Q1. Which of the following epithelial tissues is specialized for diffusion and filtration?

A. Columnar epithelium
B. Squamous epithelium
C. Ciliated epithelium
D. Cuboidal epithelium

✅ Answer: B. Squamous epithelium
Explanation:
Simple squamous epithelium forms thin, flat cells that allow diffusion and filtration; found in lungs and capillaries.

 Q2. Which type of connective tissue connects muscles to bones?

A. Ligament
B. Areolar tissue
C. Tendon
D. Cartilage

✅ Answer: C. Tendon
Explanation:
Tendons connect muscle to bone and are made of dense regular connective tissue rich in collagen fibres.

 Q3. The matrix of cartilage is secreted by:

A. Chondrocytes
B. Osteoblasts
C. Fibroblasts
D. Adipocytes

✅ Answer: A. Chondrocytes
Explanation:
Chondrocytes are the cells in cartilage that secrete the matrix made of chondrin, a protein-carbohydrate complex.

 Q4. Match the following:

| A. Areolar tissue | 1. Bone cells

| B. Chondrocyte | 2. Loose connective tissue
| C. Osteocyte | 3. Cartilage cell
| D. Neuron | 4. Functional unit of nervous tissue

Options:
A. A-2, B-3, C-1, D-4
B. A-3, B-2, C-4, D-1
C. A-1, B-2, C-3, D-4
D. A-2, B-1, C-3, D-4

✅Answer: A. A-2, B-3, C-1, D-4
Explanation:

Areolar tissue = Loose connective tissue

Chondrocyte = Cartilage cell

Osteocyte = Mature bone cell

Neuron = Structural and functional unit of nervous system

 Q5. Which one of the following is a correct statement?

A. Ligaments connect muscles to bones
B. Tendons are elastic and connect bones
C. Ligaments connect bones to bones and are elastic
D. Tendons are non-elastic and connect bones

✅Answer: C. Ligaments connect bones to bones and are elastic
Explanation:
Ligaments are slightly elastic and connect bone to bone, while tendons are non-elastic and connect muscle to bone.

 Q6. Identify the correct feature of cardiac muscles:

A. Multinucleate and unbranched
B. Involuntary and non-striated
C. Uninucleate, branched and striated
D. Voluntary and unbranched

✅Answer: C. Uninucleate, branched and striated
Explanation:
Cardiac muscles are involuntary, branched, striated, and uninucleate; found in the heart wall.

 **Q7. Assertion (A): Skeletal muscles work under voluntary control.

Reason (R): They are made up of smooth muscle fibres.**

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

✅Answer: C. A is true but R is false
Explanation:
Skeletal muscles are under voluntary control, but they are made of striated, not smooth muscle fibres.

 Q8. Which connective tissue acts as a reservoir for fat storage?

A. Ligament
B. Cartilage
C. Adipose tissue
D. Areolar tissue

✅Answer: C. Adipose tissue
Explanation:
Adipose tissue stores fat in large vacuoles and provides insulation and energy reserve.

 Q9. Which among the following is a simple epithelium lining the inner surface of blood vessels?

A. Cuboidal epithelium
B. Columnar epithelium
C. Endothelium
D. Ciliated epithelium

✅Answer: C. Endothelium
Explanation:

Endothelium is a type of simple squamous epithelium lining blood vessels, allowing smooth flow of blood.

 Q10. Which connective tissue joins skin to muscles?

A. Adipose
B. Cartilage
C. Areolar
D. Ligament

✅Answer: C. Areolar
Explanation:
Areolar tissue is a loose connective tissue that connects skin to underlying muscles and supports internal organs.

 Q11. In cockroach, the exoskeleton is composed of:

A. Chitin
B. Keratin
C. Cellulose
D. Collagen

✅Answer: A. Chitin
Explanation:
The exoskeleton of cockroach is made of chitin, a nitrogenous polysaccharide, which provides protection and support.

 Q12. Which of the following is not a part of the cockroach alimentary canal?

