Structural Organisation in Animals

Question1

Which of the following is/are present in female cockroach?
A. Collateral gland
B. Mushroom gland
C. Spermatheca
D. Anal style
E. Phallic gland

Choose the most appropriate answer from the options given below:

[NEET 2024 Re]

Options:

A.

B and D only

B.

B and E only

C.

A only

D.

A and C only

Answer: D

Solution:

The correct answer is option (4) as

A.	Collateral gland	Present in female cockroaches It is a pair of gland that secrete the hard egg case or ootheca
B.	Mushroom gland	Absent in female cockroaches Present in males in the 6^{th} to 7^{th} abdominal segments
C.	Spermatheca	Present in female cockroaches in the 6^{th} abdominal segment
D.	Anal style	Absent in female cockroaches Present in males and project backwardly from 9^{th} sternum
E.	Phallic gland	Absent in female cockroaches

Present in males as a large club shaped gland located below the ejaculatory duct and reaches anteriorly up to the 5th abdominal segment.

Thus, only structures represented by 'A' and 'C' are present in female cockroaches.

Whereas, structures indicated by 'B', 'D' and 'E' are present in males.

Options (1) and (2) are incorrect as these structures are present in males.

Option (3) is incorrect as it represents only a single structure which is present in female cockroaches.

Question2

In which of the following connective tissues, the cells secrete fibres of collagen or elastin?
A. Cartilage
B. Bone
C. Adipose tissue
D. Blood
E. Areolar tissue

Choose the most appropriate answer from the options given below :

[NEET 2024 Re]

Options:

A.

B, C, D and E only

B.

A, B, C and E only

C.

B, C and D only

D.

A, C and D only

Answer: B

Solution:

The correct answer is option (2) as blood does not contain fibre secreting cells called as fibroblasts. Whereas, cartilage, bone, adipose tissue and areolar tissue contain cells that secrete fibres of collagen or elastin or structural protein.

The other options (1), (3) and (4) are incorrect as they mention blood which lacks fibroblasts.

Question3

Match List I with List II :

	List-I		List-II
A.	Squamous Epithelium	I	Goblet cells of alimentary canal
B.	Ciliated Epithelium	II	Inner lining of pancreatic ducts

C.	Glandular Epithelium	III	Walls of blood vessels
D.	Compound Epithelium	IV	Inner surface of Fallopian tubes

Choose the correct answer from the options given below :

[NEET 2024 Re]

Options:

A.

A-II, B-III, C-I, D-IV

B.

A-II, B-IV, C-III, D-I

C.

A-III, B-I, C-II, D-IV

D.

A-III, B-IV, C-I, D-II

Answer: D

Solution:

The correct answer is option (4) as

• The simple squamous epithelium is involved in functions like forming a diffusion boundary and is found in the walls of blood vessels.

• The main function of ciliated epithelium is to move particles in a specific direction over the epithelium and is present in the inner surface of fallopian tubes.

• Goblet cells of the alimentary canal are examples of unicellular glands which consist of isolated glandular cells.

• Compound epithelium is made of more than one layer of cells and is found in the inner lining of pancreatic ducts.

Question4

In both sexes of cockroach, a pair of jointed filamentous structures called anal cerci are present on

[NEET 2024]

Options:

A.

5^{th} segment

B.

10^{th} segment

C.

8^{th} and 9^{th} segment

D.

11^{th} segment

Answer: B

Solution:

Correct answer is option (2), because in both sexes of cockroach, 10^{th} segment bears a pair of jointed filamentous structures called anal cerci.

Options (1), (3) and (4) are incorrect because 5^{th} ,8^{th} and 9^{th} segments do not bear such structures. In adult cockroaches only 10^{th} segments are present in abdomen. 11^{th} abdominal segment is absent.

Question5

Match List I with List II related to digestive system of cockroach.

	List-I		List-II
A.	The structures used for storing of food	I.	Gizzard
B.	Ring of 6-8 blind tubules at junction of foregut and midgut.	II.	Gastric Caeca
C.	Ring of 100-150 yellow coloured thin filaments at junction of midgut and hindgut.	III.	Malpighian tubules
D.	The structures used for grinding the food.	IV.	Crop

Choose the correct answer from the options given below:

[NEET 2024]

Options:

A.

A-IV, B-II, C-III, D-I

B.

A-I, B-II, C-III, D-IV

C.

A-IV, B-III, C-II, D-I

D.

A-III, B-II, C-IV, D-I

Answer: A

Solution:

The correct answer is option no. (1) as

	List-I		List-II
A.	The structure used for griding the food particles	-	Gizzard

B.	The structure used for storing of food	-	s
C.	Ring of 6-8 blind tubules at junction of foregut and midgut which assists in secretion of digestive juices	-	Gastric Caeca
D.	Ring of 100-150 yellow coloured thin filaments at junction of midgut and hindgut which assists in elimination of nitrogenous wastes	-	Malpighian tubules

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Question6

Match List I with List II:

	List-I		List-II
A.	Unicellular glandular epithelium	I.	Salivary glands
B.	Compound epithelium	II.	Pancreas
C.	Multicellular glandular epithelium	III.	Goblet cells of alimentary canal
D.	Endocrine glandular epithelium	IV.	Moist surface of buccal cavity

Choose the correct answer from the options given below:

[NEET 2024]

Options:

A.

A-II, B-I, C-III, D-IV

B.

A-IV, B-III, C-I, D-II

C.

A-III, B-IV, C-I, D-II

D.

A-II, B-I, C-IV, D-III

Answer: C

Solution:

The correct answer is option no. (3) as

	List-I		List-II
A.	Unicellular glandular epithelium	III.	Goblet cells of alimentary canal
B.	Compound epithelium	IV.	Moist surface of buccal cavity
C.	Multicellular glandular epithelium	I.	Salivary glands
D.	Endocrine glandular epithelium	II.	Pancreas

Question7

Given below are two statements:
Statement I: Ligaments are dense irregular tissue.
Statement II: Cartilage is dense regular tissue.
In the light of the above statements, choose the correct answer from the options given below:

[NEET 2023]

Options:

A.

Both Statement I and Statement II are false

B.

Statement I is true but Statement II is false

C.

Statement I is false but Statement II is true

D.

Both Statement I and Statement II are true

Answer: A

Solution:

Solution:

Option (1) is the correct answer because ligament is an example of dense regular connective tissue so Statement I is incorrect and cartilage is an example of specialised connective tissue and not dense regular tissue. Therefore Statement II is also incorrect.

Question8

Match List I with List II.

List I	List II
A. Taenia	I. Nephridia
B. Paramoecium	II. Contractile vacuole
C. Periplaneta	III. Flame cells
D. Pheretima	IV. Urecose gland

Choose the correct answer from the options given below:

[NEET 2023]

Options:

A.

A-I, B-II, C-IV, D-III

B.

A-III, B-II, C-IV, D-I

C.

A-II, B-I, C-IV, D-III

D.

A-I, B-II, C-III, D-IV

Answer: B

Solution:

Solution:

Option (2) is the correct answer because protonephridia or flame cells are the excretory structures inplatyhelminthes. Nephridia are the tubular excretory structures of earthworms (Pheretima) and otherannelids. Single celled organisms like Paramoecium have contractile vacuoles for excretion. Urecose glands.are present in cockroach

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Question9

Which of the following is characteristic feature of cockroach regarding sexual dimorphism?

[NEET 2023]

Options:

A.

Presence of anal styles

B.

Presence of sclerites

C.

Presence of anal cerci

D.

Dark brown body colour and anal cerci

Answer: A

Solution:

Solution:

Option (1) is the correct answer because anal styles are present in male cockroaches and absent in female cockroaches.

Option (2), (3) and (4) are not the correct answers because sclerites, anal cerci and dark brown body colour are common features of both male and female cockroaches.

Question10

Match List I with List II.

List I	List II
A. Mast cells	I. Ciliated epithelium
B. Inner surface of bronchiole	II. Areolar connective tissue
C. Blood	III. Cuboidal epithelium
D. Tubular parts of nephron	IV. Specialised connective tissue

Choose the correct answer from the options give below:

[NEET 2023]

Options:

A.

A-II, B-III, C-I, D-IV

B.

A-II, B-I, C-IV, D-III

C.

A-III, B-IV, C-II, D-I

D.

