CHAPTER 5 - A REPRESENTATIVE STUDY OF MAMMALS

(Blue Print – 1 X 1 = 1 and 3 X 2 = 6 Total Marks : 7)

PART - A

1. Select important characteristic features of mammals
   i) four-chambered heart ii) fore-limbs and hind limbs iii) milk-producing glands iv) post anal tail
   Answer: iii) milk-producing glands

2. Carnivorous animals use these teeth to tear flesh.
   i) incisors ii) canines iii) premolars iv) molars
   Answer: ii) canines

3. The Henle’s loop of nephron is mainly responsible for reabsorption of water in the kidney. Which of the following has a long loop of Henle in its nephrons to conserve water?
   i) polar bear ii) camel iii) frog iv) whale
   Answer: ii) camel

4. Which blood cells of mammals are concerned with immunity?
   i) Young Erythrocytes ii) Leucocytes iii) Thrombocytes iv) Matured Erythrocytes
   Answer: ii) Leucocytes

5. You were given two unlabelled slides with blood smears of an amphibian and a mammal. You would differentiate the blood samples by observing the ________.
   i) colour ii) nature of RBC’s iii) nature of WBC’s iv) contents of plasma
   Answer: ii) nature of RBC’s

6. For the digestion of cellulose, an enzyme called cellulase is required. Some mammals lodge cellulase producing bacteria in their digestive system by offering them food and shelter. These mammals are mostly _______________. i) Herbivores ii) Carnivores iii) Omnivores iv) Sanguivores
   Answer: i) Herbivores

7. Forelimbs of mammals have a common basic structure or pattern, but are different in their usage/ function in different animals. They can be called ________.
   i) Homologous organs ii) Analogous organs iii) Vestigial organs iv) Rudimentary organs
   Answer: i) Homologous organs

8. Sensitive whiskers are found in __________.
   i) Bat ii) Elephant iii) Deer iv) Cat
   Answer: iv) Cat

9. The tusks of elephants are modified ________.
   Answer: Canines

10. Pick out an animal which has a four-chambered stomach.
    i) Elephant ii) Dolphin iii) Deer iv) Kangaroo
    Answer: iii) Deer

11. Normal body temperature of man is __________.
    i) 98.4 – 98.6 °F ii) 96.6 – 96.8 °F iii) 94.4 – 96.6 °F iv) 98.4 – 99.6 °F
    Answer: i) 98.4 – 98.6 °F

12. Mitral valve is found between __________.
    i) Right auricle and right ventricle ii) Left auricle and left ventricle
    iii) Right ventricle and pulmonary artery iv) Left ventricle and aorta
    Answer: ii) Left auricle and left ventricle

13. Assertion (A) : Mammalian heart is called myogenic heart.
    Reason (R) : Heartbeat is regulated by a specialized muscle bundle (pacemaker) in mammals.
    i) Both ‘A’ and ‘R’ are true and ‘R’ explains ‘A’. ii) Both ‘A’ and ‘R’ are true but ‘R’ doesn’t explain ‘A’.
    iii) ‘A’ is true but ‘R’ is false. iv) A is false but ‘R’ is true.
    Answer: i) Both ‘A’ and ‘R’ are true and ‘R’ explains ‘A’.

14. One of the following groups contains a non-mammalian animal. Pick up the group.
    i) dolphin, walrus, porcupine, rabbit, bat ii) elephant, pig, horse, donkey, monkey
    iii) antelope, deer, cow, buffalo, black buck iv) dog, cat, crocodile, lion, tiger
    Answer: iv) dog, cat, crocodile, lion, tiger

15. The epidermis of mammals contains __________.
    i) hair, bristles, quills ii) hair, nails, claws iii) hair, bristles, horns iv) hair, nails, scales
    Answer: i) hair, bristles, quills
16. Based on relationship, fill up:
Whale: Flippers:
Bat : _______
Answer: Bat : Wing - Patagium
17. Fill in the blank.
RBC: Carrier of oxygen
WBC: _______
Answer: WBC: Immunity
18. Based on modifications, make the pairs:
Incisor: tusks of elephant;
_________ : quills of porcupine
Answer: Epidermal hair : quills of porcupine

PART - B

19. Mention the two unique characteristics of mammals.
Answer: 1. Epidermal Hair  
2. Milk producing glands
20. Give two examples each: (i) ruminating mammals (ii) marine mammals.
Answer: (i) Ruminating mammals – Goats and Deer  
(ii) Marine mammals – Whale and Dolphin
21. What type of dentition is seen in mammals? What are elephant tusks?
Answer: 1. Mammals have heterodont dentition with different types of teeth that are highly specialized to match specific eating habits. For example, the carnivorous animals have canine teeth to tearing flesh.
2. In elephants, the incisors are modified into tusks and are used in defence.
22. Mention any four adaptations seen in the camel so that it can live successfully in deserts.
Answer: 1. The skin of the camel is doubly thick.  
2. The skin contains water-storing osmotic cells to conserve water, as they live in deserts.  
3. They have thick bushy eyebrows covering the eyes to protect their eyes from sand storms.  
4. Their nostrils can be closed during desert storms to prevent the entry of sand particles.
23. What is echo location? Give an example.
Answer: The nocturnal bat can fly without crashing into things and still capture insects by echo location. As a bat flies, it emits a rapid series of extremely high pitched clicking sounds. The sound waves bounce off objects or flying insects and the bat hears the echo.
24. Mention the various valves and their location in the human heart.
Answer:

<table>
<thead>
<tr>
<th>Name of the valve</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tricuspid valve</td>
<td>It is found in the right auriculo-ventricular aperture.</td>
</tr>
<tr>
<td>2. Bicuspid valve</td>
<td>It is found in the left auriculo ventricular aperture.</td>
</tr>
<tr>
<td>3. Semi-lunar valve</td>
<td>It is found at the base of the pulmonary artery.</td>
</tr>
<tr>
<td>4. Aortic valve</td>
<td>It is found at the base of the aorta.</td>
</tr>
</tbody>
</table>

25. Write any four differences between arteries and veins in mammals.
Answer:

<table>
<thead>
<tr>
<th>No.</th>
<th>Arteries</th>
<th>Veins</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Arteries carry the blood from the heart to different parts of the body.</td>
<td>The veins carry the blood from different parts of the body to the heart.</td>
</tr>
<tr>
<td>2.</td>
<td>All the arteries carry oxygenated blood except pulmonary artery which carries deoxygenated blood.</td>
<td>All veins carry deoxygenated blood except the pulmonary vein which carries oxygenated blood.</td>
</tr>
<tr>
<td>3.</td>
<td>Arteries are thick walled.</td>
<td>Veins are thin walled.</td>
</tr>
<tr>
<td>4.</td>
<td>Arteries are mostly deeply situated.</td>
<td>Veins are mostly superficially situated.</td>
</tr>
</tbody>
</table>
26. Name the three important blood proteins seen in plasma. Add a note on their functions.

**Answer:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Blood proteins seen in plasma</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Globulin</td>
<td>For immunity</td>
</tr>
<tr>
<td>2.</td>
<td>Fibrinogen</td>
<td>For blood clotting</td>
</tr>
<tr>
<td>3.</td>
<td>Albumin</td>
<td>For water balance</td>
</tr>
</tbody>
</table>

27. Which blood cells are without nuclei? What is the advantage of this condition?

**Answer:** Red blood cells are without nuclei.

*The advantage of Non-Nucleated condition of RBCs.*

RBCs contain the red pigments haemoglobin which helps in carrying oxygen throughout the body. As an adaptation to accommodate greater amount of Haemoglobin, RBCs do not have nucleus.

28. Name the protein and the blood-cells responsible for the clotting of blood.

**Answer:**

1. The protein responsible for the clotting of blood is **Fibrinogen**.
2. The blood-cells responsible for the clotting of blood is **Blood Platelets – Thrombocytes**.

29. i) What are the structural and functional units of kidney?
   ii) Arrange the organs of the human excretory system in the correct order, based on the passage of urine.

**Answer:**

i. Nephrons are the structural and functional units of kidney?
   ii. The correct order of Human excretory system based on the passage of urine.

![Diagram of the excretory system](image)

30. Observe the following flow-chart depicting blood-circulation in mammals.

1. Pick out the correct blood vessels A, B, C, D from the following:
   i) Pulmonary veins ii) Venacava iii) Pulmonary artery iv) Aorta
2. Among the P, Q, R and S samples, identify the correct match from the following
   a) P & Q = Oxygenated and R & S = Deoxygenated
   b) P & Q = Deoxygenated and R & S = oxygenated
   c) All are Oxygenated
   d) All are Deoxygenated

**Answer:**

1. A. Venacava
   B. Pulmonary artery
   C. Pulmonary vein
   D. Aorta

2. b) P & Q = Deoxygenated and R & S = oxygenated

31. Study the following passage:
Most of the vertebrates have jaws with teeth. The mode of arrangement of teeth on the jaws is called dentition. The various types of teeth seen in mammals are incisors (I) canines (C) premolars (P) and molars (M). They are used for biting, tearing, chewing and grinding respectively. Canines, the tearing teeth are well-developed in carnivores and ill-developed or absent in herbivores.
Now answer the following questions:

i) In frogs, all the teeth in the upper jaw look alike, whereas in human beings they are different. The type of dentition in man can be called__________.
   a) Homodont b) Isodont c) Heterodont d) Acrodont

ii) The dental formula of a mammal is written as ICPM =2023/1023. The teeth missing in it are ________.
   a) incisors b) canines c) premolars d) molars.