A. Crop
B. Gizzard
C. Malpighian tubules
D. Hepatic caecae

✅Answer: C. Malpighian tubules
Explanation:
Malpighian tubules are part of the excretory system, not the alimentary canal. The alimentary canal includes crop, gizzard, and hepatic caecae.

 Q13. In cockroach, blood flows in:

A. Closed circulatory system
B. Arteries and veins
C. Sinuses (open circulation)
D. Capillaries

✅Answer: C. Sinuses (open circulation)
Explanation:
Cockroach has an open circulatory system; blood (haemolymph) flows freely in body sinuses, not confined to vessels.

 Q14. Match the following (Cockroach anatomy):

| A. Crop | 1. Grinding
| B. Gizzard | 2. Temporary food storage
| C. Hepatic caecae | 3. Secretion of digestive enzymes
| D. Malpighian tubules | 4. Excretion

Options:
A. A-2, B-1, C-3, D-4
B. A-1, B-2, C-3, D-4
C. A-2, B-3, C-1, D-4
D. A-3, B-1, C-2, D-4

✅Answer: A. A-2, B-1, C-3, D-4
Explanation:

Crop stores food

Gizzard grinds food

Hepatic caecae secrete digestive enzymes

Malpighian tubules help in excretion

 Q15. Which pair of mouthparts in cockroach forms the lower lip?

A. Mandibles
B. Maxillae
C. Labium
D. Labrum

✅Answer: C. Labium
Explanation:
The labium forms the lower lip, derived from fused second pair of maxillae.

 **Q16. Assertion (A): The cockroach has a 13-chambered heart.

Reason (R): Each chamber opens into the next through valved openings.**

A. Both A and R are true, and R is the correct explanation of A
B. Both A and R are true, but R is not the correct explanation of A
C. A is true but R is false
D. A is false but R is true

✅Answer: A. Both A and R are true, and R is the correct explanation of A
Explanation:
Cockroach heart has 13 chambers, with valved ostia that allow unidirectional flow of haemolymph.

 Q17. In cockroach, the compound eyes provide:

A. Monocular vision
B. Colour vision
C. Mosaic vision
D. Depth perception

✅Answer: C. Mosaic vision
Explanation:
Cockroach eyes are compound, composed of many ommatidia, producing a mosaic vision, especially effective at night.

 Q18. Which of the following statements is correct regarding cockroach reproductive system?

A. Male has a pair of ovaries
B. Female has mushroom glands

C. Spermathecae are present in female
D. Testes are found in the abdomen of female

✅Answer: C. Spermathecae are present in female
Explanation:
Spermathecae in female cockroach store sperms after copulation. Males have mushroom glands, females have ovaries.

 Q19. The respiratory openings in cockroach are called:

A. Bronchioles
B. Spiracles
C. Alveoli
D. Gills

✅Answer: B. Spiracles
Explanation:
Spiracles are small openings on the body surface that lead to tracheal tubes, allowing respiration.

 Q20. The number of segments in the abdomen of adult male cockroach is:

A. 8
B. 9
C. 10
D. 11

✅Answer: C. 10
Explanation:
The abdomen of adult male cockroach is composed of 10 segments; the 11th segment is reduced.

 Q21. In frog, respiration occurs through all of the following except:

A. Skin
B. Gills
C. Lungs
D. Buccal cavity

✅Answer: B. Gills
Explanation:
Adult frogs respire through skin (cutaneous), lungs (pulmonary), and buccal cavity (buccopharyngeal). Gills are present only in larval stages (tadpole).

❓ Q22. The chamber of frog's heart which receives blood from lungs is:

A. Right auricle
B. Sinus venosus
C. Left auricle
D. Ventricle

✅Answer: C. Left auricle
Explanation:
Oxygenated blood from lungs enters the left auricle, while deoxygenated blood enters the right auricle via sinus venosus.

❓ Q23. Which of the following is excreted in maximum amount in frogs?

