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Class XI

Class XII

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Contents

Class XI

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Class XII

4 Animal Kingdom

1. In which phylum the body can be divided into identical left and right halves in only one plane?
(a) Coelenterata (b) Annelida
(c) Ctenophora (d) Echinodermata

2. Skeleton of porifera is made up of
(a) Spongin fibres (b) Collagen
(c) Calcium carbonate (d) Calcareous ossicles

3. *Ascaris* is characterized by
(a) Absence of true coelom but presence of metamerism
(b) Presence of neither true coelom nor metamerism
(c) Presence of true coelom but absence of metamerism
(d) Presence of true coelom and metamerism

4. **Statement I:** Ctenophores are exclusively marine, radially symmetrical, diploblastic organisms.
Statement II: Bioluminescence is well marked in ctenophores.
(a) Both Statement I and Statement II are true
(b) Both Statement I and Statement II are false
(c) Statement I is true but Statement II is false
(d) Statement I is false but Statement II is true

5. Identify the incorrect statements:
(i) *Taenia* and *Fasciola* are examples of platyhelminthes.
(ii) Ctenophores are also called comb jellies.
(iii) Hooks and suckers are present in the parasitic platyhelminthes.
(iv) Flatworms are radially smmetrical.
(v) Flatworms exhibit tissue level of organisation.
Choose the most appropriate answer from the options given below
(a) (i), (iii) and (v) only (b) (i) and (iv) only
(c) (i), (ii) and (v) only (d) (iv) and (v) only

6. **Assertion A:** The members of Aschelminthes are commonly known as flatworms.
Reason R: The body of Aschelminthes is circular in cross-section.
(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.

7. Match the following Columns.

	Column-I (Symmetry)		**Column-II (Phylum)**
A.	Arthropoda	(i)	Asymmetry
B.	Ctenophora	(ii)	Radial symmetry
C.	Cnidaria	(iii)	Cnidocytes
D.	Porifera	(iv)	Bilateral symmetry

(a) A – (iv); B – (ii); C – (iii); D – (i)
(b) A – (ii); B – (iii); C – (iv); D – (i)
(c) A – (iii); B – (ii); C – (iv); D – (i)
(d) A – (iv); B – (iii); C – (ii); D – (i)

8. Match the following columns and choose the correct answer from the options given below:-

	Column - I		**Column - II**
(A)	Organ level	(i)	*Pheretima*
(B)	Cellular aggregate level	(ii)	*Fasciola*
(C)	Tissue level	(iii)	*Spongilla*
(D)	Organ system level	(iv)	*Obelia*

(a) A-(ii), B-(iii), C-(iv), D-(i)
(b) A-(i), B-(iii), C-(iv), D-(ii)
(c) A-(iii), B-(ii), C-(i), D-(iv)
(d) A-(ii), B-(i), C-(iii), D-(iv)

9. Identify the organism X and select the characteristic which is not true for the given organism.

X
(a) Possess dorsal hollow nerve cord
(b) Heart is dorsal
(c) Post anal tail is present
(d) Pharynx perforated by gill slits

10. Identify the correct characteristics of porifera.
(i) Commonly known as sea walnuts.
(ii) Presence of ostia and collar cells.
(iii) Exhibit tissue level of characteristics.
(iv) It is the largest phylum of animal kingdom.
(v) The body is supported by spicules and sponging fibers.
(a) (ii), (v) only
(b) (i), (ii), (v) only
(c) (i), (ii), (iii), (iv) only
(d) All of these.

11. Which one of the following is a radially symmetrical, blind sac body plan and diploblastic animal?
(a) *Spongilla* (b) *Euspongia*
(c) *Asterias* (d) *Physalia*

12. Which of the following animal is radially symmetrical but has a bilaterally symmetrical larva.
(a) *Ascaris* (Round worm)
(b) *Nereis* (Ring worm)
(c) *Pila* (Apple snail)
(d) *Asterias* (Star fish)

13. Pick the odd pair out:
(a) Cellular level : Porifera
(b) Tissue level : Aschelminthes
(c) Organ level : Platyhelminthes
(d) Organ system level : Annelida

14. Select the group of organisms given below those have diploblastic members only:
(a) *Ctenoplana, Taenia, Fasciola*
(b) *Euspongia, Physalia, Meandrina*
(c) *Wuchereria, Culex, Limulus*
(d) *Aedes, Ascaris, Hydra*

15. Which of the following is not the common fundamental feature for animal classification?
(a) Germinal layers
(b) Pathway of water transport
(c) Pattern of organisation of cells
(d) Serial repetition of the segments

16. Which contains animals that are not pseudocoelomate?
(a) *Wuchereria* (b) *Ascaris*
(c) *Ancylostoma* (d) *Taenia*

17. Which one of the following groups of animals is bilaterally symmetrical and triploblastic?
(a) Sponges
(b) Coelenterates (Cnidarians)
(c) Aschelminthes (round worms)
(d) Ctenophores

18. Animals with metameric segmentation, bilateral symmetry and closed circulatory system belong to phylum:
(a) Annelida (b) Echinodermata
(c) Arthropoda (d) Mollusca

19. In which triploblastic animal, coelom is absent?
(a) Platyhelminthes (b) Aschelminthes
(c) Annelids (d) Arthropods

20. Which of the following is correctly matched?
(a) Radial symmetry – Coelenterates
(b) Coelomates – Aschelminthes
(c) Metamerism – Molluscs
(d) Triploblastic – Sponges

21. Sponges has a
(a) Symmetrical body
(b) Radial symmetry
(c) One single opening of digestive canal
(d) Cilia on the surface to create water current

22. Diploblastic and triploblastic are terms that describe
(a) the number of invaginations during embryonic development.
(b) the number of heads during embryonic development.
(c) the number of germinal layers during embryonic development.
(d) the number of cell types during development.

23. Which of the following is not a characteristic feature of kingdom animalia?
(a) Storage of carbohydrates as starch
(b) Multicellularity
(c) Obtaining nutrients by ingestion
(d) Having eukaryotic cells without walls

24. An animal having diploblastic acoelomic condition is:
(a) *Ascaris* (b) sea anemone
(c) *Planaria* (d) *Periplaneta*

25. The adults are radially symmetrical but larvae exhibit bilateral symmetry in:
(a) Mollusca (b) Hemichordata
(c) Echinodermata (d) Cephalochordata

26. Which of the following statement(s) is/are **correct** regarding phylum aschelminthes?
(i) The body is circular in cross-section hence known as roundworms.
(ii) Alimentary canal is complete with a well-developed muscular pharynx.
(iii) Sexes are separate (dioecious), i.e., males and females are distinct.
(iv) Nephridia help in osmoregulation and excretion.

(a) (i) and (ii) only (b) (iii) and (iv) only
(c) (i), (ii) and (iii) only (d) All of these

27. **Statement I:** Cnidoblasts are present on the tentacles and the body in cnidarians.
Statement II: Cnidoblasts are used for anchorage, defence and capture of the prey.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both statements I and II are correct.
(b) Both statements I and II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement II is correct but statement I is incorrect.

28. Which of the following is a correct match of a phylum with its three examples?
(a) Platyhelminthes – *Planaria, Obelia, Ancylostoma*
(b) Mollusca – *Loligo, Sepia, Octopus*
(c) Porifera – *Spongilla, Pennatula, Gorgonia*
(d) Cnidaria – *Ascaris, Physalia, Aurelia*

29. Match column-I with column-II and select the correct answer using the codes given below.

Column-I	Column-II
A. *Obelia*	I. Roundworm, pseudocoelomate
B. *Ascaris*	II. Metagenesis
C. *Asterias*	III. Radial symmetry, water vascular system, tube feet
D. *Hirudinaria*	IV. Blood sucking leech, Metameric segmentation.

(a) A – II; B – I; C – III; D – IV
(b) A – II; B – I; C – IV; D – III
(c) A – II; B – IV; C – I; D – III
(d) A – III; B – I; C – II; D – IV

30. **Statement I:** Fishes, amphibians, reptiles, birds are placed in a single phylum based on the common features like presence of notochord and dorsal hollow neural system.
Statement II: They are placed in phylum chordata but not mammals.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both statements I and II are correct.
(b) Both statements I and II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement II is correct but statement I is incorrect.

31. Which of the following phylum is being described by the given statements?
(i) They are bilaterally symmetrical, triploblastic, segmented and coelomate animals.
(ii) The body consists of head, thorax, abdomen and have jointed appendages.
(iii) Circulatory system is of open type.
(iv) Excretion takes place through malphigian tubules.
(a) Arthropoda (b) Annelida
(c) Mollusca (d) Echinodermata

32. Which of the following statement(s) (i) to (iv) is/are **incorrect**?
(i) Circulatory system in arthropods is of closed type.
(ii) Parapodia in annelids helps in swimming.
(iii) Phylum mollusca is the second largest animal phylum.
(iv) Aschelminthes are dioecious.
(a) (i) only (b) (iii) only
(c) (i) and (iii) (d) (iii) and (iv)

33. **Statement I:** Cnidarians, flatworms and roundworms have blind sac body plan.
Statement II: Cnidarians exhibit tissue level of organisation and are diploblastic
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both statements I and II are correct.
(b) Both statements I and II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement II is correct but statement I is incorrect.

34. Cellular grade of organisation is found in:
(a) Helminthes (b) Coelenterata
(c) Porifera (d) All of these

35. Which one of the following features is common in scorpion, dragonfly and prawn?
(a) Three pairs of legs and segmented body
(b) Chitinous cuticle and two pairs of antennae
(c) Jointed appendages and chitinous exoskeleton
(d) Cephalothorax involves

36. **Statement I:** In cockroaches excretion of waste material occurs through malpighian tubules.
Statement II: Earthworms are hermaphrodites and get cross-fertilisation takes place among them.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both statements I and II are correct.
(b) Both statements I and II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement II is correct but statement I is incorrect.

37. In which one of the following groups all animals are hermaphrodite:
(a) *Hydra*, *Ascaris*, *Pheretima*
(b) *Hydra*, *Homo sapiens*, Leech
(c) Tapeworm, Toad, Starfish
(d) *Hydra*, Leech, Tapeworm

38. *Ascaris* is characterised by
(a) presence of true coelom but absence of metamerism.
(b) presence of true coelom and metamerism.
(c) absence of true coelom but presence of metamerism.
(d) presence of neither true coelom nor metamerism.

39. **Statement I:** Arthropoda is the largest phylum of Animalia.
Statement II: The body of Arthropods is covered by chitinuous exoskeleton.
(a) Both statements I and II are correct.
(b) Both statements I and II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement II is correct but statement I is incorrect.

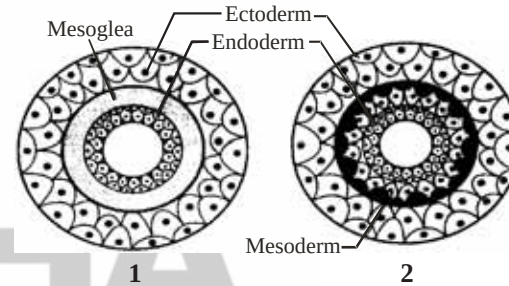
40. Which of the following characteristic is shared by all arthropods?
(a) Complete metamorphosis
(b) Wings
(c) Jointed appendages
(d) Asexual reproduction

41. Which of the following character is **incorrect** for phylum chordata?
(a) Presence of notochord
(b) Presence of vertebral column
(c) Paired gill slits
(d) A central nervous system dorsal to digestive canal

42. Which of the following characteristic distinguish arthropoda from annelids and molluscs?
(a) An external skeleton made of chitin (a polysaccharide) and protein rather than a shell made chiefly of mineral salts.
(b) Subdivision of the legs into movable segments.
(c) Distinct group of muscles, derived from many body segments, that move the separate parts of the exoskeleton.
(d) All of the above

43. Which one of the following is a very unique feature of the mammalian body?
(a) Presence of diaphragm
(b) Four chambered heart
(c) Rib cage
(d) Homeothermy

44. The given figures (1 & 2) shows the germinal layer.



The animals having structures shown in the figures are respectively called:
(a) Diploblastic, triploblastic
(b) Triploblastic, diploblastic
(c) Diploblastic, diploblastic
(d) Triploblastic, triploblastic

45. Jaws are absent in:
(a) Protochordata
(b) Cyclostomata
(c) A*mphioxus* and *Balanoglossus*
(d) *Cephalochordata* and *Myxine*

46. Which of the following pairs of animals are similar to each other pertaining to the feature stated against them?
(a) *Pteropus* and *Ornithorhyncus* - Viviparity
(b) Garden lizard and crocodile - Three chambered heart
(c) *Ascaris* and *Ancylostoma* - Metameric segmentation
(d) Sea horse and flying fish - Cold blooded (poikilothermal)

47. **Assertion (A):** Sponges have body organisation of "cellular level".
Reason (R): There is some physiological division of labour.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
(c) (A) is correct but (R) is not correct.
(d) (A) is not correct but (R) is correct.

