

V3

STUDENT NAME:

STUDENT NUMBER:

ANP 1107

Midterm #1

Date: June 1, 2011

Instructor:

Time: 11:30 h

Dr. J. Komorowski

Duration: 1 hr 20 min

INSTRUCTIONS:

1. **42 multiple choice questions** (1 mark/1 correct answer per question), two labelling question (2.5 + 1.5 = 4 marks), three definitions (3 marks) and one descriptive question (5 marks) = **46 QUESTIONS TOTAL = 54 marks total possible** plus one BONUS mark (2 marks).
2. Please use the computer sheet for the multiple choice questions, but answer the labelling/written questions right on the exam itself as well.
3. Please put your name and student number at the top of each page of this exam and on your computer sheet and hand in everything when you have finished.
4. Make sure this exam is complete. This exam contains **11 pages**. The excuse of missing a page will not be accepted after the exam.

GOOD LUCK!!!!!!

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1. Digestion of which of the following would be affected if the pancreas were severely damaged?

- A. disaccharides
- B. lipids
- C. proteins
- D. both B) and C)
- E. all of the above would be affected equally

2. Which of the following is true about saliva and salivation?

- A. about 70% of saliva's content is water
- B. salivation is controlled by the sympathetic division of the autonomic nervous system.
- C. saliva is slightly acidic
- D. saliva contains amylase, pepsin and trypsin
- E. saliva's pH is alkaline (>7)

3. Which of the following is true about the oxidative phosphorylation?

- A. It takes place in the mitochondrial matrix
- B. Its main purpose is production of ATP
- C. Its main purpose is production of CO₂ and H₂O
- D. It does not require oxygen
- E. It takes place in the cytosol

4. Digestion of lipids requires :

- A. bile
- B. pancreatic amylase
- C. acidic pH
- D. intact stomach

5. Which of the following is the correct order for the pathway that food follows through this area of the GI tract?

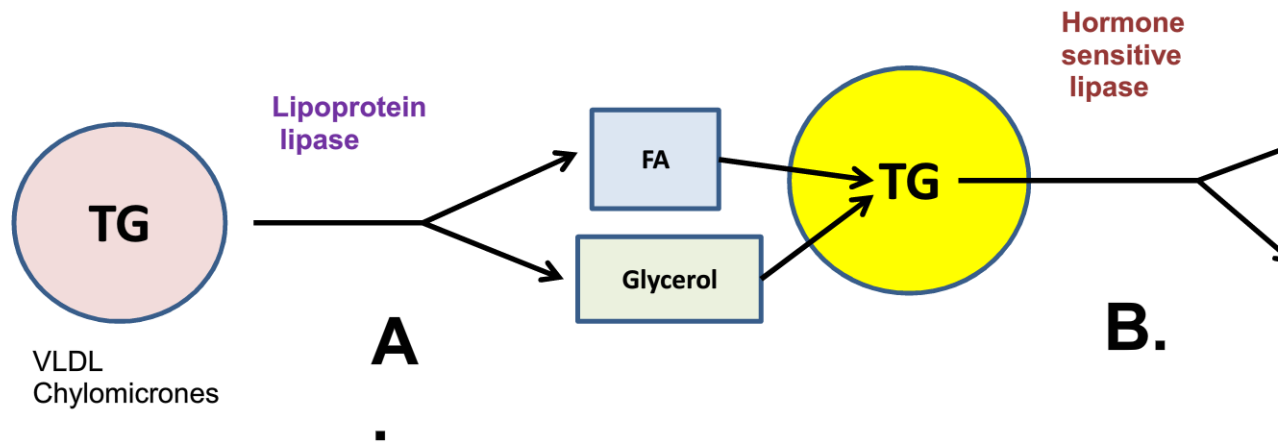
- A. pylorus, duodenum, ileum, jejunum, cecum
- B. jejunum, duodenum, cecum, ileum, pylorus
- C. pylorus, duodenum, jejunum, ileum, cecum
- D. ileum, jejunum, cecum, duodenum, pylorus
- E. jejunum, duodenum, pylorus, cecum, ileum

6. Which of the following is true about vitamin K?

- A. Vitamin K is produced by the liver
- B. Vitamin K is produced by bacteria living in the large intestine
- C. All vitamin K present in our body is delivered with food
- D. Vitamin K requires the intrinsic factor for its transport and absorption

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7. Which of the following (A or B) represents the absorptive state?



