

BIOLOGY

NEET

CRASH COURSE

**STRUCTURAL ORGANISATION
IN ANIMAL-I & II**

SMART ACHIEVERS
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STRUCTURAL ORGANISATION IN ANIMAL-I

1. Cells, tissues, organs and organ systems split up the work in a way that ensures the survival of the body as a whole and exhibit division of labour.
2. A tissue is defined as group of cells along with intercellular substances performing one or more functions in the body.
3. Epithelial tissues are sheet like tissues lining the body's surface and its cavities, ducts and tubes.
4. Epithelia have one free surface facing a body fluid or the outside environment.
5. Their cells are structurally and functionally connected at junctions.
6. Epithelial tissue is classified into different categories on the basis of shape and function of cell.
7. Diverse types of connective tissues bind together, support, strengthen, protect and insulate other tissue in the body.
8. Soft connective tissues consists of protein fibres as well as a variety of cells arranged in a ground substance.
9. Cartilage, bone, blood, and adipose tissue are specialised connective tissues.
10. Cartilage and bone are both structural materials.
11. Blood is a fluid tissue with transport functions.
12. Adipose tissue is a reservoir of stored energy.
13. Muscle tissue, which can contract (shorten) in response to stimulation, helps in movement of the body and specific body parts.
14. Skeletal muscle is the muscle tissue attached to bones.
15. Smooth muscle is a component of internal organs.
16. Cardiac muscle makes up the contractile walls of the heart.
17. Connective tissue covers all three types of tissues.
18. Nervous tissue exerts greatest control over the response of body.
19. Neurons are the basic units of nervous tissue.

STRUCTURAL ORGANISATION IN ANIMAL-II

1. In *Pheretima posthuma* (earthworm) is a hermaphrodite animal belongs to phylum Annelida. Its body is covered by cuticle.
2. All segments of its body are alike except the 14th, 15th & 16th segment, which are thick and dark and glandular, forming clitellum.
3. A ring of S-shaped chitinous setae is found in each segment which helps in locomotion.
4. On the ventral side spermathecal openings are present in between the grooves of 5 & 6, 6 & 7, 7 & 8 and 8 & 9 segments.
5. Female genital pores are present on 14th segment and male genital pores on 18th segment.

6. The alimentary canal is a narrow tube made of mouth, buccal cavity, pharynx, gizzard, stomach, intestine and anus.
7. The blood vascular system is of closed type with heart and valves.
8. Nervous system is represented by ventral nerve cord.
9. Earthworm is hermaphrodite.
10. Two pairs of testes occur In the 10th and 11th segment, respectively.
11. A pair of ovaries are present on 12th and 13th intersegmental septum.
12. It is a protandrous animal with crossfertilisation.
13. Fertilisation and development takes place in cocoon secreted by the glands of clitellum.
14. The body of Cockroach (*Periplaneta americana*) is covered by chitinous exoskeleton.
15. It is divided into head, thorax and abdomen.
16. Segments bear jointed appendages.
17. There are three segments of thorax, each bearing a pair of walking legs.
18. Two pairs of wings are present, one pair each on 2nd and 3rd segment.
19. There are ten segments in abdomen.
20. Alimentary canal is well developed with a mouth surrounded by mouth parts, a pharynx, oesophagus, crop, gizzard, midgut, hindgut and anus.
21. Hepatic caecae are present at the junction of foregut and midgut.
22. Malpighian tubules are present at the junction of midgut and hindgut and help in excretion.
23. A pair of salivary gland is present near crop.
24. The blood vascular system is of open type.
25. Respiration takes place by network of tracheae.
26. Trachea opens outside with spiracles.
27. Nervous system is represented by segmentally arranged ganglia and ventral nerve cord.
28. A pair of testes is present in 4th and 5th segments and ovaries in 4th, 5th and 6th segments.
29. Fertilisation is internal.
30. Female produces 10-40 ootheca bearing developing embryos.
31. After rupturing of single ootheca sixteen young ones, called nymphs come out.
32. The Indian bullfrog, *Rana tigrina*, is the common frog found in India.
33. Body is covered by skin.
34. Mucous glands are present in the skin which is highly vascularised and helps in respiration in, water and on land.
35. Body is divisible into head and trunk.
36. A muscular tongue is present, which is bilobed at the tip and is used in capturing the prey.
37. The alimentary canal consists of oesophagus, stomach, intestine and rectum, which open into the cloaca.
38. The main digestive glands are liver and pancreas.