A. Uric acid
B. Ammonia
C. Urea
D. Creatinine

✅Answer: C. Urea
Explanation:
Frogs are ureotelic (excrete urea) in adult stage, though the tadpole excretes ammonia (ammonotelic).

❓ Q24. The cloaca in frog is a common chamber for:

A. Digestive and excretory systems only
B. Reproductive and excretory systems only
C. Reproductive, excretory and digestive systems
D. Only excretory system

✅Answer: C. Reproductive, excretory and digestive systems
Explanation:
Cloaca is a common opening for urine, faeces and gametes in frogs.

 Q25. Which of the following statements is incorrect about frog's circulatory system?

A. Heart is three-chambered
B. Sinus venosus is present
C. Truncus arteriosus arises from ventricle
D. Blood flows in closed sinuses

✅Answer: D. Blood flows in closed sinuses
Explanation:
Frogs have a closed circulatory system, but blood does not flow in sinuses (sinuses are a feature of open circulation like in insects).

 Q26. Match the following (Frog organs & functions):

| A. Vomerine teeth | 1. Secretion of bile
| B. Liver | 2. Holding and grinding prey
| C. Cloaca | 3. Common exit
| D. Stomach | 4. Capturing prey

Options:
A. A-4, B-1, C-3, D-2
B. A-1, B-4, C-3, D-2
C. A-2, B-1, C-4, D-3
D. A-3, B-2, C-1, D-4

✅Answer: A. A-4, B-1, C-3, D-2
Explanation:

Vomerine teeth help in prey capture

Liver secretes bile

Cloaca is a common exit

Stomach helps in digestion/grinding food

 **Q27. Assertion (A): In frog, RBCs are nucleated.

Reason (R): Amphibians are cold-blooded vertebrates.**

A. Both A and R are true, and R is the correct explanation of A
B. Both A and R are true, but R is not the correct explanation
C. A is true, R is false
D. A is false, R is true

✅ Answer: B. Both A and R are true, but R is not the correct explanation
Explanation:
Frog's RBCs are nucleated (unlike mammalian RBCs), but this is not because they are cold-blooded.

 Q28. The number of lobes in frog's liver is:

A. Two
B. Three
C. Four
D. One

✅ Answer: B. Three
Explanation:
Frog's liver is tri-lobed – one of the largest internal organs, with a gall bladder beneath it.

 Q29. Which of the following structures in frogs is involved in sound production?

A. Glottis
B. Buccal cavity
C. Vocal sacs
D. Cloaca

✅ Answer: C. Vocal sacs
Explanation:
Male frogs have vocal sacs that amplify sound during croaking for mating calls.

 Q30. The kidneys in frog are located:

A. Anterior, dorsal side

B. Posterior, ventral side
C. Posterior, dorsal side
D. Anterior, ventral side

✅Answer: C. Posterior, dorsal side
Explanation:
Frog kidneys are elongated, bean-shaped structures situated posteriorly on the dorsal side of abdominal cavity.

 Q31. Match the following components of connective tissue with their functions:

| A. Collagen fibers | 1. Provide elasticity
| B. Mast cells | 2. Secrete histamine
| C. Ligament | 3. Join bone to bone
| D. Elastin fibers | 4. Provide tensile strength

Options:
A. A-4, B-2, C-3, D-1
B. A-1, B-3, C-2, D-4
C. A-2, B-1, C-4, D-3
D. A-3, B-2, C-1, D-4

✅Answer: A. A-4, B-2, C-3, D-1
Explanation:

Collagen → tensile strength

Mast cells → histamine

Ligaments → bone to bone

Elastin → elasticity

 Q32. Which of the following is a simple epithelial tissue?

A. Stratified squamous epithelium
B. Cuboidal epithelium
C. Transitional epithelium

D. Compound columnar epithelium

✅Answer: B. Cuboidal epithelium
Explanation:
Cuboidal is a simple epithelium (single layer), unlike stratified or compound types.