48. Which of the following statement(s) is/are **correct**?
(i) Organ systems in different group of animals show various patterns of complexities.
(ii) The digestive system in platyhelminthes has only a single opening to the outside of the body that serve as both mouth and anus, and is hence called complete.
(iii) In open type of circulatory system, the blood is pumped out of the heart and the cells and tissues are directly bathed in it.
(iv) In closed circulatory type, the blood is circulated through a series of vessels of varying diameters (arteries, veins and capillaries).
(a) Only (i) (b) Both (ii) and (iii)
(c) (i), (iii) and (iv) (d) All of these

49. The following statement are associated with the occurrence of notochord. Identify the **incorrect** statement. Tricky
(a) It is present only in larval tail in ascidians.
(b) It is replaced by a vertebral column in adult frog.
(c) It is absent throughout the life in humans from the very beginning.
(d) It is present throughout life in *Amphioxus*.

50. **Assertion (A):** Platyhelminthes are generally hermaphrodites.
Reason (R): Fertilisation is internal in Platyhelminthes.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
(c) (A) is correct but (R) is not correct.
(d) (A) is not correct but (R) is correct.

51. Cnidocytes are present on
(a) Tentacle (b) Head
(c) Nematocyst (d) Leg

52. Book-lungs are found in:
(a) Aves
(b) Mollusca
(c) Arthropoda
(d) Annelida

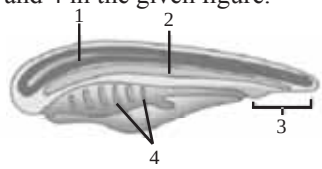
53. **Assertion (A):** Aschelminthes are called as pseudocoelomates.
Reason (R): In aschelminthes, mesoderm is present as scattered pouches in between ectoderm and endoderm.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
(c) (A) is correct but (R) is not correct.
(d) (A) is not correct but (R) is correct.

54. Which of the following sets of animals give birth to young ones?
(a) *Platypus*, Penguin, Bat, *Hippopotamus*
(b) Shrew, Bat, Cat, Kiwi
(c) Kangaroo, Rat, Dolphin, Flying fox
(d) Lion, Bat, Whale, Ostrich

55. A student has identified a triploblastic coelomate segmented animal as an arthropod. Which additional character the student should have verified before identifying that animal as an arthropod? Critical Thinking
(a) Presence of wings
(b) Presence of antenna
(c) Type of coelom
(d) Type of symmetry

56. **Assertion (A):** Bats and whales are classified as mammals.
Reason (R): Bats and whales have four-chambered heart.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
(c) (A) is correct but (R) is not correct.
(d) (A) is not correct but (R) is correct.

57. Identify the characteristic feature marked as 1, 2, 3 and 4 in the given figure.



(a) 1-Notochord; 2-Post-anal part; 3-Gill slits; 4-Nerve cord
(b) 1-Nerve cord; 2-Notochord; 3-Post-anal part; 4-Gill slits
(c) 1-Notochord; 2-Nerve cord; 3-Gill slits; 4-Post-anal part
(d) 1-Gill slits; 2-Post-anal part; 3-Nerve cord; 4-Notochord

58. What is the true for mammalia?
(a) *Platypus* is oviparous.
(b) Bats have feather.
(c) Elephant is an ovo-viviparous.
(d) Diaphragm is absent.

59. **Assertion (A):** *Calotes*, *Crocodilus* and *Chelone* are members of class Reptilia.
Reason (R): Heart is three chambered in *Calotes*, *Crocodilus* and *Chelone*.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
(c) (A) is correct but (R) is not correct.
(d) (A) is not correct but (R) is correct.

60. Which of the following statements (i) to (v) are **incorrect**?
(i) Parapodia are lateral appendages in arthropods used for swimming.
(ii) In molluscs radula is responsible for the process of excretion.
(iii) Aschelminthes are dioecious.
(iv) Echinoderm adults show radial symmetry.
(v) Ctenophorans are diploblastic.
(a) (i) and (ii) only (b) (i) and (iii) only
(c) (i), (iv) and (v) only (d) (iii) and (v) only

61. Read the following statements and answer the question.
(i) They are exclusively marine, radially symmetrical, diploblastic organisms with tissue level of organisation.
(ii) Body bears eight external rows of ciliated comb plates, which help in locomotion.
(iii) Digestion is both extracellular and intracellular.
(iv) Reproduction takes place only by sexual means.
Which of the following phylum is being described by above statements?
(a) Platyhelminthes
(b) Arthropoda
(c) Mollusca
(d) Ctenophora

62. Hemichordates have now been placed with the non-chordates, close to echinoderms, because true
(a) notochord is absent.
(b) pharyngeal gill-slits are lacking.
(c) dorsal nerve cord is absent.
(d) heart is lacking.

63. Choanocytes present in
(a) Porifera (b) Ctenophora
(c) Annelida (d) Arthropoda

64. Which of the following characteristics is **correct** for reptilia?
(a) Body covered with dry and cornified skin, scales over the body are epidermal, they do not have external ears.
(b) Body is covered with moist skin and is devoid of scales, the ear is represented by a tympanum, alimentary canal, urinary and reproductive tracts, open into a common cloaca.
(c) Fresh water animals with bony endoskeleton and air-bladder regulate buoyancy.
(d) Marine animals with cartilaginous endoskeleton and body is covered with placoid scales.

65. Which of the following is a living fossil?
(a) *Limulus* (b) *Lamprey*
(c) Shark (d) Eel

66. Read the following statements (i to v) carefully:
(i) Triploplastic
(ii) Bilateral symmetric
(iii) Organ system organisation
(iv) Pseudocoelomate
(v) Metameric segmentation
Which of the above statement(s) is/are correct for phylum Aschelminthyes?
(a) (i) and (ii) only
(b) (i), (ii), (iii) and (v) only
(c) (i), (ii), (iii) and (iv) only
(d) (i), (ii), (iii), (iv) and (v)

67. Which of the following statements is without exception in sponges?
(a) They all have calcareous spicules.
(b) They have high regenerative power.
(c) They are found only in marine water.
(d) They are all radially symmetrical.

68. Which of the following belongs to phylum Annelida?
(a) *Nereis* (b) Octopus
(c) Crab (d) Ant

69. Which is not a feature of annelids?
(a) Metameric segmentation
(b) Nephridia
(c) Pseudocoelom
(d) Double ventral nerve cord

70. What is common among silkworm, scorpion, crab and honey bee?
(a) Jointed appendages
(b) Metamorphosis
(c) Closed circulatory system
(d) Poison gland

71. Incorrect statements is/are
(a) Bioluminescence is the well-marked feature in ctenophores.
(b) Members of Aschelminthes are monoecious.
(c) Molluscs show metameric segmentation.
(d) Both (b) and (c)

72. **Statement I:** *Parapodia* of *Nereis* are meant for swimming.
Statement II: *Nereis* is dioecious but earthworms and leeches are monoecious.
(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.

73. Read the following statements and choose option which have correct ones only.
(i) The body of arthropods are generally consists of head, thorax and abdomen.
(ii) In member of phylum Platyhelminthes, alimentary canal is complete with a well-developed muscular pharynx.
(iii) Body of molluscans is unsegmented with a distinct head, muscular foot and visceral hump.
(iv) In Annelids, neural system is consists of paired ganglia connected by lateral nerves to a double dorsal nerve cord.
(v) Circulatory system of arthropods are closed type.
(a) (i), (ii) and (iv) only
(b) (i), (iii) and (iv) only
(c) (i) and (iii) only
(d) (i), (ii), (iii) and (v) only

74. **Assertion A:** Annelids and chordates have a closed circulatory system.
Reason R: In annelids and chordates, the blood pumped by the heart is always circulated through a closed network of blood vessels.
(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.

75. Match the following columns and select the correct option.

	Column-I		**Column-II**
A.	Gregarious, pest	(i)	*Asterias*
B.	Adult with radial symmetry and larva with bilateral symmetry	(ii)	Scorpion
C.	Book lungs	(iii)	Ctenoplana
D.	Bioluminescence	(iv)	*Locusta*

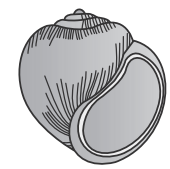
(a) A-(iv), B-(i), C-(ii), D-(iii)
(b) A-(iii), B-(ii), C-(i), D-(iv)
(c) A-(ii), B-(i), C-(iii), D-(iv)
(d) A-(i), B-(iii), C-(ii), D-(iv)

76. Match the columns and find out the correct combination:

	Column-I		**Column-II**
(A)	*Pinctada*	(i)	Pearl oyster
(B)	*Apis*	(ii)	Honey bee
(C)	*Sepia*	(iii)	Cuttlefish
(D)	*Limulus*	(iv)	King crab

(a) (A)-(ii); (B)-(i); (C)-(iv); (D)-(iii)
(b) (A)-(iii); (B)-(iv); (C)-(ii); (D)-(i)
(c) (A)-(iv); (B)-(iii); (C)-(ii); (D)-(i)
(d) (A)-(i); (B)-(ii); (C)-(iii); (D)-(iv)

77. Correct statement, regarding A and B is:



A

B

(a) A is having radula while larva of B is having radial symmetry.
(b) A and B both are coelomate.
(c) A and B both show indirect development.
(d) Both (b) and (c)

78. Which of the following statement(s) is/are **correct** regarding phylum coelenterata?
(i) They are aquatic, mostly marine, sessile or free-swimming, radially symmetrical animals.
(ii) They have a central gastro-vascular cavity with a single opening called hypostome.
(iii) Digestion is extracellular and intracellular.
(iv) Examples are *Sycon, Spongilla* and *Euspongia*.
(a) (i) and (ii) (b) (i) and (iv)
(c) (i), (ii) and (iii) (d) All of these

79. Match Column-I and Column-II correctly and find your answer from the code given below:

	Column-I (Animal)		**Column-II (Common Name)**
A.	*Physalia*	I.	Brain coral
B.	*Pennatula*	II.	Sea fan
C.	*Gorgonia*	III.	Sea pen
D.	*Meandrina*	IV.	Portuguese man of war

(a) A – I; B – II; C – III; D – IV
(b) A – IV; B – III; C – II; D – I
(c) A –IV; B – III; C – I; D – II
(d) A – III; B – IV; C – II; D – I

80. Column-I contains the characteristics features and column-II contains the function/ location. Select the correct match from the option given below.

	Column-I (Characteristic feature)		**Column-II (Function/Location)**
A.	Water canal system	I.	Sponges
B.	Comb plates	II.	A body part of arthropoda
C.	Nephridia	III.	Helps in osmoregulation and excretion
D.	Jointed appendages	IV.	Eight ciliated external rows present in a body of ctenophora.

(a) A – I; B – IV; C – III; D – II
(b) A – IV; B – III; C – I; D – II
(c) A – II; B – III; C – I; D – IV
(d) A – III; B – II; C – IV; D – I

81. Match the characteristic feature/terms given in column I with the phylum to which they belongs given in column II and choose the correct option.