39. It can respire in water through skin and through lungs on land.
40. Circulatory system is closed with single circulation.
41. RBCs are nucleated.
42. Nervous system is organised into central, peripheral and autonomic.
43. The organs of urinogenital system are kidneys and urinogenital ducts, which open into the cloaca.
44. The male reproductive organ is a pair of testes.
45. The female reproductive organ is a pair of ovaries.
46. A female lays 2500-3000 ova at a time.
47. The fertilisation and development are external.
48. The eggs hatch into tadpoles, which metamorphose into frogs.

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EXERCISE**STRUCTURAL ORGANISATION IN ANIMAL-I**

- Q.1 Cells of the epithelial tissue rest on a basement membrane which is made up of
(1) Monosaccharides (2) Mucopolysaccharides
(3) Disaccharides (4) Lipids
- Q.2 The cells of a tissue are similar in
(1) Structure (2) Function (3) Origin (4) Both (1) and (2)
- Q.3 The basement membrane acts as
(1) Plasma membrane (2) Plasmalemma (3) Both (4) None
- Q.4 Simple cuboidal epithelium is found in
(1) Sweat gland (2) Choroid of eye (3) Thin bronchioli (4) All of the above
- Q.5 The ducts of mammary gland are lined by
(1) Stratified columnar epithelium (2) Stratified cuboidal epithelium
(3) Transitional epithelium (4) All of the above
- Q.6 Oedema is
(1) An abnormal accumulation of tissue fluid in intercellular spaces
(2) An abnormal accumulation of tissue fluid in epithelial tissue cells
(3) An abnormal accumulation of extracellular fluid in intercellular spaces
(4) Allergic disease of skin
- Q.7 Tissue which has power of division and regeneration throughout life
(1) Epithelial tissue (2) Muscular tissue (3) Connective tissue (4) Nervous tissue
- Q.8 When collagen fibres are removed from the areolar tissue
(1) Tissue becomes hard (2) Tissue becomes loose and elastic
(3) Tissue becomes hard and inelastic (4) Remains unchanged
- Q.9 Function of adipose tissue is
(1) Fat storing tissue (2) Helps in homeothermy
(3) Acts as shock absorber (4) All the above
- Q.10 New born mammals generally do not shiver inspite of lower temperature outside because of
(1) Brown fat which has larger capacity for generating heat
(2) White fat which has larger capacity for generating heat
(3) Chromatophores present in them
(4) Skeletal tissue present in them

- Q.11 Haversian system is a diagnostic feature of
(1) Avian bones (2) All animals
(3) Mammalian bones only (4) Reptilian bones
- Q.12 Long shaft of a bone is called as
(1) Epiphysis (2) Diaphysis (3) Metaphysis (4) None of the above
- Q.13 Bone marrow is made up of
(1) Muscular fibre and fatty tissue (2) Fatty tissue and areolar tissue
(3) Fatty tissue and cartilage (4) Fatty tissue, areolar tissue and blood vessel
- Q.14 Covering around bone is called
(1) Perichondrion (2) Periosteum (3) Epiosteum (4) Endosteum
- Q.15 Haversian canals of long bones have
(1) One vein and one artery (2) One nerve and one lymphatic
(3) Some bone cells, fat and areolar tissue (4) All the above
- Q.16 The membrane that covers cartilage is known as
(1) Periostium (2) Perichondrium (3) Perineurium (4) Pericardium
- Q.17 Hyaline cartilage forms
(1) Tracheal rings (2) Pubic symphysis (3) Epiglottis (4) External ear
- Q.18 Which of the following muscle gets into fatigue very early
(1) Skeletal muscle (2) Smooth muscle (3) Cardiac muscle (4) All the above
- Q.19 The most abundant tissue in the body is
(1) Nervous (2) Muscular (3) Vascular (4) Epithelial
- Q.20 Which of the following is the contractile protein of a muscle
(1) Tubulin (2) Myosin (3) Tropomyosin (4) All of these

STRUCTURAL ORGANISATION IN ANIMAL-II

- Q.21 Clitellum in earthworm includes segments.
(1) 19, 20, 21 (2) 14, 15, 16 (3) Last 3 segments (4) first three
- Q.22 Setae are found in all body segments of earthworm except -
(1) Last segment (2) First segment
(3) Clitellar segment (4) First, last and clitellar segments