8. Katherine just underwent stomach bypass surgery. Which of the following nutrients will not be absorbed from her small intestine as a result of this surgery?

- A. Proteins
- B. Lipids
- C. Carbohydrates
- D. Vitamin A
- E. Vitamin B12

9. The type of epithelium present in the mouth is:

- A. simple columnar
- B. simple squamous
- C. stratified squamous
- D. transitional
- E. pseudostratified ciliated columnar

10. Which of the following statements is TRUE?

- A. The function of the enzyme dipeptidase is to begin digestion of proteins.
- B. The mucosa is found only in the small intestine because this is the only part of the gastrointestinal tract in need of mucus.
- C. Chemical digestion involves processes such as segmentation.
- D. The main cause of stomach (peptic) ulcers is stress
- E. Fibre in the food increases fecal bulk and speeds the movement of the indigested content through the large intestine

11. The first organ to receive the blood-borne products of digestion is the:

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- A. heart
- B. brain
- C. liver
- D. pancreas

12. The difference between the effects of secretin and the effects of CCK on the pancreas is that:

- A. secretin stimulates secretion of pancreatic juice, while CCK inhibits secretion of pancreatic juice and closes hepatopancreatic sphincter
- B. secretin stimulates secretion of pancreatic juice rich in bicarbonate, while CCK stimulates secretion of pancreatic juice rich in digestive enzymes.
- C. secretin causes dilation of the pancreatic duct, while CCK causes constriction of the duct.
- D. secretin is released in the stomach, while CCK is released in the small intestine

13. Cholecystokinin:

- A. inhibits release of bile from the gallbladder
- B. stimulates stomach's motility and induces opening of the pyloric sphincter
- C. induces production of bile by the liver
- D. induces release of the pancreatic enzymes to the small intestine
- E. is produced by the enteroendocrine cells of the liver

14. You have just eaten a bowl of pasta with meat and olive oil based sauce and drank a glass of cranberry juice. Which of the following glands would be involved in digestion of this meal?

- A. Pancreatic exocrine glands
- B. Salivary glands
- C. Gastric juice
- D. All of the above

15. Which of the following is NOT a brush border enzyme?

- A. lactase
- B. amylase
- C. sucrase
- D. dipeptidase
- E. maltase

16. Which of the following statements is FALSE?

- A. Hormone sensitive lipoprotein lipase is activated by insulin
- B. Protein enzymes involved in digestion are produced in an inactive form
- C. Glucose can be converted into building blocks for triglycerides.
- D. It is possible to obtain all of the amino acids that the body needs if one is a vegetarian.
- E. The number of taste buds decreases with age

17. Deamination is the process whereby the amine group of an amino acid is:

- A. removed from amino acid and converted to urea
- B. transferred to fatty acid and used for amino acid production
- C. converted to ammonia
- D. transferred to a keto acid

18. The order of events during lipid absorption is:

- A. chylomicron->intestinal epithelium->micelle->lacteal->blood
- B. micelle->intestinal epithelium->chylomicron->lacteal->blood
- C. micelle->chylomicron->intestinal epithelium->micelle->blood
- D. lacteal->chylomicron->intestinal epithelium->micelle->blood
- E. chylomicron->intestinal epithelium->micelle->blood->lacteal

19. Which of the following pairs of digestion actions correctly describes two of the functions of the large intestine?

- A. water absorption and bacterial action
- B. acid secretion and bacterial action
- C. bicarbonate secretion and bacterial action
- D. mixing action and intestinal hormone production

20. Which of the following is/are paired CORRECTLY?

- A. gastrin // stimulation of bile release by the gallbladder
- B. lactase // protein digestion
- C. secondary active transport // intestinal absorption of amino acids
- D. omega 3 fatty acids//butter and meat
- E. essential amino acid // must be synthesized in the liver

21. Which of the following occurs during the cephalic phase of gastric secretion?

- A. The sight, smell, thought or taste of food triggers parasympathetic impulses
- B. Chemoreceptors detect a change in the pH of gastric juice
- C. Stretch receptors detect distension of the stomach
- D. Chemoreceptors detect fatty acids in the duodenum
- E. CCK is released by enteroendocrine cells

