excretion of excess calcium
20. Identify the correct statements:
- a. androgenic hormones have a stimulatory effect on protein anabolism
  - b. progesterone favours the development of proliferative endometrium and sensitises the uterus to the action of oxytocin
  - c. estrogen hormones promote calcium deposition in bones
  - d. relaxin is the hormone of tranquillity, which prevents heat in the pregnant female

## **Blood:**

### **Questions with only one correct answer:**

1. The erythrocyte membrane is adapted for:
  - a. transmembrane transport of substances; external electropositive charging; maintenance of characteristic biconcave disc shape.
  - b. erythrocyte antigen exposure; external electronegative charge; deformability.
  - c. resistance to osmotic variations; electrical neutrality; maintenance of characteristic spherical shape.
  - d. exposure of membrane antibodies; resistance to thermal variations; roll formation
  
2. Fetal haemoglobin is characterised by:
  - a. 2 alpha polypeptide chains, 2 gamma polypeptide chains; maximum affinity for oxygen.
  - b. 2 alpha polypeptide chains, 2 beta polypeptide chains; low affinity for oxygen.
  - c. 2 beta polypeptide chains, 2 gamma polypeptide chains; minimal affinity for oxygen.
  - d. 2 polypeptide chains (one alpha and one gamma) with maximum affinity for oxygen.
  
3. Erythrocyte anisocytosis is:
  - a. reduction in the number of red blood cells
  - b. variation in haematite sizes
  - c. variation in the shape of red blood cells
  - d. reduction of osmotic resistance of red blood cells
  
4. MCV stands for:
  - a. a derived erythrocyte constant that provides relationships for the average volume of an erythrocyte, calculated from the hematocrit value and the number of erythrocytes per mmc of blood.
  - b. the average sedimentation rate of erythrocytes, providing relationships about the quality of erythrocytes to form rolls and to sediment under the action of gravitational force.
  - c. a derived erythrocyte constant that provides relationships about the mean value of the haemoglobin content of erythrocytes, calculated on the basis of total blood haemoglobin (g/dl) and the number of erythrocytes (million/mmc of blood).
  - d. a derived erythrocyte constant that provides relationships about the mean value of the haemoglobin concentration of the blood, calculated from total blood haemoglobin (g/dl) and haematocrit (%).
  
5. MCH stands for:
  - a. a derived erythrocyte constant that provides relationships for the average volume of an erythrocyte, calculated from the hematocrit value and the number of erythrocytes per mmc of blood.

b. the average sedimentation rate of erythrocytes, providing relationships about the quality of erythrocytes to form rolls and to sediment under the action of gravitational force.

c. a derived erythrocyte constant that provides relationships about the mean value of the haemoglobin content of erythrocytes, calculated on the basis of total blood haemoglobin (g/dl) and the number of erythrocytes (million/mmc of blood).

d. a derived erythrocyte constant that provides relationships about the mean value of the haemoglobin concentration of the blood, calculated from total blood haemoglobin (g/dl) and haematocrit (%).

6. MCHC represents:

a. a derived erythrocyte constant that provides relationships for the average volume of an erythrocyte, calculated from the hematocrit value and the number of erythrocytes per mmc of blood.

b. the average sedimentation rate of erythrocytes, providing relationships about the quality of erythrocytes to form rolls and to sediment under the action of gravitational force.

c. a derived erythrocyte constant which gives relationships about the mean value of the haemoglobin concentration of the blood, calculated from total blood haemoglobin (g/dl) and haematocrit (%).

d. a derived erythrocyte constant that provides relationships about the mean value of the haemoglobin concentration of the blood, calculated from total blood haemoglobin (g/dl) and haematocrit (%).

7. Erythrocyte deformability is important for:

a. maintaining constant blood pH and osmolarity

b. Erythrocyte antigen exposure and roll formation

c. erythrocyte circulation in the territory of the microcirculation and respiratory gas exchange

d. blood circulation in the veins and Cl-bicarbonate exchange at the erythrocyte membrane, with water attraction and increased erythrocyte volume

8. Erythrocyte aggregability or the arrangement of erythrocytes in coils influences:

a. derived erythrocyte constants

b. sedimentation rate of red blood cells

c. osmotic resistance of red blood cells

d. hydrostatic blood pressure

9. The minimum osmotic resistance threshold of red blood cells is:

a. weak hypotonic environment in which only aged and worn red blood cells is destroyed.

b. weak hypotonic environment in which only young haematites are destroyed.

c. hypertonic medium in which few red blood cells are destroyed.

d. the isotonic medium to which all red blood cells resists.

10. The threshold of the maximum osmotic resistance of red blood cells is:

- a. weak hypotonic environment in which only aged and worn red blood cells is destroyed.
- b. the hypotonic environment in which all red blood cells is destroyed
- c. isotonic medium in which red blood cells is not destroyed.
- d. weak hypotonic environment in which only young haematids are destroyed.

11. In humans, the following preformed (genetically determined) antibodies against blood group antigens exist in blood plasma:

- a. alpha (anti-A) isoagglutinin in group B individuals, beta (anti-B) isoagglutinin in group A individuals and both alpha and beta isoagglutinins in group O individuals.
- b. alpha isoagglutinin in group B individuals, beta isoagglutinin in group A individuals and both alpha and beta isoagglutinins in group AB individuals
- c. alpha-isoglutinin (anti-A) and beta-isoglutinin (anti-B) in group AB individuals.
- d. anti-Rh antibodies in Rh-negative individuals.

12. Blood group 0 (zero) is characterized by:

- a. presence of agglutinogens A and B and agglutinins alpha and beta (anti A and anti B)
- b. presence of agglutinins A and B and absence of alpha and beta agglutinins (anti-A and anti-B)
- c. absence of agglutinogens A and B and presence of alpha and beta agglutinins (anti A and anti B).
- d. absence of Rh antigens and presence of anti-Rh antibodies.

13. The Rh system in humans, the Su system in pigs and the Do system in dogs are blood group systems characterised by:

- a. the presence of a heme antigen (Rh+, respectively, Su+, respectively, Do+) in some individuals and the absence of this antigen (Rh-, Su-, Do-), but the presence of preformed anti-Rh, anti-Su, anti-Do antibodies in other individuals in the population.
- b. the presence of a heme antigen (Rh+, respectively, Su+, respectively, Do+) in some individuals and the absence of this antigen (Rh-, Su-, Do-), as well as the absence of preformed anti-Rh, anti-Su, anti-Do antibodies in other individuals in the population.
- c. the presence of preformed anti-Rh, anti-Su, anti-Do antibodies in all individuals in the human, porcine and canine populations respectively.
- d. the presence of Rh, Su, Do antigens in all individuals in the human, swine and canine populations respectively.

14. Physiological erythrolisis is predominantly produced by:

- a. SRE macrophages in spleen, liver, bone marrow.
- b. peripheral blood phagocytes.

- c. the direct action of metabolites, hemoglobin is then captured by haptoglobin and transported to the macrophage system.
- d. the lymphocyte-plasmacyte system in lymph nodes.

15. The total blood volume (volemia) of body weight is approximately:

- a. 5 - 10 %
- b. 1 - 5 %
- c. 10 - 15 %
- d. 15 - 20 %

16. Hematocrit ( Ht ) decreases in :

- a. chronic respiratory diseases
- b. anaemia
- c. polyglobules
- d. dehydration

17. The following statements are true, with one exception. Identify the false statement:

- a. the physiological haemostasis function is achieved by means of specialised figurative elements (blood platelets) and plasma coagulation factors
- b. thermoregulatory function is a basic element of general homeostasis, conditioning the rate and efficiency of metabolic reactions.
- c. through its nutritive function, the blood is the main transporter of catabolites from the tissue to the excretory organs.
- d. the defence function is carried out by means of specific proteins (antibodies) as well as by means of specialised figure elements (leukocytes).

18. The value of colloidosmotic (oncotic) pressure is:

- a. 5300 mmHg
- b. 300 osm/litre
- c. 280 osm/litre
- d. 25 mmHg

19. Blood pH has a value between:

- a. 7,00 - 7,10
- b. 8,38 - 8,42
- c. 7,30 - 7,57
- d. 6,38 - 6,42

20. The haemoglobin cluster consists of:

- a. lipid (0.7%), protein (10%), carbohydrate (0.5%)
- b. two alpha chains of 141 amino acids each
- c. two beta chains, each containing 164 amino acids
- d. An iron atom (Fe<sup>2+</sup>) fixed in the centre of a tetrapyrrolic nucleus

21. An Hb molecule can carry when saturated:

- a. 2 molecule of O<sub>2</sub>
- b. 6 molecule O<sub>2</sub>
- c. 4 molecule O<sub>2</sub>
- d. 8 molecule of O<sub>2</sub>

22. The following statements are true, except for one:

- a. the site of erythropoiesis is in the haematogenous bone marrow.
- b. the site of haem destruction (physiological haemolysis) is in the monocytophagic system in the spleen and general circulation.
- c. 85% of the human population carries the Rh antigen on their blood.
- d. group 0 can donate to all groups (universal donor), but can only receive from group 0.

23. The following statements are true, except for one:

- a. cats have only 3 blood types (A, B and AB).
- b. the dog can receive blood from any blood group and at the first and second transfusion as it has no foreign group antibodies.
- c. post-transfusion injury can occur in cats as early as the first blood transfusion if they receive blood from another group.
- d. cattle lack agglutinogens on the surface of haematids.

24. Morphologically, leukocytes are classified into:

- a. lymphocytes and monocytes
- b. neutrophils and eosinophils
- c. monocytes and mononuclears
- d. polymorphonuclear and mononuclear

25. Mononuclear leukocytes are also called \_\_\_/and are represented by \_\_\_:

- a. granulocytes/lymphocytes, neutrophils and basophils
- b. agranulocytes/lymphocytes and monocytes
- c. agranulocytes/ monocytes, eosinophilic and basophilic
- d. neutrophilic, eosinophilic and basophilic granulocytes

26. Polymorphonuclear leukocytes are also called \_\_\_/ and are represented by \_\_\_:t:

- a. granulocytes/lymphocytes, neutrophils and basophils
- b. agranulocytes/lymphocytes and monocytes
- c. agranulocytes/ monocytes, eosinophilic and basophilic
- d. neutrophilic, eosinophilic and basophilic granulocytes

27. The monocyto macrophagic complex consists of:

- a. lymphocytes and fixed macrophage group
- b. monocytes and fixed and mobile macrophage group
- c. neutrophils and monocytes

d. neutrophils and fixed and mobile macrophage group

28. Which of the following statements is **not** true about eosinophils:

- a. eosinophils perform phagocytosis of immune complexes and denatured immunoglobulins
- b. eosinophils are plasminogen deposits
- c. eosinophils contain 1/3 of the total amount of histamine in normal blood
- d. glucocorticoids increase the number of circulating eosinophils

29. Platelets (blood platelets) **are not** involved in:

- a. spontaneous haemostasis
- b. capture and removal of endotoxins from circulation
- c. production of inflammation
- d. tissue oxygenation

30. The parietal haemostasis time is :

- a. white thrombus formation.
- b. all phenomena whereby the lumen of the injured vessel shrinks (vasoconstriction).
- c. the set of coagulation phenomena consisting of the formation of fibrin thrombus, which by retraction ensures the definitive closure of the vessel.
- d. the process that occurs after 7 days when the fibrin thrombus is destroyed by the process of fibrinolysis.

31. The plasma haemostasis time is :

- a. white thrombus formation.
- b. all phenomena whereby the lumen of the injured vessel shrinks (vasoconstriction).
- c. the set of coagulation phenomena consisting of the formation of fibrin thrombus, which by retraction ensures the definitive closure of the vessel.
- d. the process that occurs after 7 days when the fibrin thrombus is destroyed by the process of fibrinolysis.

32. The thrombocyte time of haemostasis is :

- a. white thrombus formation.
- b. all phenomena whereby the lumen of the injured vessel shrinks (vasoconstriction).
- c. the set of coagulation phenomena consisting of the formation of fibrin thrombus, which by retraction ensures the definitive closure of the vessel.
- d. the process that occurs after 7 days when the fibrin thrombus is destroyed by the process of fibrinolysis.

33. The fibrinolytic system includes:

- a. plasminogen-plasmin coupling
- b. prothrombin-thrombin coupling
- c. thrombostenin and actin-myosin couple
- d. platelet factor 3 and heparin

34. Stage II of the blood clotting process, according to the enzyme cascade theory, consists of:

- a. transformation of prothrombin to thrombin under the influence of activated factor X
- b. transformation of fibrinogen into fibrin, under the influence of thrombin
- c. formation of prothrombin activators intrinsically
- d. formation of prothrombin activators extrinsically

35. The final stage of the blood clotting process consists of:

- a. activation of the fibrinolytic system by plasmin
- b. clot retraction using a thrombocyte factor - thrombostenin.
- c. clot retraction using a platelet phospholipid - FP3.
- d. the action of heparin and antithrombin to limit the clotting process at the site of vascular injury

**Multiple choice questions:**

1. The physiological combinations of haemoglobin to perform the function of respiratory gas transporter are:

- a. oxyhaemoglobin.
- b. methaemoglobin
- b. haemoglobin carbamate.
- c. carboxyhemoglobin.