	Column-I (Characteristic feature/term)		**Column-II (Phylum)**
A.	Choanocytes	I.	Platyhelminthes
B.	Cnidoblasts	II.	Porifera
C.	Flame cells	III.	Coelenterata
D.	Nephridia	IV.	Annelida

(a) A – II; B – I; C – III; D – IV
(b) A – II; B – IV; C – I; D – III
(c) A – IV; B – I; C – III; D – II
(d) A – II; B – III; C – I; D – IV

82. In which of the following animals, digestive tract has additional chambers like crop and gizzard?
(a) *Bufo, Balaenoptera, Bangarus*
(b) *Catla, Columba, Crocodilus*
(c) *Pavo, Psittacula, Corvus*
(d) *Corvus, Columba, Chameleon*

83. "Portuguese man of war" is:
(a) soldier of world war I
(b) portuguese soldier
(c) a sponge
(d) a colenterata

84. Which one of the following statement of animals is **correctly** described with no single exception in it?
(a) In chondrichthyes, notochord is persistent throughout life.
(b) All mammals are viviparous and possess diaphragm for breathing.
(c) All sponges are marine.
(d) All reptiles possess scales, have a three chambered heart and are cold blooded (poikilothermal).

85. Which one of the following is a cartilaginous fish?
(a) Silver fish (b) Dog fish
(c) Cray fish (d) Star fish

86. Which of the following statement(s) is/are **correct** for class amphibia?
(i) Body is divisible into head and trunk.
(ii) Respiration is through gills only.
(iii) The heart is two chambered *i.e.* one auricle and one ventricle.
(iv) Fertilisation is internal.
(a) Only (i) (b) Only (iv)
(c) Only (i), (ii) and (iii) (d) All of these

87. Refer the following animals and identify those which have a fluid filled body cavity with a complete lining derived from mesoderm?

Tricky

(i) *Sycon* (ii) Butterfly
(iii) *Nereis* (iv) Sea fan
(v) Scorpion
(a) (i) and (iii) only
(b) (ii) and (iv) only
(c) (ii), (iii) and (v) only
(d) All of the above

88. Which one of the following groups of animals is correctly matched with its characteristic feature without even a single exception?

(a) Reptilia : possess 3 - chambered heart with one incompletely divided ventricle.
(b) Chordata : Possess a mouth provided with an upper and lower jaw.
(c) Chondrichthyes : Possess cartilaginous endoskeleton.
(d) Mammalia : Give birth to young one.

89. Bilaterally symmetrical and acoelomate animals are exemplified by

(a) Platyhelminthes (b) Aschelminthes
(c) Annelida (d) Ctenophora

90. Which of the following animals are true coelomates with bilateral symmetry?

(a) Annelids
(b) Adult echinoderms
(c) Aschelminthes
(d) Platyhelminthes

91. Consider following features:

(i) Organ system level of organisation
(ii) Bilateral symmetry
(iii) True coelomates with segmentation of body

Select the correct option of animal groups which possess all the above characteristics.

(a) Annelida, Arthropoda and Chordata
(b) Annelida, Arthropoda and Mollusca
(c) Arthropoda, Mollusca and Chordata
(d) Annelida, Mollusca and Chordata

92. Metagenesis refers to:

(a) Alteration of generation between asexual and sexual phases of an organisms
(b) Occurrence of a drastic change in form during post-embroyonic development
(c) Presence of a segmented body and parthenogenetic mode of reproduction
(d) Presence of different morphic forms

93. Read the following statements

(i) Metagenesis is observed in Helminths.
(ii) Echinoderms are triploblastic and coelomate animals.
(iii) Round worms have organ-system level of body organization.
(iv) Comb plates present in ctenophores help in digestion.
(v) Water vascular system is characteristic of Echinoderms.

Choose the correct answer from the options given below.

(a) Only (ii), (iii) and (v) are correct
(b) Only (iii), (iv) and (v) are correct
(c) Only (i), (ii) and (iii) are correct
(d) Only (i), (iv) and (v) are correct

94. Match Column-I with Column-II.

Column-I	**Column-II**
A. Metamerism	I. Coelenterata
B. Canal system	II. Ctenophora
C. Comb plates	III. Annelida
D. Cnidoblasts	IV. Porifera

Choose the correct answer from the options given below.

(a) A – IV; B – I; C – II; D – III
(b) A – IV; B – III; C – I; D – II
(c) A – III; B – IV; C – I; D – II
(d) A – III; B – IV; C – II; D – I

95. *Planaria* possesses high capacity of:

(a) Metamorphosis
(b) Regeneration
(c) Alternation of generation
(d) Bioluminescence

96. From the following statements select the wrong one.

(a) Prawn has two pairs of antennae
(b) Nematocysts are characteristic of the Pylum Cnidaria
(c) Ctenophores commonly known as sea walnuts or comb jellies.
(d) Animals belonging to Phylum Porifera are exclusively marine

97. Identify the figure with its correct name and phylum.

(a) *Cucumaria* – Echinodermata
(b) *Ascidia* – Urochordata
(c) *Balanoglossus* – Hemichordata
(d) *Hirudinaria* – Annelida

98. What distinguishes an insect from a crustacean?
(a) Number of eye
(b) Arrangement of nerve cord
(c) Number of appendages
(d) Presence of wings

99. Which one of the following groups of structures/ organs have similar function?
(a) Typhlosole in earthworm, intestinal villi in rat and contractile vacuole in *Amoeba.*
(b) Nephridia in earthworm, Malpighian tubules in cockroach and urinary tubules in rat.
(c) Antennae of cockroach, tympanum of frog and clitellum of earthworm.
(d) Incisors of rat, gizzard (proventriculus) of cockroach and tube feet of starfish.

100. What is common in whale, bat and rat? Tricky
(a) Absence of neck
(b) Muscular diaphragm between thorax and abdomen
(c) Extra abdominal testes to avoid high temperature of body
(d) Presence of external ears

101. Which of the following statement(s) is/are **correct** regarding class aves?
(i) The forelimbs are modified into wings and the hindlimbs generally have scales and are modified for walking, swimming or clasping the tree branches.
(ii) Heart is completely four-chambered.
(iii) They are warm- blooded (homoiothermous) animals *i.e.*, they are able to maintain a constant body temperature.
(iv) They are oviparous and development is direct.
(a) Both (i) and (iii)
(b) Both (i) and (iv)
(c) (i), (ii) and (iii) only
(d) All of these

102. A student was given a specimen to identify on the basis of the characteristics given below.
(i) They are metamerically segmented.
(ii) They have closed circulatory system.
(iii) They have circular and longitudinal muscles for locomotion.
(iv) They have nephridia.
Identify the specimen.
(a) *Prawn* (b) *Pheretima*
(c) *Wuchereria* (d) *Ctenoplana*

103. Which one of the following sets of animals belongs to the same class of a phylum?
(a) *Hydra*, jelly fish, cray fish
(b) Bat, pigeon, whale
(c) Spider, scorpion, centipede
(d) Whale, tiger, kangaroo

104. Which of the following class is being described by the given statements?
(i) They are found in a variety of habitats- polar ice-caps, deserts, mountains, forests, grasslands and dark caves.
(ii) Most unique characteristic is the presence of mammary glands by which the young ones are nourished.
(iii) Heart is four-chambered.
(iv) Sexes are separate and fertilisation is internal.
(a) Reptilia (b) Aves
(c) Mammalia (d) Amphibia

105. Uricotelism is found in:
(a) fishes and fresh water protozoans.
(b) birds, reptiles and insects.
(c) frogs and toads.
(d) mammals and birds.

106. Trait common amongst earthworm, leech and *Nereis* is:
(a) Absence of legs
(b) Hermaphrodite nature
(c) Ventral nerve cord
(d) Malpighian tubules

107. Electric organs occur in:
(a) Sharks (b) Goldfish
(c) Porpoises (d) *Torpedo*

108. A common characteristic of all vertebrates without exception is:
(a) the division of body into head, neck, trunk and tail.
(b) body covered with exoskeleton.
(c) the possession of two pairs of functional appendages.
(d) the presence of well- developed skull.

109. Excretory organ of hemichordata is:
(a) Flame cells (b) Nephridia
(c) Proboscis gland (d) Trunk

110. *Salamandra* is
(a) An amphibian (b) A bird
(c) A mollusc (d) An echinoderm

111. Animals belonging to phylum Chordata are fundamentally characterized by the presence of
(a) Notochord
(b) Dorsal hollow nerve cord
(c) Paired pharyngeal gill slits
(d) All of these

112. Which of the following is the common method of reproduction in hemichordates?
(a) External fertilisation
(b) Internal fertilisation
(c) Fragmentation
(d) Parthenogenesis

113. Which of the following is not a chordate character?
(a) Presence of paired pharyngeal gill slits
(b) Ventral heart
(c) Solid and ventral nerve cord
(d) Presence of post-anal tail

114. **Statement-I:** Osteichthyes have four pairs of gills.
Statement-II: In Osteichthyes, gills are covered by an operculum on each side.
(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

115. How many statements are correct?
(i) Urochordates are also called Tunicates.
(ii) Over two-third of all named species on earth are Hemichordata.
(iii) *Bufo*, *Hyla*, *Rana* are placed under class Amphibia.
(iv) Amphibia are homoiothermous (warm-blooded) in nature.
(v) The amphibian skin is without scales.
(a) One (b) Three
(c) Two (d) Four

116. In some chordates, the notochord is modified as the vertebral column. Such animals are called vertebrates. Which one of these statements makes sense?
(i) All chordates are vertebrates, but all vertebrates are not chordates.
(ii) All vertebrates are chordates, and all chordates are vertebrates.
(iii) All vertebrates are chordates, but all chordates are not vertebrates.
(iv) Chordates are not vertebrates and vertebrates are not chordates.
(a) (i) and (ii) only (b) (ii) and (iv) only
(c) (iii) only (d) (ii) only

117. **Assertion A:** *Pristis* belongs to the class osteichthyes.
Reason R: *Pristis* possess minute placoid scales in their skin.
(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.

118. Match the columns and find out the correct combination:

	Column-I		**Column-II**
(A)	Urochordata	(i)	*Myxine*
(B)	Cephalochordata	(ii)	*Salpa*
(C)	Cyclostomata	(iii)	Lancelet
(D)	Chondrichthyes	(iv)	*Carcharodon*

(a) (A)-(ii) (B)-(iii) (C)-(i) (D)-(iv)
(b) (A)-(ii) (B)-(i) (C)-(iii) (D)-(iv)
(c) (A)-(i) (B)-(iii) (C)-(iv) (D)-(ii)
(d) (A)-(iii) (B)-(ii) (C)-(i) (D)-(iv)

119. Match the columns and find out the correct combination:

	Column-I		**Column-II**
(A)	Jawless vertebrate	(i)	Chondrichthyes
(B)	Placoid scales	(ii)	Osteichthyes
(C)	Ctenoid scales	(iii)	Amphibians
(D)	Cloaca	(iv)	Cyclostomes

(a) (A)-(iv) (B)-(i) (C)-(ii) (D)-(iii)
(b) (A)-(iii) (B)-(ii) (C)-(i) (D)-(iv)
(c) (A)-(ii) (B)-(iii) (C)-(iv) (D)-(i)
(d) (A)-(ii) (B)-(iv) (C)-(iii) (D)-(i)

120. Which of the following animal is fresh water fish?
(a) 
(b) 
(c) 
(d) 

121. A student brought a strange animal at home which he found outside under a rock. It had moist skin, a complete digestive tract, a ventral nerve cord, and had gone through torsion. Identify the phylum of the animal.
(a) Porifera (b) Annelida
(c) Mollusca (d) Echinodermata

122. Match the phylum given in column-I with their example given in column-II and choose the correct option.

	Column-I (Phylum)		**Column-II (Examples)**
A.	Echinodermata	I.	*Ascidia*, *Doliolum*
B.	Hemichordata	II.	*Asterias*
C.	Urochordata	III.	*Branchiostoma*
D.	Cephalochordata	IV.	*Balanoglossus*, *Saccoglossus*

(a) A – IV; B – II; C – I; D – III
(b) A – II; B – IV; C – I; D – III
(c) A – II; B – IV; C – III; D – I
(d) A – II; B – I; C – IV; D – III

123. Which of the following statement is **incorrect**?
(a) Platyhelminthes has incomplete digestive system.
(b) In coelenterates, the arrangement of cells is more complex.
(c) *Nereis* is monoecious but earthworms and leeches are dioecious.
(d) Simple and compound eyes are present in the animals of those phylum whose over two-thirds of all named species on earth are arthropods.