- Q.23 Segmentation in earthworm is
 (1) Metameric segmentation (2) Polymeric segmentation
 (3) Pseudosegmentation (4) Bisegmentation
- Q.24 Septal nephridia of earth worm are
 (1) Responsible for excretion (2) Present in all body segments
 (3) To Keep the surface moist (4) Present in 4,5,6 segments
- Q.25 Spermatheca of Pheretima represent
 (1) Female Copulatory organ (2) Male Copulatory organ
 (3) Coating over sperms (4) Structure for storing sperms
- Q.26 Larva is not found in the life of
 (1) Pheretima (2) Taenia (3) Musca (4) Rana
- Q.27 Which are the two common indian cockroaches ?
 (1) Periplaneta americana and Blatta indica (2) Periplaneta indica and Blatta orientalis
 (3) Periplaneta orientalis and Blatta americana (4) Periplaneta americana and Blatta orientalis
- Q.28 The plate situated between the eyes and passing below that on the head of cockroach is called
 (1) Vertex (2) Fron (3) Epicranium (4) Gena
- Q.29 Outer border of tergum bends downwards in cockroach and attaches with
 (1) Muscles (2) Sternum (3) Pleura (4) Fat body cells
- Q.30 Head of cockroach according to its position is known as
 (1) Hypopharynx (2) Hypocerebral (3) Hypognathus (4) Supragnathus
- Q.31 Tongue like structure in Periplaneta is
 (1) Maxilla (2) Hypopharynx (3) Labium (4) Labrum
- Q.32 Main character for the distinction between male and female cockroach
 (1) Antennae (2) Mandibles (3) Anal cerci (4) Anal style
- Q.33 Maximum digestion takes place in which part of cockroach?
 (1) In crop (2) In Gizzard (3) In mesenteron (4) In oesophagus
- Q.34 Heart of cockroach is
 (1) Four chamberd (2) Vertral to gut
 (3) Longitudinal and beaded (4) Three chambered
- Q.35 Main excretory product of cockroach is
 (1) Urea (2) Ammonia (3) Uric acid (4) Amino acid

- Q.36 Ecdyosone is secreted by
 (1) Prothoracic Gland (2) Corpora allata
 (3) Corpora Cardiaca (4) Cerebral neuro secretory cells
- Q.37 Ommatidia are units in the eyes of
 (1)Amphibians (2)Mammals (3) Insects (4) Fishes
- Q.38 Ootheca of Cockroach has fertilized eggs, this numbers is
 (1) 6 (2) 8 (3) 16 (4) 24
- Q.39 The type of egg in cockroach is called
 (1)Microlecithal (2)Centrolecithal (3) Isolecithal (4)Telolecithal
- Q.40 How many ovarioles are found in each every of cockroach ?
 (1) 3 (2) 6 (3) 8 (4) 16
- Q.41 In the life history of cockroach (Periplaneta) There is
 (1) No Metamorphosis (2) Incomplete metamorphosis
 (3) Complete metamorphosis (4) Anamorphosis
- Q.42 Life history of cockroach represents
 (1)Ametaboly (2) Holometaboly (3) Paurometaboly (4)None
- Q.43 Which of the following found in frog
 (1) five fingers and four toes (2) four fingers and five toes
 (3) five fingers and five toes (4) four fingers and four toes
- Q.44 Number of cranial nerves found in frog
 (1) 10 (2) 12 (3) 20 (4) 24
- Q.45 Rana tigrina is zoological name of
 (1) Frog (2) Leopard (3) Lizard (4) Earthworm
- Q.46 In male frog ureter transfer
 (1) Urine (2) Sperms (3) Both 1 and 2 (4) None
- Q.47 Teeth of frog are
 (1) Pleuro dont (2) Thecodont (3) Heterodont (4) Acrodont
- Q.48 The glands present in the skin of frog are
 (1) mucous and poisonous (2) sweat and mammary
 (3) sweat and sebaceous (4) mucous and sweat

AIIMS Special**STRUCTURAL ORGANISATION IN ANIMAL-I**

Instructions for following questions (Q.49 to Q.103).

- (1) If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).
- (2) If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2).
- (3) If Assertion is true statement but Reason is false, then mark (3).
- (4) If both Assertion and Reason are false statements, then mark (4).

Q.49 **Assertion :** Lymphocyte cells of connective tissue proper are called as cart wheel cells.

Reason : Lymphocytes cell is largest cell of connective tissue proper.

Q.50 **Assertion :** Lymphocytes are the largest corpuscles.

Reason : Nucleus of lymphocyte is large and kidney shape.

Q.51 **Assertion :** Ureter and Urinary bladder are lined with Transitional Epithelium.

Reason : Transitional Epithelium rest directly on Connective tissue.

Q.52 **Assertion :** Cardiac muscle have striations and fibre is nucleated and involuntary.

Reason : Intercalated disc form three dimensional network of cardiac muscle fibre.

Q.53 **Assertion :** Multipolar neurons have several efferent process.

Reason : Axons are the afferent processes of a neuron.