2. The non-physiological combinations of haemoglobin are:

- a. carboxyhemoglobin.
- b. haemoglobin carbamate.
- c. methemoglobin.
- d. sulfhemoglobin

3. The stability of the erythrocyte suspension in plasma depends on:

- a. the electrical charge of red blood cells.
- b. NaCl concentration of blood plasma.
- c. plasma globulin concentration.
- d. plasma albumin concentration

4. In humans, the following preformed (genetically determined) antibodies against blood group antigens may exist in blood plasma:

- a. anti A antibodies
- b. anti-B antibodies
- c. anti Rh antibodies
- d. anti-thrombocyte antibodies



5. The physiological stimulus that causes erythropoietin synthesis could be:
- a. renal tissue hypoxia
  - b. renal arterial hypotension
  - d. reduction of oxyhemoglobin concentration in blood
  - d. increased blood oxyhemoglobin concentration
6. The globular volume can physiologically represent:
- a. 10 % of the blood volume
  - b. 40 % of the blood volume
  - c. 50 % of the blood volume
  - d. 60 % of the blood pressure
7. The haematocrit value in females is lower than in males because:
- a. females lack androgen hormone-producing testes
  - b. males secrete more androgenic hormones
  - c. females secrete a higher amount of estrogen hormones
  - d. males lack estrogen hormone-producing tissues
8. Which of the following statements is true about the mastocyte-bazophil system:
- a. play a role in the phagocytosis of bacteria
  - b. participate in immune and hypersensitivity reactions
  - c. have an antitoxic role
  - d. intervene in vasomotricity
9. Macrophages have the following functions:
- a. phagocytic
  - b. histamine release
  - d. immune
  - e. metabolic
10. Which of the following statements is true:
- a. thrombocyte time is the set of phenomena by which the lumen of the injured vessel shrinks.
  - b. plasma time represents the formation of the white thrombus that closes the already contracted vascular lumen.
  - c. definitive haemostasis occurs after 7 days when vascular reendothelialisation has occurred and the fibrin thrombus is destroyed by fibrinolysis to ensure vascular recanalisation.
  - d. fibrin thrombus occurs as a result of the conversion of fibrinogen to fibrin under the influence of thrombin.
11. Stage III of the blood clotting process, according to the enzyme cascade theory, consists of:
- a. transformation of prothrombin to thrombin under the influence of activated factor X

- b. transformation of fibrinogen into fibrin monomers under the influence of thrombin
- c. spontaneous polymerisation of fibrin monomers, forming soluble fibrin
- d. conversion of soluble fibrin to insoluble fibrin under the influence of activated factor XIII

12. The first stage of the blood clotting process:

- a. is carried out in two ways: intrinsic and extrinsic.
- b. is the conversion of prothrombin to thrombin under the influence of factor X.
- c. is the spontaneous polymerisation of fibrin monomers to form soluble fibrin, which then stabilises to insoluble fibrin
- d. is the formation of prothrombin activators

13. The main antihemophilic factor, acting as a cofactor and accelerator of factor X activation in the intrinsic blood coagulability pathway, is represented by:

- a. F.VIII
- b. F. IX
- c. F. XI.
- d. F. XII

14. In the process of physiological haemostasis, almost all steps of the enzymatic cascade of coagulation are involved:

- a. sodium ions
- b. calcium ions
- c. phospholipids of tissue origin
- d. coagulation accelerating cofactors

15. Identify the false statement:

- a. Monocytes and macrophages phagocytose bulky particles
- b. Lymphocytes carry out specific cell-mediated immunity (cytotoxic effects) and humoral-mediated immunity (synthesis of antigen-specific antibodies)
- c. Plasma cells are derived from T lymphocytes by blastic transformation and play a role in the synthesis of immunoglobulins
- d. Neutrophils perform the function of focal accumulation and phagocytosis through chemotaxis, diapedesis and release of enzymes and antibacterial factors

### **Digestion:**

#### **Questions with only one correct answer:**

- 1. The interdigestive contractile complexes are:
  - a. rhythmic strangulation contractions involved in homogenization of gastric contents
  - b. peristaltic contractions that ensure the evacuation of well-digested contents as required by the duodenum

c. rhythmically repeated "hunger" peristaltic contractions when the stomach is empty or with a small amount of undigested food

d. contractions of the rectum for defecation

2. The digestive sphincters are relaxed by:

a. Orthosympathetic ANS

b. Parasympathetic ANS

c. Cortical nerve centres

d. Somatic NS motor neurons

3. Emesis represents:

a. a reflex act of elimination of incompletely digested gastric contents, a process triggered mainly by the absorption of endotoxins and stimulation of the chemosensitive zone in the medulla oblongata

b. a reflex act of vomiting involving only the distending receptors in the stomach

c. a voluntary act triggered by controlling the opening of the cardiac orifice and regurgitation of gastric contents

d. a reflex act in which the respiratory phenomenon plays the main role in the aspiration of gastric contents into the oesophagus, then its progression outwards

4. Which of the following statements is false:

a. the vomiting centre does not receive stimuli from the inner ear

b. the vomiting centre receives stimuli from the peritoneum and genital tract

c. the vomiting centre receives stimuli from the duodenal mucosa

d. the vomiting centre receives stimuli from the pharynx

6. Bile pigments are produced by the degradation of:

a. platelets

b. leukocytes

c. haemoglobin

d. bile salts

7. Which of the vitamins listed are **not** synthesised by symbiotic bacteria in the large intestine/rumen:

a. vitamin K

b. vitamin B12

c. vitamin C

d. riboflavin

8. Pancreatic juice secretion is **not** stimulated by:

a. acetylcholine

b. epinephrine;

c. pancreosimin-cholecystokinin

d. secretary

9. Which of the functions listed do not correspond to hydrochloric acid in gastric juice:
- a. creates the optimal acidic environment for the activity of gastric juice enzymes
  - b. form easily soluble acid metaproteins
  - c. converts pepsinogen into pepsin
  - d. cleaves lipids

10. Castle intrinsic anti-anemia factor:
- a. promotes the absorption of vitamin B12
  - b. inhibits mucus secretion
  - c. stimulates gastric juice secretion
  - d. stimulates iron absorption in the ileum;

11. What are the similarities of the swallowing and defecation reflexes?
- a. involves smooth and striated muscles
  - b. only involves involuntary nervous mechanisms
  - c. are coordinated by nerve centres in the medulla oblongata
  - d. are fully voluntary controlled processes

12. Closure of the oesophageal trough is a reflex which in the ruminant infant is **not** triggered under the influence:
- a. cold milk
  - b. the smell of milk
  - c. suptului
  - d. milk protein and minerals

13. Rumination means:
- a. a process of intermittent elimination of ruminal gases by the oral route.
  - b. a thorough chewing process of the cellulosic feed ingested by ruminants.
  - c. a process of regurgitation of the reticulo-ruminal contents for remastication.
  - d. strong shrinkage of the leaflet and shredding of the contents between its blades.

14. Rumination consists of the following functional sequences:
- a.mastication, insalivation, swallowing, gastric chemical rejection.
  - b. rejection of the mereric bolus, remastication, reinsalivation, redeglutition
  - c.opening the hinge and removing the rumen gases outside.
  - d. shrinkage of the net in two stages followed by passing part of the contents into the sheet for shredding.

15. Rejection **does not** contribute:
- a.contraction of the foveal muscles
  - b.diaphragm contraction
  - c. performing a forced inspiration with closed glottis
  - d. esophageal antiperistaltic contraction

16. Eructation means:

- a. a process of intermittent elimination of ruminal gases by the oral route.
- b. a process of intermittent elimination of gas from the large intestine by the anal route.
- c. a process of regurgitation of the reticulo-ruminal contents for thorough remastication.
- d. a process of elimination of gastric contents to the outside via the mouth

17. Eructation is produced by the following motor activities:

- a. triggering of the secondary ruminal contraction wave and relaxation of the grid body.
- b. triggering of the primary ruminal contraction wave, including net contraction.
- c. triggering of the contraction of the net followed by relaxation of the lower oesophageal sphincter.
- d. primary and secondary ruminal shrinkage

18. Degradation of cellulose in the rumen is carried out by:

- a. cellulases from ruminal fluid
- b. cellulolytic bacteria containing cellulase and cellobiase
- c. maltase and isomaltase of bacterial origin.
- d. amylase of bacterial origin.

19. Peristaltic movements are achieved:

- a. only by contraction of the circular muscles of the wall of the digestive tract
- b. only by contraction of the longitudinal muscles of the wall of the digestive tract
- c. by contraction of muscle fibres arranged longitudinally and circularly
- d. only in the small intestine

20. Proteolytic digestive enzymes are **not** present in:

- a. gastric juice
- b. intestinal juice
- c. pancreatic juice
- d. bile secretion

**Multiple choice questions:**

1. Inhibition of stomach emptying can be achieved by:

- a. enterogastric reflex
- b. motilin
- c. enterogastron
- d. cholecystokinin

2. The volatile fatty acids resulting from glucose fermentation are a source of energy for the host ruminant:

- a. an unusable and harmful metabolic waste.
- b. an important energy source, covering 40% of energy needs

c. precursors in the synthesis of milk fatty acids.

d. precursors in amino acid neosynthesis

3. Disaccharidases in the striatal plate of enterocytes are:

a. lactose

b. amylase

c. saccharose

d. maltose

4. Trypsinogen is produced by \_\_\_/activated by\_\_\_/and plays a \_\_\_/role.

a. main cells of the fundic glands of the stomach/hydrochloric acid/proteolytic acid

b. pancreatic acin/enterokinase/proteolytic

c. parietal cells of the gastric fundic/gastrin/glycolytic glands

d. enterocyte striatal plate/enterokinase/proteolytic

5. Intraruminal cellulose digestion results in:

a. amino acids

b. glucose and VFA

c. fermentation gases

d. free fatty acids and cholesterol

6. Synthesis processes in prestomachs are:

a. synthesis of B-complex vitamins

b. vitamin K synthesis

c. gluconeogenesis

d. amino acid neosynthesis

7. Digestive absorption of nutrients by co-transport mechanism is possible for:

a. amino acids

b. glucose

c. galactose

d. fatty acids

8. Digestive absorption of lipids is achieved:

a. by means of bile salts

b. by co-transport

c. by the formation of micellar aggregates

d. in the form of chylomicrons

9. Cecotrophophagy is a feeding behaviour found in:

a. birds

b. small ruminants

c. lagomorphs

d. cat

10. In birds, gastric juice is secreted by:
- a. proventricul
  - b. glottis epithelium
  - c. muscular stomach
  - d. anterior portion of the small intestine

### **III. Discipline PATHOPHYSIOLOGY**

#### **Inflammation pathophysiology**

1. Increased ESR in inflammation is the consequence of:

- a. decrease in albumin;
- b. decrease in alpha-globulins;
- c. leukopenia;
- d. increased red blood cell count.

2. Early increase of permeability in the inflammatory focus is achieved under the action of:

- a. prostaglandins and serotonin;
- b. bioactive lipids;
- c. interleukin-1.
- d. histamines.

3. Mediators with a vasodilator role in the inflammatory focus are the following:

- a. histamine and serotonin.
- b. adrenaline;
- c. noradrenaline;
- d. snakes

4. Activation of membrane phospholipase A<sub>2</sub> in phagocytes results in the following reactions:

- a. limiting the release of lysophospholipids;
- b. decreased prostaglandin synthesis;
- c. limitation of vasculo-exudative and chemotactic phenomena;
- d. increased bioactive lipids with vasculo-exudation.

5. Amplification of vasculo-exudative phenomena in the inflammatory focus are the result of the following interventions:

- a. increased glucocorticoid concentration;
- b. decreased concentration of kinins and prostaglandins;
- c. increased concentration of bioactive lipids;
- d. decrease in histamine.

6. Blocking the cyclooxygenase pathway results in:

- a. decrease in vasculo-exudative and chemotactic phenomena;

- b.pro-inflammatory effect;
- c.increased permeability in the microcirculation;
- d.increase in vasculo-exudative and chemotactic phenomena.

7.Active hyperemia in the first phase of acute inflammation explains:

- a.hyperemia, heat, pulsatile sensation;
- b.hyperemia, heat, pain, leukopenia;
- c.hyperemia, heat, edema, anemia;
- d.hypovolaemia.

8. Generally at the inflammatory focus the chemical mediators of inflammation produce:

- a.increased vascular permeability;
- b.decreased blood flow;
- c.decreased blood flow and vascular permeability;
- d. increased hydrostatic pressure.

9. General reactions in inflammation are as follows:

- a.hypothermia;
- b.decreased hepatic glycoprotein secretion;
- c.leukocytosis;
- d.decreased synthesis of proteases and serpins.

10.In the inflammatory focus the activation of factor XII Hageman determines:

- a.release of prostaglandins;
- b.activation of arachidonic acid metabolites;
- c.activation of the complementary cascade, coagulation and fibrinolysis systems, plasma kinin system.
- d.cytokine release.

11.Interleukin 1, also called granulocyte pyrogen, is involved in inflammation by:

- a.increased hepatic glycoprotein secretion;
- b.increased secretion of serpins;
- c.decreased leukocyte production;
- d.inhibition of hypothalamus function and hypothermia;

12.The inflammatory (phlogistic) focus is characterized by:

- a. ischemia and stasis;
- b. neutrophilia.
- c. alterative, vasculoexudative and proliferative phenomena;
- d.alteration of its own proteins, vasodilation and increased permeability.

13.The causes of inflammation are represented:

- a. only by the action of biotic, exogenous factors;



- b. only by the action of abiotic, exogenous and endogenous factors;
- c. all biotic and abiotic factors causing tissue damage;
- d. all exogenous and endogenous factors that cause tissue damage.

14. In acute septic or aseptic inflammation, the following reactions occur:

- a. increased acute phase proteins of hepatic origin
- b. leukocytosis with neutrophilia
- c. leukopenia with lymphocytosis
- d. VSH growth.

15. Pain in inflammation is the result of the action of the following mediators:

- a. histamines;
- b. serotonin;
- c. bradikinin;
- d. bioactive lipids.

16. In the inflammatory phase:

- a. inflammatory exudate is formed;
- b. it prepares the ground for the formation of inflammatory exudate;
- c. maximum phagocyte diapedesis occurs;
- d. vasculoexudation is triggered.

17. The first cells activated in inflammation are:

- a. histamine-releasing mast cells;
- b. serotonin-releasing platelets;
- c. neutrophils, the cells of the attack phase;
- d. lymphocytes, antigen-presenting cells.

18. In inflammation of allergic nature is found:

- a. increase in eosinophils;
- b. eosinophilia;
- c. neutrophilia;
- d. lymphocytopenia.

19. Among the consequences of the inflammatory phase are:

- a. an active hyperemia produced predominantly by nervous mechanism;
- b. an active congestion produced predominantly by nervous mechanism;
- c. an active hyperemia initiated by the intervention of mediators of lipid origin;
- d. ischemia and stasis.

20. The onset phase of inflammation is characterized by:

- a. release of serotonin and arachidonic acid;
- b. degranulation of mast cells and release of bioactive lipids;

- c.alteration of their own proteins, increase in the caliber and permeability of small vessels, release of histamine and serotonin;
- d. alteration of their own proteins, vasculoexudation.

## **Shock pathophysiology**

1. The shock is:

- a. a disease;
- b. a syndrome;
- c. a serious disorder of the whole body;
- d. an adaptive change.

2. From a pathophysiological point of view shock is:

- a.a disorder of the uniform distribution of blood in the body;
- b.o hypervolemia;
- c.o hyperperfusion;
- d.a predominantly anabolic reaction.

3.Among the definite causes of shock are:

- a.all polyglobulias;
- b.severe trauma;
- c. anaemia;
- d.small haemorrhages.

4 The central pathophysiological element of any form of shock is:

- a.decrease in effective circulating blood volume;
- b.increased effective circulating blood volume;
- c.decrease in total blood volume;
- d.true hypervolemia.

5. Depending on the mechanism the shock can be:

- a. hemorrhagic, anaphylactic, cardiac;
- b. hypovolemic, vasogenic, cardiogenic;
- c. reversible, irreversible.
- d. toxic, neurogenic.

6.Adaptive-compensatory reactions in shock are aimed at the following:

- a.increased blood volume, vasoconstriction, increased cardiac output;
- b.autotransfusion dependent on predominantly vagal reaction;
- c.vasodilation, hypotension, hypoperfusion;
- d.increased diuresis by osmotic mechanism.

7. In all types of shock the starting point of decompensation is:

a. disorders of the vasomotor centre with apparent hypovolaemia;

b. microcirculation disorders;

c. pH increase

d. hyperkalemia secondary to lactic acidosis;

8. Microcirculation disturbance in shock is the consequence:

a. vasodilator action of catecholamines;

b. disturbance of the activity of the vasomotor centres;

c. hemodynamic and metabolic disorders that are interrelated;

d. increasing the water balance.

