

Biol102

Chapter 1

Complete:

1. Energy nutrients include: **carbohydrates** and **lipids**
2. The principal circulatory sugar in blood is **glucose**
3. Hydrolysis of sucrose yields **Glucose** and **Fructose**
4. Some polysaccharides are associated with the structures of animal tissues; examples are: **Chitin** and **Chondroitin sulphates**
5. Oils are the predominant glycerides in plants, and **fats** are the predominant in animals
6. The main subdivisions of compound lipids are **phospholipids**, **Glycolipids** and **Lipoprotein**
7. Animal fats are important sources of some vitamins, such as **vitamin A** and **Vitamin D**
8. **Phenylalanine** and **Tyrosine** are examples of aromatic amino acids, while Tryptophan is a heterocyclic amino acid
9. Examples for essential amino acids are **Tryptophan** and **Lysine**
10. Examples for scleroproteins are **Keratins** and **Collagen**
11. Hypervitaminosis **K** is characterized by gastrointestinal disturbances and anemia

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12. Ingestion of very large doses of pyridoxine can produce **peripheral neuropathy**
13. Examples for microminerals are **Fe, I and Mn**
14. Inadequate dietary intake of **Iodine** results in an enlargement of the thyroid gland
15. Hemochromatosis is a syndrome results from **large dose of Iron**
16. Brain damage can result from excessive intake of **copper**

True or false:

1. A disaccharide molecule usually yields 2 similar monosaccharides when hydrolyzed (F)
It can yield 2 of the same, or different, monosaccharides
2. Linoleic and linolenic acids can be produced by the body like non-essential amino acids (F)
They both are essential fatty acids that can't be produced by the body
3. The nutritive value of protein depends on its content of essential amino acids (T)
4. Both essential and non-essential amino acids can be synthesized by the body (F)
Essential amino acids can't be synthesized, or not at a sufficient rate.

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5. Both collagen and elastin can be converted to easily digestible, soluble gelatin by boiling in water (F) **Elastin can't be converted to gelatin**
6. Collagen is abundant in tendons, while elastin is abundant in ligaments (T)
7. Vitamins like essential amino acids and fatty acids can not be produced inside the body and must be supplied with food (T)
8. Fat-soluble vitamins are A,D,E, and K (T)
9. Large doses of both fat-soluble and water-soluble vitamins can be rapidly cleared from the body (F)
Fat-soluble vitamins can't be rapidly cleared
10. Minerals like non-essential amino acids can be produced inside the body (F)
Minerals can't be produced inside the body Choose:
 1. Glycerides that accumulate in adipose tissues are termed as: **D (neutral fats, triglycerides, triacylglycerols)**
 2. Which of the following lipids have regulatory roles in the body: **A (steroids)**
 3. Which of these is an example of hydrolysis:
B (Dipeptide + H₂O \longrightarrow amino acid + amino acid)

Give the appropriate term:

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1. Is a polysaccharide found in the exoskeleton of arthropods (Chitin)
2. Is a phospholipid, it contains choline (Lecithins)
3. Are glycolipids containing sialic acid and found mainly in the grey matter of the nervous system (Gangliosides)
4. Known as cholecalciferol and is derived from dehydrocholesterol found under the skin (Vitamin D3)
5. Are composed of N, C, H, and O, and sometimes other elements (Proteins)
6. Upon hydrolysis yields amino acid plus prosthetic group (Conjugated proteins)
7. Found in horns, hoofs, and feathers and are rich in Sulphur amino acid, cysteine (Keratins)
8. A mineral, its deficiency increases the incidence of dental caries (Fluorine)

Chapter 2 Complete:

1. among the accessory digestive organs are teeth, tongue, liver and pancreas
2. the specific arrangement of amino acids in the tertiary structure of the polypeptide chain form the active sites of the enzyme
3. enzymes that hydrolyze proteins are called peptidases or proteinases

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4. among the reactions that require the participation of coenzymes are **ligases**, **isomerases**, and **oxidoreductases**
5. inhibition of enzyme activity could be done by: **complete destruction of enzyme**, **selective inhibition**, **blocking of active site**
6. **lipolytic enzymes hydrolyze fats into fatty acids, glycerols**
e.g **pancreatic lipase**
7. the palate refers to the roof of the buccal cavity
8. the three types of tongue papillae are **circumvallate**, **fungiform**, **fusiform**
9. the major pairs of salivary glands are **parotid**, **submandibular**, **sublingual**
10. waves of muscular contraction along the alimentary canal are known as **peristaltic contractions**
11. the intrinsic factor is produced by **parietal cells** in the stomach, and it's essential for absorption of **vitamin B12** in the intestine
12. **pepsinogen** HCl **pepsin**
13. In the presence of **calcium**, **rennin** changes **casein** (milk protein) to **para-casein**

