

Chapter 15

Short Questions:

1. What is lithotripsy? (LB-2018)

The kidney stones have been removed by kidney surgery. Presently lithotripsy is used for non-surgical removal of kidney stone. It is the technique used to break up stones that form in the kidney, ureter or gall bladder. There are several ways to do it, although the most common is extracorporeal shock wave lithotripsy. High concentrations of X-ray or ultrasound are directed from a machine outside the body to the stone inside. The shock waves break the stone in tiny pieces or into sand, which are passed out of the body in urine.

**2. What are pyrogens? (LB-2008, 2013, 2021)**

In bacterial and viral infections mainly, leukocytes increase in number. These pathogens and the blood cells produce chemicals called as pyrogens. Pyrogens displace the set point of hypothalamus above the normal point of 37° C. Fever or high temperature helps in stimulating the protective mechanisms against the pathogens

3. What is hypertonic environment and what changes occur in a cell in such environment? (OR)**Differentiate between hypotonic and hypertonic environment. (LB-2010, 2012, 2016)**

Hypertonic environment	Hypotonic environment
<ul style="list-style-type: none"> ● The more concentrated external environment as compared to internal environment. ● It has more salt concentration ● The hypertonic environment renders cell solutions concentrated and shrinks the cell due to loss of water. 	<ul style="list-style-type: none"> ● Diluted solution compared to the cell concentration ● It has more water concentration. ● Hypotonic environment osmotically causes entry of water into the cell and renders the cell solutions diluted. The cell becomes turgid.

3. What are osmoconformers and osmoregulators? (LB-2011)

Osmoconformers	Osmoregulators
<ul style="list-style-type: none"> ● Animal body fluids are kept isotonic to the external environment even for marine saltwater environment. ● These animals thus do not require actively to adjust their internal osmotic state, so are known as osmoconformers. 	<ul style="list-style-type: none"> ● The animals whose body fluid concentrations differ noticeably the outside environment. ● They actively regulate by discharging excess water in hypotonic and excreting salts in hypertonic conditions therefore, are called

	as osmoregulators.
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4. What is extracorporeal shock wave lithotripsy? (LB-2014)

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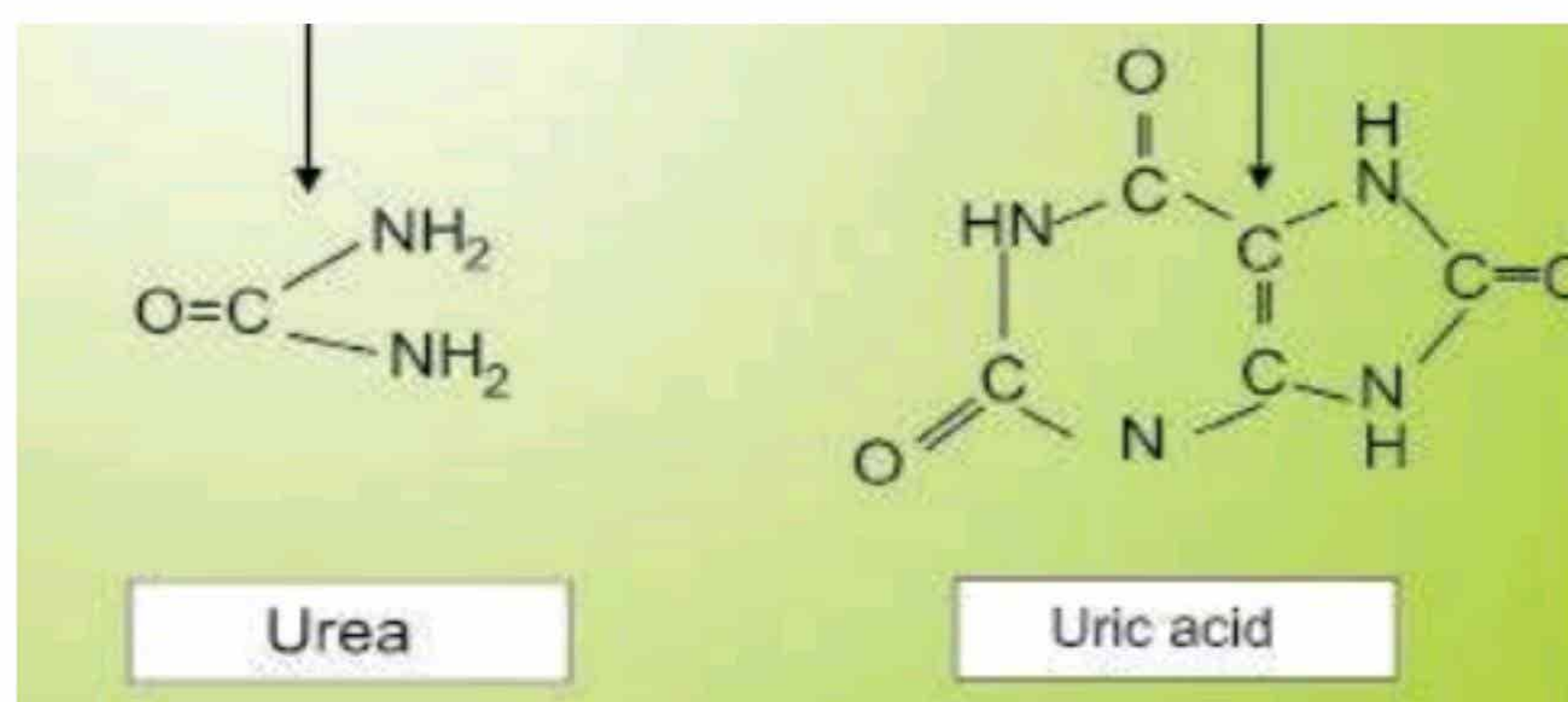
5. What are heat shock proteins? (LB-2016)