124. Exoskeleton of arthropods is composed of:
(a) Cellulose (b) Chitin
(c) Glucosamine (d) Cutin

125. Match the following:

	Column-I		**Column-II**
A.	*Physalia*	I.	Pearl oyster
B.	*Limulus*	II.	Portuguese Man of War
C.	*Ancylostoma*	III.	Living fossil
D.	*Pinctada*	IV.	Hookworm

Choose the correct answer from the options given below.
(a) A – I; B – IV; C – III; D – II
(b) A – II; B – III; C – I; D – IV
(c) A – IV; B – I; C – III; D – II
(d) A – II; B – III; C – IV; D – I

126. Which of the following featrues is not present in the Phylum - Arthropoda?
(a) Chitinous exoskeleton
(b) Metameric segmentation
(c) Parapodia
(d) Jointed appendages

127. Which one of the following statements about certain given animals is correct?
(a) Round worms (Aschelminthes) are pseudocoelomates
(b) Molluscs are acoelomates
(c) Insects are pseudocoelomates
(d) Flat worms (Platyhelminthes) are coelomates

128. Which one of the following phyla is correctly matched with its two general characteristics?
(a) Arthropoda - Body divided into head, thorax and abdomen and respiration by tracheae
(b) Chordata - Notochord at some stage and separate anal and urinary openings to the outside
(c) Echinodermata - Pentamerous radial symmetry and mostly internal fertilization
(d) Mollusca - Normally oviparous and development is indirect.

129. Which one of the following statements about all the four of *Spongilla*, *Leech*, Dolphin and Penguin is correct?
(a) Penguin is homeothermic while the remaining three are poikilothermic
(b) Leech is a fresh water form while all others are marine
(c) *Spongilla* has *special* collared cells called choanocytes, not found in the remaining three
(d) All are bilaterally symmetrical

130. The heart is 3 or 4 chambered in the vertebrate group
(a) Fishes (b) Amphibia
(c) Reptilia (d) Aves

131. Which of the following is an exclusive character of class Mammalia?
(a) Internal fertilisation
(b) Presence of a completely 4-chambered heart
(c) Homoiothermy
(d) Presence of a muscular diaphragm

132. Which one of the following characters is not typical of the class Mammalia?
(a) Thecodont dentition
(b) Alveolar lungs
(c) Ten pairs of cranial nerves
(d) Seven cervical vertebrae

133. Crocodile and Penguin are similar to whale and dog fish in which one of the following feature?
(a) Possess a solid, single and dorsal central nervous system
(b) Lay eggs and guard them till they hatch
(c) Possess bony skeleton
(d) have gill slits at some stage

134. Which of the following statement(s) is/are correct regarding class aves?
(i) The forelimbs are modified into wings and the hindlimbs generally have scales and are modified for walking, swimming or clasping the tree branches.
(ii) Heart is completely four-chambered.
(iii) They are warm- blooded (homoiothermous) animals *i.e.*, they are able to maintain a constant body temperature.
(iv) They are oviparous and development is direct.
(v) Respiration is by lungs.
(a) Both (i) and (iii)
(b) Both (i) and (iv)
(c) (i), (ii) and (iii) only
(d) All of these

135. **Statement I:** Birds and mammals are homeothermic animals.
Statement II: They are able to maintain a constant body temperature.
(a) Both Statement I and Statement II are true.
(b) Both Statement I and Statement II are false.
(c) Statement I is true but Statement II is false.
(d) Statement I is false but Statement II is true.

136. **Assertion A:** *Calotes*, *Crocodilus* and *Chelone* are members of Class Reptilia.
Reason R: Heart is three chambered in *Calotes*, *Crocodilus* and *Chelone*.
(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.

137. Match Column-I with Column-II and select the correct option from the codes given below.

	Column-I (Scientific name)		**Column-II (Common name)**
A.	*Testudo*	(i)	Tortoise
B.	*Bangarus*	(ii)	Krait
C.	*Alligator*	(iii)	Wall lizard
D.	*Hemidactylus*	(iv)	Alligator

(a) A – (i), B – (ii), C– (iii), D – (iv)
(b) A – (i), B – (ii), C – (iv), D – (iii)
(c) A – (ii), B – (i), C – (iii), D – (iv)
(d) A – (iv), B – (iii), C– (ii), D – (i)

138. Match Column-I with Column-II and select the correct option from the codes given below.

	Column-I		**Column-II**
A.	Pneumatic bones	(i)	*Delphinus*
B.	Limbless reptiles	(ii)	*Bangarus*
C.	Oviparous mammal	(iii)	*Ornithorhynchus*
D.	Viviparous mammal	(iv)	*Columba*

(a) A – (ii); B – (iv); C – (iii); D – (i)
(b) A – (iv); B – (ii); C – (iii); D – (i)
(c) A – (iv); B – (i); C – (iii); D – (ii)
(d) A – (iv); B – (iii); C – (i); D – (ii)

139. The animal shown in the adjoining picture is commonly known as:

(a) Garden lizard (b) Tree lizard
(c) Poisonous lizard (d) Wall lizard

140. In the given figure, which of the mammal is oviparous?

(a)  (b) 

(c)  (d) 

ANSWER KEY																			
1	(b)	**15**	(b)	**29**	(a)	**43**	(a)	**57**	(b)	**71**	(d)	**85**	(b)	**99**	(b)	**113**	(c)	**127**	(a)
2	(a)	**16**	(d)	**30**	(a)	**44**	(a)	**58**	(a)	**72**	(d)	**86**	(a)	**100**	(b)	**114**	(d)	**128**	(d)
3	(b)	**17**	(c)	**31**	(a)	**45**	(b)	**59**	(c)	**73**	(c)	**87**	(c)	**101**	(d)	**115**	(b)	**129**	(c)
4	(a)	**18**	(a)	**32**	(a)	**46**	(d)	**60**	(a)	**74**	(a)	**88**	(c)	**102**	(b)	**116**	(c)	**130**	(c)
5	(d)	**19**	(a)	**33**	(d)	**47**	(b)	**61**	(d)	**75**	(a)	**89**	(a)	**103**	(d)	**117**	(d)	**131**	(d)
6	(d)	**20**	(a)	**34**	(c)	**48**	(c)	**62**	(a)	**76**	(d)	**90**	(a)	**104**	(c)	**118**	(a)	**132**	(c)
7	(a)	**21**	(b)	**35**	(c)	**49**	(c)	**63**	(a)	**77**	(d)	**91**	(a)	**105**	(b)	**119**	(a)	**133**	(d)
8	(a)	**22**	(c)	**36**	(a)	**50**	(b)	**64**	(a)	**78**	(c)	**92**	(a)	**106**	(c)	**120**	(b)	**134**	(d)
9	(b)	**23**	(a)	**37**	(d)	**51**	(a)	**65**	(a)	**79**	(b)	**93**	(a)	**107**	(d)	**121**	(c)	**135**	(a)
10	(a)	**24**	(b)	**38**	(d)	**52**	(c)	**66**	(c)	**80**	(a)	**94**	(d)	**108**	(d)	**122**	(b)	**136**	(c)
11	(d)	**25**	(c)	**39**	(a)	**53**	(a)	**67**	(b)	**81**	(d)	**95**	(b)	**109**	(c)	**123**	(c)	**137**	(b)
12	(d)	**26**	(c)	**40**	(c)	**54**	(c)	**68**	(a)	**82**	(c)	**96**	(d)	**110**	(a)	**124**	(b)	**138**	(b)
13	(b)	**27**	(a)	**41**	(b)	**55**	(b)	**69**	(c)	**83**	(d)	**97**	(c)	**111**	(d)	**125**	(d)	**139**	(b)
14	(b)	**28**	(b)	**42**	(d)	**56**	(b)	**70**	(a)	**84**	(a)	**98**	(c)	**112**	(a)	**126**	(c)	**140**	(a)

Hints & Solutions

1. **(b)** Animal like annelids where the body can be divided into identical left and right halves in only one plane.

2. **(a)** Skeleton of porifera is made up of Spongin fibres.

3. **(b)** **4.** **(a)**

5. **(d)** Statement (iv) and (v) are incorrect. Flatworms are bilaterally symmetrical with organ level of organisation.

6. **(d)** The body as the aschelminthes is circular in cross-section hence, the name round worms.

7. **(a)** A – (iv); B – (ii); C – (iii); D – (i)

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

9. **(b)**

10. **(a)** Porifera is commonly referred to as sponges. They are multicellular organisms that have bodies full of pores and channels allowing water to circulate through them, consisting of jelly-like mesohyl **sandwiched** between two thin layers of cells.

11. **(d)** **12.** **(d)** **13.** **(b)** **14.** **(b)**

15. **(b)** Pathway of water transport is not the common fundamental feature for animal classification.

16. **(d)** **17.** **(c)** **18.** **(a)**

19. **(a)** From evolutionary point of view, platyhelminthes are first triploblastic animals but do not contain coelom.

20. **(a)** Coelenterates have radial symmetry. Aschelminthes are pseudocoelomates. Molluscs do not show metamerism. Sponges are diploblastic.

21. **(b)**

22. **(c)** Diploblastic animals have two germinal layers (ectoderm and endoderm) during embryonic development, e.g., poriferans. Triploblastic animals have three germinal layers (ectoderm, mesoderm and endoderm) during embryonic development, e.g., platyhelminthes.

23. **(a)** Storage of carbohydrates as starch is the characteristic feature of kingdom plantae. In animals, carbohydrates are stored in the form of glycogen while in plants, carbohydrates are stored in the form of sucrose.

24. **(b)** **25.** **(c)**

26. **(c)** Nephridia present in phylum- annelida help in osmoregulation and excretion. In aschelminthes, an excretory tube removes body wastes from the body cavity through the excretory pore.

27. **(a)** Cnidoblast cells are present on the tentacles and the body of cnidarians. A cnidoblast (also called nematoblast) has nematocyst known as 'stinging organ' (consisting of capsule, shaft and thread tube) used for anchorage, defence and offence.

28. **(b)** **29.** **(a)**

30. **(a)** Classes comprising animals like fishes, amphibians, reptiles, birds along with mammals constitute the next higher category called Phylum. All these, based on the common features like presence of notochord and dorsal hollow neural system, are included in phylum Chordata. In case of plants, classes with a few similar characters are assigned to a higher category called Division.

31. **(a)**

32. **(a)** Circulatory system in arthropods is of open type *i.e.,* blood does not flow in definite vessels. Irregular spaces known as lacunae or sinuses, filled with blood are present.

33. **(d)** Statement I is incorrect. The correct statement is-Cnidarians and flatworms have blind sac body plan whereas roundworms have tube within tube plan.

34. **(c)** **35.** **(c)** **36.** **(a)** **37.** **(d)**

38. **(d)** *Ascaris* belong to the phylum Nematoda of super phylum Aschelminthes. They have a cylindrical body without showing any metamerism, a pseudocoel (false coelom) and a complete digestive tract lined by endodermal epithelium. The cuticle covering the body surface bears minute transverse striations giving a pseudosegmented appearance to the worm.

39. **(a)** **40.** **(c)**

41. **(b)** Vertebral column is present in the vertebrates only. It is not present in all the chordates.