9. In shock cell perfusion is most faithfully mirrored by:

a. pH and plasma lactic acid concentration;

b. blood pressure value;

c. extracellular potassium concentration.

d. sodium value.

10. The following humoral changes occur as a result of metabolic disorders in shock:

a. hyperglycemia, hyperlactacidemia, hypolipemia, hypernatremia;

b. hypoglycemia, hyperlipidemia, hyperlactacidemia, hyponatremia, hyperpotassemia;

c. hypoglycemia, hypolipidemia, hypolactacidemia, hypernatremia, hyperpotassemia;

d. hyperglycemia, hyperlipidemia, hypolactacidemia.

11. The shock is:

a. a disease;

b. a syndrome,

c. a serious disorder of the whole body;

d. a serious alteration of all levels of integration of the body.

12. The definite causes of shock are the following:

a. all polyglobulias;

b. severe trauma;

c. extensive burns, large hemorrhages;

d. small haemorrhages.

13. Hyperlactacidaemia in shock represents:

a. a treatment modification index;

b. an irreversibility factor of the shock;

c. an index directly proportional to the severity of the shock;

d. is an indicator of the restoration of balance.

14. The irreversible shock phase is characterized by the following changes:

a. collapse of blood pressure;

b. alkalosis phenomena;

- c. activation of lysosomal enzymes and autodigestion;
- d. increased vascular tone.

15. All types of shock start with a:
- a. severe metabolic disorder with alkalosis;
  - b. serious hemodynamic alteration;
  - c. serious circulatory impairment
  - d. serious disorder of the vasomotor centres.

16. The pathophysiological mechanism in shock is:
- a. altered blood pooling in all types of hypovolaemia;
  - b. altered blood distribution only in true hypovolemia;
  - c. altered blood distribution in both true and apparent hypovolemia.
  - d. altered blood distribution secondary to hypervolemia.

17. Changes in protein metabolism in shock are as follows:
- a. amino acid growth;
  - b. ammonia increase;
  - c. decrease in albumin.
  - d. dysproteinemia.

18. In shock cell perfusion is most faithfully mirrored by:
- a. pH level;
  - b. plasma concentration of lactic acid;
  - c. blood pressure value;
  - d. extracellular potassium concentration.

19. In shock, hemodynamic disturbances in the microcirculation are dependent on:
- a. total blood volume;
  - b. activity of vasomotor centres;
  - c. local acidosis;
  - d. increased acid production.

20. The consequences of metabolic acidosis in shock include the following:
- a. stimulation of interleukin release, worsening hemodynamics;
  - b. increased tendency to disseminated intravascular coagulation;
  - c. decreased myocardial contractile force;
  - d. release of lysosomal enzymes.

### **Pathophysiology of thermal homeostasis**

1. The febrile reaction is:
- a. a general non-specific adaptation-defence reaction of the body;

- b. a disturbance of the thermogenesis-thermolysis balance by increasing heat production;
- c. a derangement of the heat balance due to inefficient thermolysis;
- d. a disturbance of the thermogenesis-thermolysis balance due to increased thermogenesis.

2. The following factors have a pyretogenic effect:

- a. histamine;
- b. bacteria, fungi;
- c. kinins;
- d. catabolic hormones.

3. The origin of endogenous pyrogen is:

- a. leukocyte;
- b. erythrocyte;
- c. hypothalamic;
- d. sanguine.

4. The febrile reaction is triggered by:

- a. overheated and humid environment;
- b. action of pyretogenic factors;
- c. catabolic hormone discharges.
- d. protease action.

5. For the state period of the febrile reaction are characteristic:

- a. decrease in thermolysis;
- b. restoring the thermogenesis-thermolysis balance;
- c. intensification of thermogenesis;
- d. increased thermogenesis.

6. The temperature rise phase of the febrile reaction is characterized by:

- a. vasoconstriction, horipilation, squatting, shivering;
- b. preservation of thermoregulation capacity;
- c. adaptation reactions to the warm environment;
- d. decreased thermogenesis and increased thermolysis.

7. The mechanism of overheating is represented by:

- a. functional restructuring of the thermoregulation centre;
- b. decrease in thermolysis;
- c. amplification of thermogenesis;
- d. decreased thermogenesis and increased thermolysis.

8. In the phase of rising temperature in the febrile reaction occurs:

- a. increased thermolysis;
- b. increased thermogenesis and decreased thermolysis;
- c. peripheral vasodilation.

d. peripheral vasoconstriction.

9. In hypothermia the thermogenesis-thermolysis imbalance has the following causes:

a. excessive drop in ambient temperature;

b. decreased function of catabolic hormones;

c. increased anabolic activity;

d. increased function of catabolic hormones.

10. The adaptive reactions in overheating are:

a. stimulating thermolysis;

b. stimulating thermogenesis;

c. peripheral vasodilation.

d. decrease in heat loss.

11. Peripheral vasodilation as an adaptive mechanism in hyperthermia has the following consequences:

a. hemoconcentration with hypovolemia;

b. dehydration and haemoconcentration;

c. dyserythropoietic anemia;

d. negative water balance.

12. The etiology of febrile reaction is represented:

a. only by the action of biotic factors;

b. from the action of biotic and abiotic factors that cause alteration of their own proteins;

c. all factors that produce tissue alteration and inflammation;

d. only by the action of abiotic factors.

13. At the origin of fever from inflammation are:

a. interleukins released mainly by macrophages;

b. glucocorticoids secondary to hypothalamic-pituitary-adrenal stimulation;

c. pyretogenic cytokines;

d. histamine action.

14. Mild to moderate increases in temperature in the febrile reaction are:

a. unfavourable because it overloads the activity of some systems;

b. favourable because they stimulate the body's adaptive capacity;

c. favourable because they decrease digestive activity;

d. favourable by stimulating non-specific and specific defence mechanisms.

15. Pyrogenic cytokines act:

a. in the medullary adrenals with increased adrenaline concentration;

b. directly on bacteria and viruses, which it inactivates;

c. at the level of the heat centers in the hypothalamus by changing the set-point;

d. in the hypothalamic thermostat producing a functional restructuring.

## **Pathophysiology of carbohydrate metabolism**

1. Hyperglycemia may be the result of the following changes:

- a. increased activity of hyperglycaemic systems;
- b. increased activity of hypoglycaemic systems;
- c. increased insulin concentration;
- d. decreased glycogenolysis.

2. The etiopathogenesis of chronic hyperglycemia in insulin-dependent diabetes mellitus is represented by :

- a. pancreatic beta cell alteration;
- b. alterations of the liver synthases;
- c. increased insulin concentration;
- d. cellular insulin receptor disorders.

3. The etiopathogenesis of chronic hyperglycemia in insulin-dependent diabetes mellitus is represented by :

- a. pancreatic beta cell alteration;
- b. alterations of the liver synthases;
- c. increased insulin concentration;
- d. cellular insulin receptor disorders.

4. Insulin deficiency in insulin-dependent diabetes mellitus may be the result:

- a. Insufficient insulin signal;
- b. alterations of pancreatic alpha cells;
- c. disorders of the liver synthases;
- d. all situations.

5. Insulin resistance of peripheral tissues can occur by:

- a. disorders in insulin-receptor interaction;
- b. disorders of the liver synthases;
- c. anaerobic glycolysis disorders;
- d. all situations.

6. Acute complications of chronic hyperglycemia in diabetes are:

- a. ketoacidosis, osmotic polyuria, extracellular dehydration;
- b. Metabolic Alkalosis;
- c. global hyperhydration;
- d. oligoanuria.

7. Hypoglycaemia can result from the following actions:

- a. increased insulin;

- b. decrease in the amount of insulin;
- c. use of low proportions of glucose post-stressively;
- d. all situations.

8. Hypoglycemia can be the consequence:

- a. decrease in glycogenolysis;
- b. increased neoglucogenesis
- c. increased glycogenolysis;
- d. increased glycogenolysis and neoglucogenesis;

9. The etiopathogenesis of chronic hyperglycemia in insulin-dependent diabetes mellitus is represented by :

- a. pancreatic beta cell alteration;
- b. alterations of the liver synthases;
- c. lower insulin concentration;
- d. cellular insulin receptor disorders.

10. The etiopathogenesis of chronic hyperglycemia in insulin-dependent diabetes mellitus is represented by :

- a. insulin deficiency;
- b. inability of peripheral tissues to respond to insulin;
- c. increased insulin concentration;
- d. cellular insulin receptor disorders.

11. Insulin resistance of peripheral tissues can occur by:

- a. disorders in insulin-receptor interaction;
- b. glucose transporter disorders;
- c. disorders in the enzyme machinery involved in glucose utilization;
- d. active congestion.

12. Insulin deficiency in insulin-dependent diabetes mellitus may be the result:

- a. insufficient insulin signal;
- b. insulin secretion modified quantitatively and qualitatively;
- c. insulin binding with some proteins;
- d. true hypovolemia.

13. Acute complications of chronic hyperglycemia in diabetes are:

- a. ketoacidosis;
- b. osmotic polyuria;
- c. hypertonic extracellular dehydration
- d. Metabolic Alkalosis;

14. Hypoglycaemia can result from the following actions:



- a.increased insulin;
- b.decrease in the amount of insulin;
- c.increased use of glucose, post-meal;
- d. increased secretion of insulin-like hormone.

15.Hypoglycemia can be the consequence:

- a.decrease in glycogenolysis;
- b.decrease in neoglucogenesis
- c.increased glycogenolysis;
- d.decreased glycogenolysis and neoglucogenesis;

### **Pathophysiology of water electrolyte balance**

1. Dehydration is the result:

- a. an insufficient supply or significant losses at the hydro-electrolytic level;
- b. a positive water balance;
- c. significant erythropoietic disorders;
- d.hyperaldosteronism.

2.Increase in hematocrit, plasma protein, intracellular compartment concomitant with decrease in plasma volume means:

- a.isotonic dehydration;
- b.hypotonic dehydration;
- c.hypertonic dehydration;
- d.global hyperhydration.

3.Decrease in hematocrit, plasma proteins, intracellular compartment concomitant with increase in plasma volume means:

- a.hypotonic hyperhydration;
- b.hypertonic dehydration;
- c.hypertonic hyperhydration;
- d. hypotonic dehydration.

4.Lack of thirst is specific to the following water-electrolyte balance disorder:

- a.isotonic extracellular dehydration;
- b.hypertonic and hypotonic extracellular dehydration;
- c.hypotonic extracellular dehydration;
- d.cellular dehydration.

5.Compensatory mechanisms in isotonic dehydration are:

- a.vasoconstriction, increased blood volume, increased heart activity;
- b.vasodilation, increased parasympathetic activity;
- c.hyposecretion of ADH and aldosterone;

d.increased diuresis.

6. Mechanisms of oedema include:

a.increased intravascular hydrostatic pressure;

b.increased intravascular oncotic pressure;

c.increased oncotic pressure in hyperalbuminemia;

d.decrease in hydrostatic pressure.

7. The consequences of hypotonic hyperhydration are:

a.global hyperhydration;

b.cellular dehydration;

c.extracellular hyperhydration and cellular dehydration;

d.dyshidria.

8. The consequences of hypocalcaemia on the body are

a.increased neuromuscular excitability;

b.decrease in clotting time,

c.soft tissue calcifications.

d.decreased excitability.

9.The consequences of hyperkalemia on the body are:

a.metabolic disorders translated by metabolic alkalosis;

b.digestive disorders;

c.arrhythmias;

d. true hypovolemia.

10. Consequences of hyperphosphatemia on the body:

a.tetanic contractions secondary to hypocalcaemia;

b.haematological changes characterised by a disorder of the structure and function of erythrocytes;

c.metabolic changes translated by metabolic acidosis;

d. hypercalcaemia.

11.Among the coping mechanisms in hypovolemia are:

a. increased secretion and release of ADH;

b. stimulation of the renin-angiotensin-aldosterone system;

c. decreased renal reabsorption;

d. decreased cardiac activity.

12.General mechanisms of oedema include:

a. increased vascular permeability and hydrostatic pressure;

b. hypoalbuminemia;

c. actual hypovolaemia;

d. relative hypovolaemia.

13. The consequences of hypocalcaemia on the body are

- a.increased neuromuscular excitability;
- b.blood clotting disorders;
- c.soft tissue calcifications.
- d.decreased excitability.

14. Consequences of hyperphosphatemia on the body:

- a.tetanic contractions secondary to hypocalcaemia;
- b.haematological changes characterised by a disorder of the structure and function of erythrocytes;
- c.metabolic changes translated by metabolic acidosis;
- d. hypocalcaemia.

15. The consequences of hypotonic hyperhydration are:

- a.global hyperhydration;
- b.cellular dehydration;
- c.extracellular and cellular hyperhydration;
- d.dyshidria.

### **Pathophysiology of acid-base balance**

1.Acid-base balance disorders can be:

- a.respiratory and metabolic;
- b.only of respiratory origin;
- c. of metabolic origin only;
- d.of diverse origin.

2.Respiratory acidosis is the consequence:

- a.increased ventilatory function;
- b.decrease in ventilatory function;
- c.increased production of non-volatile acids;
- d.decrease in base production.

3.Causes of respiratory acidosis include:

- a.blood marrow disorders;
- b. disorders of the thoraco-pulmonary system;
- c. stimulation of catabolism;
- d.some nephropathies.

4.Hypercapnia from respiratory acidosis may be accompanied by :

- a.onset of hypoxemia;
- b.the onset of renal acidosis;

- c. the onset of a metabolic alkalosis;
- d. decrease in red blood cell count.

5. Respiratory alkalosis is the consequence:

- a. increase in base production;
- b. decrease in the production of non-volatile acids;
- c. hyperventilation;
- d. hypoventilation.

6. Causes of respiratory alkalosis are:

- a. hypothalamus stimulation in hyperthermia;
- b. stimulation of the erythrocyte system;
- c. inhibition of respiratory centers;
- d. increased oxygen pressure in the atmospheric air.

7. Metabolic acidosis is the result of:

- a. digestive disorders;
- b. blood disorders;
- c. pulmonary congestion;
- d. respiratory disorders.

8. The mechanisms of metabolic acidosis are:

- a. increased production of non-volatile acids;
- b. increased production of bases;
- c. increased elimination of acids at the renal level;
- d. decrease in carbon dioxide concentration.

9. The primary element in metabolic alkalosis is:

- a. increase in bicarbonates;
- b. decrease in hydrogen ion concentration;
- c. decrease in bicarbonates;
- d. increased hydrogen ion concentration.

10. Causes of respiratory acidosis can be:

- a. lesions in the respiratory centres;
- b. disorders of the thoraco-pulmonary apparatus;
- c. stimulation of catabolism;
- d. some nephropathies.

11. Hypercapnia from respiratory acidosis may be accompanied by :

- a. onset of hypoxemia;
- b. the onset of lactic acidosis;
- c. the onset of a metabolic alkalosis;
- d. decrease in red blood cell count.