The cells of some plants synthesize large quantities of special proteins called heat-shock proteins. These proteins embrace enzymes and other proteins thus help to prevent denaturation.

6- What are flame cells? Give their role. (OR) What are flame cells? Why they are called so? (LB-2014)

Planaria the animals of the group of flatworms have simple tubular excretory system called protonephridium. A protonephridium is a network of closed tubules without internal openings. Tubular system is spread throughout the body and branches are capped by a cellular setup termed as flame cell. Each flame cell has a tuft of cilia, whose beating propels interstitial fluid into the tubular system (The beating of cilia looks like a flickering flame, therefore these cells are termed flame cells). The tubular system is drained into excretory ducts, which open to the exterior through several nephridiopores

8. Write structural formula of urea and uric acid. (LB-2010, 2012)



9. Define homeostasis. Give its importance. (LB-2011, 2013)

Definition: The protection of internal environment from the harms of fluctuations in external environment is termed as homeostasis.

Importance:

The homeostasis keeps the internal fluctuations in a narrow range with various control systems compared to wider external fluctuations. Most susceptible components of internal environment that may be affected by fluctuations in external environments are water, solutes and temperature. Also the mechanism an organism has adapted to eliminate harmful nitrogenous wastes depends upon the availability of water.

10. Define anhydrobiosis with an example. (LB-2012, 2014, 2018)

Terrestrial animals can tolerate dehydration and it differs in various animals. This characteristic is known as anhydrobiosis.

10. Define counter current multiplier mechanism. (LB-2018, 2019)

The interstitial fluid of the kidney is gradually concentrated from cortical to medullary part, thus inner medulla is highly concentrated with the presence of urea and through a mechanism of countercurrent multiplier. This mechanism causes gradual osmotic outflow of water from the filtrate back to kidney as it passes downward in the descending loop of Henle. Furthermore, ascending loop of Henle does not allow outflow of water from its filtrate, instead actively transport Na ions into kidney interstitium to sustain its high concentration.

11. Differentiate between poikilotherms and homeotherms. (LB-2012, 2013)

Poikilotherms	Homeotherms
<ul style="list-style-type: none"> There are animals in which body temperature tends to fluctuate more or less with ambient temperature where air or water temperatures are changed, these are poikilotherms, All invertebrates, fish, amphibians and reptiles are considered in this category. 	<ul style="list-style-type: none"> Animals when exposed to changing air or water temperature maintain their body temperature are the homeotherms and These include birds and mammals.

12. Differentiate between ectotherms and endotherms. (LB-2009, 2014)

Ectotherms	Endotherms
<ul style="list-style-type: none"> ● Ectotherm is the other type, which produce metabolic heat at low level and that is also exchanged quickly with the environment, however, absorb heat from their surroundings. ● Most invertebrates, fish, amphibians and reptiles are in this category 	<ul style="list-style-type: none"> ● Endotherms are animals that generate their own body heat through heat production as by-product during metabolism are endotherms. ● They include lying insects, some fishes, birds and mammals

13. Differentiate between shivering and non-shivering thermogenesis. (LHR 2020)

Shivering thermogenesis	Non-Shivering thermogenesis
<ul style="list-style-type: none"> ● The rate of heat production is increased by increased muscle contraction by movements or shivering so called as shivering thermogenesis. 	<ul style="list-style-type: none"> ● Hormones trigger the heat production as do thyroid hormones and are termed as non-shivering Thermogenesis.