Q.54 **Assertion :** Calcified cartilage is formed by the calcification of hyaline cartilage.

Reason : Calcified cartilage is the strongest cartilage.

Q.55 **Assertion :** Blood circulation is absent in Epithelium Tissue.

Reason : Blood vessels are unable to pierce Basement membrane.

Q.56 **Assertion :** New Born baby is resistant for cold.

Reason : The immune system of new born baby is very well developed.

Q.57 **Assertion :** Simple columnar epithelium is also called as Germinal epithelium.

Reason : Columnar cells of gonads forms gametes.

Q.58 **Assertion :** Epithelia are highly regenerative.

Reason : When epithelia get damaged, they regenerate more rapidly than other Tissue.

Q.59 **Assertion :** Platelets play an important role in blood clotting.

Reason : In the blood oozing from an injury the platelets disintegrate and release thromboplasm that initiates clotting.

- Q.60 **Assertion :** Bone and cartilage are rigid connective tissue.
Reason : Blood is a connective tissue with matrix.
- Q.61 **Assertion :** Where a man usually travel in aeroplane RBC count increase in his body.
Reason : At high attitude production of vit. increase and percentage of haemoglobin is increase.
- Q.62 **Assertion :** Glands originate from all germinal layers.
Reason : All glands are composed of epithelial tissue.
- Q.63 **Assertion :** Brown fat produce more energy.
Reason : Brown fat composed of monolocular adipocyte.
- Q.64 **Assertion :** Simple cuboidal epithelium is called as germinal epithelium.
Reason : Cuboidal cells of gonads forms gametes.
- Q.65 **Assertion :** During embryonic development mother gives to child IgG.
Reason : IgG is able to cross placenta.
- Q.66 **Assertion :** Platelets repair damage endothelium of blood vessels
Reason : Platelets secrete serotonin which is a constrictor.
- Q.67 **Assertion :** Rh factor is considered in blood transfusion.
Reason : Rh antigen may leads agglutination of blood.
- Q.68 **Assertion :** Heparin is a anticoagulant found in mammals.
Reason : Heparin prevent conversion of Prothrombin to Thrombin.
- Q.69 **Assertion :** Epithelium cells get their nutrients from Adjacent cells.
Reason : In epithelium tissue large intercellular spaces are present.
- Q.70 **Assertion :** Patella bone of knee is a sesamoid bone.
Reason : Skull bones and clavical bone are membranous bones.
- Q.71 **Assertion :** Epiphysis of long bone is haemopoietic.
Reason : In epiphysis yellow bone marrow is present which produce blood corpuscles.
- Q.72 **Assertion :** Perichondrium is a white fibrous connective tissue.
Reason : Perichondrium is a connective tissue.
- Q.73 **Assertion :** Most bones body are cartilaginous.
Reason : Connective tissue originated first during embryonic development.
- Q.74 **Assertion :** Squamous epithelium helps in glomerular filtration.
Reason : It forms inner lining of Bowman's capsule.

- Q.75 **Assertion :** Prothrombinase enzyme act as antiheparin.
Reason : Heparin prevent coagulation of blood in Blood vessels.
- Q.76 **Assertion :** Lower most layer of stratified tissue is known as Germinative layer.
Reason : Lower most layer of stratified tissue is mostly cuboidal in shape and rest directly on connective tissue.
- Q.77 **Assertion :** Cells of epithelium tissue rest on a thin basement membrane.
Reason : Basement membrane has both fibrous and basal lamina part secreted by connective tissue and epithelial tissue respectively.
- Q.78 **Assertion :** Most of the human haemoglobin in our body has 22 polypeptide chains.
Reason : Haemoglobin is a conjugate protein and has 4 polypeptide chain in its one globin molecules.
- Q.79 **Assertion :** During contraction both half I-bands and A-band disappears.
Reason : Sarcolemma is a real contractile unit found between two Z-lines.
- Q.80 **Assertion :** Human bone has haversian canals.
Reason : Haversion canals are interconnected by Volkmann's canal.
- Q.81 **Assertion :** Yellow bone marrow is reserve erythropoietic tissue.
Reason : After severe bleeding yellow marrow may convert to red marrow.
- Q.82 **Assertion :** Muscle cells are also called myofibrils.
Reason : Muscle cells are very thin and short.
- Q.83 **Assertion :** Deficiency of proteins lead to poor healing of wounds.
Reason : Plasma proteins immunoglobulins play a major role in the healing of wounds.
- Q.84 **Assertion :** Smooth muscle fibres do not appear to be striated.
Reason : This is due to regular alternate arrangement of thick and thin filaments in smooth muscle fibre.
- Q.85 **Assertion :** Non-striated muscles are said to be voluntary in nature.
Reason : Non-striated muscle can be moved according to will.
- Q.86 **Assertion :** Cardiac muscle have striations and fibre is nucleated and involuntary.
Reason : Intercalated disc form three dimensional network of cardiac muscle fibre.
- Q.87 **Assertion :** During contraction both half I-bands and A-band disappears.
Reason : Sarcolemma is a real contractile unit found between two Z-lines.