12. Causes of respiratory alkalosis are:  
a. hypothalamus stimulation in hyperthermia;  
b. stimulation of the limbic system;  
c. stimulation of respiratory centres;  
d. decrease in oxygen pressure in the atmospheric air.

13. Metabolic acidosis is the result of:  
a. digestive disorders;  
b. renal disorders;  
c. tissue hypoxia;  
d. respiratory disorders.

14. The mechanisms of metabolic acidosis are:  
a. increased production of non-volatile acids;  
b. increased loss of bases;  
c. decreased elimination of acids at the renal level;  
d. decrease in carbon dioxide concentration.

#### **IV. Semiology**

1. Muscle tone is examined by:  
a. Inspection and palpation  
b. Electrocardiography  
c. Electrocardiography  
d. Listening

2. As special methods of examination of the heart, it can be applied:  
a. Ultrasound examination  
b. Endoscopic examination  
c. Microbiological examination  
d. Mycological examination

3. First heart sound:  
a. Is systolic  
b. Is diastolic  
c. Represents closure of the sigmoid valves  
d. Represents closure of the atrioventricular valves

4. Electrocardiography evaluates:  
a. Intracardiac hemodynamics  
b. Electrical potential of the heart

- c. Arrhythmias
- d. Cardiac silhouette

5. Depending on the amplitude, the pulse can be characterized as:

- a. Hard or soft pulse
- b. Rhythmic or arrhythmic pulse
- c. Tachycardic or bradycardic pulse
- d. Differential or uneven pulse

6. Examination of the oesophagus in carnivores looks for:

- a. Oro-gastric digestive tract
- b. Time III dysphagia
- c. Time dysphagia II
- d. Food prehension

7. Indirect heart percussion is applied to assess:

- a. A normal dull sound
- b. The percussion area between spaces 3-6 (4-7 in dog)
- c. Cardiac pain
- d. Checking reflexes

8. Palpation of cardiac shock requires examination:

- a. Rhythm, rate
- b. Intensity, site
- c. Pain sensitivity
- d. Wave sensations in case of fluid accumulation

9. Stomach sounding in the horse is performed:

- a. By the buccal and nasopharyngeal technique
- b. By opening the mouth and pulling out the tongue
- c. For diagnostic and therapeutic purposes
- d. For therapeutic and surgical purposes only

10. Liver inspection at carnivores is carried out in the region:

- a. Epigastric, the infero-posterior border of the right hypochondrium
- b. Epigastric, infero-posterior margin of the left hypochondrium
- c. Ventral abdomen
- d. Epigastric, dorsal border of left and right hypochondrium

11. The dyspneic facies in horses is represented by:

- a. Startled look and agitation
- b. Open mouth and trumpet nostrils
- c. Semi-closed eyes
- d. Contraction of facial muscles

12. Tachycardia appears in

- a. Vagotonics
- b. Fever syndrome
- c. Anemia
- d. Hypothermic shock

13. The intensity of cardiac shock decreases in:

- a. Fever syndrome
- b. Pericardial effusion
- c. Cardiac hypertrophy
- d. Inhibitory and vagotonic states

14. In case of intestinal meteorism, the percussion sound is:

- a. Tympanic
- b. Atympanic
- c. Hypersonor
- d. Submatus

15. Gastric sampling in carnivores cannot be performed in:

- a. Megaesophagus
- b. Gastritis
- c. Esophageal obstruction
- d. Gastric neoplasia

16. At the level of the right hemithorax is the listening focus for the orifice:

- a. Mitral
- b. Aortic
- c. Pulmonary
- d. Tricuspid

17. Indirect liver percussion gives a normal sound:

- a. Timpanic to horse
- b. Tympanic in horse
- c. Dull in cow
- d. Dull in horse

18. The special methods recommended for liver analysis are:

- a. Endoscopy
- b. Ultrasound
- c. Blood biochemical analysis
- d. Puncture of the abdomen in the flank fossa

19. Phonocardiography represents:

- a. Recording the electrical potential of the heart

- b. Graphical and acoustic recording of heart sounds
- c. Recording of blood dynamics disturbances in the heart
- d. Recording of cardiac movements

20. Hyperesthesia/hyperalgia irradiant represents:

- a. Exaggeration of tenderness over an area served by collateral branches of the same sensory nerve
- b. Exaggeration of sensitivity at the site of excitation
- c. Exaggeration of sensitivity reflected at a great distance via a neuroma
- d. Exaggeration of generalised sensitivity

21. Coluria represents:

- a. Presence of bile salts in the urine.
- b. Presence of bile pigments in urine
- c. Presence of bile salts in the blood
- d. Presence of bile pigments in the blood

22. Specific symptoms in gastric pain in horses are:

- a. Colic
- b. Vomiting
- c. Diarrhoea
- d. Epiphidrosis on the left humeromastoid area

23. The usual special methods of the stomach in the dog are:

- a. Radiography, ultrasonography
- b. Exudate sampling and analysis
- c. Puncture and examination of puncture fluid
- d. Examination of gastric contents

24. Xeroderma represents:

- a. Increased secretion of sweat glands
- b. Dryness of the skin
- c. Increased secretion of sebaceous glands
- d. No secretion of sebaceous glands

25. Orthotonus represents

- a. Keeping the head in extension
- b. Keeping the head bowed
- c. Keeping the head in a horizontal line with the neck
- d. Turning the head on the neck

26. Exteroceptive sensitivity includes:

- a. Superficial and sensory sensitivity
- b. Superficial and proprioceptive sensitivity



c. Tactile and pain sensitivity

d. Visceral sensitivity

27. Pleurostotonus:

a. It is also called self-listening

b. Phenomenon also referred to as hooding

c. Represents the twisting of the head on the neck

d. Represents sideways deflection and holding the head towards the thorax

28. Calcium oxalate:

a. Spherical or granular in shape

b. Shaped like thin prismatic needles

c. Shaped as octahedral crystals

d. Is a normal component of urine in horses

29. Emprostotonus represents:

a. Neck wringing

b. Keeping the head down

c. Keeping the head extended

d. Holding the head towards the chest

30. The normal constitution is

a. Harmonious or defective

b. Thin or robust

c. Weak or coarse

d. Lively or lymphatic

31. Lymphatic temperament is specific:

a. In horse

b. In carnivores

c. In ruminants

d. Swine

32. Cortical inhibition states include:

a. Apathy, syncope

b. Apathy, phobia

c. Coma, lipotimia

d. Reactivity, hysteria

33. Cortical arousal states include:

a. Apathy, syncope

b. Hallucination, phobia

c. Coma, lipotimia

d.Reactivity, hysteria

34.Diskinesias are:

a.Normokinetics

b.Hyperkinesias

c.Hypokinesias

d.Normal contractions in response to excitations

35.The dyspnic facies is characterized by:

a.Contraction of the muscles of the face and retraction of the corner of the lips

b.Startled look, extreme agitation, head lying on neck and dilated nostrils

c.Posterior displacement of the eyeballs in the eye sockets, a blank look and the appearance of muscular contraction

d.Reduced facial mobility

36.Pale pink color (faint) in the mucous membranes occurs in:

a.Physiological mode

b.Anaemia

c.Hypoxia

d.Inflammation

37.Large (magnus) or high pulse is present in:

a.Aortic insufficiency

b.Aortic stenosis

c.Left heart hypertrophy

d.Severe bleeding

38.In the normal behaviour of the animal we look for:

a.Orientation of the animal in time and space

b.The state of genetic arousal

c.Owner recognition

d.State of muscular inhibition

39.Inspection of lymph nodes provides data on:

a.Local temperature

b.Shape

c.Pain

d.Mobility

40.In phosphorus poisoning, the vomited content is:

a.haemorrhagic, with a pungent acid odour

b.blackish, with an intensely ammoniacal odour

c.with an allylic odour

d.with a dark colour and a foul smell

41. During heart auscultation we hear:

- a. Two distinct noises are heard in rhythmic succession
- b. The systolic noise is caused by the closure of the sigmoid valves
- c. The diastolic noise is caused by the closure of the atrioventricular valves.
- d. Systolic noise corresponds to ventricular systole

42. The foci of heart listening are:

- a. Mitral, aortic and pulmonary foci on the left
- b. Mitral, aortic and pulmonary foci
- c. Tricuspid foci on the left
- d. Tricuspid foci on the right

43. Arterial pulse rate is evaluated by:

- a. Frequency and location
- b. Intensity and location
- c. Frequency, rate
- d. Amplitude, voltage and velocity

44. Normal skin colour is determined by:

- a. Sweat and sebaceous glands
- b. Melanin pigment and vascularisation
- c. Uropigial glands
- d. Skin glands and vasculature

45. Dyschromias are manifested by:

- a. Changes in skin colour of a vascular nature
- b. Changes in distribution and intensity of melanin pigment
- c. Vascular nevi
- d. Erythema, congestion, hyperemia

46. Ehidrosis is manifested by:

- a. profuse sweat secretion
- b. lack of sweat secretion
- c. profuse sweating, but on circumscribed skin areas
- d. profuse sweating over large areas

47. Cardiac shock in dogs:

- a. It is received more strongly on the left side
- b. It is received more strongly on the right side
- c. Is more intense in geriatric and weak patients
- d. Is more intense in young and weak patients

48. Heart sounds are assessed in terms of:

- a. Frequency and rhythm
- b. Intensity and location
- c. Frequency, rhythm, amplitude, voltage and velocity
- d. Presence of murmurs in normal cases

49. The observation sheet is:

- a. A document containing data about the patient and the owner
- b. A medical, scientific and legal document
- c. A document with financial value
- d. A medical document of great importance for the anamnesis

50. Volvulus represents:

- a. Torsion of the intestinal loops
- b. Torsion of the mesentery
- c. Engagement of one loop of intestine into the lumen of another loop of intestine
- d. Herniation of an intestinal loop into the subcutaneous space

51. Vomiting represents:

- a. The reflex oral elimination of food.
- b. Reflexive nasal elimination of food
- c. Is common in dogs
- d. Is common in dog and horse

52. In the physical examination of the liver in the dog, the following are checked:

- a. Deformation of the infero-posterior margin of the right hypochondrium
- b. Deformity of the infero-posterior margin of the left hypochondrium
- c. Jaundiced colour of skin and mucous membranes
- d. Reddish colour of skin and mucous membranes

53. The term habitus means:

- a. The general present state
- b. The first part of the general examination and examination
- c. State of maintenance and temperament
- d. First part of the clinical observation sheet

54. Palpation of the pharynx is performed:

- a. Deep, behind the recurved branches of the mandible, cranial and dorsal to the larynx
- b. Deep, behind the recurved branches of the mandible cranial and ventral to the larynx
- c. Deep, behind the recurved branches of the mandible caudal and ventral to the larynx
- d. Sliding along the neck

55. Adler's urine test refers to:

- a. Determination of haemoglobin
- b. Determination of ketone bodies
- c. Determination of bile salts

d Determination of ketonuria

56. Apoplexy:

a. Results in paralysis

b. Results in repeated spastic contractions

c. Represents sudden loss of consciousness, motility and sensitivity

d. Represents slow loss of motility

57. Incoercible vomiting refers to:

a. Exhausting, almost continuous vomiting

b. Repeated vomiting also called vomiting

c. Repeated vomiting interrupted by coughing

d. Painless vomiting

58. The arm sign appears in the rectal examination being represented by:

a. The presence of pus on the arm

b. The appearance of brown droplets on the arm

c. The appearance of large amounts of mucus on the arm

d. The appearance of blood drops on the arm

59. The ulcer is:

a. A healed wound

b. A wound through lack of substance, with no tendency to heal

c. A superficial wound involving the epidermis

d. A wound occurring after surgery

60. The term asteatosis means :

a. Lack of sebaceous secretion

b. Lack of sweat secretion

c. Inflammation of the skin

d. Without serious lesions

61. Urinary cylinders occur in case of:

a. Urethritis

b. Acute nephritis

c. Hyperbilirubinemia

d. Urethritis and prostatitis

62. Proteinuria can be:

a. Filtration or morphological

b. Normally, it should be negative

c. Occurs frequently in urine

d. Renal proteinuria occurs in prostatitis

63. Urinary sediment is examined:

- a. Macroscopically after acidification
- b. Microscopically on smear
- c. Macroscopically after centrifugation and acidification
- d. Electron microscopic

64. Calcium oxalate crystals have a microscopic appearance (shape):

- a. Prismatic and needle-like
- b. Envelope shape
- c. Hexagonal
- d. Fan-shaped

65. Morphological proteinuria in the dog has origin:

- a. Prerenal and renal
- b. Strictly renal
- c. Vesical (from the urinary bladder)
- d. Vaginal

66. In the dilation of the stomach in the horse, the animal shows:

- a. Penguin attitude
- b. Sitting dog attitude
- c. Kangaroo attitude
- d. Orthopneic posture

67. The tendency to walk non-stop (without any direction) is called:

- a. Pulsation
- b. Dromomania
- c. Pirutium
- d. Walking in circle

68. Glucosuria:

- a. Has hyperglycemia as its primary cause
- b. Occurs in diabetes mellitus
- c. Represents low blood glucose
- d. Represents increased blood glucose

69. The pale colour (greyish-white) of the mucosa is characteristic of

- a. In anthrax
- b. In gum inflammation
- c. In liver diseases
- d. In internal bleeding

70. Acute lymphnoditis shows the following signs:

- a. High local temperature, pain absence, hard consistency

- b. Swelling, pain present, fluctuating or elastic consistency
- c. Normal local temperature, pain present, swollen surface
- d. Absent mobility, swelling, pain present, crepitus

71. Functional changes in the skin are represented by:

- a. Macula and erythema
- b. Hyperhidrosis and hypohidrosis
- c. Vegetation and wartiness
- d. Crevices and ulcerations

72. Serpiginous ulcers:

- a. Have irregular appearance of the margins and a tendency to move to the surrounding areas
- b. Located on the limbs, along the lymphatic vessels
- c. Have smooth margins and centrally oriented depth
- d. Tendency to extend in depth

74. Failure to follow the clinical examination plan can lead to :

- a. A faulty and chaotic manner of examination
- b. A certain way of examination
- c. Failure of diagnosis
- d. Establishing the diagnosis

75. Anamnesis is sufficient to establish a presumptive diagnosis in the case:

- a. Fractures in street accidents
- b. Digestive disorders due to poisoning
- c. Respiratory pathologies
- d. Reproductive disorders

76. Exulceration or erosion is of interest only:

- a. Dermis
- b. Hypodermis
- c. Epidermis
- d. All structures

78. Enanthema of the mucous membranes is manifested by the appearance of:

- a. Congested patches on their surface
- b. Haemorrhagic spots on their surface
- c. Jaundiced spots on their surface
- d. Areas of cyanosis

79. Epiphora occurs because of:

- a. Tear hypersecretion
- b. Obstruction of the tear duct
- c. Salivary hypersecretion

d.Parotid gland obstruction

80.Colaluria represents:

- a.Presence of bile salts in the urine.
- b.Presence of bile salts in the blood
- c.Presence of bile pigments in urine
- d.Presence of bile pigments in the blood

81.In carnivores, ketonuria occurs in the following pathology:

- a.Diabetes mellitus
- b.Respiratory pathology
- c.Renal pathology
- d.Cardiovascular pathology

82.The correct terms for movement incoordination and balance disturbances in standing position are:

- a.Dysmetria
- b.Astasia
- c. Aphasia
- d.Ataxia

83.The observation sheet includes:

- a. Anamnesis, examination of apparatus and systems
- b.Inspection, palpation, percussion, listening, thermometry
- c. Signalment data, general examination and epicritical examination
- d.Results of laboratory examinations and other combined, special methods

84. Anamnesis represents:

- a.Sex, age, weight and body index of the animal
- b.A discussion with the owner, conducted by the veterinarian
- c.The final part of the observation sheet
- d.The animal's signalling data

85.Deep sensitivity:

- a.Is conferred by kinaesthetic receptors
- b.Occurs in internal organ pain
- c.Represents the animal's ability to maintain normal position in space
- d.May be localised, reflected or generalised

86. On the observation sheet we note:

- a.General and special methods
- b.Attitudes, conformation, constitution
- c.Cost of operations and medicines
- d.Prognosis, diagnosis, recommendations, treatment



87. Superficial sensitivity refers to:

- a. Skin reflexes
- b. Algesia
- c. Aesthetics
- d. Kinesthesia

88. The examination plan shall include the following steps:

- a. Inspection
- b. Palpation
- c. Anamnesis
- d. Completion of the observation sheet

89. The semnalment sheet:

- a. The colour of the animal and its characteristics
- b. Anamnesis
- c. Body size and weight of the animal
- d. General examination data

90. Exulceration:

- a. Is a synonymous term for erosion
- b. Is synonymous with eschar
- c. Is a lesion accompanied by lymphadenopathy
- d. It is a loss of substance involving only the epidermis

91. Ulcerations can be:

- a. Crateriform, located on the course of lymphatic vessels
- b. Vegetative, with irregular appearance of the edges and a tendency to spread to neighbouring areas
- c. Fagedenic, with a tendency to extend in depth
- d. Serpiginous, with smooth edges and centrally oriented depth

92. Edema of the conjunctival mucosa gives the appearance of oily eyes, called:

- a. Chemosis
- b. Epiphora
- c. Entropion
- d. Ectropion

93. Postrenal proteinuria occurs as a cause of:

- a. Intoxication
- b. Hyperadrenocorticism
- c. Glomerulonephritis
- d. Cystitis

94. Anamnesis follows:

- a. The use of scientific terms in dialogue with the owner.
- b. Establishing maintenance conditions
- c. Establishing a final diagnosis
- d. Establishment of clinical signs

95. The observation sheet does not include:

- a. Epicrysis
- b. Sign sheet
- c. Anamnesis
- d. Fiscal estimate

96. Coluria is a pathological sign for:

- a. Renal failure
- b. Protein loss
- c. Jaundice
- d. Diabetes

97. Hyperesthesia is:

- a. Exaggeration of tactile sensitivity
- b. Exaggeration of pain sensitivity
- c. Decreased pain sensitivity
- d. Lack of tactile sensitivity

98. Hyperketonemia is due to dysregulation of mechanisms:

- a. Lipids
- b. Proteins
- c. Carbohydrates
- d. All of the above

99. Cholaluria occurs in case:

- a. Biliary vessel stasis
- b. Pancreatic duct stasis
- c. Hepatocellular jaundice
- d. Renal failure

100. Which of the following is correct:

- a. Crater ulcers have smooth edges and centrally oriented depth.
- b. Vegetative ulcers have a tendency to go forward in depth accompanied by the reaction of lymph nodes and lymphatic vessels
- c. Fagedenic ulcers have irregular appearance of the edges and a tendency to spread to adjacent areas
- d. Serpiginous ulcers are localised to the hind limbs along the lymphatic vessels

## V. PHARMACOLOGY

1. Atropine have the following pharmacodynamic effects:
  - a) Activates peristalsis causing the evacuation of the digestive tract
  - b) It has a digestive antispasmodic effect
  - c) Increase the heart rate
  - d) It has a bronchodilator action
  
2. Atropine is used in pre-anesthesia to reduce:
  - a) Convulsions
  - b) Stress
  - c) Secretion of the salivary glands
  - d) Pain
  
3. Which of the following information about sodium glycopyrrolate are false:
  - a) Induced tachycardia is less obvious compared to atropine
  - b) Accelerates the motility of the small intestine in dogs
  - c) Induces an exciting effect
  - d) It is recommended in spasm of the abdominal viscera
  
4. Nicotinic receptor sites are found in all of the following locations, EXEPT:
  - a) parasympathetic ganglia
  - b) sympathetic ganglia
  - c) skeletal muscle
  - d) bronchial smooth muscle
  
5.  $\alpha_1$ -Receptors are associated with which one of the following effects:
  - a) Cardioacceleration
  - b) Vasodilation
  - c) Pupillary dilation
  - d) Pupillary constriction
  
6. Which of the following adrenergic agonists at clinical doses produces dilation of vessels in muscle, constriction of cutaneous vessels, and positive inotropic and chronotropic effects on the heart?
  - a) Phenylpropanolamine
  - b) Isoproterenol
  - c) Epinephrine (adrenaline)
  - d) Dobutamine
  
7. During the period of recovery from anesthesia, is attention paid to the following issues:
  - a) Prevention of heat loss
  - b) Evolution of the pupil and the position of the eyeballs
  - c) Changing the position of the head

- d) Postoperative hydration
8. Which of the following anesthetics does not sensitize the myocardium to catecholamines:
- a) Nitrogen oxide
  - b) Methoxyflurane
  - c) Enfluran
  - d) Isoflurane
9. Which are the concentrations used in Isoflurane anesthesia:
- a) Induction 3 - 5%; 1-2% maintenance
  - b) Induction 2.5 - 4.5%; maintenance 1-3%
  - c) Induction 3.5 - 4.5%; maintenance 2 - 4%
  - d) Induction 1.5 - 2.5%; maintenance 3 - 4%
10. Which the following statement is not correct about thiobarbiturates:
- a) Distributes rapidly in the brain, causing rapid anesthesia
  - b) With their redistribution in muscle and fat, the concentration in the brain increases
  - c) Post-narcotic sleep is shorter in species with rich adipose tissue
  - d) Post-narcotic sleep is longer in species with little adipose tissue
11. Hypnotic substances have the following pharmacodynamic actions:
- a) Depressing on the CNS and promotes the installation of physiological sleep
  - b) Stimulating on the CNS and promotes the installation of physiological sleep
  - c) Decreased brain activity and motor capacity
  - d) It does not act on the CNS
12. Which of the following statements is correct for tranquilizers?
- a) They can be used in the excitation phase of some nervous disorders
  - b) Enhances anesthesia and/or local anesthesia
  - c) Prevent operator shock
  - d) They have a convulsive action
13. Neuroleptic-induced vegetative-lytic syndrome is characterized by?
- a) Actuation/excitation of the thermoregulatory center
  - b) Anti-vomiting effect
  - c) Increased appetite
  - d) None of the options is correct
14. Which of the following statement is a correct about phenothiazine tranquilizers?
- a) They also have potent analgesic activity.
  - b) They stimulate  $\alpha$ 1-adrenergic receptors to induce hypertension.
  - c) Most of them are desirable restraining agents for aggressive dogs.
  - d) They suppress emesis by blocking dopamine receptors in the chemoreceptor-trigger zone.

15. Which of the following statements about xylazine are true:
- a) Has the ability to eliminate ketamine-induced hypertension in dogs and cats
  - b) It has a sedative action
  - c) Induces muscle relaxant and analgesic effects
  - d) The duration of local anesthesia is about 15-80 minutes
16. Which of the following statements about detomidine are true:
- a) Recommended for all animal species
  - b) Induces xylazine-like cardiovascular disorders in horses
  - c) Induces long-term sedation and analgesia
  - d) Cannot be combined with ketamine or butorphanol
17. IV administration of an  $\alpha_2$ -agonist produces all of the following pharmacological effects, EXCEPT:
- a) bradycardia
  - b) increased GI motility
  - c) transient hypertension
  - d) diuresis
18. The  $\alpha_2$ -agonist with the most selectivity and potency for  $\alpha_2$ -receptors is:
- a) medetomidine
  - b) detomidine
  - c) romifidine
  - d) xylazine
19. Which of the following statements about atipamezole (Antisedan®) are true:
- a) It is an  $\alpha_2$  adrenoceptor agonist
  - b) Neutralizes the pharmacodynamic effect of xylazine, detomidine, medetomidine and romifidine
  - c) The dose of atipamezole is 4-5 times higher than the dose of anesthetic used
  - d) No special attention should be paid to animals with heart failure and shock
20. Which of the following statements about medetomidine are true:
- a) Administered intravenously, it acts in maximum 2 minutes
  - b) Induces bradycardia and bradypnea
  - c) The intensity of the sedative and analgesic effects is not dose dependent
  - d) Cannot be associated with opioids
21. Which of the following statements about ketamine are true:
- a) Produces dissociative anesthesia
  - b) It has fast action without excitation phase
  - c) It has no analgesic qualities
  - d) It has a strong bronchodilator effect
22. Which of the following statements about tiletamine are true:

- a) It is similar to ketamine, but with more intense effects at the same dosage
  - b) Do not combine with minor tranquilizers (diazepam, zolazepam, etc.)
  - c) It has no muscle relaxant qualities
  - d) May induce amnesia
23. Which one of the following statements concerning buprenorphine are true?
- a) It is a partial agonist opioid with partial agonist activity at the  $\mu$ -receptor and agonist activity at the  $\kappa$ -receptor.
  - b) It is an agonist–antagonist opioid with partial agonist activity at the  $\mu$ -receptor.
  - c) It is a very potent  $\mu$ -agonist used to immobilize nondomestic ungulates.
  - d) It is an  $\alpha 2$ -adrenoreceptor agonist in the central and peripheral nervous system.
24. Inhalant anesthetics vary in how quickly the alveolar concentration (blood concentration) will approximate the inspired concentration. Which one of the following anesthetics has the fastest rate of rise in alveolar concentration?
- a) Sevoflurane
  - b) Desflurane
  - c) Nitrous oxide
  - d) Isoflurane
25. Which one of the following anesthetics is an NMDA receptor antagonist?
- a) Thiopental
  - b) Propofol
  - c) Etomidate
  - d) Ketamine
26. Which injectable anesthetic is best suited for use in a small animal requiring an outpatient procedure?
- a) Propofol
  - b) Pentobarbital
  - c) Thiopental
  - d) Tiletamine-zolazepam
27. Which of the following statements about propofol are true:
- a) The animal recovers quickly from anesthesia
  - b) The duration of action in cats is longer than in dogs
  - c) It has no analgesic qualities
  - d) Has affinity for adipose tissue, risk of accumulation
28. In which situations is propofol recommended:
- a) When the aim is to perform a short-term or medium-term anesthesia
  - b) When aiming for a fast and safe induction
  - c) When aiming for rapid loss of consciousness
  - d) None of the options is correct

29. Naloxone is a total antagonist for the group of medicines:
- Butyrophenone
  - Benzodiazepines
  - Alpha 2-agonists
  - Opioids
30. Which of the following is the most frequently seen adverse effect of the prostaglandin inhibitors?
- Agranulocytosis
  - Gastric ulcers
  - Renal papillary necrosis
  - Anemia
31. The antipyretic effect of an NSAID can result from all of the following except:
- Inhibition of prostaglandin synthesis in the central nervous system
  - Dilation of the peripheral vasculature
  - Sweating
  - Lowering body temperature in both normal and febrile animals
32. All of the following concerning the pharmacological actions of aspirin are true, EXCEPT:
- Reversible inhibition of COX-1.
  - Significant drug interaction with anticoagulants.
  - GI ulceration and hemorrhage.
  - Antiplatelet effects.
33. Which of the following is the correct statement concerning COX-2 inhibitors?
- They decrease platelet function
  - They have greater analgesic activity than other NSAIDs
  - Their anti-inflammatory activity is better than that of other NSAIDs
  - They cause less gastric ulceration than other NSAIDs
34. Which of the following is an incorrect statement concerning the drug interactions of NSAID?
- Concurrent use of a glucocorticoid is encouraged, since this practice will ensure better anti-inflammatory activity.
  - Concurrent use of diazepam may increase the activity of both drugs.
  - Concurrent use of gentamicin can increase nephrotoxicity of NSAID.
  - Concurrent use of two NSAIDs should be avoided.
35. Which of the following statements about diuretics are true:
- Furosemide, ethacrynic acid and thiazides increase kaliuresis
  - Spironolactone prevents the reabsorption of sodium ions and the secretion of potassium and hydrogen in the distal tube
  - Mannitol (osmotic diuretic) causes a predominantly aqueous diuresis
  - None of the options is correct

36. Regarding the indications of thiazide diuretics, which are false information:
- Chronic heart failure
  - Chronic liver and / or kidney disease
  - Acute heart failure
  - High doses cause hyperkalemia, hypernatremia and hypermagnesemia
37. About mannitol, which are true information:
- It is indicated in the early stages of acute renal failure
  - It is recommended as an immediate treatment in acute intoxications with nephrotoxic substances
  - Not indicated in acute intoxications with aminoglycosides, barbiturates, acetylsalicylic acid.
  - It is indicated in cerebral edema and acute glaucoma crisis
38. About furosemide, which are true information:
- Eliminate a large volume of isotonic or slightly hypotonic urine
  - Eliminates an increased amount of sodium, potassium, chlorine, calcium and magnesium ions
  - The increase in diuresis occurs quickly and is maintained for a short time;
  - All variants are incorrect.
39. Which of the following exemple is not a side effect of furosemide:
- Dehydration
  - Electrolyte depletion (eg hyponatremia, hypochloremia, hypokalemia)
  - Azotemia
  - Pulmonary toxicity (eg acute respiratory distress syndrome)
40. About carbonic anhydrase inhibitors, which are the true information:
- Sodium is no longer reabsorbed
  - Decreases urine volume
  - Decreases the alkaline reserve of the blood
  - It leads to the accumulation of  $H^+$  in body fluids, acidosis occurs
41. In cases of severe generalized edema, which of the following fluid compartments is increased in volume?
- Intracellular
  - Interstitial
  - Transcellular
  - Plasma
42. Fluid and electrolyte imbalance leading to dehydration, muscle weakness, hypokalemia, and CNS depression may result from high or prolonged dosage with:
- Chlorothiazide
  - Amiloride



- c) Furosemide
  - d) Theophylline
43. Regarding pimobendan, all the following are true, EXCEPT:
- a) Elimination in the dog is primarily via hepatic metabolism.
  - b) The drug is often called an inodilator.
  - c) The drug has phosphodiesterase III inhibiting effects.
  - e) The drug substantially increases myocardial oxygen requirement while increasing contractility.
44. Which of the following statements about pimobendan is correct?
- a) It is an inodilator used in the treatment of chronic heart failure in dogs
  - b) It is a diuretic with beta-blocking properties
  - c) In cats, the half-life is almost three times shorter than in dogs
  - d) Increases survival time and improves quality of life in dogs with congestive heart failure
45. A purely venous vasodilator would be most useful in treating which of the following conditions?
- a) Chronic, stable dilated cardiomyopathy
  - b) Aortic regurgitation from endocarditis
  - c) Cardiac tamponade with ascites
  - d) Mitral regurgitation with acute pulmonary edema
46. The effects of digital cardiotoxic glycosides are characterized by?
- a) Positive inotropic effect
  - b) Positive batmotropic effect
  - c) Negative dromotropic effect
  - d) Negative chronotropic effect
47. In general, digoxin would be indicated for a dog with:
- a) Dilated cardiomyopathy and atrial fibrillation
  - b) Heartworm disease
  - c) Pericardial effusion
  - d) Hypertrophic cardiomyopathy
48. The mechanism of action of digoxin's positive inotropic effect is:
- a) direct stimulation of the Na<sup>+</sup>-Ca<sup>2+</sup> exchanger
  - b) competitive inhibition of Na<sup>+</sup>, K<sup>+</sup>-ATPase
  - c) activation of Gs protein
  - d) peripheral and central sympathetic stimulation

49. A dog is presented in severe heart failure from dilated cardiomyopathy; you decide to institute therapy with a catecholamine. Regarding dopamine and dobutamine, all the following are true, EXCEPT:

- a) Both agents have a  $t_{1/2}$  between 10 and 20 minutes
- b) Both agents have extensive hepatic metabolism
- c) Long-term use is limited by  $\beta$ -receptor down-regulation.
- d) Dopamine is more arrhythmogenic than dobutamine.