22. All of the following are FALSE about type 2 diabetes mellitus, EXCEPT:

- A. most people suffering from type 2 diabetes mellitus must take exogenous insulin
- B. uncontrolled type 2 diabetes is characterized by hyperglycemia and ketonuria
- C. in late stages, management of the disease may require insulin injections
- D. people suffering from type 2 diabetes have low levels of circulating fatty acids
- E. excessive accumulation of adipose tissue is believed to contribute to insulin resistance and development of type 2 diabetes mellitus

23. Which of the following is true about pepsinogen?

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- A. It is produced by the pancreas
 - B. It is produced by the epithelial cells of the duodenum
 - C. It requires HCL for its conversion to pepsin
 - D. It requires bicarbonate for its activation
24. If you have not been eating for 12 hours but remained physically and mentally active during this period of time, your physiological adaptations to this situation will include:
- A. increased formation of glycogen
 - B. increased formation of structural materials
 - C. increased production of insulin
 - D. increased production of glucagon and catecholamines
25. Umami :
- A. is derived from the tongue's/palate's ability to detect sweet taste
 - B. is the 5th sense of taste derived from the tongue's and palate's ability to detect glutamate
 - C. is a digestive enzyme
 - D. is the type of carbohydrate-rich Japanese food that induces sensation of olfactory delight
26. Increased activity of the sympathetic nervous system will:
- A. decrease the production of digestive juices and decrease intestinal motility
 - B. increase the production of digestive juices and increase intestinal motility
 - C. increase only the production of those digestive juices rich in buffers
 - D. have no effect on the digestive system
 - E. increase the movement of food through the alimentary canal
27. Anabolism includes reactions in which:
- A. carbohydrates are metabolized to yield ATP
 - B. larger molecules or structures are built from smaller ones
 - C. structural proteins are used as a potential energy source
 - D. ketone bodies are formed
 - E. B) and D)
28. Increased production of ketone bodies may indicate:
- A. increased intake of fatty acids, proteins and uncontrolled type 2 diabetes mellitus
 - B. decreased production and storage of glycogen and type 2 diabetes mellitus
 - C. decreased intake of carbohydrates, starvation or uncontrolled type 1 diabetes mellitus
 - D. decreased intake of fatty acids, high carbohydrate diet and type 2 diabetes mellitus
 - E. dietary restrictions and hypothyroidism
29. Which of the following enzymes acts in the mouth?
- A. amylase

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- B. enterokinase
- C. pepsin
- D. dextrinase
- E. trypsin

30. The intestinal absorption of short chain fatty acids occurs via:

- A. secondary active transport
- B. simple diffusion
- C. osmosis
- D. bulk flow
- E. endocytosis

31. Which of the following is true about the pancreatic hormones?

- A. Glucagon increases glycogenesis
- B. Insulin increases lipolysis
- C. Glucagon is released when blood glucose levels drops below the normal level
- D. Insulin is released in response to fasting

32. Thyroglobulin is:

- A. the major component of colloid inside thyroid follicles
- B. another name for thyroid hormone
- C. the major stimulus for release of thyroid hormones
- D. the protein that transports thyroid hormones in blood

33. During fasting.....can be converted to glucose.

- A. glycerol and fatty acids
- B. glycerol and some amino acids
- C. glucagon and fatty acids
- D. ketone bodies and glucagon

34. All of the following statements concerning thyroid hormones are correct EXCEPT:

- A. synthesis of thyroid hormones requires iodide trapping by the thyroid follicular cells
- B. the thyroid gland stores several months worth of thyroid hormones as colloid
- C. elevated levels of thyroxine inhibit the release of TSH
- D. secretion of thyroid hormones is stimulated by TSH released from the anterior pituitary
- E. Grave's disease is characterised by high level of TSH and low levels of thyroid hormones

35. Acetyl-CoA entering the Kreb's cycle CAN come from which of the following sources?

- A. B-oxidation of fatty acids
- B. pyruvic acid
- C. amino acids

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D. B) and C)

E. All of the above

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36. Lipogenesis:

- A. is stimulated by glucagon
- B. can use excess dietary glucose and amino acids as a substrate
- C. releases energy
- D. all of the above
- E. occurs when cellular ATP and glucose levels are low

37. Which of the following statements is TRUE?

- A. Triglycerides and cholesterol circulate freely in the bloodstream.
- B. The pancreas is the primary source of VLDLs.
- C. Diets high in cholesterol tend to lead to high HDL levels.
- D. VLDLs are the only transporters of triglycerides
- E. Triglycerides are the main constituent of chylomicrons and VLDLs