A-I, B-II, C-IV, D-III

Answer: B

Solution:

Solution:

Sol. Option (2) is the correct answer because,
● Areolar connective tissue contains fibroblasts (cells that produce and secrete fibres), macrophages and mast cells.
● Inner surface of bronchioles is lined by ciliated epithelium.
● Blood is a specialised connective tissue.
● Tubular parts of nephron are lined by cuboidal epithelium.

Question11

In cockroach, excretion is brought about by-
A. Phallic gland
B. Urecose gland
C. Nephrocytes
D. Fat body
E. Collaterial glands
Choose the correct answer from the options given below:

[NEET 2023]

Options:

A.

A,B and E only

B.

B, C and D only

C.

B and D only

D.

A and E only

Answer: B

Solution:

Solution:

Option (2) is the answer because,

In cockroach, excretion is brought about by Malpighian tubules, fat body, nephrocytes and urecose glands.

Urecose glands are present in male cockroach of some species. They synthesise uric acid. Nephrocytes are large, colourless, ovoid, binucleate cells attached to the dorsal diaphragm in the body cavity. Fat body accumulates, produces and stores uric acid.

Phallic gland is the structure of male reproductive system of cockroach and it secretes the outer layer of spermatophore. Collaterial gland is the structure of female reproductive system of cockroach and it secretes the hard egg-case or ootheca around fertilised eggs.

Question12

The Cockroach is :

[NEET 2023 mpr]

Options:

A.

Ammonotelic only

B.

Uricotelic only

C.

Ureotelic only

D.

Ureotelic and Uricotelic

Answer: B

Solution:

Cockroaches are uricotelic organisms. The process of excretion in cockroaches is performed by Malpighian tubules, which are part of the insect's excretory system. These tubules are lined by glandular and ciliated cells, which absorb

nitrogenous waste products and convert them into uric acid. This uric acid is then excreted out through the hindgut.

The nature of the nitrogenous waste excreted can be species-specific and is often influenced by the organism's environment and water availability. For instance, many bony fishes, aquatic amphibians, and aquatic insects, which have abundant access to water, are ammonotelic and excrete waste in the form of ammonia. In contrast, mammals, many terrestrial amphibians, and marine fishes, which live in environments where water conservation is critical, are ureotelic and excrete waste in the form of urea.

Given these details, the correct answer to the question "The Cockroach is:" would be Option B : Uricotelic only.

Question13

Given below are two statements :

Statement I :
In cockroach, the forewings are transparent and prothoracic in origin.

Statement II :
In cockroach, the hind wings are opaque, leathery and mesothoracic in origin.
In the light of the above statements, choose the correct answer from the options given below :

[NEET 2023 mpr]

Options:

A.

Statement I is correct but Statement II is false

B.

Statement I is incorrect but Statement II is true

C.

Both Statement I and Statement II are true

D.

Both Statement I and Statement II are false

Answer: D

Solution:

In a cockroach :

The first pair of wings (forewings or tegmina) are not transparent and prothoracic in origin, as stated in Statement I. Instead, they are opaque, dark, leathery and originate from the mesothorax.

The second pair of wings (hind wings) are not opaque, leathery and mesothoracic in origin, as stated in Statement II. Instead, they are transparent, membranous and originate from the metathorax.

Question14

	List - I		List - II
(A)	Columnar epithelium	(I)	Ducts of glands
(B)	Ciliated epithelium	(II)	Inner lining of stomach and intestine
(C)	Squamous epithelium	(III)	Inner lining of bronchioles
(D)	Cuboidal epithelium	(IV)	Endothelium

Choose the correct answer from the options given below:

[NEET 2023 mpr]

Options:

A.

(A)-(III), (B)-(II), (C)-(I), (D)-(IV)

B.

(A)-(III), (B)-(II), (C)-(IV), (D)-(I)

C.

(A)-(II), (B)-(III), (C)-(I), (D)-(IV)

D.

(A)-(II), (B)-(III), (C)-(IV), (D)-(I)

Answer: D

Solution:

Explanation :

(A) Columnar epithelium : This type of epithelium consists of tall, slender and column-like cells. It's found in the inner lining of the stomach and intestine where it aids in secretion and absorption. So, (A) matches with (II).

(B) Ciliated epithelium : These are typically columnar or cuboidal cells that have cilia (small hair-like projections) on their surface. Ciliated epithelium is usually found in the bronchioles (air passages in the lungs) and in the fallopian tubes in females. The cilia help to move mucus and other substances. So, (B) matches with (III).

(C) Squamous epithelium : Squamous cells are thin and flat, similar in shape to fish scales (the word "squamous" means scaly). This type of epithelium forms the endothelium (the lining of the heart, blood vessels, and lymphatic vessels). So, (C) matches with (IV).

(D) Cuboidal epithelium : These cells are cube-shaped and are most commonly found in the ducts of glands and kidney tubules, where they assist with secretion and absorption. So, (D) matches with (I).

Question15

Which of the following types of epithelium is present in the bronchioles and Fallopian tubes?
[NEET Re-2022]

Options:

A. Stratified squamous epithelium

B. Simple squamous epithelium

C. Simple columnar epithelium

D. Ciliated epithelium

Answer: D

Solution:

Ciliated epithelium is mainly present in the inner surface of hollow organs like bronchioles and Fallopian tubes.

Question16

Choose the correct statement about a muscular tissue: [NEET Re-2022]

Options:

A. Smooth muscles are multinucleated and involuntary.

B. Skeletal muscle fibres are uninucleated and found in parallel bundles.

C. Intercalated discs allow the cardiac muscle cells to contract as a unit.

D. The walls of blood vessels are made up of columnar epithelium.

Answer: C

Solution:

Solution:

Smooth muscles are uninucleated and involuntary.

Skeletal muscle fibres are multinucleated and bundled together in a parallel fashion.

Communication junctions (Gap junctions) in the intercalated discs of cardiac muscles at some fusion points allow the cells to contract as a unit.

Wall of blood vessels is lined by simple squamous epithelial tissue.

Question17

List - I	List - II
(a) Crop	(i) grinding the food particles
(b) Proventriculus	(ii) secretion of digestive juice
(c) Hepatic caecae	(iii) removal of nitrogenous waste
(d) Malpighian tubules	(iv) storage of food

Choose the correct answer from the options given below .
[NEET Re-2022]

Options:

A. (a) - (i), (b) - (iv), (c) - (iii), (d) - (ii)

B. (a) - (iv), (b) - (i), (c) - (ii), (d) - (iii)

C. (a) - (iii), (b) - (ii), (c) - (i), (d) - (iv)

D. (a) - (ii), (b) - (iv), (c) - (i), (d) - (iii)

Answer: B

Solution:

- Crop - storage of food
- Proventriculus - grinding of food
- Hepatic caecae - secretion of digestive juices
- Malphighian tubules - Removal of excretory products

Question18

Choose the correct statements :
(a) Bones support and protect softer tissues and organs
(b) Weight bearing function is served by limb bones
(c) Ligament is the site of production of blood (d) Adipose tissue is specialised to store fats.
(e) Tendons attach one bone to another. Choose the most appropriate answer from
the options given below
[NEET Re-2022]

Options:

A. (a), (b) and (e) only

B. (a), (b) and (d) only

C. (b), (c) and (e) only

D. (a), (c) and (d) only

Answer: B

Solution:

Solution:

C---Ligament is the site of production of blood cells (false statement).... should be bone marrow

D---Tendons join one bone to another bone (False statement)...should be ligament

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Question19

Excretion in cockroach is performed by all, EXCEPT: [NEET Re-2022]

Options:

A. Hepatic caeca

B. Urecose glands

C. Malpighian tubules

D. Fat body

Answer: A

Solution:

Solution:

A ring of 6−8 blind tubules called Hepatic or gastric caeca is present at the junction of foregut and midgut, which secrete digestive juice.

Question20

Match List-I with List-II

	List-I		List-II
(a)	Bronchioles	(i)	Dense Regular Connective Tissue
(b)	Goblet Cell	(ii)	Loose Connective Tissue
(c)	Tendons	(iii)	Glandular Tissue
(d)	Adipose Tissue	(iv)	Ciliated Epithelium

Choose the correct answer from the options given below:

[NEET-2022]

Options:

A. (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii)

B. (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv)

C. (a) - (ii), (b) - (i), (c) - (iv), (d) - (iii)

D. (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)

Answer: A

Solution:

Option (1) is the correct answer because Ciliated epithelium is mainly present in the inner surface of hollow organs like bronchioles and fallopian tubes. The function is to move particles or mucus in a specific direction over the epithelium.