42. **(d)** An arthropod has a segmented body covered by an exoskeleton made from chitin and other chemicals. This exoskeleton serves as protection and provides places for muscle attachment. Arthropods must moult because their exoskeletons do not grow with them. The body feature from which the phylum takes its name is the jointed appendages, which include antennae and mouthparts as well as walking legs.

43. **(a)**

44. **(a)** On the basis of the given figure of germinal layers, the animals belongs to 1 and 2 are respectively diploblastic and triploblastic. Diploblastic animals have two germinal layers, outer ectoderm and inner endoderm, *e.g.*, porifera and coelenterate. Triploblastic animals have three germinal layers – outer ectoderm, middle mesoderm and inner endoderm, *e.g.*, platyhelminthes, aschelminthes, annelida, arthropoda, molluscs, echinodermata and chordata.

45. **(b)** Jaws are absent in *cyclostomata*. *Cyclostomata* is a class of group agnatha, where paired appendages, girdles and jaw are absent.

46. **(d)** Sea horse and flying fish are cold blooded animals. *Ornithorhyncus* is oviparous. Crocodile has four chambered heart. *Ascaris* and *Ancylostoma* are segmented roundworms.

47. **(b)** Sponges are multicellular but they have cellular level of body organisation i.e., true tissue, movable parts, or appendages are not formed. Although, there is some physiological division of labour, accompanied with structural differentiation amongst body cells. But here, similar cells are arranged neither in permanent layer nor masses to form tissues.

48. **(c)** The digestive system of platyhelminthes is incomplete. A complete digestive system has two openings, mouth and anus.

49. **(c)** Notochord is a flexible rod like structure that forms the main support of the body in the lowest chordates. It is not absent in humans throughout their life. Notochord is present in embryonic stage and get changed or replaced by vertebral column in the adult.

50. **(b)** Platyhelminthes are generally hermaphrodites, i.e., both the sexes are present in one organism. These show internal as well as cross fertilisation where male gametes of one organism fertilise female gametes of another organism.

51. **(a)**

52. **(c)** Book-lungs are found in Arthropoda.

53. **(a)** In aschelminthes, the body cavity is not lined by mesoderm, instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm. Hence, they are called pseudocoelomates.

54. **(c)** Penguin, kiwi and ostrich all belong to class aves (*i.e.* birds) under phylum chordata and they do not give birth to their young ones. They are oviparous while kangaroo, rat, dolphin and flying fox, all belong to class mammalia and are viviparous.

55. **(b)**

56. **(b)** Bats and whales are the members of class Mammalia. The bats are the only mammals which have wings and can really fly while whales are the largest animals in existence. Both bats and whales have four chambered heart but birds and crocodiles also have four chambered heart.

57. **(b)** The give figure belongs to phylum chordata, which are characterised by the presence of notochord, a dorsal hollow nervechord, paired pharyngeal gill slits and post anal part.

58. **(a)**

59. **(c)** *Calotes*, *Crocodilus* and *Chelone* are members of class Reptilia. Heart is four chambered in *Crocodilus* while three chambered in *Calotes* and *Chelone*.

60. **(a)** Aquatic annelids like *Nereis* possess lateral appendages (called parapodia) which help in swimming. Radula is the rasping organ for feeding which is present in the mouth of molluscs.

61. **(d)** Ctenophores, also known as comb jellies/ sea gooseberries/sea walnuts, or Venus's girdles, are voracious predators.

62. **(a)** Hemichordates have now been placed with the non-chordates because true notochord is absent in them but a buccal diverticulum is present in pre-oral region which is often called stomochord.

63. **(a)** Choanocytes present in Porifera.

64. **(a)** Characteristics given in options (b), (c) and (d), belong to the classes amphibia, osteichthyes and chondrichthyes respectively.

65. **(a)** **66.** **(c)**

67. **(b)** Sponges may have calcareous or siliceous spicules. All sponges are not marine, some are freshwater living also. Sponges may be asymmetrical or bilaterally symmetrical, besides being radially symmetrical. So, these characters are with exception. The character without exception is the regenerative power of sponges. All sponges have a good power of regeneration. They can regrow any part of the body lost or cut off. Small fragments can grow into a complete sponge.

68. **(a)** *Nereis* belongs to phylum Annelida.

69. **(c)** **70.** **(a)**

71. **(d)** Statement (b) and (c) are incorrect. Members of aschelminthes are dioecious.

72. **(d)** **73.** **(c)** **74.** **(a)**

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

76. **(d)** (A)-(i); (B)-(ii); (C)-(iii); (D)-(iv)

77. **(d)**

78. **(c)** *Sycon*, *Spongilla* and *Euspongia* are examples of phylum Porifera. *Physalia*, *Adamsia*, *Pennatula*, *Gorgonia* and *Meandrina* are examples of phylum coelenterata (Cnidaria).

79. **(b)** **80.** **(a)** **81.** **(d)**

82. **(c)** The digestive tract of birds has additional chambers, the crop and gizzard. Example: *Corvus* (Crow), *Columba* (Pigeon), *Psittacula* (Parrot), *Struthio* (Ostrich), *Pavo* (Peacock), *Aptenodytes* (Penguin), *Neophron* (Vulture).

83. **(d)**

84. **(a)** *Platypus* is an oviparous mammal. *Spongilla* and *Euspongia* are fresh water sponges. Crocodiles have four chambered heart. In the members of class chondrichthyes, the notochord is persistent throughout life.

85. **(b)** *Elasmobranchii* (dog fish) is one of the two subclasses of cartilaginous fish in the class chondrichthyes, the other being holocephali. Members of elasmobranchii subclass have no swim bladders, five to seven pairs of gills clefts opening individually to the exterior, rigid dorsal fins, and some placoid scales.

86. **(a)** As the name suggests, amphibians can live in aquatic as well as terrestrial habitats. Respiration is by gills, lungs and through skin. The heart is three chambered (two auricles and one ventricle) and the fertilisation is external.

87. **(c)** Butterfly, *Nereis*, scorpion and *Pila* are animals which have a fluid filled body cavity with a complete lining derived from mesoderm, Hence, called as coelomate animals.

88. **(c)** Chondrichthyes are the cartilaginous fish with a flexible skeleton made of cartilage rather than bone.

89. **(a)** Platyhelminthes are bilaterally symmetrical, triploblastic and acoelomate animals with organ level of organisation.

90. (a) Annelids exhibit bilateral symmetry with metameric segmentation where external segments correspond to internal segments.
Adult echinoderms are bilaterally symmetrical. Aschelminthes are pseudocoelomates and platyhelminthes are acoelomates.

91. (a) Organ system of organisation, bilateral symmetry and true coelomates with segmented body are found in annelid, arthropoda and chordates.
In mollusca , the body is unsegmented.

92. (a) Metagenesis is defined as alternation of generation found in phylum cnidaria (eg. *Obelia*). In this phenomenon one generation of an organism reproduces asexually, followed by a sexually reproducing generation.

93. (a) Statements (II), (III) and (V) are correct
- Metagenesis (alternation of generation) is observed in members of phylum Coelenterata (Cnidaria).
- Echinoderms are triploblastic and coelomate animals as true coelom is observed in them.
- Roundworms (Aschelminths) have organ system level of organization.
- Comb plates present in ctenophores help in locomotion.
- Water vascular system is seen in echinoderms, which helps in locomotion, capture and transport of food and respiration.

94. (d) The correct match is as follows -
A – III; B – IV; C – II; D – I
Metamerism is commonly seen in the members of phylum Annelida where the body is externally and internally divided into segments with a serial repetition of atleast some organs.
Water canal system is present in the members of phylum Porifera.
The body of ctenophores bears 8 external rows of ciliated comb plates which help in locomotion.
Cnidoblasts or cnidocytes are characteristic feature of cnidarians (coelentrata).

95. (b) *Planaria* is a flatworm which possesses a high capacity of regeneration.

96. (d) Animals belonging to Phylum Porifera are mostly marine except a few which are found in fresh water- *e.g. Spongilla, Euspongia*.

97. (c) *Balanoglossus* belong to phylum hemichordata.

98. (c) 99. (b) 100. (b)

101. (d) Aves are warm blooded, oviparous, bipedal flying vertebrates with an exoskeleton of feathers. Forelimbs are modified as wings for flying and hind limbs are adapted for walking, perching and swimming.

102. (b) *Pheretima* belongs to annelida phylum. Annelida is a group of segmented worms, and they are found worldwide from the deepest marine sediments to the soils in our city parks and yards.

103. (d) Because they are belong to the class mammalia.

104. (c) Mammals are tetrapod that have hair, a four-chambered heart, a diaphragm, and mammary glands.

105. (b) 106. (c)

107. (d)

108. (d) The sub-phylum vertebrata (or craniata) have a well-developed nervous system that is differentiated into brain and spinal cord. Brain is protected by a brain box called cranium, so they are also called as craniata.

109. (c) Excretory organ of hemichordata is proboscis gland.

110. (a) *Salamandra* is an amphibian.

111. (d) Animals belonging to phylum Chordata are fundamentally characterized by the presence of notochord, dorsal hollow nerve cord, paired pharyngeal gill slits.

112. (a) External fertilisation is the common method of reproduction in hemichordates.

113. (c) The **chordate** is the phylum which includes humans and other vertebrates. However, not all chordates are vertebrates. All chordates have the following features at some point in their life (in the case of humans and many other vertebrates, these features may only be present in the embryo): Pharyngeal slits, dorsal nerve cord, notochord, Post-anal tail.

114. (d)

115. (b) Statement (i), (iii) and (v) are correct.

116. (c)

117. (d) Reason is false because pristis belongs to class chondrichthyes.

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

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

120. (b) Rohu that is given in option (b) is a fresh water fish.

121. (c) The animal found by the boy belongs to mollusca phylum. Mollusca are the second largest phylum after arthropoda and include predominantly marine animals. They are triploblastic, bilaterally symmetrical, schizocoelic and unsegmented protostomes. They have moist skin, a complete digestive tract, a ventral nerve cord, and had gone through torsion.

122. (b)

123. (c) *Nereis* is dioecious but earthworms and leeches are monoecious.

124. (b) Exoskeleton of arthropods is made up of chitin.

125. (d) *Physalia* is a marine hydrozoans and is generally found in the atlantic ocean and the Indian ocean. It is also known as Portuguese man of war or blue bottle jelly fish. Limulus is known as king crab and is considered as living fossil. Pinctada is named as pearl oyster and the *Ancylostoma* is called hookworm.

126. (c) All arthropods possess a stiff exoskeleton (external skeleton) composed primarily of chitin. Arthropod bodies are divided into segments. Parapodia are paired, lateral appendages extending from the body segments. Arthropod appendages may be either biramous (branched) or uniramous (unbranched). They possess jointed appendages.

127. (a) Acoelomates are animals that have no body cavity or coelom. The examples are poriferans, coelentrates, ctenophores, platyhelminthes and nemertean. Pseudo-coelomates are animals that have false or pseudo coelom. Examples are aschelminthes.

128. (d) Mollusca mostly oviparous and a few viviparous. The development may be direct or indirect with trochophore, velliger and glochidium.

129. (c) *Spongilla* is a fresh water sponge that belongs to phylum porifera. It has special collared cells called choanocytes. Choanocytes are not found in leech, dolphin and penguin.

130. (c) The heart is 3 or 4 chambered in the vertebrate group reptilia.

131. (d)

132. (c) Mammals have 12 pairs of cranial nerves.

133. (d)

134. (d) **Aves** are warm blooded, oviparous, bipedal flying vertebrates with an exoskeleton of feathers. Forelimbs are modified as wings for flying and hind limbs are adapted for walking, perching and swimming.

135. (a) Warm-blooded animals or homeotherms beings, maintain a steady body temperature. Birds and mammals are two examples.

136. (c) *Calotes*, *Crocodilus* and *Chelone* are members of Class Reptilia. Heart is four chambered in *Crocodilus* and three chambered in *Calotes* and *Chelone*.