15- Differentiate between hemodialysis and peritoneal dialysis. (LB-2018)

Hemodialysis	Peritoneal dialysis
<ul style="list-style-type: none"> ● Hemodialysis means 'cleaning the blood'. In this procedure blood is circulated through a machine which contains a dialyzer also called an artificial kidney. ● Dialyzer has two spaces separated by thin membrane. Blood passes from one side of the membrane and dialysis fluid on the other. ● The wastes and excess water pass from the blood through the membrane into the dialysis fluid. 	<ul style="list-style-type: none"> ● Peritoneal dialysis work on the same principle except that abdomen has a peritoneal cavity, lined by a thin epithelium called peritoneum. ● Peritoneal cavity is filled with dialysis fluid that enters the body through a catheter. ● Excess water and wastes pass through the peritoneum into the dialysis fluid

16- Differentiate between xerophytes and mesophytes. (OR) What are xerophytes? Give two adaptationsofxerophytes. (LB-2012)

Mesophytes:

- Have moderate water availability.
- In sufficient supply of water stomata are kept open to promote loss of excess water, however, in restricted supply stomata close to prevent the loss
- Example: Brassica, rose, mango etc.

Xerophytes:

- Have the adaptations for reduced rate of transpiration.
- Many xerophytes possess small, thick leaves to limit water loss by reducing surface area proportional to the volume.
- Their cuticle is thick, waxy and leathery.
- Stomata are on lower surface of leaves and located in depression.
- Some as cacti, during the driest season, shed their leaves to restrict transpiration completely, thus stems are the photosynthetic organs.
- In rainy season, stem stores water for use in dry conditions

17. Draw and label urea cycle. (LB-2018)



18. Explain the process of panting with example. (LHR 2019)

Panting, the evaporative cooling in the respiratory tract. This is the mechanism as represented in the dogs. Bats etc use saliva and urine for evaporative cooling

19- Illustrate the function of Malpighian tubules. (LB-2010)

Terrestrial arthropods particularly in the insects, the excretory structures are adapted to collect excretory products from hemolymph in sinuses through suspended tubular structures called

Malpighian tubules. These Malpighian tubules remove nitrogenous waste from the hemolymph. These are the only excretory structures in animal kingdom that are associated with digestive tract.

20- Why leaves are said to be excretophore? (LB-2011, 2019)

leaves are destined to fall of, as is the case of autumn leaves in plants or die of as happens in the leaves and stalk of certain bulbs e.g. bluebell, leaving the bulb underground. This is the reason gardener ind rotted autumn leaves a good source of minerals.

The falling of yellow leaves in autumn is thseasonal time for the plants to get rid of the accumulated wastes and because of the reason leaves are said to be excretophore. According to an explanation the change in color in these leaves is not due to removal of chlorophyll as the microscopic examination of autumn leaves shows that leaves are loaded with pigmented compounds prior to falling of and many toxic materials like heavy metals increase sharply as the yellowing proceeds.

21. Differentiate between protonephridium and metanephridium. (LHR 2019)

Protonephridium	Metanephridium
<ul style="list-style-type: none"> ● A protonephridium is a network of closed tubules without internal openings. ● Tubular system is spread throughout the body and branches are capped by a cellular setup termed as flame cell. ● Each lame cell has a tuft of cilia, whose beating propels interstitial fluid into the tubular system (The beating of cilia looks like a flickering lame, therefore these cells are termed flame cells). ● The tubular system is drained into excretory ducts, which open to the exterior through several nephridiopores 	<ul style="list-style-type: none"> ● Another type of tubular excretory system called as metanephridium. ● Each segment of earthworm has a pair of metanephridia. This system has an internal ciliated opening the nephrostome immersed in coelomic fluid and enveloped by a network of capillaries. ● Nephrostome collects coelomic fluid. As fluid moves along the tubule, epithelium reabsorbs salt from the lumen and sends to blood vessels surrounding the nephridium. ● The left over appears as urine containing nitrogenous waste

22. Define uremia. What is permanent treatment? (LHR 2021)

In high degree renal failure also called as uremia or end-stage renal disease, the dialysis can not be done hence thus the surgical transplantation of a matching donor kidney is the only option left for as the permanent treatment.