Some of the columnar or cuboidal cells get specialised for secretion and are called glandular epithelium. Goblet cells are unicellular glands.

Tendons are dense regular connective tissues. They attach skeletal muscles to bones.

Adipose tissue is a type of loose connective tissue located mainly beneath the skin. The cells of this tissue are specialised to store fats.

Question21

Which of the following statements wrongly represents the nature of smooth muscle?
[NEET 2021]

Options:

A. These muscle have no striations

B. They are involuntary muscles

C. Communication among the cells is performed by intercalated discs

D. These muscles are present in the wall of blood vessels

Answer: C

Solution:

● Option (3) is incorrect because intercalated discs are found only in cardiac muscle tissue.
● Smooth muscle fibres are non-striated and involuntary in nature and are present in the wall of blood vessels, uterus, gall bladder, alimentary canal etc

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Question22

Identify the types of cell junctions that help to stop the leakage of the substances across a tissue and facilitation of communication with neighbouring cells via rapid transfer of ions and molecules.
[NEET 2021]

Options:

A. Gap junctions and Adhering junctions, respectively

B. Tight junctions and Gap junctions, respectively

C. Adhering junctions and Tight junctions, respectively.

D. Adhering junctions and Gap junctions, respectively

Answer: B

Solution:

Three types of junctions are found in tissues
● Tight junctions stop leakage of substances fromleaking across a tissue.
● Adhering junctions cement and keep neighbouring cells together.
● Gap junctions or communication junctions facilitate communication between cells by connecting the cytoplasm of adjoining cells.

Question23

Following are the statements about prostomium of earthworm.
(a) It serves as a covering for mouth.
(b) It helps to open cracks in the soil into which it can crawl.
(c) It is one of the sensory structures.
(d) It is the first body segment.
Choose the correct answer from the options given below.
[NEET 2021]

Options:

A. (a), (b) and (c) are correct

B. (a), (b) and (d) are correct

C. (a), (b), (c) and (d) are correct

D. (b) and (c) are corre

Answer: A

Solution:

● The anterior end of the earthworm has mouth which has covering called prostomium.
● Prostomium acts as a wedge to force open cracks in the soil.
● Prostomium has receptors, so it is sensory in function.
● The first body segment of earthworm is the peristomium

Question24

Cuboidal epithelium with brush border of microvilli is found in [2020]

Options:

A. Ducts of salivary gland

B. Proximal convoluted tubule of nephron

C. Eustachian tube

D. Lining of intestine

Answer: B

Solution:

Solution:
(b) Cuboidal epithelium with brush border of microvilli is found in proximal convoluted tubule of nephron (PCT).

Question25

Match the following cell structure with its characteristic feature :

Column-I	Column-II
(a) Tight junctions	(i) Cement neighbouring cells together to form sheet.
(b) Adhering junctions	(ii) Transmit information through chemical to another cells.
(c) Gap junctions	(iii) Establish a barrier to prevent leakage of fluid across epithelial cells.
(d) Synaptic junctions	(iv) Cytoplasmic channels to facilitate communication between adjacent cells.

Select correct option from the following : [2019]

Options:

A. (a)-(iv), (B)-(iii), (C)-(i), (D)-(ii)

B. (a)-(ii), (B)-(iv), (C)-(i), (D)-(iii)

C. (a)-(iv), (B)-(ii), (C)-(i), (D)-(iii)

D. (a)-(iii), (B)-(i), (C)-(iv), (D)-(ii)

Answer: D

Solution:

(d) Tight junctions provide a barrier which prevents leakage of fluid across epithelial cells.
Adherens junctions aid to cement adjacent cells to form a sheet.
Gap junctions provide cytoplasmic channels to facilitate communication between adjacent cells.
Synaptic junctions help in transmission of information through chemicals

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Question26

Which of the following statements is INCORRECT ? [NEET 2019]

Options:

A. Female cockroach possesses sixteen ovarioles in the ovaries.

B. Cockroaches exhibit mosaic vision with less sensitivity and more resolution.

C. A mushroom-shaped gland is present in the 6th-7th abdominal segments of male cockroach.

D. A pair of spermatheca is present in the 6th segment of female cockroach.

Answer: B

Solution:

Solution:
(b) Cockroaches receive several images of an object with the help of ommatidia. This kind of vision possessed by cockroaches is known as mosaic vision which has more sensitivity but less resolution.

Question27

Select the correct route for the passage of sperms in male frogs: (NEET 2017)

Options:

A. Testes →Vasa efferentia → Kidney → Seminal Vesicle → Urinogenital duct → Cloaca

B. Testes → Vasa efferentia → Bidder's canal → Ureter → Cloaca

C. Testes → Vasa efferentia → Kidney → Bidder's canal → Urinogenital duct → Cloaca

D. Testes → Bidder's canal → Kidney → Vasa efferentia → Urinogenital duct → Cloaca

Answer: C

Solution:

(c) The correct route for transport of sperms in male frog is
Testes → Vasa efferentia → Kidney → Bidder's canal → Urinogenital duct → Cloaca

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Question28

Frog's heart when taken out of the body continues to beat for sometime. Select the best option from the following statements.
(1) Frog is a poikilotherm.
(2) Frog does not have any coronary circulation.
(3) Heart is "myogenic" in nature.
(4) Heart is autoexcitable.
(NEET 2017)

Options:

A. Only (4)

B. (1) and (2)

C. (3) and (4)

D. Only (3)

Answer: C

Solution:

Solution:
(c) : Frog's heart is myogenic, i.e., heartbeat originates from muscles of heart. Hence, it is autorythmic. Wave of contraction originates from sinus venosus and spreads to wall of sinus venosus and both auricles. This compels the heart to beat. Due to this reason, frog's heart will continue to beat as long as it gets supply of ATP.

Question29

In male cockroaches, sperms are stored in which part of the reproductive system?
(NEET-II 2016)

Options:

A. Seminal vesicles

B. Mushroom glands

C. Testes

D. Vas deferens

Answer: A

Solution:

Solution:
(a) : Seminal vesicles are numerous small sacs present on ventral surface of anterior part of the ejaculatory duct which store sperms.

Question30

Smooth muscles are
(NEET-II 2016)

Options:

A. involuntary, fusiform, non-striated

B. voluntary, multinucleate, cylindrical

C. involuntary, cylindrical, striated

D. voluntary, spindle-shaped, uninucleate.

Answer: A

Solution:

Solution:
(a) : Smooth muscle fibres are elongated and spindle shaped (fusiform). Each fibre contains a single oval nucleus surrounded by cytoplasm (sarcoplasm). In cytoplasm myofibrils are arranged longitudinally. These fibres lack striations and sarcolemma, however are enclosed by plasma membrane.

Question31

Which type of tissue correctly matches with its location?

	Tissue	Location
(a)	Transitional epithelium	Tip of nose
(b)	Cuboidal epithelium	Liming of stomach
(c)	Smooth muscle	Wall of intestine
(d)	Areolar tissue	Tendons

(NEET-I 2016)

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: C

Solution:

(c) : Areolar tissue is present in the skin and binds the outer layers of skin to the muscles beneath.
Transitional epithelium forms the lining of the wall of urinary bladder.
Cuboidal epithelium is commonly found in ducts of glands and tubular parts of nephrons in kidneys and its main function is absorption and secretion.
The wall of intestine is formed by smooth muscles which are non-striated and involuntary.So, the correct option is 'Smooth muscle - Wall of intestine'.

Question32

Which of the following features is not present in Periplaneta americana?
(NEET-I 2016)

Options:

A. Exoskeleton composed of N -acetylglucosamine

B. Metamerically segmented body

C. Schizocoelom as body cavity

D. Indeterminate and radial cleavage during embryonic development

Answer: D

Solution:

(d) : In insect cleavage is superficial

Question33

The body cells in cockroach discharge their nitrogenous waste in the haemolymph mainly in the form of
(NEET 2015)

Options:

A. urea

B. calcium carbonate

C. ammonia

D. potassium urate.

Answer: D

Solution:

Solution:
Cockroach excretes nitrogenous waste in the form of soluble potassium urate, which is liberated into the haemolymph. It is taken up by the cells lining the Malpighian tubules which facilitate the absorption of urate. In the cells of these tubules, potassium urate reacts with water and carbon dioxide to form potassium hydrogen carbonate and uric acid. The former is absorbed back and the uric acid is excreted.