137. (b) A – (i), B – (ii), C – (iv), D – (iii)

138. (b) A – (iv); B – (ii); C – (iii); D – (i)

139. (b)

140. (a)

2 Human Reproduction

1. The sertoli cells are located in
(a) Caput epididymis
(b) Cauda epididymis
(c) Seminiferous tubules
(d) Germinal epithelium

2. Human primary spermatocyte contains

Tricky

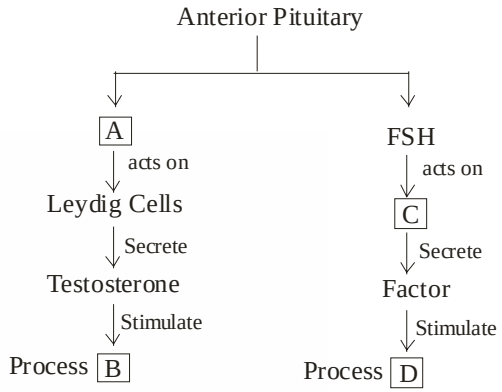
(a) 22 autosomes and an X-chromosomes
(b) 22 autosomes and a Y-chromosomes
(c) 22 autosomes and an X or Y chromosomes
(d) 22 pairs of autosomes and XY chromosomes

3. The difference between spermiogenesis and spermiation is
(a) In spermiogenesis spermatozoa from sertoli cells are released into the cavity of seminiferous tubules, while in spermiation spermatozoa are formed.
(b) In spermiogenesis spermatozoa are formed, while in spermiation spermatids are formed.
(c) In spermiogenesis spermatids are formed, while in spermiation spermatozoa are formed.
(d) In spermiogenesis spermatozoa are formed, while in spermiation spermatozoa are released from sertoli cells into the cavity of seminiferous tubules.

4. **Assertion A:** In the testis spermatogenesis occur in the seminiferous tubules and testosterone secretion take place by the interstitial cells.
Reason R: Testosterone brings about growth and maturation of secondary sex organ and also development of accessory sex characters.
(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.

5. Following is the flow chart showing the influence of hormones on testis in males. Choose the option which correctly fills the gaps represented by A, B, C and D.

Toughnut



(a) A - Androgen, B - Spermiation; C - Seminiferous tubule; D - Spermatogenesis
(b) A - Inhibin, B - Spermatogenesis; C - Spermatogonia; D - Spermatogensis
(c) A-LH; B-Spermatogenesis; C-Sertoli cells; D - Spermiogenesis
(d) A - LH ; B - Spermiogenesis; C - Sustentacular cells; D - Spermatogenesis

6. Which of the following is correct regarding the male reproductive system?
(a) Sperms are diploid.
(b) It includes testes, accessory ducts and glands, and oviducts.
(c) The scrotum keeps the testis warmer, thus helping it to promote the sperm formation.
(d) Sertoli cells are found in seminiferous tubules and provide nutrition to germ cells.

7. Which of the following statements regarding mammary gland is incorrect?
(a) They are paired glandular structures that lie over the pectoral muscles.
(b) Each gland has 100–500 lobulated milk glands, each having a number of lobules containing number of alveoli.
(c) The cells of alveoli secrete milk which is stored in the cavity of the alveoli.
(d) Each milk gland or lobule has lactiferous ducts that drain into openings in the nipple.

8. Which one of the following is the correct matching of the events occurring during menstrual cycle?
(a) Proliferative phase: Rapid regeneration of myometrium and maturation of graafian follicle.
(b) Development of corpus luteum: Secretory phase and increased secretion of progesterone.
(c) Menstruation: Breakdown of myometrium and ovum not fertilised.
(d) Ovulation: LH and FSH attain peak level and sharp fall in the secretion of progesterone.

9. Which of the following statement is correct regarding menstruation?
(a) The menstrual fluid can easily clot.
(b) The end of the cycle of menstruation is called menarche.
(c) At menopause in the female, there is especially abrupt decrease in gonadotropic hormones.
(d) In human female, menstruation can be deferred by the administration of combination of oestrogen and progesterone.

10. Which of the following statements about human pregnancy and foetal development is incorrect?
(a) The blastocyst is a stage in foetal development that appears early during the third trimester.
(b) A vital connection between the foetal and maternal blood supplies occurs at the placenta.
(c) Most of the growth in foetal size occurs during the second and third trimesters.
(d) All major organ systems have formed by the end of the foetus's first three months of life.

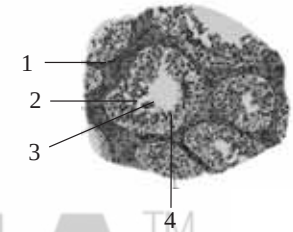
11. Which of the following is a transporting tube leading from the bladder which brings urine outside the body *via* penis? **Critical Thinking**
(a) Ureter (b) Epididymis
(c) Ejaculatory duct (d) Urethral meatus

12. Sperms produce an enzymatic substance for dissolving egg coverings. It is called
(a) Hyaluronic acid (b) Hyaluronidase
(c) Androgamone (d) Diastase

13. Ovulation or release of ovum occurs on day of menstrual cycle.
(a) 8-10 day (b) 12-14 day
(c) 4-14 day (d) Last two days

14. Read the following statements (i) to (v) and answer the following question. **Tricky**
(i) This structure is also called womb.
(ii) Its shape is like an inverted pear.
(iii) The process of fertilisation takes place in this structure.
(iv) The wall of this structure has three layers of tissue.
(v) It secretes several steroid hormones.
Identify the correct characteristics feature regarding uterus from the above statements.
(a) (i) and (iv) only
(b) (iii) and (v) only
(c) (i), (ii) and (iv) only
(d) All the five statements.

15. Given below is the diagrammatic sectional view of seminiferous tubule with their parts marked as 1, 2, 3, and 4. Select the option which shows the correct identification of the structure with its characteristics.



(a) 1: Spermatozoa, secretes testicular hormones that control spermatogenesis.
(b) 2: Spermatogonium, it is also called male germ cells which undergo meiotic division to from spermatozoa.
(c) 3: Interstitial cells, present in the interstitial spaces and store and transport the sperms from the testis to the outside through the urethra.
(d) 4: Sertoli cells, it maintains low temperature of the testis.

16. Match the column-I with column-II and select the correct option.

	Column-I		**Column-II**
A.	Fertilisation	I.	Mitotic division
B.	Implantation	II.	Embryo with 8 to 16 blastomeres
C.	Cleavage	III.	Ampullary-isthmic junction
D.	Morula	IV.	Embedding of blastocyst in the endometrium

(a) A – I; B – II; C – IV; D – III
(b) A – III; B – I; C – IV; D – II
(c) A – III; B – II; C – I; D – IV
(d) A – III; B – IV; C – I; D – II

17. Which one of the following is the most likely root cause for menstruation not taking place at regular cycling in human female?

Critical Thinking

(a) Maintenance of the hypertrophical endo-metrial lining.
(b) Maintenance of high concentration of sex hormones in the blood stream.
(c) Retention of well developed corpus luteum.
(d) Fertilisation of the ovum.

18. **Statement I:** Each seminiferous tubule is lined on its inside by three type of cells.
Statement II: These cells are male germ cells, sertoli cells and Leydig cells.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both statement I and statement II are correct.
(b) Both statement I and statement II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement II is correct but statement I is incorrect.

19. Which of the following statements about the mammalian blastocyst is **not true**?
(a) The trophoblast gives rise to the embryo proper.
(b) Maternal genes are expressed during cleavage.
(c) The blastocyst implants in the mother's uterus.
(d) Early mammalian development is slow.

20. Menstruation results in the discharge of:
(a) the corpus luteum of the uterus.
(b) surface cells from the vagina.
(c) blood from the outer surface of the uterus.
(d) the endometrial lining.

21. Which one of the following is the precise site of embryo implantation in a normal pregnancy?
(a) Endometrium (b) Vagina
(c) Oviduct (d) Cervix

22. **Statement I:** In the testis, spermatogenesis occurs in the seminiferous tubules and testosterone secretion takes place from the Sertoli cells.
Statement II: Testosterone brings growth and maturation of primary sex organs and also development of accessory sex characters.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both statement I and statement II are correct.
(b) Both statement I and statement II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement II is correct but statement I is incorrect.

23. The role of the corpus luteum and the hormones it produces ends:
(a) at the time of embryonic implantation in the uterus.
(b) with the formation of the placenta.
(c) during the second trimester of pregnancy.
(d) just prior to parturition.

24. The given figure shows the male reproductive system. Some structures are marked as 1, 2, 3, and 4.
Identify the structure whose removal will cause the sperm to be reacted with acidic urine in the urethra.

(a) 1 (b) 2
(c) 3 (d) 4

25. **Statement I:** Production of FSH increases, while that of LH decreases in the ovulation phase.
Statement II: Due to decrease in the level of LH, ovulation (release of ovum) takes place.

Toughnut

In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both statement I and statement II are correct.
(b) Both statement I and statement II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement II is correct but statement I is incorrect.

26. In the given columns, column-I contain structures of male reproductive system and column-II contains its feature. Select the correct match from the options given below.

Column-I (Structure of male reproductive system)		**Column-II (features)**	
A.	Seminiferous tubule	I.	Network of seminiferous tubule
B.	Rete testis	II.	Secondary sexual characters
C.	Leydig cells	III.	Meiosis and sperm formation occurs
D.	Foreskin	IV.	Skin of penis

(a) A – I; B – II; C – III; D – IV
(b) A – III; B – I; C – II; D – IV
(c) A – III; B – I; C – IV; D – II
(d) A – II; B – IV; C – III; D – I

27. Which of the following statements regarding sertoli cell is **correct**? Tricky

(a) It is found in seminiferous tubule and secrete testosterone hormone.
(b) It is a place where spermatozoa is concentrated and stored until ejaculation.
(c) It secretes spermatozoa activating substances like fructose, citrate, inositol, prostaglandin and protein.
(d) It is found in seminiferous tubule and function as nurse cells for differentiating spermatozoa.

28. **Statement I:** During pregnancy, the levels of hormones like oestrogens and progesterone are increased.
Statement II: The increased production of these hormones is essential for foetal growth.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both statement I and statement II are correct.
(b) Both statement I and statement II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement II is correct but statement I is incorrect.

29. Which one of the following statements is **incorrect** about menstruation? Tricky

(a) During normal menstruation, about 40 ml blood is lost.
(b) The menstrual fluid can easily clot.
(c) At menopause in the female, there is especially abrupt increase in gonadotropic hormones.
(d) The beginning of the cycle of menstruation is called menarche.

30. Which of the following best represents the normal path of a sperm cell as it makes its way from the point of entry into the female's reproductive tract to the place where fertilisation typically occurs?
(a) Cervix, vagina, ovary, oviduct
(b) Vagina, cervix, uterus, oviduct
(c) Uterus, cervix, vagina, oviduct
(d) Vagina, uterus, cervix, oviduct

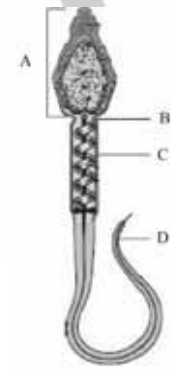
31. Assume 2n =12 in a hypothetical species. In gametogenesis, the number of chromosomes in a spermatid would be _____ and in a first polar body would be _____. Toughnut

(a) 3, 6 (b) 3, 3
(c) 6, 3 (d) 6, 6

32. **Statement I:** Upto morula stage, the cells divide without any increase in size.
Statement II: Cell division convert unicellular zygote into a multicellular embryo.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both statement I and statement II are correct.
(b) Both statement I and statement II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement II is correct but statement I is incorrect.

33. Which of the following groups of cells in the male gonad represent haploid cells?
(a) Spermatogonial cells
(b) Germinal epithelial cells
(c) Secondary spermatocytes
(d) Primary spermatocytes

34. The figure given below shows the structure of sperm. Identify the correct feature corresponding to the marked structure 1, 2, 3 and 4.