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14. Substances which cause gastric irritation include:
ethanol, vinegar, and bile salts
 15. Bile is secreted by the liver and stored and concentrated in gall bladder
 16. In newborn babies, jaundice is usually caused by excessive destruction of RBCs
 17. Enterokinase is required for activation Trypsin which enters the intestine in pancreatic juice **True or False:**
1. Biting, grinding, and chewing of food is a type of mechanical digestion (T)
 2. The action of bile juice on fats in the small intestine is a type of mechanical digestion (T)
 3. All proteins are enzymes (F)
All enzymes are proteins.
 4. The rate of all enzyme-catalyzed reactions is decreased when the PH value is lowered from 7 to 2 (F)
Different enzymes have different ranges where they occur
 5. Salivary glands send their juices directly to the buccal cavity (F)
By way of ducts
 6. Digestion of carbohydrates begins in the buccal cavity by the action of amylase (T)
 7. The parietal cells of the gastric glands secrete HCl, and the chief cells secrete pepsinogen (T)

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8. Gastrin hormone is produced by pancreas to inhibit the gastric gland (F)
G-cells (endocrine cells) of the stomach / stimulate
9. The gallbladder serves to produce and concentrate the bile (F) store
10. Protein digestion begins in the stomach by the action of HCl (F) **Choose:**
 1. churning of food in the stomach is a type of a-
mechanical digestion
 2. the precursor of coenzymes are commonly b-vitamin
B series
 3. which of the following statements about enzymes is
true? b- all enzymes are proteins
 4. the enzyme lysozyme has lysing effect on b- bacteria
 5. the buffering action of saliva is due to its content of d-
bicarbonates, phosphates
 6. during swallowing the opening of trachea is covered
by b- epiglottis
 7. the absorptive and major secretory layer of the GIT is
b- mucosa
 8. the part of the stomach that permits its distention
after eating is b- rugae
 9. gastric HCl is produced by a- parietal cells

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10. gastric lipase like rennin is important in the digestion process in the stomach of a- youngs
11. enterogastrone a- inhibits the secretion of the gastric juice
12. cholecystokinin b- stimulates the gall bladder
13. bile in man is an important enzyme that c- emulsifies fats
14. the following enzymes are found in the pancreatic juice except c-pepsin and maltase
15. chemotrypsin is a powerful b- protein-splitting enzyme
16. which association is incorrect c- maltose-pepsin
17. most digestion occurs in the
c- small intestine
18. which of these combinations is most likely to result in complete digestion?
a- fats, bile, sodium bicarbonate, lipase **Give**

the appropriate term:

1. The chemical changes which take place on the ingested food by the action of hydrolytic enzymes (chemical digestion)
2. Organic catalysts with protein nature, responsible for chemical changes occurring in the body, and are highly specific in their action (enzymes)

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3. The part of the enzyme that is produced in living cells under genetic control and determines its specificity (apoenzyme)
4. The anterior part of the roof of the mouth (hard palate)
5. Contains lysozyme enzyme, amylase, mucin and buffering agents (saliva)
6. A hormone secreted by the stomach that stimulates the gastric secretion of HCl and pepsin (gastrin)
7. The mass of partially digested food that pass from the pylorus of the stomach into the duodenum (chyme)
8. Yellow coloration of the skin and eyes due to high level of bilirubin in blood (jaundice)
9. A modification of the mucosa at the junction of the small and large intestine that forms a one-way passage and prevents the backflow of food materials (ileocecal valve)

Chapter 3&4 pretest

Complete:

1. The hydrophobic centers of the micelles generally contain fatty acids, monoglycerides and cholesterol
2. After absorption of fructose and galactose, they are converted to glucose in the liver

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3. The end product of polymerization of glucose-6-phosphatase is **glycogen**
4. The breakdown of glycogen to produce glucose is called **glycogenolysis**
5. The breakdown of glucose to form pyruvate is called **glycolysis**
6. Phosphorylation of glycerol yields a **triose phosphate** that follows the normal route for carbohydrate metabolism
7. Lipogenesis occurs mainly in **adipose tissue and in the liver** when the level of glucose in blood is elevated
8. During lipogenesis, the glycolytic intermediate, (PGAL) can be converted to **glycerol**, which binds with 3 molecules of **fatty acid** to form a **triglyceride** molecule
9. Fatty acids are converted to molecules of acetyl co-A by the process of **β -oxidation**
10. Synthesis of ketone bodies occurs in liver mitochondria by condensation of **acetyl co-A** to form 4 carbon acetoacetate
11. When the extrahepatic tissues fail to utilize the excess amounts of ketone bodies, this results in a condition known as **ketosis**
12. Transamination reaction means conversion of one **keto acid** to the corresponding **amino acid**
13. Transamination reactions occur in many tissues, e.g **liver, heart, and kidney**