Question34

The function of the gap junction is to (NEET 2015)

Options:

A. separate two cells from each other

B. stop substance from leaking across a tissue

C. performing cementing to keep neighbouring cells together

D. facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and some large molecules.

Answer: D

Solution:

Solution:
(d) : Most cells in animal tissues (with the exception of a few terminally differentiated cells such as skeletal muscle cells and blood cells) are in communication with their adjoining cells via gap junctions. At the place where gap junction is present, membranes of two adjacent cells are separated by a uniform narrow gap of about 2-4 nm. The gap is spanned by channel forming proteins called connexins, which allow inorganic ions and other small water soluble molecules to pass directly from cytoplasm of one cell to cytoplasm of other cell.

Question35

The terga, sterna and pleura of cockroach body are joined by (NEET 2015 Cancelled)

Options:

A. arthrodial membrane

B. cartilage

C. cementing glue

D. muscular tissue.

Answer: A

Solution:

Solution:
Arthrodial membrane is a tough, flexible cuticle that joins the skeletal elements of cockroach and other arthropods. It connects terga, pleura and sterna of cockrocah body.

Question36

Choose the correctly matched pair. (NEET 2014)

Options:

A. Tendon - Specialized connective tissue

B. Adipose tissue - Dense connective tissue

C. Areolar tissue - Loose connective tissue

D. Cartilage - Loose connective tissue

Answer: C

Solution:

Solution:
(c) : Areolar tissue is the most widely distributed loose connective tissue in the body. Tendon is a type of dense connective tissue, adipose tissue is a fat-storing loose connective tissue and cartilage is a specialised connective tissue.

Question37

Choose the correctly matched pair. (NEET 2013)

Options:

A. Inner lining of - Ciliated epithelium salivary ducts

B. Moist surface - Glandular epithelium of buccal cavity

C. Tubular parts of - Cuboidal epithelium nephrons

D. Inner surface of - Squamous epithelium bronchioles

Answer: C

Solution:

(c) : Inner lining of salivary ducts - Simple cuboidal epithelium
Moist surface of buccal cavity - Non-Keratinized stratified squamous epithelium
Inner surface of bronchioles - Ciliated columnar epithelium

Question38

What external changes are visible after the last moult of a cockroach nymph?
(KN NEET 2013)

Options:

A. Both forewings and hindwings develop

B. Labium develops

C. Mandibles become harder

D. Anal cerci develop

Answer: A

Solution:

Solution:
(a) : Cockroach undergoes paurometabolous development. The nymph moults about 6-7 times to reach the adult form. The next to last nymphal stage has wing pads but only adult cockroaches have wings.

Question39

Select the correct option with respect to cockroaches.
(KN NEET 2013)

Options:

A. Malpighian tubules convert nitrogenous wastes into urea.

B. Males bear short anal styles not present in females.

C. Nervous system comprises of a dorsal nerve cord and ten pairs of ganglia.

D. The forewings are tegmina which are used in flight.

Answer: B

Solution:

(b) : Malpighian tubules are the main excretory structures in cockroach. They extract nitrogenous wastes and water from haemolymph and reabsorb certain salts resulting in precipitation of uric acid. So, cockroach is uricotelic. Males have paired anal styles on 9^{th} abdominal sternite which are absent in females.

Question40

Identify the tissue shown in the diagram and match with its characteristics and its location.

(KN NEET 2013)

Options:

A. Smooth muscles, show branching, found in the wall of the heart

B. Cardiac muscles, unbranched muscles, found in the walls of the heart

C. Striated muscles, tapering at both-ends, attached with the bones of the ribs

D. Skeletal muscles show striations and are closely attached with the bones of the limbs

Answer: D

Solution:

(d) : Locomotion (performed by limbs) in humans depends on the movements of muscle fibres. Skeletal muscles are attached to the bones by tendons and help in the movement of the parts of skeleton. These muscles are under the control of conscious mind and are called voluntary muscles. Under the microscope, these muscles show transverse stripes and hence are designated as striated muscles.

Question41

Compared to those of humans, the erythrocytes in frog are (2012)

Options:

A. without nucleus but with haemoglobin

B. nucleated and with haemoglobin

C. very much smaller and fewer

D. nucleated and without haemoglobin.

Answer: B

Solution:

Solution:
(b) : Human erythrocytes are enucleated, discoidal while in frogs erythrocytes are large, oval and biconvex nucleated cells. Erythrocytes are the carriers of haemoglobin.

Question42

Select the correct statement from the ones given below with respect to Periplaneta americana.
(2012)

Options:

A. Nervous system located dorsally, consists of segmentally arranged ganglia joined by a pair of longitudinal connectives.

B. Males bear a pair of short thread like anal styles.

C. There are 16 very long Malpighian tubules present at the junctions of midgut and hindgut.

D. Grinding of food is carried out only by the mouth parts.

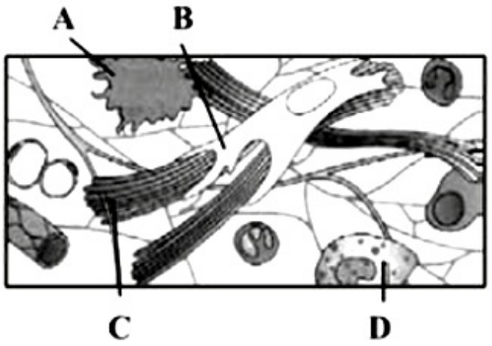
Answer: B

Solution:

Solution:
(b) : The posterior segment of cockroaches bear appendages named as anal cerci. These are found in both male and female. But male cockroach can be distinguished by female ones by the presence of an extra pair of accessory appendages named as anal styles. It assists during copulation.

Question43

Given below is the diagrammatic sketch of a certain type of connective tissue. Identify the parts labelled A, B, C and D and select the right option about them.



	A	B	C	D
(a)	Macrophage	Fibroblast	Collagen fibres	Mast cell
(b)	Mast cell	Macrophage	Fibroblast	Collagen fibres
(c)	Macrophage	Collagen fibres	Fibroblast	Mast cell
(d)	Mast cell	Collagen fibres	Fibroblast	Macrophage

(Mains 2012)

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: A

Solution:

Solution:
A macrophage is a type of white blood cell derived from monocytes and is responsible for detecting, engulfing and destroying pathogens and apoptotic cells. They do this by the process called phagocytosis. Fibroblasts are large, flat cells with many branching processes. They secrete collagen fibers. Collagen fibers are unbranched, wavy and arranged in bundles. They contain a proteinous substance called collagen. Mast cells contain heparin and histamine granules in their cytoplasm. Heparin prevents clotting of blood and histamine carry out vasodilation.

Question44

The supportive skeletal structures in the human external ears and in the nose tip are examples of
(Mains 2012)

Options:

A. ligament

B. areolar tissue

C. bone

D. cartilage.

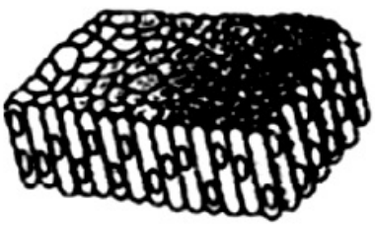
Answer: D

Solution:

(d) : Cartilage is a semi-rigid supportive or skeletal connective tissue in which matrix is solid and made of mucoprotein or proteoglycan called chondrin. It is of four types -hyaline, fibrous, calcified and elastic. Yellow elastic fibrocartilage is found in pinna and external auditory canal of the ear, Eustachian tubes, epiglottis and tip of the nose. Its matrix contains numerous yellow fibres which form a network by uniting with one another. Due to the presence of yellow fibres, the cartilage becomes more flexible. Hence, it provides flexibility to these organs.

Question45

The four sketches (A, B, C and D) given below, represent four different types of animal tissues.

(A) 

(B) 

(C) 

(D) 

Which one of these is correctly identified in the options given, along with its correct location and function?