STRUCTURAL ORGANISATION IN ANIMAL-II

- Q.88 **Assertion :** Earthworm is brown or clay coloured.
Reason : Because of presence of pigment porphyrin.
- Q.89 **Assertion :** Chlorogogen cells are considered, analogous to liver of vertebrates.
Reason : Because it is concerned with storage of reserve food, deamination of protiens, formation of urea etc.
- Q.90 **Assertion :** Earthworm is saprozoic.
Reason : Because it feed on small insect.
- Q.91 **Assertion :** Earthworm is hermaphrodite.
Reason : Because in earthworm both sexes are separate.
- Q.92 **Assertion :** Earthworms are enemy of farmer.
Reason : Because they destroy the crop in field.
- Q.93 **Assertion :** In body of earthworm porphyrin pigment is found.
Reason : Because it protect earthworm from chemicals.
- Q.94 **Assertion :** In earthworm development is direct.
Reason : Because in development larval stage is not found.
- Q.95 **Assertion :** In cockroach, inspiration is an active process.
Reason : It is due to the contraction of tergo-sternal muscle.
- Q.96 **Assertion :** In frog, sinus-venosus is present.
Reason : In mammals and birds the remnant of sinus venosus has taken part in the formation of SA node.
- Q.97 **Assertion :** Septal nephridia take part in osmoregulation.
Reason : They are enteronephric.
- Q.98 **Assertion :** In Periplaneta, only super position or over lapping images are formed.
Reason : Retinal pigment sheath remains contracted through out the life.
- Q.99 **Assertion :** Pharyngeal gland of earthworm includes chromophil cells, which secrete saliva.
Reason : Salivary amylase of earthworm is essential to digest carbohydrates.
- Q.100 **Assertion :** The head of cockroach is hypognathus.
Reason : Proximal part of lower lip of cockroach is called pastmentum.
- Q.101 **Assertion :** The heart of cockroach is neurogenic.
Reason : He heart beats in cockroach are 49 perminute.

- Q.102 **Assertion :** Albetoreceptors are found on the antennae.
Reason : Phonoreceptors are found on the joints of legs.
- Q.103 **Assertion :** Corpora allata glands secrete molting hormone.
Reason : Carpora cardiaca secrets juvenile hormone.

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ANSWER KEY

Q.1	2	Q.2	4	Q.3	3	Q.4	4	Q.5	1	Q.6	1	Q.7	1
Q.8	2	Q.9	4	Q.10	1	Q.11	3	Q.12	2	Q.13	4	Q.14	2
Q.15	4	Q.16	2	Q.17	1	Q.18	1	Q.19	2	Q.20	2	Q.21	2
Q.22	4	Q.23	1	Q.24	1	Q.25	4	Q.26	1	Q.27	4	Q.28	2
Q.29	3	Q.30	3	Q.31	2	Q.32	4	Q.33	1	Q.34	3	Q.35	3
Q.36	1	Q.37	3	Q.38	3	Q.39	2	Q.40	3	Q.41	2	Q.42	3
Q.43	2	Q.44	3	Q.45	1	Q.46	3	Q.47	4	Q.48	1	Q.49	4
Q.50	4	Q.51	2	Q.52	3	Q.53	4	Q.54	3	Q.55	3	Q.56	3
Q.57	4	Q.58	1	Q.59	1	Q.60	2	Q.61	4	Q.62	1	Q.63	3
Q.64	1	Q.65	1	Q.66	2	Q.67	1	Q.68	1	Q.69	4	Q.70	2
Q.71	3	Q.72	1	Q.73	3	Q.74	1	Q.75	2	Q.76	3	Q.77	2
Q.78	2	Q.79	4	Q.80	2	Q.81	1	Q.82	4	Q.83	3	Q.84	2
Q.85	4	Q.86	3	Q.87	4	Q.88	1	Q.89	1	Q.90	3	Q.91	3
Q.92	4	Q.93	3	Q.94	1	Q.95	4	Q.96	2	Q.97	1	Q.98	4
Q.99	3	Q.100	2	Q.101	2	Q.102	3	Q.103	3				