**Answer:**

i. c) Heterodont

ii. b) canines

32. Fill up the empty boxes with suitable answers with respect to the valves of a mammalian heart.

<table>
<thead>
<tr>
<th>Valve(s)</th>
<th>Location</th>
<th>Function</th>
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<tbody>
<tr>
<td>Bicuspid valve or Mitral valve</td>
<td>At the right auricular ventricular aperture</td>
<td>Prevents the backward flow of blood from left ventricle to left auricle</td>
</tr>
<tr>
<td>Aortic valve</td>
<td>At the base of Aorta</td>
<td>Regulates the flow of blood from right auricle to right ventricle</td>
</tr>
<tr>
<td>Semi-lunar valve</td>
<td></td>
<td>Regulates the flow of blood from right ventricle to pulmonary artery</td>
</tr>
</tbody>
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**Answer:**

Valve(s)                  | Location                              | Function                                                      |
---|---|---|
Bicuspid valve or Mitral valve | At the left auricular ventricular aperture | Prevents the backward flow of blood from left ventricle to left auricle |
Tricuspid valve              | At the right auricular ventricular aperture | Regulates the flow of blood from right auricle to right ventricle |
Aortic valve                 | At the base of Aorta                  | **It regulates the flow of blood from the left ventricle into the aorta.** |
Semi-lunar valve             | At the base of the pulmonary artery.   | Regulates the flow of blood from right ventricle to pulmonary artery |

33. Any change in the lifestyle, the food habits and the body form of an organism in order to make it comfortable in the environment / habitat, is called adaptation. Identify the suitable adaptation given below against each mammal.

i) conservation of body heat in large marine mammals like whale (Jaws are modified into baleen plates / Forelimbs are modified into flippers / Fat is deposited in subcutaneous tissue.)

ii) Locating food source by bats-( Forelimbs are modified into wings / Hanging upside down using legs / Production of sounds and detection of the echo)

**Answer:**

i. Fat is deposited in **subcutaneous tissue.**

ii. Production of sounds and detection of the echo

34. The Master chemists of our body are the kidneys. Justify.

i) Kidneys filter all chemicals in the body. ii) Kidneys maintain the chemical composition of blood.

iii) Kidneys eliminate all chemicals absorbed by the body. iv) Kidneys store the chemicals accumulated in the body.

**Answer:**

ii) Kidneys maintain the chemical composition of blood.

35. Observe the chart depicting the structure of a nephron and mention the structures A to F
36. Write the main function of a nephron.
   **Answer:** 1. Nephrons are the **structural** and **functional** units of the kidney.
   2. The nephrons **filter the blood** and form the **urine**.

37. Draw and label the L.S of Heart.
   **Answer:** **L.S of Heart**

38. Draw and label the L.S of kidney.
   **Answer:** **L.S of kidney**.

39. Draw and label the Arteries, Veins and Capillaries.
   **Answer:** **Arteries, Veins and Capillaries**
40. Draw the diagrams of the Blood cells.
Answer: Blood cells

41. Draw and label the Excretory System of Man.
Answer: Excretory System of Man.

42. Draw and label the Nephron.
Answer: Nephron

43. Draw the diagram of Basic pattern of forelimbs of vertebrates.
Answer: Basic pattern of forelimbs of vertebrates.
44. What is adaptation?
Answer: A change or adjustment in a plant or animal that makes it better able to live in a particular environment or habitat is known as adaptation.

45. Mention the adaptations found in Whale.
Answer: 1. In marine-mammals like whales and dolphins the limbs are modified into flippers which are used as oars to swim in water.
   2. They also possess huge subcutaneous fat deposits to conserve heat.
   3. The jaws of the whales are modified into baleen plates to sieve the water and trap minute planktonic organisms called krill, which is their food.

46. Mention the adaptations found in Polar bear.
Answer: Polar bears have thick skin and wooly fur so as to withstand cold weather in the polar regions.

47. Mention the adaptations found in Kangaroo.
Answer: Marsupials, like kangaroo, have developed abdominal pouches to bear young ones.

48. Mention the adaptations found in Herbivorous mammals.
Answer: 1. Herbivorous mammals eat plants only. To digest the cellulose-rich food, they have developed a mutual partnership with bacteria that have cellulose-splitting enzymes (cellulase).
   2. Herbivorous mammals have a huge four-chambered stomach that functions as storage and fermentation vats. The stomach of cattle also helps them to ruminate or chew the cud.

49. Fill up the empty boxes with suitable answers with respect to the important excretory organ and their excretory products.

<table>
<thead>
<tr>
<th>Excretory organ</th>
<th>Disposed as</th>
<th>Excretory products</th>
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<tbody>
<tr>
<td>Kidneys</td>
<td>Urine</td>
<td>Nitrogenous waste products – urea, uric acid, creatinine, etc,</td>
</tr>
<tr>
<td>Skin</td>
<td>Exhaled / Expired air</td>
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<td>Sweat</td>
<td>Excess water and salt</td>
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50. Fill in the blanks.
   i. Milk producing glands are modified ____________. (Endocrine gland / Sweat gland)
   ii. Mammals are __________. (Warm blooded / Cold blooded)
   iii. A thin transparent membrane called ________ covers the kidney. (Meninges / Capsule)
   iv. The heart is covered by a protective double layered membrane called _________. (Pericardium / Pleura)

Answer:  
   i. Sweat gland
   ii. Warm blooded
   iii. Capsule
   iv. Pericardium

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