	Tissue	Location	Function
(a)	(B) Glandular epithelium	Intestine	Secretion
(b)	(C) Collagen	Cartilage	Attach skeletal muscles fibresbones
(c)	(D) Smooth muscle tissue	Heart	Heart contraction
(d)	(A) Columnar epithelium	Nephron	Secretion and absorption

(Mains 2012)

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: A

Solution:

Solution:
(a) : Intestine is lined by glandular epithelium which is secretory in function. The glands found in intestine are exocrine and may be unicellular or multicellular. When unicellular glands secrete mucus, they are called mucus cells or goblet cells and are common in the columnar epithelium of intestine. When unicellular glands secrete a clear watery fluid, they are called serous cells which are also present in intestinal glands. On the other hand, multicellular glands consist of a duct and secretory portion, both formed of epithelial cells. They are further of two types: tubular and saccular. In tubular glands secretory portion is tube like for example, Crypts of Lieberkuhn (a type of simple straight tubular glands found in intestine) and Brunner's gland (a type of simple branched tubular glands found in intestine).

Question46

The ciliated columnar epithelial cells in humans are known to occur in (2011)

Options:

A. Eustachian tube and stomach lining

B. bronchioles and Fallopian tube

C. bile duct and oesophagus

D. Fallopian tube and urethra.

Answer: B

Solution:

(b) : The ciliated columnar epithelial cells in humans are present in the nasal passages, oviducts (Fallopian tubes) terminal bronchioles, ventricles of the brain and central canal of the spinal cord of the embryo. Columnar ciliated epithelium consists of columnar cells, which bear cilia on the free surface.

Question47

One very special feature in the earthworm (Pheretima) is that (2011)

Options:

A. fertilization of eggs occurs inside the body

B. the typhlosole greatly increases the effective absorption area of the digested food in the intestine

C. the S-shaped setae embedded in the integument are the defensive weapons used against the enemies

D. it has a long dorsal tubular heart.

Answer: B

Solution:

Solution:
(b) : In Pheretima, next to stomach is the intestine. It is a long, wide and thin walled tube extending from 25^{th} segment to the last. Second or middle part of the intestine lies between 27^{th} segment upto 23-25 segments in front of anus. This is characterised by the presence of a highly glandular and vascular longitudinal ridge, arising as a median in-growth of the dorsal aspect of the intestinal cavity. This is called the typhlosole. The typhlosole greatly increases the effective absorption area of the digested food in the intestine.

Question48

Which of the following happens in the common cockroach? (2011)

Options:

A. Malpighian tubules are excretory organs projecting out from the colon.

B. Oxygen is transported by haemoglobin in blood.

C. Nitrogenous excretory product is urea.

D. The food is ground by mandibles and gizzard.

Answer: D

Solution:

Solution:
(d) : Mouth part of cockroach contain two mandibles, which bears teeth. When both the mandibles work simultaneously in a horizontal plane, the food matter is cut and masticated into fine and smaller pieces. Gizzard is a part of alimentary canal. It bears six muscular folds which are covered by chitinous conical plates, the teeth, used for grinding the food.

Question49

Frogs differ from humans in possessing (Mains 2011)

Options:

A. paired cerebral hemispheres

B. hepatic portal system

C. nucleated red blood cells

D. thyroid as well as parathyroid.

Answer: C

Solution:

Solution:
(c) : Human erythrocytes are enucleated, discoidal while in frogs erythrocytes are large, oval and biconvex nucleated cells. Erythrocytes are the carriers of haemoglobin.

Question50

The cells lining the blood vessels belong to the category of (Mains 2011,2010)

Options:

A. smooth muscle tissue

B. squamous epithelium

C. columnar epithelium

D. connective tissue.

Answer: B

Solution:

(b) : Simple squamous epithelium is composed of large flat cells whose edges fit closely together like the tiles in a floor, hence it is also called pavement epithelium. The nuclei of the cells are flattened and often lie at the centre of the cells and cause bulgings of cells surface. The epithelium lines the blood vessels, lymph vessels, heart, terminal bronchioles, alveoli of the lungs, walls of the Bowman's capsules, descending limbs of loop of Henle. In the blood vessels and heart it is called endothelium.

Question51

Which one of the following structures in Pheretima is correctly matched with its function?
(Mains 2011)

Options:

A. Clitellum - Secretes cocoon

B. Gizzard - Absorbs digested food

C. Setae - Defence against predators

D. Typhlosole - Storage of extra nutrients

Answer: A

Solution:

(a) : In a mature earthworm, segments $14^{th} - 16^{th}$ are covered by a prominent dark band of glandular tissues called clitellum which secretes cocoon where fertilization and development takes place. In alimentary canal, muscular gizzard ($8^{th} - 9^{th}$ right. segments) helps in grinding the soil particles and decaying leaves, etc. The characteristic feature of the intestine between $26^{th} - 35^{th}$ segments is the presence of internal median fold of dorsal wall called typhlosole. This increases the effective area of absorption in the intestine. In each body segment, except the first, last and clitellum, there are rows of S-shaped setae, embedded in the epidermal pits in the middle of each segment. Setae can be extended or retracted. Their principal role is in locomotion.

Question52

Which one of the following pairs of structures is correctly matched with their corrected description?

	Structures	Description
(a)	Tibia and fibula	Both form parts of knee joint
(b)	Cartilage and cornea	No blood supply but do require oxygen for respiratory need
(c)	Shoulder joint and elbow joint	Ball and socket type of joint
(d)	Premolars and molars	20 in all and 3 rooted

(Mains 2010)

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: B

Solution:

Solution:
(b) : Cartilage is avascular, as the blood vessels innervate only perichondrium through which nutrition diffuses into cartilage cells. Cornea is also avascular.

Question53

Which one of the following correctly describes the location of some body parts in the earthworm Pheretima? (2009)

Options:

A. Four pairs of spermathecae in $4^{th} - 7^{th}$ segments

B. One pair of ovaries attached at intersegmental septum of 14^{th} and 15^{th} segments

C. Two pairs of testes in 10^{th} and 11^{th} segments

D. Two pairs of accessory glands in $16^{th} - 18^{th}$ segments

Answer: C

Solution:

Solution:
In earthworm, two pairs of testes are found in 10th and 11th segments, accessory glands in 17th and 19th segments, four pairs of spermatheca from 6th-9th segment and one pair of ovaries in 13th segment.

Question54

Which one of the following is correct pairing of a body part and the kind of muscle tissue that moves it? (2009)

Options:

A. Biceps of upper arm - Smooth muscle fibres

B. Abdominal wall - Smooth muscle

C. Iris - Involuntary smooth muscle

D. Heart wall - Involuntary unstriated muscle

Answer: C

Solution:

Solution:
(c) : Smooth muscles are called as involuntary muscles as action of these muscles is controlled by autonomic nervous system i.e. not under the control of animal's will. Iris of eyes consist of smooth involuntary muscles. Abdominal wall also have smooth muscles. Biceps of upper arm is made of skeletal muscles while heart wall consists of cardiac muscles.

Question55

The epithelial tissue present on the inner surface of bronchioles and Fallopian tubes is
(2009)

Options:

A. glandular

B. ciliated

C. squamous

D. cuboidal.

Answer: B

Solution:

Solution:
(b) : The ciliated columnar epithelial cells in humans are present in the nasal passages, oviducts (Fallopian tubes) terminal bronchioles, ventricles of the brain and central canal of the spinal cord of the embryo. Columnar ciliated epithelium consists of columnar cells, which bear cilia on the free surface.

Question56

The cell junctions called tight, adhering and gap junctions are found in (2009)

Options:

A. connective tissue

B. epithelial tissue

C. neural tissue

D. muscular tissue.

Answer: B

Solution:

Solution:
(b) : Epithelial tissues consist of variously shaped cells closely arranged in one or more layers. The cells are held together by intercellular junctions like tight, adhering and gap junctions.

Question57

The kind of tissue that forms the supportive structure in our pinna (external ears) is also found in (2009)

Options:

A. nails

B. ear ossicles

C. tip of the nose

D. vertebrae.

Answer: C

Solution:

Solution:
(c) : Yellow elastic fibrocartilage, a type of skeletal tissue, is found in the pinna, Eustachian tubes, epiglottis and tip of the nose. It is a type of cartilage and due to presence of yellow fibres, it becomes more flexible.