50. Drugs which act by blocking  $\beta$ -adrenergic receptors comprise which class of antiarrhythmic agents?

- a) Class I
- b) Class II
- c) Class III
- d) Class IV

51. Which antiarrhythmic drug is INCORRECTLY matched with its classification?

- a) Lidocaine—Class IA
- b) Procainamide—Class IA
- c) Tocainide—Class IB
- d) Quinidine—Class IA

52. When used IV, lidocaine has all of the following effects, EXCEPT:

- a) It usually suppresses premature ventricular contractions
- b) It consistently abolishes atrial arrhythmias
- c) It decreases  $\text{Na}^+$  conductance in automatic cells
- d) It has little to no effect on sinus node pacemaker function

53. Heparin is used in cats after acute thromboembolism because of its inhibitory effects on coagulation. In combination with antithrombin III, it neutralizes all the following factors, EXCEPT:

- a) XII
- b) X, XI
- c) VIII
- d) IX

54. Which of the following statements regarding route of administration for fluid therapy is correct?

- a) The oral route causes more adverse effects than most of other routes.
- b) The rectal route may be useful when standard IV access is impossible.
- c) KCl in the concentration of 30 mEq/L is best given IV if parenteral administration is necessary.

- d) The SC route is versatile in dogs and cats because it can be used to administer a large amount of isotonic, hypertonic, or hypotonic solution
55. Which of the following statements are true recommendations for rehydration therapy?
- a) It is recommended in hypovolemia by dehydration
  - b) Not indicated in acute and chronic diarrhea
  - c) It is recommended for exhausted animals
  - d) None of the options is true
56. What are the factors that determine the amount of fluid to be administered to the animal?
- a) Determination of % dehydration and estimation of water deficit
  - b) Amount of body water maintenance
  - c) Water losses at the time of intervention
  - d) None of the options is correct
57. Which of the following statements about dextran are correct?
- a) They produce an increase in the circulating volume
  - b) The duration of the effect is 6 hours
  - c) It is pharmacologically inactive
  - d) It is very toxic
58. Which of the following colloid solutions has the shortest duration of action?
- a) 6% Hetastarch
  - b) 6% Dextran 70
  - c) 10% Dextran 40
  - d) 5% Oxypolygelation
59. Flucytosine absorption is achieved rapidly and completely when?
- a) It is administered intravenously;
  - b) It is administered orally;
  - c) In the absence of the food.
  - d) None of the options is correct
60. Flucytosine activity spectrum does not include:
- a) Aspergillus and Coccidioides immunitis
  - b) Cryptococcus neoformans, Candida albicans, Cladosporium spp
  - c) Histoplasma capsulatum
  - d) Gram-positive bacteria
61. Co-administration of fluconazole and erythromycin may increase the risk of:
- a) Nephrotoxicity
  - b) Hepatotoxicity
  - c) Cardiotoxicity
  - d) Encephalopathy
62. Therapeutic activity of griseofulvin is more effective when administered:

- a) Orally and in ultramicronized form
  - b) Intravenous and in ultramicronized form
  - c) Subcutaneous and in micronized form
  - d) Intramuscularly and in ultramicronized form
63. Which are the therapeutic indications for griseofulvin:
- a) Dermatophytosis of the skin, hair and nails
  - b) Nematodes of small animals
  - c) Candidiasis infections
  - d) Viral infections
64. Co-administration of amphotericin B with colistin potentiates:
- a) Therapeutic effect
  - b) Cardiac toxic effect
  - c) Renal toxic effect
  - d) Ototoxicity
65. All of the following statements concerning ketoconazole are true, EXCEPT:
- a) It is more effective than flucytosine for meningeal cryptococcosis since it penetrates the CNS more completely
  - b) It inhibits ergosterol synthesis in both systemic mycotic infections and candidiasis (yeast infections)
  - c) Cortisol and testosterone synthesis in mammals is inhibited at high doses
  - d) It must be administered for 3–6 months in therapy for systemic mycoses
66. Ketoconazole is characterized by:
- a) Very high toxicity
  - b) Relatively low toxicity
  - c) Nephrotoxicity
  - d) Cardiotoxicity
67. What is the most widely used antifungal in the treatment of *Aspergillus fumigatus* infections:
- a) Terbinafine
  - b) Clotrimazole
  - c) Itraconazole
  - d) Flucitazine
68. Nystatin is used to treat mycoses caused by fungi such as:
- a) *Candida*, *Aspergillus*, *Sporotrichum*
  - b) *Tricophyton*
  - c) *Microsporum*
  - d) It has no antifungal action

69. Which of the following enilconazolol indications in veterinary medicine are correct:
- It is a topical antifungal used in the treatment of dermatophytosis in animals
  - It is a systemic antifungal
  - It is active against the genera *Aspergillus* and *Penicillium*
  - None of the options is correct
70. What does the term "antibiotic" mean?
- Synthetic analogues of natural substances that destroy protozoa and helminths
  - Substances produced by some micro-organisms and their synthetic analogues which selectively destroy or inhibit the growth of another micro-organism
  - Inorganic or synthetic substances which selectively destroy or inhibit the growth of other micro-organisms
  - Substances produced by some microorganisms and their synthetic analogues that inhibit the growth of cells in the body
71. A good example of the responsible use of antibiotics in animals is:
- Use of a broad-spectrum antibiotic instead of a narrow-spectrum antibiotic
  - Prescribing antibiotics before vaccination to prevent possible infections
  - Avoiding the use of antibiotics for bacterial infections secondary to a viral infection.
  - The selection of antibiotics should be made on the basis of the antibiogram
72. Which is the most important factor in the selection of antibiotics:
- Age of the animal
  - A definite indication for the use and choice of antibiotics
  - Previous experience with the use of antibiotics in animals in similar situations.
  - Price
73. Which of the following uses of antibiotics in farm animals is no longer approved:
- Prevention
  - Treatment
  - Control
  - Growth promoter
74. Which are the mechanisms of antimicrobial resistance:
- Inactivation or destruction of the antibiotic
  - Inhibition of antibiotic entry into the cell
  - Target modification (antibiotic binding site) so that the antibiotic molecule can no longer react with cellular components
  - Elimination of antibiotic (active efflux)
75. Infectious or transferable drug resistance, which involves transfer of multiple-drug resistant genes via pili, has been observed clinically in Gram(-) infections of the:
- Urinary tract

- b) Intestinal tract
  - c) Respiratory tract
  - d) Skin
76. A therapeutic protocol with anti-infectious substances should aim at:
- a) Maintaining a serum concentration above the MIC (minimum inhibitory concentration)
  - b) Do not administer the therapeutic dose more than 4 times
  - c) The curative dose should be higher than the preventive one
  - d) None of the options is correct
77. To be active, an antibiotic must:
- a) To penetrate all barriers to its bacterial target
  - b) Not to be inactivated
  - c) Be able to relate to his target
  - d) Act locally to reduce the risk of toxicity
78. The bacteriostatic effect means:
- a) Inhibition of bacterial growth
  - b) Destruction of bacterial cells
  - c) Acceleration of bacterial cell division
  - d) Accelerating the division of young bacterial cells
79. What are the general principles of anti-infectious therapy:
- a) Optimal route of administration, dose, frequency of dosing and duration of treatment
  - b) Identification of bacterial infection and susceptibility of the microorganism
  - c) Non-involvement of microbiological factors
  - d) All are correct
80. The minimum duration of antibacterial treatment is usually:
- a) Not less than 5 or 7 days
  - b) Not less than 10-14 days
  - c) Not less than 3 weeks
  - d) Not less than 1 day
81. The rational combination of antimicrobials is used to:
- a) A broad spectrum of antimicrobial action
  - b) To prevent antibiotic resistance
  - c) Antibacterial synergism (when microorganisms are not effectively eradicated with just one antibiotic)
  - d) All
82. Which of the following antibiotic combinations is correct:
- a) Crystalline penicillin and chloramphenicol

- b) Crystalline penicillin and streptomycin
- c) Ciprofloxacin and streptomycin
- d) Sulfamides and penicillin

83. Which of the following statements about antibiotic associations are correct:

- a) The main reason for the association of antibiotics in veterinary medicine is to obtain a broad or ultra-wide antibacterial spectrum.
- b) The combination of two bacteriostatic antibiotics does not usually lead to a synergistic effect
- c) The associations lead to the limitation of the toxicity of some antibiotics, by reducing the doses of each one
- d) Bactericidal antibiotics active in the multiplication phase may be associated with bacteriostatic antibiotics

84. Antibiotics that inhibit bacterial cell wall synthesis are:

- a) Beta-lactam antibiotics
- b) Tetracyclines
- c) Macrolides
- d) Aminoglycosides

85. Considering the pharmacology of the penicillin G and the first-generation cephalosporins, all of the following are true, EXCEPT:

- a) They inhibit peptidoglycan cross-linking in the third stage of bacterial cell wall synthesis.
- b) Bacterial resistance is most commonly due to  $\beta$ -lactamase production.
- c) Tissue penetration of cephalosporins is superior to penicillin G and thus they are preferred for antibiotic prophylaxis in surgery.
- d) They are eliminated primarily by hepatic metabolism and biliary excretion of conjugated drug.

86. Which beta-lactamase inhibitors are used with amoxicillin and ampicillin:

- a) Clavulanic acid
- b) Tazobactam
- c) Sulbactam
- d) All are correct

87. Cephalosporins are recommended for the treatment of:

- a) Infections with gram-negative microorganisms
- b) Viral infections
- c) Infections with gram-positive microorganisms

d) Infections with gram-negative and gram-positive microorganisms, if penicillins have no effect

88. Trimethoprim or ormetoprim combined with a sulfonamide results in all of the following, EXCEPT:

- a) a sequential blockade of folate synthesis in susceptible bacteria.
- b) a decreased ability of sulfonamides to produces dry keratoconjunctivitis (KCS).
- c) a decrease in the rate of development of resistant bacteria.
- d) an extended antibacterial spectrum.

89. Two semisynthetic penicillins that are effective against *Pseudomonas* spp. are:

- a) Methicillin and ampicillin
- b) Ampicillin and amoxicillin
- c) Amoxicillin and ticarcillin
- d) Ticarcillin and piperacillin

90. The aminoglycoside antibiotics such as amikacin and gentamicin:

- a) Are lipid soluble and distribute widely to tissues including the CNS.
- b) Are not effective against Gram(-) anaerobes because their uptake by bacteria is oxygen linked.
- c) Are bacteriostatic at therapeutic concentrations.
- d) Are well absorbed orally if they are enteric coated to protect them from gastric acid

91. Adverse reactions to the aminoglycoside antibiotics include all of the following, EXCEPT:

- a) Neuromuscular blockade
- b) Myelosuppression and anemia
- c) Nephrotoxicity
- d) Ototoxicity

92. Tetracyclines are broad spectrum and bacteriostatic by a mechanism of action that involves

- a) Binding to the 30S ribosome to inhibit the addition of aminoacids to the growing peptide chain
- b) Binding to phospholipids in bacterial cell membranes to increase permeability
- c) Binding to the 50S ribosome to inhibit peptidyl transferase
- d) Inhibition of DNA gyrase

93. Considering the pharmacology of the and tylosin, all of the following are false, EXCEPT:

- a) inhibits the first step of cell wall synthesis and thus is bactericidal in growing bacteria.
- b) may produce anemia by blocking iron uptake in erythroblasts
- c) antibacterial spectrum includes mycoplasma



d) is usually effective in organisms resistant to erythromycin

94. Considering the pharmacology of the and clindamycin, all of the following are false, EXCEPT:

- a) Is primarily active against Gram (–) pathogens
- b) Is used in equine enteric infections since it is a poorly absorbed “enteric” macrolide
- c) Distribution is generally limited to the ECF
- d) Is frequently effective in staphylococcal osteomyelitis

95. Which of the following antibiotics have a bacteriostatic effect:

- a) Carbapeneme
- b) Cephalosporins
- c) Lincosamide
- d) Aminoglycosides

96. Which of the following therapies is not correct?

- a) Lincomycin—swine dysentery
- b) Florfenicol—bovine respiratory disease
- c) Tetracycline—psittacosis in birds
- d) Chloramphenicol—mycoplasmal pneumonia in swine

97. Three antibiotic used topically or orally but not parenterally (primarily because of nephrotoxicity) are:

- a) streptomycin, kanamycin, bacitracin
- b) polymixin B, bacitracin, neomycin
- c) bacitracin, tiamulin, polymixin B
- d) neomycin, gentamicin, rifampin

98. What is the antibiotic that inhibits bacterial RNA synthesis:

- a) Imipenem
- b) Rifampicin
- c) Chloramphenicol
- d) Erythromycin

99. The information about carbapenems is true:

- a) They have an ultra-wide anti-bacterial spectrum
- b) It acts against gram-negative microorganisms
- c) They are resistant to most beta-lactamases
- d) Acts against gram-positive microorganisms