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14. Ammonia molecules are highly **toxic** and are converted into **urea** in the liver which is then excreted by **kidney**
15. Amino acids that can be converted to ketone bodies are known as **ketogenic amino acids**

True or False:

1. Amino acids need common carrier molecules for their transport (F)
different
2. Certain substances like alcohol and aspirin can be absorbed through the wall of the stomach (T)
3. Glycolysis to pyruvate takes place in the matrix of mitochondria (F)
Kreb's cycle/ β -oxidation
4. Both citric acid cycle and β -oxidation of fatty acids occur within the matrix of mitochondria (T)
5. Lipogenesis occurs when the level of blood glucose is reduced (F)
increased
6. Both lipolysis and β -oxidation of fatty acids are types of catabolism (T)

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7. Synthesis of ketone bodies occurs in liver mitochondria and metabolized by the heart, skeletal muscle and kidney (T)
8. In untreated diabetes, CO₂ is formed from the circulating acetoacetate and is lost in the expired air and appears in the patient's breath (F)
Acetone
9. In catabolism of proteins, the average yield of energy is comparable to that of fats (F)
carbohydrates
10. Deaminases aid in the addition of NH₂ group to a keto acid producing a new amino acid and a molecule of ammonia (F)
the removal of NH₂ group from an amino acid producing a new keto acid
11. Urea formation occurs in the kidney and excreted in the urine (F)
liver
12. In severe hepatic disease, both of the blood urea nitrogen level and the blood NH₃ level fall (F)
Blood urea nitrogen level falls and blood NH₃ level rises

Choose:

1. Glucose transport through the plasma membrane of the intestinal cell uses (b- a common carrier protein)

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2. Most of the absorption of the products of digestion takes place in humans across the (c- fingerlike villi of the small intestine)
3. The large intestine in humans (c- absorbs water and electrolytes)
4. Which of the following statements about chylomicrons is **false**? (c- necessary for absorption of monosaccharides)
5. The normal fasting level of glucose in peripheral blood is (a- 70-110mg/100ml of blood)
6. Which of these is **not** a function of the liver? (d- make red blood cells)
7. Which of the following represents an endergonic reaction? (d- $ADP+Pi \longrightarrow ATP$ / $CO_2+H_2O \longrightarrow$ glucose)
8. Which of the following is a character of β -oxidation? (c- it occurs in the mitochondrial matrix)
9. The substrate of the citric acid cycle is (b- acetyl co-A)
10. The citric acid cycle does not function in (b- absence of O_2)
11. The sequence of reactions responsible for the breakdown of fatty acid molecules is called (a- β -oxidation)
12. Considerable production of ketone bodies occurs in care of (e- high rate of fatty acid oxidation and limited carbohydrate intake)

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13. Catabolic processes of proteins occur in case of (b- insufficient energy sources)
14. Amination is essential in the synthesis of (b- non-essential amino acids)
15. Which of these processes can produce both new amino acids and new keto acids? (d- both amination and transamination)
16. Patients suffering from severe hepatic disease should have (b-low protein) diets to reduce the development of ammonia

Scientific term:

1. All the chemical changes which take place in the absorbed food inside the body (metabolism)
2. Using the absorbed molecules in building up organic compounds e.g. protein, glycogen and fat (anabolism)
3. Chemical reactions in a cell through which complex molecules are converted into smaller ones, with release of energy (catabolism)
4. A chemical reaction that requires the input of energy from an external source in order to proceed (endergonic reactions)
5. Chemical reaction that liberates energy (exergonic reactions)

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6. Fat globules coated with a layer of protein, the globules are composed of triglycerides, phospholipids, and cholesterol (**Chylomicrons**)
7. A series of enzymatically catalyzed reactions occur in the mitochondrial matrix, through which the final oxidation of cell metabolic fuels that are catabolized to the substrate acetyl-CoA takes place with formation of ATP (**Kreb's cycle**)
8. The formation of glucose from non-carbohydrate molecules such as amino acids, glycerol and lactate (**gluconeogenesis**)
9. Presence of large amounts of ketone bodies in the blood (**ketonemia**)
10. Produced in the liver through conversion of the amino acid ornithine and excreted by the kidney (**urea**)