 **Q33. Assertion (A): Areolar tissue is a loose connective tissue.

Reason (R): It provides structural framework to bones.**

A. Both A and R are true, and R explains A
B. Both A and R are true, but R does not explain A
C. A is true, R is false
D. A is false, R is true

✅Answer: C. A is true, R is false
Explanation:
Areolar tissue supports organs, not bones. Bones are supported by skeletal tissue.

 Q34. Which of the following is not found in cockroach’s alimentary canal?

A. Crop
B. Gizzard
C. Malpighian tubules
D. Gastric caeca

✅Answer: C. Malpighian tubules
Explanation:
Malpighian tubules are excretory structures, not part of the alimentary canal.

 Q35. How many pairs of spiracles are present in cockroach?

A. 6
B. 10
C. 2
D. 4

✅Answer: B. 10

Explanation:
Cockroach has 10 pairs of spiracles: 2 thoracic + 8 abdominal.

 Q36. Identify the incorrect match:

A. Neuroglia – Support to neurons
B. Cartilage – Solid, pliable matrix
C. Tendon – Connects bone to bone
D. Blood – Fluid connective tissue

✅Answer: C. Tendon – Connects bone to bone
Explanation:
Tendon connects muscle to bone, while ligament connects bone to bone.

 Q37. In cockroach, which part of the gut helps in food grinding?

A. Pharynx
B. Crop
C. Gizzard
D. Ileum

✅Answer: C. Gizzard
Explanation:
Gizzard has cuticular plates and muscles for grinding food.

 Q38. Match the structures in frog with their functions:

| A. Tympanum | 1. Sound perception
| B. Gall bladder | 2. Bile storage
| C. Fat bodies | 3. Energy reserve
| D. Ventricle | 4. Pumps blood

Options:
A. A-1, B-2, C-3, D-4
B. A-2, B-3, C-4, D-1
C. A-4, B-1, C-2, D-3
D. A-3, B-4, C-1, D-2

✅Answer: A. A-1, B-2, C-3, D-4
Explanation:
Self-explanatory functional matches.

 Q39. Which tissue has branching fibers and intercalated discs?

A. Skeletal muscle
B. Smooth muscle
C. Cardiac muscle
D. Areolar tissue

✅Answer: C. Cardiac muscle
Explanation:
Cardiac muscles are branched, involuntary, and have intercalated discs.

 Q40. Which of the following is not a function of epithelial tissue?

A. Secretion
B. Absorption
C. Protection
D. Conduction

✅Answer: D. Conduction
Explanation:
Conduction is a function of nervous tissue, not epithelial.

 Q41. Select the correct statement about cartilage:

A. Cartilage contains blood vessels
B. Cartilage has a mineralized matrix
C. It is found in joints, trachea and pinna
D. It connects bones and muscles

✅Answer: C. It is found in joints, trachea and pinna
Explanation:
Cartilage is avascular, has flexible matrix, and found at structural sites.

 Q42. How many pairs of ganglia are present in cockroach’s thoracic region?

A. 2
B. 3
C. 4
D. 6

✅Answer: B. 3
Explanation:
Cockroach has three thoracic ganglia, one in each segment (prothorax, mesothorax, metathorax).

 Q43. The bone cells are called:

A. Chondrocytes
B. Osteocytes
C. Neurons
D. Erythrocytes

✅Answer: B. Osteocytes
Explanation:
Osteocytes are mature bone cells embedded in bone matrix.

 **Q44. Assertion (A): Cardiac muscles contract involuntarily.

Reason (R): They have a central nucleus and intercalated discs.**

A. Both A and R are true, and R explains A
B. Both A and R are true, but R does not explain A
C. A is true, R is false
D. A is false, R is true

✅Answer: A. Both A and R are true, and R explains A
Explanation:
Their structure helps in rhythmic involuntary contraction.

 Q45. Which type of connective tissue connects skin to underlying muscles?

A. Cartilage

B. Areolar tissue
C. Adipose tissue
D. Dense regular connective tissue

✅Answer: B. Areolar tissue
Explanation:
Areolar tissue is loose and found between skin and muscles.