38. Type 1 diabetes mellitus is associated with:

- A. accelerated rate of entry of glucose into the skeletal muscle and adipose cells
- B. increased secretory activity of pancreatic B cells
- C. an autoimmune destruction of pancreatic B cells
- D. insulin resistance
- E. polycystic ovarian disease in female patients

39. Which of the following statements is true?

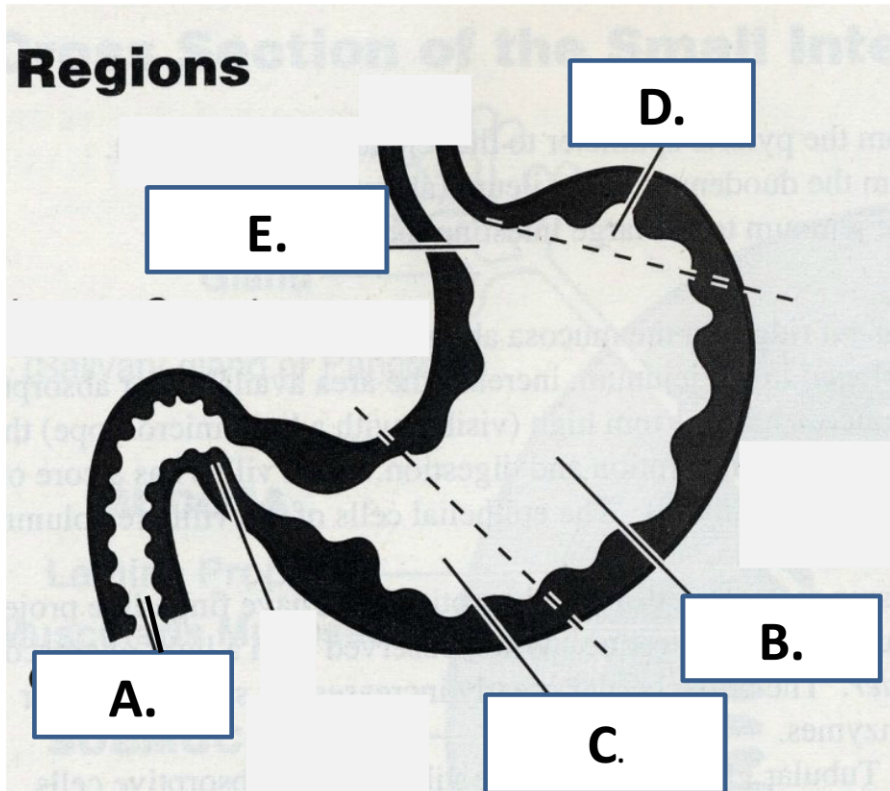
- A. HDLs have cardioprotective effect because they remove cholesterol from blood vessels
- B. High levels of LDL may lead to heart attack and other cardiovascular problems
- C. After depositing triglycerides in target tissues, chylomicron remnants return to the liver
- D. All of the above