Question58

Earthworms have no skeleton but during burrowing, the anterior end becomes turgid and acts as a hydraulic skeleton. It is due to (2008)

Options:

A. gut peristalsis

B. setae

C. coelomic fluid

D. blood.

Answer: C

Solution:

Solution:
(c) : Hydraulic skeleton is the system of support found in soft bodied invertebrates, which relies on the incompressibility of fluids contained within the body cavity. In earthworms the coelomic fluid is under pressure within the coelom and therefore provides support for internal organs. Due to hydraulic skeleton, during burrowing, the anterior end becomes turgid and aids in relaxation of longitudinal muscles.

Question59

Which one of the following is the true description about an animal concerned?
(2008)

Options:

A. Rat - Left kidney is slightly higher in position than the right one

B. Cockroach - 10 pairs of spiracles (2 pairs on thorax and 8 pairs on abdomen)

C. Earthworm - The alimentary canal consists of a sequence of pharynx, oesophagus, stomach, gizzard and intestine

D. Frog - Body divisible into three regions head, neck and trunk

Answer: B

Solution:

Solution:
(b) : There are 10 pairs of spiracles in cockroach. Two pairs are thoracic in which first pair is known as mesothoracic, lying infront of the mesothorax between the bases of first and second pair of legs and are the largest. The second pair is called metathoracic. Abdominal spiracles are eight pairs. The first pair is dorsal in position and lies on the lateral margins of the first abdominal tergum. The remaining are situated on the sides of their corresponding segments on the pleura between the terga and sterna. Spiracles are meant for intake of fresh air and release of foul air.

Question60

Which one of the following pairs of structures distinguishes a nerve cell from other types of cell?
(2007)

Options:

A. Vacuoles and fibres

B. Flagellum and medullary sheath

C. Nucleus and mitochondria

D. Perikaryon and dendrites

Answer: D

Solution:

Solution:
(d) : Neuron (nerve cell) is one of the basic functional units of the nervous system. Neuron is a cell specialized to transmit electrical nerve impulse and so carry information from one part of the body to another. Each neuron has an enlarged portion, the cell body (perikaryon), containing the nucleus; from the body extend several processes (dendrites) through which impulses enter from their branches. A longer process, the nerve fibre, extends outward and carries impulses away from the cell body. This is normally unbranched except at the nerve ending. The point of contact of one neuron with another is known as asynapse

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Question61

In which one of the following preparations are you likely to come across cell junctions most frequently?
(2007)

Options:

A. Thrombocytes

B. Tendon

C. Hyaline cartilage

D. Ciliated epithelium

Answer: D

Solution:

Solution:
(d) : From the given four options cell junctions come across most frequently in the preparation of ciliated epithelium. A cell junction is a structure within a tissue of a multicellular organism. Cell junctions are especially abundant in epithelial tissues. They consist of protein complexes and provide contact between neighbouring cells, between a cell and the extracellular matrix, or they built up the paracellular barrier of epithelia and control the paracellular transport. Ciliated epithelium is a region of epithelium consisting of columnar or cuboidal cells bearing hairlike appendages that are capable of beating rapidly. Ciliated epithelium performs the function of moving particles or fluid over the epithelial surface in such structures as the trachea, bronchial tubes, and nasal cavities. It often occurs in the vicinity of mucussecreting goblet cells.

The other three (thrombocytes, tendon and hyaline cartilage) belongs to connective tissue. Connective tissue is widely distributed and has many functions including support, packing, defence and repair. Thrombocytes or platelets aid the formation of blood clots by releasing various protein substances. Tendon attaches a muscle to a bone and hyaline cartilage consists largely of glycosaminoglycan, giving a shiny glass like appearance and gives flexibility and support at the joints.

Question62

Areolar connective tissue joins (2006)

Options:

A. bones with bones

B. fat body with muscles

C. integument with muscles

D. bones with muscles.

Answer: C

Solution:

Solution:
(c) : Areolar tissue is a loose connective tissue comprised of a semifluid ground substance containing several kinds of loosely arranged fibres. Its function is to attach the skin to the underlying tissues, to fill the spaces between various organs and thus holds them in place, and surrounds and supports the blood vessels. Tendons connect muscles with bone while ligaments connect bone with bone.

Question63

Mast cells secrete (2006)

Options:

A. haemoglobin

B. hippurin

C. myoglobin

D. histamine.

Answer: D

Solution:

Solution:
(d) : Mast cells are granulated wandering cells that are found in connective tissue. Their granules contain histamine which is a vasodilator. It causes running nose, sneezing and itching; and narrows the airways in the lungs. Haemoglobin and myoglobin are the pigments present in the blood and muscles respectively.

Question64

Earthworms are
(2006)

Options:

A. ammonotelic when plenty of water is available

B. ureotelic when plenty of water is available

C. uricotelic when plenty of water is available

D. uricotelic under conditions of water scarcity.

Answer: A

Solution:

Solution:
(a) : Earthworm has excretory organ called nephridia. Ammonia is the chief excretory waste when water is available and hence it is ammonotelic in water and terrestrial earthworm is ureotelic.

Question65

Four healthy people in their twenties got involved in injuries resulting in damage and death of few cells of the following. Which of the cells are least likely to be replaced by new cells?
(2005)

Options:

A. Liver cells

B. Neurons

C. Malpighian layer of the skin

D. Osteocytes

Answer: B

Solution:

Solution:
(b) : Neurons are least likely to be replaced by new cells as they have least regeneration power. Osteocytes are the bone forming cells. Liver cells and Malpighian layer of the skin have regeneration power.

Question66

Mast cells of connective tissue contain

(2004)

Options:

A. vasopressin and relaxin

B. heparin and histamine

C. heparin and calcitonin

D. serotonin and melanin.

Answer: B

Solution:

Solution:
(b) : Mast cells are the large cells with densely granular cytoplasm that is found in connective tissues. Their granules contain histamine which is a vasodilator, heparin which is an anticoagulant and serotonin which acts as a mediator of inflammation and allergic reactions. Vasopressin is a hormone secreted by posterior pituitary gland. Calcitonin is a hormone secreted by thyroid gland. Melanin is a pigment produced by specialized epidermal cells called melanocytes. Relaxin is a hormone produced by the corpus luteum and placenta during the terminal stages of pregnancy.

Question67

Which one of the following contains the largest quantity of extracellular material?
(2003)

Options:

A. Striated muscle

B. Areolar tissue

C. Stratified epithelium

D. Myelinated nerve fibres

Answer: B

Solution:

Solution:
(b) : In areolar tissue, there is more intercellular space, so largest quantity of extracellular material is. present in this tissue. It contains all cell types and fibres of connective tissue. There is a thin layer of extracellular fluid in stratified epithelium whereas striated muscle is attached with tendons and there is very less amount of extracellular fluid in myelinated nerve fibre.

Question68

Collagen is (2002)

Options:

A. fibrous protein

B. globular protein

C. lipid

D. carbohydrate.

Answer: A

Solution:

Solution:
(a) : Collagen is an insoluble fibrous protein found extensively in the connective tissue of skin, tendons and bone. Collagen accounts for over 30% of the total body protein of mammals. Globular proteins have compact rounded molecules and are usually water soluble. Lipid is a diverse group of organic compounds, that are insoluble in water but soluble in organic solvents. Carbohydrates are compounds of carbon, hydrogen and oxygen.

Question69

Melanin protects from (2002)

Options:

A. UV rays

B. visible rays

C. infrared rays

D. X-rays.

Answer: A

Solution:

Solution:
(a) : Melanin is produced by specialized epidermal cells called melanophores (or melanocytes). Their dispersion in these cells is controlled by melanocyte - stimulating hormone and melatonin. Melanin, a pigment present in skin, protects it from harmful effects of UV rays. People living in tropics have more melanin in their skin which is an adaptation to protect themselves from harmful UV rays. Melanin cannot protect from infrared rays and X-rays.

Question70

During an injury nasal septum gets damaged and for its recovery which cartilage is preferred?
(2001)

Options:

A. Elastic cartilage

B. Hyaline cartilage

C. Calcified cartilage

D. Fibrous cartilage (2001)

Answer: B

Solution:

Solution:
(b) : Nasal septum consists of hyaline cartilage. It is bluish-green and translucent in appearance. It has fewer very fine white fibres in the matrix. This type of cartilage gives flexibility and support at the joints. Elastic, calcified and fibrous cartilages occur in other parts of body.