(a) 1 – Head: Its anterior portion is covered by a structure filled with enzymes that help in the fusion of male and female gametes.
(b) 2 – Middle piece: It contains a haploid nucleus.
(c) 3 – Neck: It possesses few ribosomes which produces energy for the process of fertilisation.
(d) 4 – Tail: It releases energy source for swimming of sperm.

35. Read the following statements (i) to (v) and answer the question. Toughnut

(i) Each testis has highly coiled 250 compartments called seminiferous tubules.
(ii) Erection of the penis occurs due to presence of special tissues that facilitate insemination.
(iii) Immunologically competent cells are also present in the interstitial spaces of seminiferous tubules.
(iv) Testes lie outside the abdominal cavity in a thin pouch like skin called scrotum.
(v) Bulbourethral gland is a single accessory gland.

How many of the above statements are **incorrect**?
(a) (i), (ii) and (iii) only
(b) (iii) and (v) only
(c) (i) and (v) only
(d) (ii), (iv) and (v) only

36. **Statement I:** Placenta is an endocrine gland.
Statement II: It secretes many hormones essential for pregnancy.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both statement I and statement II are correct.
(b) Both statement I and statement II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement II is correct but statement I is incorrect.

37. **Assertion (A):** In human male, testes are extra-abdominal and lie in scrotal sacs.
Reason (R): Scrotum acts as thermoregulator and keeps testicular temperature lower by 2°C for normal spermatogenesis.
In the light of the above statements, choose the **correct** answer from the options given below.
(a) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
(c) (A) is correct but (R) is not correct.
(d) (A) is not correct but (R) is correct.

38. For approximately how long during the human female's menstrual cycle are progesterone concentrations high enough to maintain the uterus in a proper condition for pregnancy?
(a) All of the cycle
(b) None of the cycle
Critical Thinking
(c) During the first half of the cycle
(d) During the second half of the cycle

39. In the human female, menstruation can be deferred by the administration of
(a) combination of FSH and LH
(b) combination of estrogen and progesterone
(c) FSH only
(d) LH only

40. No new follicles develop in the luteal phase of the menstrual cycle because
(a) follicles do not remain in the ovary after ovulation
(b) FSH levels are high in the luteal phase
(c) LH levels are high in the luteal phase
(d) both FSH and LH levels are low in the luteal phase

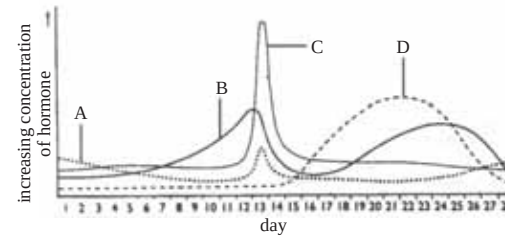
41. In human beings, at the end of 12 weeks (first trimester) of pregnancy, the following is observed.
(a) Eyelids and eyelashes are formed
(b) Most of the major organ systems are formed
(c) The head is covered with fine hair
(d) Movement of the foetus

42. Match the items given in Column I with those in Column II and select the correct option given below :

Column I	Column II
(A) Proliferative Phase	(i) Breakdown of endometrial lining
(B) Secretory Phase	(ii) Follicular Phase
(C) Menstruation	(iii) Luteal Phase
(D) Leydig cells	(iv) Androgen

(a) (A)–(iii), (B)–(ii), (C)–(i), (D)–(iv)
(b) (A)–(i), (B)–(iii), (C)–(ii), (D)–(iv)
(c) (A)–(iii), (B)–(i), (C)–(ii), (D)–(iv)
(d) (A)–(ii), (B)–(iii), (C)–(i), (D)–(iv)

43. The following graph represents the relative concentrations of the four hormones (A, B, C and D) present in the blood plasma of a woman during her menstrual cycle. Identify the hormones.



	A	B	C	D
(a)	FSH	Progesterone	LH	Oestrogen
(b)	LH	Progesterone	FSH	Oestrogen
(c)	FSH	Oestrogen	LH	Progesterone
(d)	LH	Oestrogen	FSH	Progesterone

44. Shortest phase in the menstruation cycle of women is:
(a) Menses
(b) Luteal phase
(c) Ovulatory phase
(d) Follicular phase

45. Which gland releases a small amount of fluid just prior to ejaculation to decrease acidity in the urethra caused by urine?
Critical Thinking
(a) Prostate
(b) Glans penis
(c) Seminal vesicle
(d) Bulbourethral gland

46. The head of mature mammalian sperm is made of:
(a) An acrosome
(b) Elongated nucleus covered by acrosome
(c) Two centrioles and an axial filament
(d) Nucleus, acrosome, cytoplasm and mitochondrial sheath

47. A sac shaped like an upside down pear with a thick lining and muscles in the pelvic area where a fertilised egg or zygote comes to grow into a baby is called _____.
Tricky
(a) Oviduct (b) Uterus
(c) Vagina (d) Vulva

Directions (Qs. 48-49): These questions consist of two statements each, labelled as Assertion A and Reason R. While answering these questions, you are required to choose any one of the following four responses.
(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.

48. **Assertion (A):** Primary spermatocytes of testes are Diploid.
Reason (R): These are formed by meiosis I in the spermatogonia.

49. **Assertion (A):** Vigrous contraction of the uterus at the end of pregnancy causes expulsion.
Reason (R): The stimulatory reflex between the uterine contraction and oxytocin results in weakening contractions.

50. Cleavage in the fertilised egg of humans:
(a) starts in uterus
(b) is meroblastic
(c) starts when egg is in fallopian tube
(d) is discoidal

51. Match column-I with column-II and select the correct answer using the codes given below.
Critical Thinking

	Column-I		Column-II
A.	Proliferative phase	I.	Testosterone
B.	Leydig cell	II.	Oestrogen
C.	Spermiogenesis	III.	Progesterone
D.	Secretory phase	IV.	Spermatid

(a) A – II; B – I; C – IV; D – III
(b) A – IV; B – II; C – III; D – I
(c) A – IV; B – III; C – II; D – I
(d) A – IV; B – III; C – I; D – II

52. Select the **correct** statements regarding oogenesis.
(i) It is initiated during the embryonic development stage when millions of oogonia are formed within each ovary.
(ii) Graafian follicle releases primary oocyte from the ovary by ovulation.
(iii) At puberty, only 60,000 – 80,000 primary follicles are left in each ovary.
(iv) Secondary oocyte within tertiary follicles grows in size and completes its second meiotic division.
(a) (i), (ii) and (iii) only (b) (i) and (iii) only
(c) (ii) and (iv) only (d) All of the above

Directions (Qs. 53-54): These questions consist of two statements each, labelled as Assertion A and Reason R. While answering these questions, you are required to choose any one of the following four responses.
(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.

53. **Assertion (A):** Vagina acts as copulation canal.
Reason (R): Both insemination and fusion of gametes occur in the vagina of female.

54. **Assertion (A):** In females, parturition occurs after the pregnancy.
Reason (R): Signal for parturition originates from fully developed foetus.

55. In the given columns, column-I contain various phases of menstrual cycle and column-II contain its features. Select the correct match from the options given below.

	Column-I (Phases of menstrual cycle)		Column-II (Features)
A.	Menstrual phase	I.	Breakdown of endometrial lining of uterus along with its blood vessels which form liquid that comes out of vagina.
B.	Luteal phase	II.	A temporary endocrine gland is formed and secretes a hormone which maintains endometrium and implantation of fertilised ovum and other events of pregnancy.
C.	Follicular phase	III.	Secretion of luteinising hormone at its maximum level and induces breakdown of mature follicle to release the female gamete.
D.	Ovulatory phase	IV.	Formation of mature Graafian follicle and regeneration of endometrium of uterus.

(a) A – IV; B – II; C – III; D – I
(b) A – III; B – I; C – II; D – IV
(c) A – III; B – I; C – IV; D – II
(d) A – I; B – II; C – IV; D – III

56. Keeping a normal, sexually mature woman in her mid-twenties on continuous high doses of progesterone will:

Tricky

(a) cause her to ovulate repeatedly within each menstrual cycle.
(b) stimulate the production of mature follicles.
(c) prevent her from producing mature follicles and ovulating.
(d) cause the endometrial lining of her uterus to slough off.

57. Which of the following is the first change that occurs to the zygote after fertilisation?

Critical Thinking

(a) It divides to form a hollow ball of cells, called the blastocyst.
(b) It begins to secrete the hormones.
(c) It contacts the endometrial wall of the uterus and becomes buried inside it.
(d) It initiates the formation of a placenta.

58. The human embryo, with 8 to 16 blastomere is called:

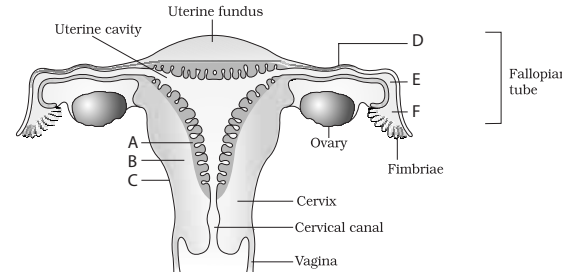
(a) Morula (b) Blastula
(c) Gastrula (d) Foetus

59. In males, testes are contained in the scrotal sacs because:

Toughnut

(a) other organs do not make space for the testes in the abdominal cavity.
(b) testes in the abdomen will hamper maturation of sperms.
(c) it provides temperature that is slightly lower than body temperature required for formation of functional sperms.
(d) it facilitates ejaculation.

60. The given figure shows the diagrammatic sectional view of female reproductive system with few structures marked as 1, 2, 3, 4, 5 and 6.



Which of the following options shows the correct labeling of A–F?

(a) 1 – Myometrium, 2 – Isthmus, 3 – Endometrium, 4 – Perimetrium, 5 – Ampulla, 6 – Infundibulum

(b) 1 – Infundibulum, 2 – Perimetrium, 3 – Endometrium, 4 – Myometrium, 5 – Ampulla, 6 – Isthmus

(c) 1 – Endometrium, 2 – Myometrium, 3 – Perimetrium, 4 – Isthmus, 5 – Ampulla, 6 – Infundibulum

(d) 1 – Perimetrium, 2 – Endometrium, 3 – Isthmus, 4 – Infundibulum, 5 – Ampulla, 6 – Myometrium

61. Match column-I with column-II and choose the correct option.

	Column-I		**Column-II**
A.	Enzymes for fertilisation	I.	Graafian follicle
B.	Corpus luteum	II.	Mammary gland
C.	Colostrum	III.	Progesterone
D.	Antrum	IV.	Acrosome

(a) A – II; B – I; C – IV; D – III

(b) A – IV; B – II; C – III; D – I

(c) A – IV; B – III; C – II; D – I

(d) A – IV; B – III; C – I; D – II

62. Hormones, secreted by human placenta are:

(i) Human chorionic gonadotropin (hCG)

(ii) Human placental lactogen (hPL)

(iii) Oestrogen and progesterone

(iv) Relaxin

(a) (i) and (ii) only

(b) (i), (ii), (iii) and (iv)

(c) (iii) and (iv) only

(d) (i), (ii) and (iii) only

63. Polar body is produced during the formation of:

(a) Sperm (b) Secondary oocyte

(c) Oogonium (d) Spermatocytes

64. Which of the following statement regarding human development is **correct**?

(a) Ovulation occurs at primary oocyte stage.

(b) Chorion develops from inner cell mass.

(c) Embryonic disc develops from trophoblast.

(d) Primitive streak is formed in the post part of the embryonic shield.

65. Which of the following is required for the increased production of oestrogen, progesterone, cortisol, prolactin and thyroxine etc. in the maternal blood?

(i) Metabolic changes in the mother.

(ii) Maintenance of pregnancy.

(iii) Supporting the foetal growth.

(iv) Destruction of Graafian follicle.