Chapter 5 pretest:

Complete

1. The first blood vessels that branch off the aorta are **coronary arteries** They bring oxygen and nutrients to cardiac cells. If they are blocked, they cause **a heart attack**

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2. The AV valve located between the right atrium and the right ventricle has **three** flaps, and is called **tricuspid valve**
3. The AV valves allow the flow of blood in one direction only, from the **atria** to the **ventricles**
4. The only arteries that carry deoxygenated blood in the body
are **pulmonary arteries**
5. The only veins that carry oxygenated blood in the body
are **pulmonary veins**
6. The cardiac cycle (heartbeat) consists of **atrial systole**,
ventricular systole and **complete cardiac diastole**
7. The first heart sound "lub" is produced by **closing of AV valves during ventricular contraction**
8. The conducting system of the heart is composed of the following (starting from the pacemaker of the heart): **SA node**, **AV node** and **AV bundle**
9. The QRS wave of the ECG is due to **ventricular systole**
10. The three types of plasma proteins are **albumins**,
globulins and **fibrinogen**
11. Gamma globulins are produced by cells of **the immune system**
12. The effect of ADH secretion in excess amount on viscosity of blood is **it decreases water viscosity**
13. Serum + **fibrinogen** = plasma.

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14. The protective function of blood could be achieved through and

Clotting against blood loss and leukocytes against disease causing agents

True or False, correct the false ones:

1. The sympathetic stimulation decreases the heartbeat. (F)

Increases

2. The P wave of the ECG is produced by the atrial systole. (T)

3. The second heart sound "dub" is produced by the closing of the AV valves. (F) the semilunar valves

4. The clotting property of blood is due to the presence of beta- globulins. (F)

fibrinogen

5. Plasma albumins like beta-globulins are produced by the liver. (T)

6. ADH concentrates both urine and blood viscosity. (F)

It concentrates urine and decreases blood viscosity **Choose**

the correct answer:

1. The autonomic centers for cardiac function are located in the: a- myocardial tissue of the heart. b- cardiac centers

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of the medulla oblongata. c- cerebral cortex. d- (a), (b) and (c) are correct.

2. In the cardiac cycle, during diastole, the chambers of the heart: a- relax and fill with blood. b- contract and push blood into an adjacent chamber. c- experience a sharp increase in pressure.

3. Which of these associations is incorrect? a- white blood cells — infection fighting.

b- red blood cells — blood clotting. c- plasma — water, nutrients and wastes. d- platelets — blood clotting.

4. The formed elements of blood include:

a- plasma, fibrin, serum.

b- albumins, globulins, fibrinogen. c- WBCs, RBCs, platelets. d- all are correct.

5. Erythropoitin directly stimulates RBC formation by: a- increasing rates of mitotic divisions in erythroblasts. b- speeding up the maturation of red blood cells. c- accelerating the rate of hemoglobin synthesis. d- all are correct.

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6. which of the following is the correct sequence of blood flow? a- arteries — capillaries — . venules — arterioles — veins. b- veins — venules —capillaries — arterioles — arteries. c- capillaries — arteries — arterioles — venules — veins. d- arteries — arterioles — capillaries — venules — veins.

7. The following are characters of the heart except:

a- is a cone-shaped, hollow, muscular organ. b- about the size of the fist.

c- located between the lungs directly behind the sternum, d- its right side carries oxygenated blood.

e- its wall is stimulated to contract without the need for outside nervous system. **Give the appropriate term:**

- Arise from the walls of the heart, collect deoxygenated blood from its wall and empty it into the right atrium. (cardiac veins)
- The heart sound which is produced due to closing of the semilunar valves. (“dub”)
- Crescent or half-moon shaped heart valves positioned at the entrances to the aorta and the pulmonary trunk. (semilunar valves)

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- The system of blood vessels from the right ventricle of the heart to the lungs, transporting deoxygenated blood and returning oxygenated blood from the lungs to the left atrium of the heart. ([pulmonary circulation](#))
- Specialized cardiac muscle fibers that conduct electrical impulses from the AV bundle into the ventricular walls. ([purkinje fibers](#))
- Abnormal heart sounds caused by an abnormal flow of blood in the heart due to structural defects. ([heart murmurs](#))
- A tissue that forms blood cells, located in the medullary cavity of certain bones. ([myeloid tissue](#))
- A hormone produced by the hypothalamus and secreted by the posterior pituitary gland, it acts on the kidneys to promote water reabsorption. ([ADH](#))

- A hormone secreted by the kidney and stimulates the bone marrow to increase the production of RBCs in case of anemia. ([erythropoietin](#))