Question71

Which cells do not form layer and remains structurally separate?
(2001)

Options:

A. Epithelial cells

B. Muscle cells

C. Nerve cells

D. Gland cells

Answer: C

Solution:

Solution:
(c) : Nerve cells are the highly excitable cells, specialized for impulse conduction. They originate from neural plate of embryonic ectoderm and serve as structural and functional units of nervous tissue.

Question72

Proteoglycan in cartilages which is a part of polysaccharide is

(2000)

Options:

A. chondroitin

B. ossein

C. casein

D. cartilagin.

Answer: A

Solution:

Solution:
(a) : Proteoglycans consist of polysaccharide attached with a protein chondroitin. It is present in cartilage as well as in extracellular material. Ossein is a protein present in matrix of bone. Casein is a milk protein.

Question73

Characteristic of simple epithelium is that they
(2000)

Options:

A. are arranged indiscriminately

B. make a definite layer

C. continue to divide and help in organ function

D. none of the above.

Answer: B

Solution:

Solution:
(b) : Simple epithelium consists of a single layer of cells resting on a basement membrane. This makes a definite layer.

Question74

Which pair is correct?
(2000)

Options:

A. Sweat - Temperature regulation

B. Saliva - Sense of food taste

C. Sebum - Sexual attraction

D. Humerus - Hindleg

Answer: A

Solution:

(a) : Sweat is secreted by sweat glands of skin and helps in regulating body temperature. Saliva is secreted by salivary glands and helps in digestion (carbohydrate digestion). Sebum is the waxy secretion secreted by sebaceous glands. Sebum is a fatty mildly antiseptic material that protects, lubricates, and waterproofs the skin and hair and helps prevent desiccation. Humerus is the long bone of the upper arm. It articulates with the scapula at the glenoid cavity and with the ulna and radius at the elbow.

Question75

Primary function of enteronephric nephridia of Pheretima is (2000)

Options:

A. osmoregulation

B. excretion of nitrogenous wastes

C. respiration

D. locomotion.

Answer: A

Solution:

Solution:
(a) : Pharyngeal nephridia and septal nephridia are enteronephric as they discharge excretory matter into the gut. Discharge of waste matter via gut is an adaptation to conserve water by its reabsorption in the gut. Integumentary nephridra are exonephric, as they discharge waste matter to the exterior.

Question76

Ligament is a/an (1999)

Options:

A. inelastic white fibrous tissue

B. modified white fibrous tissue

C. modified yellow elastic fibrous tissue

D. none of the above.

Answer: C

Solution:

Solution:
(c) : Ligament occurs in the form of cords in a modified yellow elastic fibrous tissue and connects bone with a bone. Modified white fibrous tissue is present in the tendons.

Question77

Tendon is made up of (1999)

Options:

A. yellow fibrous connective tissue

B. modified white fibrous tissue

C. areolar tissue

D. adipose tissue.

Answer: B

Solution:

Solution:
(b) : White fibrous tissue has two forms : cords and sheets. The white fibres run parallel to form cords, called tendons. Tendon attaches a muscle to a bone. It consists of collagen fibres and are therefore inelastic. They ensure that the force exerted by muscular contraction is transmitted to the relevant part of the body to be moved. Yellow elastic tissue also has two forms : cords and sheets. Here, cords are called ligaments. Adipose tissue is a fat storing loose connective tissue. Areolar tissue is the most widely distributed connective tissue in the body.

Question78

In mammals, histamine is secreted by (1998)

Options:

A. lymphocytes

B. mast cells

C. fibroblasts

D. histiocytes.

Answer: B

Solution:

Solution:
(b) : Mast cells are found in the matrix of areolar connective tissue and secrete histamine (vasodilator), serotonin (vasoconstrictor) and heparin (anticoagulant). These take part in allergic reactions and also help in a body defence. Fibroblasts and histiocytes are also found in the matrix of areolar tissue. Fibroblasts secrete ground substance while histiocytes engulf the microbes, foreign particles and damaged cells. Lymphocytes are the type of leucocytes present in blood and secrete antibodies.

Question79

Protein present in cartilage is (1997)

Options:

A. cartilagin

B. ossein

C. chondrin

D. none of these.

Answer: C

Solution:

Solution:
(c) : Chondrin is a protein present in the matrix of cartilage. It forms a constituent of a compound called chondrin sulphate. Chondrin sulphate consists of proteoglycans, that is protein chains bonded to long chains of disaccharide hyaluronic acid. Matrix of bone is made up of a protein called ossein.

Question80

Basement membrane is made up of (1997)

Options:

A. no cell product of epithelial cell

B. epidermal cell only

C. endodermal cell

D. both (b) and (c).

Answer: A

Solution:

(a) : Basement membrane (basal lamina) is a thin sheet of fibrous proteins that underlies and supports the cells of an epithelium, separating this from underlying tissue. Basement membranes are components of the extracellular matrix (= the viscous watery fluid that surrounds cells in animal tissue) and help to regulate passage of materials between epithelial cells and adjacent blood vessels. Each consists of a framework of collagen fibrils within which are glycosaminoglycans (mucopolysacc harides) and laminins, which are proteins that bind the basement membrane to neighbouring cells via cell adhesion molecules.

Question81

Stratum germinativum is an example of which kind of epithelium? (1997)

Options:

A. Columnar

B. Squamous

C. Cuboidal

D. Ciliated

Answer: A

Solution:

Solution:
(a) : Stratum germinativum (also stratum basale or basal cell layer) is the layer of keratinocytes that lies at the base of the epidermis immediately above the dermis. It consists of a single layer of tall, simple columnar epithelial cells lying on a basement membrane. These cells undergo rapid cell division, mitosis to replenish the regular loss of skin by shedding from the surface. About 25 % of the cells are melanocytes, which produce melanin which provides pigmentation for skin and hair.

Question82

The roof of the cranium of frog is formed by (1997)

Options:

A. frontoparietal

B. orbitosphenoid

C. parasphenoid

D. alisphenoid.

Answer: A

Solution:

Solution:
(a) : Fronto-parietals are a pair of long, broad, flattened and membranous bones. They are united along the mid-dorsal line and form the whole roof of cranium. In larval frog, each fronto-parietal occurs into separate frontal and parietal parts, but in adult frog, they become fused to form a single fronto-parietal. The entire floor of cranium is covered and strengthened by a large parasphenoid bone.

Question83

In frog, the surface of attachment of tongue is (1997)

Options:

A. pterygoid

B. hyoid apparatus

C. parasphenoid

D. palatine.

Answer: B

Solution:

Solution:
(b) : In adult frog, gills disappear and their skeletal framework is also reduced to form hyoid apparatus. It lies below tongue in the floor of mouth and provides surface of attachment to the tongue. Pterygoid contributes to the postero-ventral margin of orbit of its side. Palatine connects the anterior side of cranium with the middle of maxilla, Parasphenoid forms floor of the cranium.

Question84

In frog, "fenestra ovalis" is (1997)

Options:

A. the communication between the pharynx and the tympanic cavity

B. the external opening of the tympanic cavity which is covered by the tympanic membrane

C. the air filled cavity of the middle ear

D. the opening in the auditory capsule which separates the middle ear from the internal ear.

Answer: C

Solution:

Solution:
(c) : The bony partition between tympanic cavity (cavity of middle ear) and auditory capsule (internal ear) is perforated by a small window-like oval aperture, the fenestra ovalis, which remains closed by a membrane and a cartilaginous nodule, the stapedial plate.

Question85

The kidney of an adult frog is (1997)

Options:

A. metanephros

B. opisthonephros

C. pronephros

D. mesonephros.

Answer: D

Solution:

Solution:
(d) : Mesonephros kidney is present in both adult as well as embryo of frog. A mesonephros develops from the middle part of intermediate mesoderm, posterior to each pronephros soon after its degeneration.