100. Which substance belongs to the group Cephalosporins:

- a) Phenoxyethylpenicillin
- b) Erythromycin
- c) Streptomycin
- d) Cefaclor

**Răspunsuri:**

1. b, c, d / 2. c / 3. b, c, d / 4. d / 5. c / 6. c / 7. a, c, d / 8. d / 9. b / 10. b / 11. a, c / 12. a, b, c / 13. a, b, c, d / 14. d / 15. a, b, c / 16. b, c / 17. b / 18. a / 19. b, c / 20. a, b / 21. a, b, d / 22. a, c, d / 23. b / 24. c / 25. d / 26. a / 27. a, b / 28. a, b, c / 29. d / 30. b / 31. d, 32. a / 33. d / 34. a / 35. a, b, c / 36. c, d / 37. a, b, d / 38. a, b, c / 39. d / 40. a, c, d / 41. c / 42. c / 43. d / 44. a, d / 45. d / 46. a, d / 47. a / 48. b / 49. a / 50. b / 51. a / 52. b / 53. c / 54. b / 55. a, c / 56. a, b, c / 57. a, b, c / 58. c / 59. b, c / 60. a, c, d / 61. c / 62. a / 63. a / 64. c / 65. a / 66. b / 67. c / 68. a / 69. d / 70. b / 71. d / 72. b / 73. d / 74. a, b, c, d / 75. b / 76. a, b, c, d / 77. a, b, c / 78. a / 79. a, b / 80. a / 81. d / 82. b, c / 83. c, d / 84. a / 85. d / 86. d / 87. d / 88. b / 89. b / 90. b / 91. b / 92. a / 93. c / 94. d / 95. c / 96. d / 97. b / 98. b / 99. a, c / 100. d

**VI. MICROBIOLOGY**

1. Bacteria are microorganisms with the following type of structure
  - a. Acellular (subcellular)
  - b. Unicellular prokaryote
  - c. Pluricellular eukaryote
  - d. Unicellular eukaryote
  
2. The bacterial cell has dimensions in the unit of
  - a. Nanometers
  - b. Micrometers
  - c. Millimeters
  - d. Centimeters
  
3. The genetic material of the bacteria is represented by:
  - a. A single chromosome and DNA plasmids
  - b. A varying number of chromosomes depending on species
  - c. A single nucleic acid, DNA or RNA
  - d. 2-4 chromosomes and extrachromosomal units (plasmids)
  
4. Bacteria with a comma-like shape are named:
  - a. Cocci

- b. Rods
  - c. Vibrions
  - d. Spirochetes
5. Bacteria that are helically coiled are named:
- a. Vibrions
  - b. Filaments
  - c. Spirochetes
  - d. Rods
6. Spherical bacteria (cocci) can be found in groups:
- a. Strepto (chains)
  - b. Diplo (joined in pairs)
  - c. Palisades
  - d. Clusters with Chinese letters appearance
7. Rod shape bacteria, after division can remain grouped:
- a. Diplo (joined in pairs)
  - b. Chains of variable lengths (strepto)
  - c. Grape like clusters
  - d. Palisades
8. It is the result of the division of the cocci into parallel planes, with the persistence of the connections between the cells over several generations:
- a. Diplococcus
  - b. Staphylococcus
  - c. Streptococcus
  - d. None of the above
9. The enzymes that bacteria constantly synthesize, regardless of the substrate on which they multiply are:
- a. Inductive enzymes
  - b. Adaptive enzymes
  - c. Constitutive enzymes
  - d. All of the above
10. Which of the bacterial cell components are present in absolutely all bacteria:
- a. Cytoplasmic membrane
  - b. Cell wall
  - c. Capsule
  - d. Bacterial genome
11. Cilia (flagella) are organelles:
- a. Present in all species of bacteria
  - b. Found only in some species of bacteria

- c. With role in motility
  - d. With role in attachment
12. The cell wall represents a component of the bacterial cell:
- a. Found in all species of bacteria
  - b. Found in the majority species of bacteria
  - c. Found in a small number of bacteria
  - d. Present only in mycoplasmas
13. Bacteria that lack a cell wall belong to the class:
- a. Firmicutes
  - b. Gracilicutes
  - c. Mollicutes
  - d. None of the above
14. What structure gives resistance to the bacterial cell wall:
- a. Lipopolysaccharide (LPS)
  - b. Peptidoglycan (murein)
  - c. Lipoproteins
  - d. Bacterial lipid components
15. The lipopolysaccharide component (LPS) in the outer membrane of the cell wall in Gram-negative bacteria fulfils the role of:
- a. Enzyme with role in metabolism
  - b. Antiphagocytic factor
  - c. Endotoxin
  - d. Adherence
16. In the presence of penicillin or lysozyme they turn into protoplasts:
- a. Gram-positive bacteria
  - b. Gram-negative bacteria
  - c. Acid-fast bacteria
  - d. Bacteria that have a capsule
17. In the presence of penicillin or lysozyme they turn into spheroplasts:
- a. Gram-positive bacteria
  - b. Gram-negative bacteria
  - c. Acid-fast bacteria
  - d. Bacteria that have a capsule
18. They have the capacity to resynthesize their cell wall:
- a. Spheroplasts
  - b. Protoplasts
  - c. Both spheroplasts and protoplasts
  - d. None of the above

19. Which of the components of the bacterial cell ensures its shape?
- Capsule
  - Cell wall
  - Cytoplasmic membrane
  - Glycocalyx
20. The morpho-chemical structure of the cell wall in various groups of bacteria is responsible for:
- the shape and grouping of bacterial cells
  - the thickness and degree of rigidity of the wall
  - different way of staining bacteria by Gram and Ziehl-Neelsen methods
  - resistance to harmful environmental factors
21. Which of the following bacterial cell components are not found in all bacteria:
- Cytoplasmic membrane
  - Genome (nucleoid, chromosome)
  - Capsule
  - Cilia (flagella)
22. Which of the following organelles are found in the cytoplasm of the bacterial cell:
- Golgi body
  - Mitochondria
  - Palade particles
  - Ribosomes
23. Which of the following organelles are absent in the cytoplasm of the bacterial cell:
- Endoplasmic reticulum
  - Golgi body
  - Ribosomes
  - Mitochondria
24. Bacteria can be found in nature:
- Only in the vegetative state (the bacterial cell itself)
  - Only in the form of spores
  - Both in vegetative state and in the form of spores
  - Only in the parasitic state present only in the host organism
25. The nucleus of the bacterial cell (nuclear genetic material, nucleoid) consists of:
- 2-4 chromosomes, single-stranded DNA, and is bounded by the membrane
  - A single chromosome, double-stranded DNA and is not separated by a nuclear membrane
  - RNA and polyglucides

- d. A single chromosome, single stranded DNA and is not separated by a nuclear membrane
26. Plasmids are specific structures of the bacterial cell, which consist of:
- a. Invagination of the cytoplasmic membrane
  - b. Adhesion organs
  - c. Small molecules of double-stranded DNA
  - d. Forms of bacterial resistance
27. The capsule protects bacteria against:
- a. Phagocytosis (in pathogenic bacteria)
  - b. High temperatures
  - c. Desiccation (dryness)
  - d. Does not fulfill any protection role
28. The mobility of bacteria is ensured by:
- a. Pili
  - b. Fimbriae
  - c. Cilia
  - d. Flagella
29. The fimbriae have a role in:
- a. Absorption of nutrients from culture media
  - b. Fixation of bacteria on the surface of epithelia and other solid substrates
  - c. Mobility
  - d. Resistance of bacteria
30. Cilia (flagella) have a role in:
- a. Adhesion of the bacterial cell to various substrates
  - b. Mobility
  - c. Transfer of genetic material in the conjugation process
  - d. Multiplication of bacteria
31. The majority of bacteria multiply by:
- a. Spores
  - b. Direct division (scissiparity)
  - c. Budding
  - d. Elementary bodies
32. The bacterial spore represents:
- a. The multiplication process of most bacterial species
  - b. The form of preservation of bacteria in unfavorable environmental conditions
  - c. A biological form of bacteria in nature
  - d. A form of resistance found only in certain bacteria

33. Bacterial resistance to antibiotics induced by R-factor (plasmids) is of the type:
- “One-steep”
  - “Multi-steep”
  - Not transmissible from one bacterial strain to another by conjugation
  - Transmissible by the conjugation phenomenon
34. R-factor (plasmids):
- Are transmitted between bacterial strains of the same species and between related species
  - They are fixed, they cannot be lost from the bacterial cell
  - Can be removed spontaneously from the bacterial cell, which is why it is mandatory to inoculate pathological materials immediately after sampling
  - Cannot be transmitted by the conjugation phenomenon
35. In which of the multiplication phases, characterized by the total absence of cell division, the bacterial cells present atypical forms and low tinctorial affinity, causing the examinations performed for the purpose of identification to lead to errors:
- The log phase (exponential)
  - The stationary phase
  - The death phase
  - The lag phase (adaptation)
36. The bacterial lawn results from:
- Confluence of colonies in case of abundant inoculation
  - Invasion of the environment by mobile bacteria
  - Rapid multiplication of encapsulated bacteria
  - Rapid multiplication of fimbriate bacteria
37. Through germination, from a spore, results:
- A single vegetative cell
  - A double number of vegetative bacterial cells
  - Two spores
  - Numerous vegetative bacterial cells
38. In the cytoplasm of bacterial cells there may be small fragments of DNA encoding antibiotic resistance, which are called:
- Mesosomes
  - Plasmids
  - Ribosomes
  - Vacuoles

39. The multiplication of bacteria in liquid culture media goes through the following phases:
- Lag phase (adaptation)
  - Log phase (exponential)
  - Stationary phase
  - Death phase
40. They are able to multiply at low temperatures, close to zero degrees Celsius:
- Cryophilic bacteria
  - Psychrophilic bacteria
  - Halophilic bacteria
  - Thermophilic bacteria
41. The bactericidal effect of the high temperatures used in sterilization is mainly due to:
- Dehydration of bacterial cells
  - Denaturation of cellular proteins
  - Destruction of the cell wall
  - Distortion of the bacterial genome
42. Bacteria capable of multiplying at temperatures between 80<sup>0</sup> C-105<sup>0</sup> C are called:
- Mesophilic bacteria
  - Hyperthermophilic bacteria
  - Osmophilic bacteria
  - Psychrophilic bacteria
43. In terms of temperature, most pathogenic bacteria are:
- Psychrophilic
  - Cryophilic
  - Mesophilic
  - Thermophilic
44. Bacterial spores are destroyed at the temperature of:
- 60 80<sup>0</sup> C dry heat
  - 100-120<sup>0</sup> C moist heat
  - 140-180<sup>0</sup> C dry heat
  - 80-100<sup>0</sup> C dry heat
45. The native (resident) microbiota of the healthy animal organism populates:
- The skin
  - Digestive tract
  - Parenchymal organs (liver, spleen, kidneys)
  - Lower genitourinary tract



46. The relationship between the rumen microbiota and the host animal is of the following type:
- a. Symbiotic
  - b. Commensal
  - c. Antagonistic (conflictual)
  - d. Indifferent

Microbiologie speciala

47. Free coagulase confers pathogenicity to staphylococci by:

- a. inhibition of phagocytosis
- b. lysis of the fibrin barrier around focal inflammatory areas
- c. destruction of red blood cells
- d. toxicity

48. Antiphagocytic factors that inhibit phagocyte digestion are:

- a. bacterial capsule, staphylococci free coagulase
- b. Trehalose 6,6'-dimycolate
- c. "cord-factor" in bacteria of the genus Mycobacterium
- d. collagenase

49. Bacterial toxins responsible for digestive disorders encountered in food poisoning are:

- a. collagenase
- b. hemolysins
- c. enterotoxins
- d. leukocidins

50. Bacterial enzymes with necrotic effect are:

- a. diphtheria toxin
- b. lecithinase
- c. hemolysins
- d. leukocytes

51. Bacterial hyaluronidases and fibrinolysins are responsible for:

- a. inhibition of phagocytosis
- b. diffusion of bacteria into surrounding tissues
- c. implication in food poisoning
- d. necrotic effect on tissues

52. Synthesizes carotenoid pigments (white → orange), non-diffusible in the culture media:

- a. Streptococci
- b. Staphylococci
- c. E. coli
- d. Mycobacteria

53. Selective media for staphylococci contain:

- a. sodium azide
- b. NaCl 6.5%
- c. brilliant green
- d. ovalbumin

54. Which of the following are halophilic bacteria:

- a. Clostridia
- b. Leptospira
- c. Staphylococci
- d. Enterococci

55. Staphylococci have the following characteristics:

- a. form small, transparent, unpigmented colonies on solid media
- b. form pigmented colonies, with white or different shades of yellow pigment
- c. in smears they appear grouped in clusters (grape-like)
- d. in smears they appear grouped in chains

56. The etiological agent of sheep gangrenous mastitis (Blue Bag) is:

- a. *Staphylococcus aureus*
- b. *Streptococcus agalactiae*
- c. *Clostridium perfringens*
- d. *Mycobacterium bovis*

57. The main pathogenicity of *Bacillus anthracis* is:

- a. the spore, due to thermal resistance
- b. the capsule, which prevents phagocytosis (antiphagocytic role)
- c. cilia, due to mobility
- d. coagulase

58. The diagnosis of anthrax in live animals is made by:

- a. Heated Ascoli reaction
- b. abundant blood cultures
- c. coprocultures
- d. Cooled Ascoli reaction

59. *Bacillus anthracis* has the following cultural characteristics:

- a. in liquid medium abundant flaky deposit, discrete or absent turbidity
- b. on nutrient agar large smooth and glossy S-type colonies
- c. on nutrient agar large opaque colonies, unpigmented type R (rough)
- d. in broth accentuated turbidity and lack of deposit

60. From a morphological point of view, *Bacillus anthracis*:

- a. a Gram-negative cocobacillus, frequently stained bipolar, not encapsulated

- b. a Gram-positive rod, large, with severed ends, grouped in chains, encapsulated
- c. a large Gram-positive rod, with the severed ends, grouped in chains, not encapsulated
- d. a large Gram-positive rod with rounded ends, grouped in chains, encapsulated

61. For the isolation of bacteria of the genus *Clostridium*, the pathological materials are inoculated on what type of media:

- a. hyperchlorinated
- b. anaerobic
- c. glycerinate, 2%
- d. aerobic

62. Species of the genus *Clostridium* pathogenic by toxicity and virulence are:

- a. *Clostridium tetani*
- b. *Clostridium botulinum*
- c. *Clostridium perfringens*
- d. *Clostridium chauvei*

63. The only encapsulated and unciliated species of the genus *Clostridium* are:

- a. *Clostridium tetani*
- b. *Clostridium botulinum*
- c. *Clostridium perfringens*
- d. *Clostridium septicum*

64. The toxin produced by *Clostridium perfringens* is identified by:

- a. Ascoli reaction
- b. seroneutralization in mice
- c. inoculation loop test
- d. coagulase test

65. The spore in *Cl. tetani* is:

- a. centrally located and does not deform the vegetative form
- b. terminally placed and does not deform the vegetative form
- c. terminally placed and deforms the vegetative form (matchstick appearance)
- d. centrally located and deforms the vegetative form

66. *Escherichia coli* has the following morphological characteristics:

- a. Gram-negative cocobacillus, frequently stained bipolar, ciliated, fimbriate, non-sporulated
- b. Gram-negative cocobacillus, bipolar stained, unciliated, fimbriate, non-sporulated
- c. Gram-negative cocobacillus, bipolar stained, ciliated, non-fimbriate, non-sporulated
- d. Gram-positive cocobacillus, frequently bipolar stained, ciliated, fimbriate, non-sporulated

67. *Escherichia coli* has the following dyeing and biochemical characteristics:

- a. Gram negative, glucose (+), lactose, sucrose (+), indole (+), hydrogen sulfide (-), urease (-)

- b. Gram negative, glucose (-), lactose, sucrose (-) indole (+), hydrogen sulfide (-), urease (+),
- c. Gram positive, lactose (+), indole (-), hydrogen sulfide (+), urease (-)
- d. Gram positive, lactose, sucrose (+), glucose (+), indole (+), hydrogen sulfide (-), urease (-),

68. The mobility of leptospire is given by:

- a. external cilia
- b. periplasmic endoflagella
- c. internal cilia
- d. pili

69. The examination of leptospire is usually carried out on:

- a. Gram-stained smears
- b. A smear slide with cover slip, dark field microscopy (with cardioid condenser)
- c. colored smears by the Giemsa method
- d. A smear slide with cover slip under an optical microscope with normal condenser

70. Leptospire are grown on:

- a. usual media (broth, nutrient agar)
- b. Korthof medium
- c. Uhlenuth medium
- d. on ovalbumin supplemented media

71. Which of the following bacterial forms are considered to be the main forms:

- a. The coccus
- b. The bacillus (rod)
- c. The vibron
- d. The spirochaete

72. Species of the genus *Clostridium* pathogenic exclusively by toxicity are:

- a. *Clostridium tetani*
- b. *Clostridium botulinum*
- c. *Clostridium perfringens*
- d. *Clostridium chauveii*

73. Differentiation of *Staphylococcus aureus* from other *Staphylococcus* species is achieved by:

- a. mannitol fermentation
- b. hemolysis test
- c. coagulase test
- d. catalase test

74. In smears made from pathological materials and cultures, the following bacteria are grouped into chains:

- a. *Streptococcus spp.*

- b. *Staphylococcus aureus*
- c. *Bacillus anthracis*
- d. *Bacillus cereus*

75. Species from the family *Bacillaceae*:

- a. are sporulated bacteria;
- b. are Gram negative
- c. all are encapsulated
- d. are Gram positive

76. Which of the following pathogens causes abortion in cattle and sheep:

- a. *Campylobacter coli*
- b. *Campylobacter sputorum*
- c. *Campylobacter fetus subsp.fetus*
- d. *Campylobacter jejuni*

77. It gives off a pleasant smell of linden flowers due to a volatile substance called aminoacetophenone and a blue-green pigment (diffuses in culture media) called fluorescein:

- a. *Staphylococcus aureus*
- b. *Brucella spp.*
- c. *Pasteurella multocida*
- d. *Pseudomonas aeruginosa*

78. *Pseudomonas aeruginosa* has the following cultural characteristics on solid media:

- a. large pigmented colonies in yellowish white of carotenoid origin, not diffusible in the media
- b. round colonies, pigmented in bluish green, diffusible in the media
- c. gives off a pleasant odor due to aminoacetophenone
- d. gives off a putrid odor due to the production of hydrogen sulfide

79. Bacteria from the genus *Brucella* show an increased tropism to:

- a. the digestive tract
- b. the respiratory system
- c. the genital tract
- d. the nervous system

80. Causes brucellosis in pigs:

- a. *Brucella melitensis*
- b. *Brucella abortus*
- c. *Brucella suis*
- d. *Brucella neotomae*

81. Which of the following bacteria form “R” type colonies in primary cultures:

- a. *Staphylococcus spp.*

- b. *Streptococcus spp.*
- c. *Bacillus anthracis*
- d. *Mycobacterium tuberculosis*

82. Bacteria from the genus *Mycobacterium*:

- a. Can be stained by the Ziehl-Neelsen method due to the lipids in the cell wall
- b. Requires an incubation period of 24-48 hours
- c. Requires an incubation period of 15-70 days
- d. is stained by the Giemsa method

83. The species with the widest spectrum of pathogenicity from the genus *Mycobacterium* is:

- a. *M. bovis*
- b. *M. tuberculosis*
- c. *M. avium*
- d. *M. leprae*

84. The pathogenicity factor in tuberculosis bacilli is represented by:

- a. the presence of the capsule,
- b. Trehalose 6,6'-dimycolate
- c. the presence of fimbriae
- d. the "cord" factor.

85. Pathogenic strains of *Mycobacterium* grow in:

- a. 10-15 days
- b. 15-30 days
- c. 30-90 days
- d. 1-2 days

86. Mycobacteria are grown on special ovalbumin-containing media such as:

- a. Lowenstein
- b. Levin
- c. Petragnani
- d. Chapman

87. Form "S" type colonies in primary cultures:

- a. *Staphylococcus spp.*
- b. *Streptococcus spp.*
- c. *Bacillus spp.*
- d. *Escherichia coli*

88. *Salmonella* pluripathogenic serotypes, with a broad spectrum of pathogenicity, are:

- a. *S. abortus ovis*
- b. *S. typhi*
- c. *S. enteritidis*

d. *S. typhimurium*

89. The *Enterobacteriaceae* family groups bacteria whose natural ecological niche is:

- a. the soil
- b. skin and mucous membranes
- c. digestive tract (large intestine)
- d. respiratory mucosa

90. *Salmonella* immobile serotypes are:

- a. *S. abortus equi*
- b. *S. abortus ovis*
- c. *S. gallinarum pullorum*
- d. *S. enteridis*

91. Which of the following tests are used to determine the pathogenicity of staphylococci:

- a. Catalase test
- b. Hemolysis test
- c. Citrated rabbit plasma coagulation test
- d. Oxidase test

92. The following tests are used to differentiate staphylococci from other Gram-positive cocci:

- a. oxidase test
- b. catalase test
- c. coagulase test
- d. hemolysis test

93. The etiological agent of avian cholera and haemorrhagic sepsis in cattle is:

- a. *Streptococcus zooepidemicus*
- b. *Listeria monocytogenes*
- c. *Pasteurella multocida*
- d. *Pseudomonas aeruginosa*

94. In smears from pathological materials, is stained bipolar with methylene blue:

- a. *Staphylococcus aureus*
- b. *Pasteurella multocida*
- c. *Mycobacterium spp.*
- d. *Escherichia coli*

95. Among the bacteria studied, the following may be transmitted through dirty (contaminated) water and the following is examined on slide with slide cover preparations in the dark field:

- a. streptococci
- b. *Mycobacterium tuberculosis*
- c. *Brucella spp.*

d. leptospires

96. The conduct of the bacteriological diagnosis in colibacillosis goes through the following stages:

- a. Isolation of the strain from the pathological material
- b. Identification of the isolated strain
- c. Demonstration of the pathogenicity of the isolated strain
- d. Classification of the strain into serogroups and serotypes

97. Which of the bacteria studied is considered the most mobile bacterium:

- a. *E coli*
- b. *Salmonella spp.*
- c. *Proteus spp.*
- d. *Pasteurella multocida*

98. Which of the following statements is true regarding the family *Enterobacteriaceae*:

- a. The ecological niche is the digestive tract (large intestine);
- b. It has an accentuated polymorphism, but the cocobacillary forms predominates
- c. Ferments glucose, often with gas production
- d. They are Gram negative, non-spore forming

99. Humans and horses are vaccinated for tetanus immunoprophylaxis with:

- a. antitetanic serum
- b. live attenuated vaccine
- c. Tetanus anatoxin inactivated with formalin and heat
- d. mutant strain 1190R

100. For differential diagnosis between *Escherichia coli* and other enterobacteriaceae, the following media are used:

- a. Chapmann
- b. Levin, MacConkey, Simmons
- c. MIU, TSI
- c. Lovenstein-Jensen, Petraghani

## **VII. PATHOLOGICAL ANATOMY**

1. The persistence of the oval hole of the heart after birth causes:

- a. cardiac hyperplasia
- b. **the mixing of arterial and venous blood**
- c. stenosis of the pulmonary artery
- d. tumors of the heart

2. Granulomatous bronchopneumonia may be seen in animals suffering from:



- a. parvovirus
- b. influenza
- c. tuberculosis**
- d. pasteurellosis

3. Chylopericardium represents:

- a. the accumulation of blood inside the pericardial cavity
- b. the presence of suffusions on the pericardial walls
- c. the accumulation of puss inside the pericardial cavity
- d. the accumulation of lymph inside the pericardial cavity**

4. The presence inside the pericardial cavity of increased amounts of citrine liquid that coagulates when comes into contact with air is termed:

- a. serous pericarditis**
- b. hydropericardium
- c. pericardial empyema
- d. purulent pericarditis

5. Fibrous pericarditis occurs in:

- a. Marek disease in poultry
- b. pyobacillosis in pigs
- c. gout in pigs
- d. salmonellosis in pigs and poultry**

6. Myocardial steatosis may be seen in:

- a. mycoplasmosis
- b. young animals
- c. fattening animals**
- d. tuberculosis

7. Cardiac dilatation is translated macroscopically into:

- a. thickened myocardium and narrowed cavities
- b. thickened myocardium and widen cavities
- c. thin myocardium and widen cavities**
- d. thickened pericardium

8. Thrombosis is:

- a. a circulatory change of the blood vessels**
- b. a distrophy of the veins
- c. an inflammation of the blood vessels
- d. a synonym of embolism

9. Granulomatous myocarditis may be seen in:

- a. echinococcosis, cysticercosis**

- b. pyobacillosis, mycoplasmosis
- c. pasteurellosis, pseudomonosis
- d. acute colibacillosis, infections with *Erysipelothrix rhusiopathie*

10. Fibroelastosis manifests through:

- a. brown areas located on the epicardium
- b. bright red areas located on the endocardium
- c. thickening of the endocardium**
- d. fibrotic areas inside the myocardium

11. Based on its topography endocarditis may be:

- a. acute, chronic
- b. valvular, parietal, trabecular, papillary**
- c. septic, aseptic
- d. primary, secondary

12. Fibrinous bronchopneumonia:

- a. has four stages: filling, red hepatization, grey hepatization, resolution**
- b. is characterized by the presence of multiple abscesses
- c. manifests through the presence of catarrhus
- d. has as main characteristic the increasing number of collagen fibers

13. Chronic infections with streptococci and rujet bacillus may cause:

- a. granulomas
- b. valvular ulcero-vegetative endocarditis**
- c. serous pericarditis
- d. cardiac tumors

14. Viral, chlamydial and mycoplasmal infections produce:

- a. lymphohistiocytic bronchopneumonia**
- b. purulent bronchopneumonia
- c. granulomatous bronchopneumonia
- d. gangrenous bronchopneumonia

15. Phlebitis is a term that defines:

- a. the inflammation of the endocardium
- b. a dystrophic process of the arteries
- c. an inflammation of the veins**
- d. the vehiculation of emboli through the blood stream

16. Aneurysms are:

- a. areas of hypertrophy in the myocardium
- b. an expresion of granulomatous inflammation

**c. permanent dilatations in the wall of the arteries**

d. cholesterol plaques

17. Pneumoconiosis is a term that defines:

**a. the inhalation of exogenous dust particles**

b. a type of fibrinous bronchopneumonia

c. a parasitary infestation of the lungs

d. a mineral dystrophy of the lung

18. Pulmonary passive congestion is expressed macroscopically through:

a. bright red color, decreased volume, light floating at the floating test

b. pink color, normal volume, granular sectioned surface

**c. dark red color, increased volume, large amount of blood on section**

d. marbled aspect, dry sectioned surface, increased consistency

19. Haemopericardium means:

a. the accumulation of air inside the pericardial cavity

b. the accumulation of exudate inside the pericardial cavity

**c. the accumulation of blood inside the pericardial cavity**

d. the welding of the the two pericardial walls

20. Parasitic arteritis may be caused by:

**a. *Strongylus vulgaris* in horses**

b. *Pasteurella spp.* in pigs

c. *Staphylococcus spp.* in carnivores

d. all of the above

21. Umbilical phlebitis usually evolves in a:

a. lymphohistiocytic form

b. diffuse giant cell form

**c. purulent form**

d. catarrhal form

22. Aortic calcification may occur in:

**a. hypervitaminosis D**

b. vitamin E deficiency

c. congestion

d. selenium deficiency

23. Viral arteritis is characterized by:

a. dilatation of the lumen

**b. fibrinoid or hyaline degeneration of the intima**

c. the presence of parasitic larvae

d. the presence of granulomas

24. Verrucous endocarditis follows:

- a. bronchopneumonia
- b. ulcero-vegetative endocarditis

**c. simple endocarditis**

- d. aneurysms

25. Necrotic spleen is frequently found in birds in:

**a. pasteurellosis**

- b. tuberculosis

**c. histomoniasis**

- d. E vitamime deficiency

26. Granulomatous inflammation of the spleen is particularly common in:

- a. parvovirosis

**b. coligranulomatosis**

**c. tuberculosis**

- d. necrobacillosis

27. Macroscopic the kidneys in fatty dystrophy are:

**a. slightly enlarged, yellow**

- b. smaller in size, brown
- c. no macroscopical changes
- d. normal in size and white

28. Amyloid nephrosis or renal amyloidosis, occurs mainly in:

**a. cattle and poultry in chronic inflammation**

**b. in malignant tumors**

- c. visceral gout
- d. topographic changes of the spleen

29. In avian gout, the microscopically examination of the kidneys reveals:

**a. uric acid and urate crystals in the tubules, along with necrosis and desquamation of the renoepitheliums**

- b. hemorrhages
- c. hyaline cylinders in tubes
- d. lipidic cylinders

30. Renal infarction is typically:

- a. red
- b. venous
- c. hemorrhagic

**d. white or anemic**

31. Purulent glomerulonephritis means:

**a. accumulation of purulent exudate in the glomerular space**

- b. purulent exudate in the pelvis
- c. accumulation of purulent exudate in the interstitial space
- d. purulent exudate in the urinary tubes

32. In membranoproliferative glomerulonephritis are involved:

- a. circulating immune complexes
- b. blood flow disorders
- c. alimentary deficiencies
- d. growth disorders

33. Ascending nephritis are the result of:

**a. infections from distal urinary tract (urethra, urinary bladder, ureters)**

- b. pathogens which arrive in kidney through blood vessels
- c. renal hypoplasia
- d. renal dystrophies

34. Red splenic infarctus:

**a. is frequently seen in swine and has a triangular shape**

- b. is frequently seen in birds
- c. is caused by hyperemia
- d. originates in the lymphatic vessels

35. Small translucent lumps visible on the sectioned surface of the spleen may be seen in which lesion:

- a. congestion
- b. jaundice
- c. amyloid lienosis**
- d. hypostasis

36. Parasitic anemia with the destruction of red blood cells will cause in the spleen:

- a. fibrinoid lienosis
- b. amyloid lienosis
- c. infarctus
- d. hemosiderosis**