(a) (iii) and (iv) only

(b) (i), (ii) and (iv) only

(c) (i), (ii) and (iii) only

(d) All the four statements

66. All of the following statements concerning pregnancy are accurate except: Tricky

(a) the detection of human chorionic gonadotropin in the urine forms the basis for pregnancy tests.

(b) the cyclic release of pituitary gonadotropins and ovarian steroids is continued.

(c) the mammary gland tissue of the pregnant woman is stimulated to develop by placental hormones.

(d) the corpus luteum of pregnancy maintains the uterus until the placenta is well established.

67. Spermiogenesis/Spermatogenesis is the transformation of:

(a) spermatogonium into primary spermatocyte.

(b) spermatogonium into functional spermatozoa.

(c) primary spermatocytes into secondary spermatocytes.

(d) spermatids into spermatozoa.

68. By the end of how many weeks, major organ system are formed during the embryonic development? Critical Thinking

(a) 4 weeks

(b) 8 weeks

(c) 12 weeks

(d) 24 weeks

69. An important factor contributing to the onset and maintenance of labour contractions is:

(a) increased contractility of the uterine muscles from increased oxytocin levels.

(b) mechanical pressure on the cervix generated by the emerging baby's head.

(c) stretching of the uterus during the final stages of foetal growth.

(d) All of the above

70. Which of the following organ is differentiated, first during development?

(a) Heart (b) Skin

(c) Brain (d) Neural tube

71. Which of the following statement regarding female reproductive system is (are) **correct**?
(i) Myometrium undergoes strong contraction at the time of delivery of baby.
(ii) Ovary is secondary female sex organ which produces female gamete and steroid hormones.
(iii) Ovarian stroma is divided into two zones: inner cortex and outer medulla.
(iv) Infundibulum possess finger like projections which help in collection of ovum after the release of secondary oocyte.
(v) A functional mammary gland is the characteristic of all the mammals (including male and female).
(a) (ii) and (iv) only
(b) (i), (ii), (iii) and (v) only
(c) (iii), (iv) and (v) only
(d) All of the above

72. Select the correct match of terms given in column-I with their definition given in column-II.

Column-I (Terms)	**Column-II (Definition)**
A. Parturition	I. Duration between pregnancy (of about 9 month) and birth.
B. Ovulation	II. Attachment of zygote to the endometrium.
C. Gestation	III. Childbirth
D. Implantation	IV. Release of egg from Graafian follicle.

(a) A – I; B – II; C – III; D – IV
(b) A – III; B – I; C – IV; D – II
(c) A – III; B – IV; C – I; D – II
(d) A – III; B – II; C – I; D – IV

73. The head of a mature sperm is mainly composed of:
(a) elongated nucleus and acrosomal material.
(b) mitochondria, cytoplasm & nucleus.
(c) two centriole & the axial filament.
(d) all of the above

74. A mature sperm has
(a) A pair of flagella
(b) A nucleus, an acrosome and a centriole
(c) A nucleus, an acrosome, a pair of centrioles
(d) A nucleus, an acrosome, a pair of centrioles and a tail.

75. Which of the following does not occur during and immediately following fertilisation?
(a) Fusion of the sperm and ovum nuclei
(b) Division of the oocyte cell by meiosis
(c) Implantation of the ovum in the uterus
(d) Digestion of cell layers around the oocyte by sperm

ANSWER KEY

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

Hints & Solutions

1. **(c)** The sertoli cells are located in seminiferous tubules.

2. **(d)** Human primary spermatocyte contains 22 pairs of autosomes and XY chromosomes.

3. **(d)** **4.** **(b)**

5. **(c)** A - LH; B - Spermatogenesis ; C - Sertoli cells; D - Spermiogenesis.

6. **(d)** Sperms are haploid male gametes. Oviducts are a part of female reproductive system. Scrotum maintains testes at lower (2–2.5 degrees) than normal body temperature. Sertoli cells certainly nourish the developing male germ cells.

7. **(b)** The glandular tissue of each breast is divided into 15–20 mammary lobes containing clusters of cells called alveoli.

8. **(b)** The corpus luteum is essential for establishing and maintaining pregnancy in females. In the ovary, the corpus luteum secretes oestrogens and progesterone, which are steroid hormones responsible for the thickening of the endometrium and its development and maintenance, respectively.

9. **(d)** Menstrual cycle is the cycle of natural changes that occur in the uterus and ovary as an essential part of making sexual reproduction possible. Menstrual fluid cannot easily clot. The end of the cycle of menstruation is called menopause. During the follicular phase, gonadotropins (LH and FSH) increase gradually and stimulate follicular development as well as secretion of oestrogen by growing follicles.

10. **(a)** The blastocyst is one of the very first stages in human embryonic development, occurring early in the first trimester.

11. **(d)** The urethra originates from the urinary bladder and extends through the penis to its external opening called urethral meatus.

12. **(b)** **13.** **(b)**

14. **(c)** The process of fertilisation takes place in the ampullary part of fallopian tube. Uterus does not secrete any steroid hormones. It is the ovary which secretes the steroid hormones.

15. **(b)** Spermatogonia are undifferentiated germ cells which originate in seminiferous tubules and divide into two primary spermatocytes (a kind of germ cell) in the production of spermatozoa.

16. **(d)** A – III; B – IV; C – I; D – II

17. **(d)** Fertilisation of ovum is the most likely root cause for menstruation not taking place at regular cycling in human female.

18. **(d)** Each seminiferous tubule is lined on its inside by two types of cells called male germ cells (spermatogonia) and sertoli cells. The male germ cells undergo meiotic divisions finally leading to sperm formation, while sertoli cells provide nutrition to the germ cells. The regions outside the seminiferous tubules called interstitial spaces, contain small blood vessels and interstitial cells or leydig cells. Leydig cells synthesise and secrete testicular hormones called androgens.

19. **(a)** In the mammalian blastocyst, the trophoblast forms the foetal part of the placenta. A disc-shaped portion of the inner cell mass surrounded by the trophoblast becomes the embryo.

20. **(d)** In menstrual cycles, the endometrium is shed from the uterus through the cervix and vagina.

21. **(a)** This is the capillary-rich inner wall of the uterus, where implantation is accomplished for the developing human embryo.

22. **(d)** In the testis, spermatogenesis occurs in the seminiferous tubules and testosterone secretion takes place in the interstitial cells. Testosterone brings growth and maturation of secondary sex organs. It also brings about development of secondary sex characters.

23. **(c)** The corpus luteum's production of hormones is essential for the maintenance of early pregnancy. During the second trimester, however, the placenta becomes fully formed and takes over hormone production, leading to degeneration of the corpus luteum.

24. **(d)** The marked structure 1, 2, 3 and 4 are respectively called as seminal vesicles, urinary bladder, ejaculatory duct and bulbourethral gland.
25. **(b)**
26. **(b)** A – III; B – I; C – II; D – IV
27. **(d)**
28. **(a)** During pregnancy, the levels of hormones like oestrogen, progestrogens, cortisol, prolactin, thyroxine, etc., are increased several folds in the maternal blood. Increased production of these hormones is essential for supporting the foetal growth, metabolic changes in the mother and maintenance of pregnancy.
29. **(b)** In human female, the periodic discharge of blood, mucus and cellular debris from uterine wall from non-pregnant women of sexual maturity is known as menstrual cycle. Few hours before the start of mensuration, the spiral arterioles constrict one by one resulting into the blanche mucosa. The mucosa shrinks and the death of the blood deprived tissues takes place.
30. **(b)** A sperm is ejected by the male into the vagina. From the vagina, the sperm move through the cervix into the uterus and finally the oviduct where fertilisation occurs.
31. **(d)** Haploid sex cells contain half as many chromosomes as diploid somatic cells.
32. **(a)** **33.** **(c)** **34.** **(a)**
35. **(c)** Each testes has about 250 compartments called testicular lobules. Each lobule contains one to three highly coiled seminiferous tubules. Bulbourethral glands are paired male accessory glands.
36. **(a)** Placenta is an endocrine gland that is present only during pregnancy. It is responsible for production of various hormones like human chorionic gonadotropin (hCG), oestrogen, progesterone, human placental lactogen (hPL).
37. **(a)** In human male, one pair of testes are present in thin-walled skin pouches called scrotal sac (so are extra-abdominal) hanging from lower abdominal wall between the legs. Scrotal sac acts as thermoregulator and keeps the testicular temperature 2°C lower than body temperature for normal spermatogenesis, as high abdominal temperature kills the spermatogenic tissue.
38. **(d)** High levels of progesterone are needed to maintain the uterus in the proper condition for pregnancy. The levels of progesterone are high only during the second half of the uterine cycle.
39. **(b)** **40.** **(d)**
41. **(b)** In human beings, at the end of 12 weeks (first trimester) of pregnancy most of the major organ systems are formed.
42. **(d)** In proliferative phase, the follicles start developing, called follicular phase. Secretory phase is also called as luteal phase mainly controlled by progesterone secreted by corpus luteum. Menstruation involves breakdown of overgrown endometrial lining.
43. **(c)** A represents FSH hormone, B indicate oestrogen hormone and hormones LH and progesterone are represented by C and D respectively.
44. **(c)**
45. **(d)** Bulbourethral gland releases a small amount of fluid just prior to ejaculation to decrease the acidity in the urethra. Bulbourethral gland are homologous to Bartholin's glands present in females.
46. **(b)**
47. **(b)** The uterus is a female reproductive organ located between the bladder and the rectum, in the pelvic area.
48. **(c)** Primary spermatocytes of testes are diploid and formed by mitotic division in the spermatogonia.
49. **(c)** Vigorous contraction of the uterus at the end of pregnancy causes parturition. Parturition is induced by a complex neuroendocrine mechanism. The signals for parturition originate from the fully developed foetus and the placenta which induce mild uterine contractions called foetal ejection reflex.
50. **(c)** **51.** **(a)**
52. **(b)** Graafian follicle releases secondary oocyte from the ovary by the process of ovulation. Primary oocyte within the tertiary follicle grows in size and completes its first meiotic division.
53. **(c)** Vagina is the tubular female copulatory organ, passageway for menstrual flow as well as birth canal. Vagina receives semen from male during mating but fertilisation (fusion of gametes) occurs in fallopian tube.
54. **(a)** **55.** **(d)** **56.** **(c)**

57. **(a)** The zygote divides mitotically to form 8, 16 daughter cells called blastomeres. This stage is called morula which continues to divide and transforms into blastocyst.

58. **(a)** **59.** **(c)**

60. **(c)** In the given figure of female reproductive system, the marked structures (1 to 6) are the parts of uterus and fallopian tube. 1 to 6 are respectively endometrium, myometrium, perimetrium, isthmus, ampulla and infundibulum.

61. **(c)** **62.** **(b)** **63.** **(b)**

64. **(d)** Primitive streak extends maximum up to the middle of the disc.

65. **(c)** During pregnancy, the increased production of the levels of hormones like oestrogen, progesterone, cortisol, prolactin, thyroxine in the maternal blood are essential for supporting the foetal growth, metabolic changes in the mother and maintenance of pregnancy.

66. **(b)** The high levels of oestrogen and progesterone in the maternal circulation during pregnancy inhibit the cyclic release of pituitary gonadotropins and prevent the menstrual cycles.

67. **(d)**

68. **(c)** By the end of 12 weeks (first trimester), most of the major organ systems are formed, for example, the limbs and external genital organs are well-developed.

69. **(d)** Labour contraction is brought on and intensified by all the given factors.

70. **(c)**

71. **(a)** Statement (ii) and (iv) are correct. Ovary is the primary female sex organ which produces female gamete (ovum) and steroid hormones. Ovarian stroma is divided into peripheral cortex and inner medulla. Mammary gland is a paired structure that contains glandular tissue and variable amount of tissue. It is the characteristic of all female mammals.

72. **(c)** A – III; B – IV; C – I; D – II

73. **(a)** **74.** **(d)**

75. **(c)** Implantation is not the immediate process. It occurs 4–6 days after fertilisation.