Question86

An epithelial tissue which has thin flat cells, arranged edge to edge so as to appear like closely packed tiles, is found to be present at (1994)

Options:

A. outer surface of ovary

B. inner lining of fallopian tube

C. inner lining of stomach

D. inner lining of cheeks.

Answer: D

Solution:

Solution:
(d) : An epithelial tissue which has thin flat cells, arranged edge to edge so as to appear like closely packed tiles is known as pseudostratified epithelium. It covers moist surfaces where there is little wear and tear by friction such as inner lining of cheeks.

Question87

Hair present in the skin are (1993)

Options:

A. epidermal in origin and made of dead cells

B. epidermal in origin and made of living cells

C. dermal in origin and made of living cells

D. dermal in origin and made of dead cells.

Answer: A

Solution:

Solution:
(a) : Each hair is present in a tubular pit called hair follicle which is made up by sinking of epidermis. Living cells are present only at the base of hair i.e. in hair papilla, rest of the hair is dead and is divisible into outer cuticle, middle cortex and inner medulla.

Question88

The layer of actively dividing cells of skin is termed as (1993)

Options:

A. stratum compactum

B. stratum corneum

C. stratum malpighii/stratum germinativum

D. stratum lucidum.

Answer: C

Solution:

Solution:
(c) : Stratum malpighii/stratum germinativum is the innermost layer of the skin consisting of one celled thick columnar epithelial cells. It lies on the basement layer. Its cells are active and continuously produce new cells by mitotic division that is why called germinative layer.

Question89

Formation of cartilage bones involves (1993)

Options:

A. deposition of bony matter by osteoblasts and resorption by chondroclasts

B. deposition of bony matter by osteoclasts

C. deposition of bony matter by osteoclasts only

D. deposition of bony matter by osteoblasts only.

Answer: A

Solution:

Solution:
(a) : Bone is an unusual tissue in that it is continually being reconstructed. The osteoblasts secrete bone matrix, whereas the large, much branched, motile, lysosome-rich, multinucleate cells, called osteoclasts, destroy bone matrix. The twin process of resorption and reconstruction enables a particular bone to remodel its structure to meet any change in the mechanical requirements of the animal during its development.

Question90

Mucus helps frog in forming (1993)

Options:

A. thick skin

B. dry skin

C. smooth skin

D. moist skin.

Answer: D

Solution:

Solution:
(d) : Mucus helps frog in forming moist skin as skin is its respiratory organ.

Question91

Characteristics of smooth muscle fibres are (1992)

Options:

A. spindle-shaped, unbranched, nonstriated, uninucleate and involuntary

B. spindle-shaped, unbranched, unstriped, multinucleate and involuntary

C. cylindrical, unbranched, unstriped, multinucleate and involuntary

D. cylindrical, unbranched, striated, multinucleate and voluntary.

Answer: A

Solution:

Solution:
(a) : The smooth muscle consists of long, narrow unbranched spindle-shaped fibres. Each fibre contains a single oval nucleus in its thick middle part. The cross-striations are absent so that the fibres look smooth, hence the name non striated. Its contraction is not under the control of the animal, therefore, also called involuntary muscle.

Question92

Male and female cockroaches can be distinguished externally through (1991)

Options:

A. anal styles in male

B. anal cerci in female

C. anal style and antennae in females

D. both (b) and (c).

Answer: A

Solution:

Solution:
(a) : In male cockroach, 9^{th} sternum bears a pair of short, unjointed thread-like anal styles which are absent in female. Anal cerci and antennae are present in both male and female cockroaches.

Question93

Earthworm possesses hearts (1991)

Options:

A. 6 pairs

B. 4 pairs

C. 2 pairs

D. 1

Answer: B

Solution:

Solution:
(b) : In each of the segments 7,9,12 and 13 is found a pair of large, thick, muscular and rhythmically contractile vertical vessels, called hearts. They pump blood from dorsal to ventral vessel, while flow in opposite direction is prevented by internal valves. Hearts of 7^{th} and 9^{th} segments connect dorsal and ventral vessels only and are called lateral hearts. Those of 12^{th} and 13^{th} segments connect both dorsal and supra-oesophageal vessels with ventral vessel, and are designated as latero-oesophageal hearts.

Question94

Blood of Pheretima is (1990)

Options:

A. blue with haemocyanin in corpuscles

B. blue with haemocyanin in plasma

C. red with haemoglobin in corpuscles

D. red with haemoglobin in plasma.

Answer: D

Solution:

(d) : Circulatory or blood vascular system of earthworm is a closed system consisting of blood vessels and capillaries which ramify to all parts of the body. Blood is composed of a fluid plasma and colourless corpuscles, physiologically comparable to the leucocytes of the vertebrates. The red respiratory pigment, haemoglobin (or erythrocruorin) occurs dissolved in plasma. It gives a red colour to blood and aids in the transportation of oxygen for respiration.

Question95

Pheretima posthuma is highly useful as (1990)

Options:

A. their burrows make the soil loose

B. they make the soil porous, leave their castings and take organic debris in the soil

C. they are used as fish meal

D. they kill the birds due to biomagnification of chlorinated hydrocarbons.

Answer: B

Solution:

Solution:
(b) : Pheretima posthuma is highly useful and beneficial in agriculture. Its habit of burrowing and swallowing earth makes it porous and increases the soil fertility in many ways. Their burrows permit penetration of air and moisture in porous soil and their excretory wastes and other secretions also enrich soil by adding nitrogenous matters to the soil. Pheretima posthuma is not used as fish meal. Whereas a small white earthworm (Enchytraeus albidus) is often grown in soil and used to feed aquarium fish.

Question96

Haversian canals occur in (1989)

Options:

A. humerus

B. pubis

C. scapula

D. clavicle.

Answer: A

Solution:

(a) : Small bones are solid. Long bones, such as the humerus and femur, have a cavity, the marrow cavity, at the centre. The substance of the bone is distinguishable into 3 regions : periosteum, matrix and endosteum. The matrix of bone along with the bone forming cells (osteoblasts) is arranged in concentric layers (lamellae) round the small canals which run parallel to the long axis (shaft) of the bone. These canals, called Haversian canals, are interconnected with one another via Volkmann's canals and contain a blood vessel, a nerve and a lymph vessel. Bone cells remain alive and once they have completely surrounded by the hard bone matrix, they are called osteocytes. The osteocytes are embedded in fluid-filled cavities within the concentric lamellae. These cavities are known as lacunae and occur at regular intervals in these concentric layers of bone tissue. The lacunae are connected to one another and to the Haversian canals by a system of interconnecting canals known as canaliculi. Each Haversian canal, its concentric lamellae, lacunae with osteocytes and canaliculi forms a long cylinder and is called a Haversian system. Separate Haversian systems are joined to each other by means of interstitial lamellae.

Question97

Histamine secreting cells are found in (1989)

Options:

A. connective tissues

B. lungs

C. muscular tissue

D. nervous tissue.

Answer: A

Solution:

Solution:
(a) : Mast cells are found in the matrix of areolar connective tissue and secrete histamine (vasodilator), serotonin (vasoconstrictor) and heparin (anticoagulant). These take part in allergic reactions and also help in a body defence. Fibroblasts and histiocytes are also found in the matrix of areolar tissue. Fibroblasts secrete ground substance while histiocytes engulf the microbes, foreign particles and damaged cells. Lymphocytes are the type of leucocytes present in blood and secrete antibodies.

Question98

Mineral found in red pigment of vertebrate blood is (1989)

Options:

A. magnesium

B. iron

C. calcium

D. copper.

Answer: B

Solution:

(b) : Red pigment of vertebrate blood is haemoglobin. Haemoglobin is a conjugated protein. It consists of a basic protein globin joined to a nonprotein group heme, hence the name haemoglobin. Heme is an iron-porphyrin ring. A mammalian haemoglobin molecule is a complex of 4 heme molecules joined with 4 globin molecules.

Question99

Photoreceptors of earthworm occur on (1989)

Options:

A. clitellum

B. many eyes

C. dorsal surface

D. lateral sides.

Answer: C

Solution:

(c) : Photoreceptors restricted only to dorsal surface, are more numerous on prostomium and peristomium of earthworm and gradually reduce in number towards posterior end of body. They are totally absent in clitellum. Each photoreceptor consists of a single ovoid cell, with a nucleus and clear cytoplasm containing a network of neurofibrillae and a small transparent L-shaped lens or optic organelle or phaosome, made up of a hyaline substance. Photoreceptors enable worms to judge the intensity and duration of light.