40. Which of the following is/are NOT function(s) of the liver?

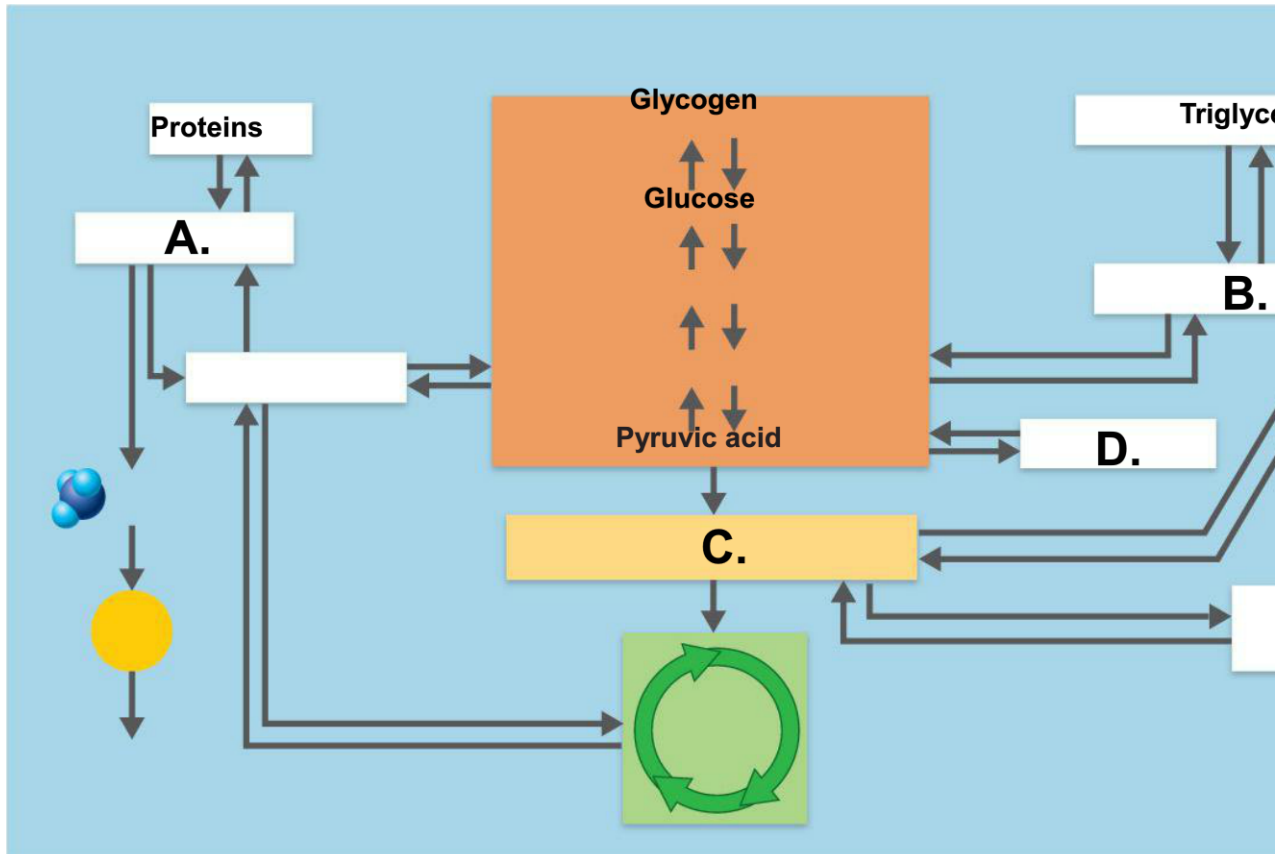
- A. synthesis of plasma proteins
- B. detoxification of substances such as drugs or alcohol
- C. storage of glucose as glycogen
- D. production of lipoproteins for cholesterol and triglyceride transport
- E. production of hormones

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41. Which of the following (A, B, C, D, or E) represents pylorus?

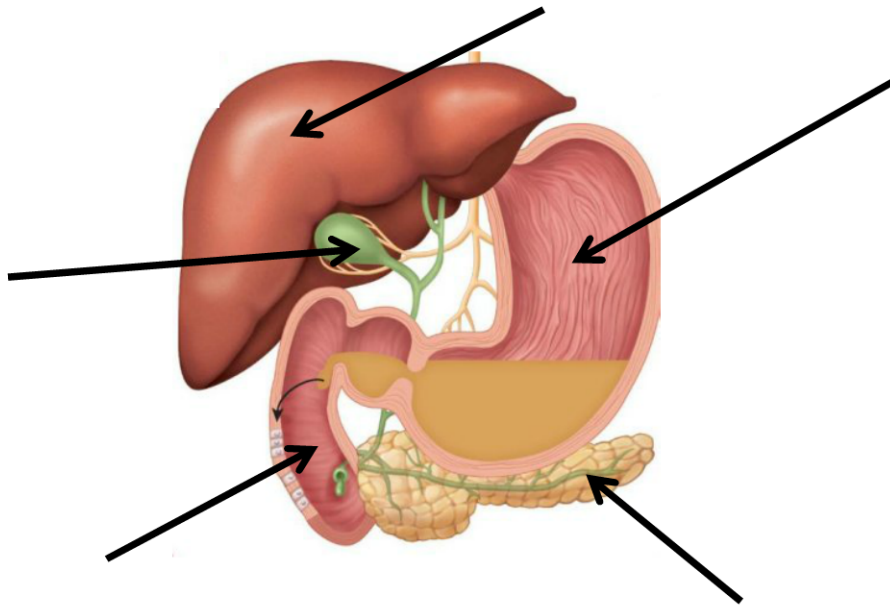


42. Which of the following (A, B, C, D or E) represents ketone bodies?

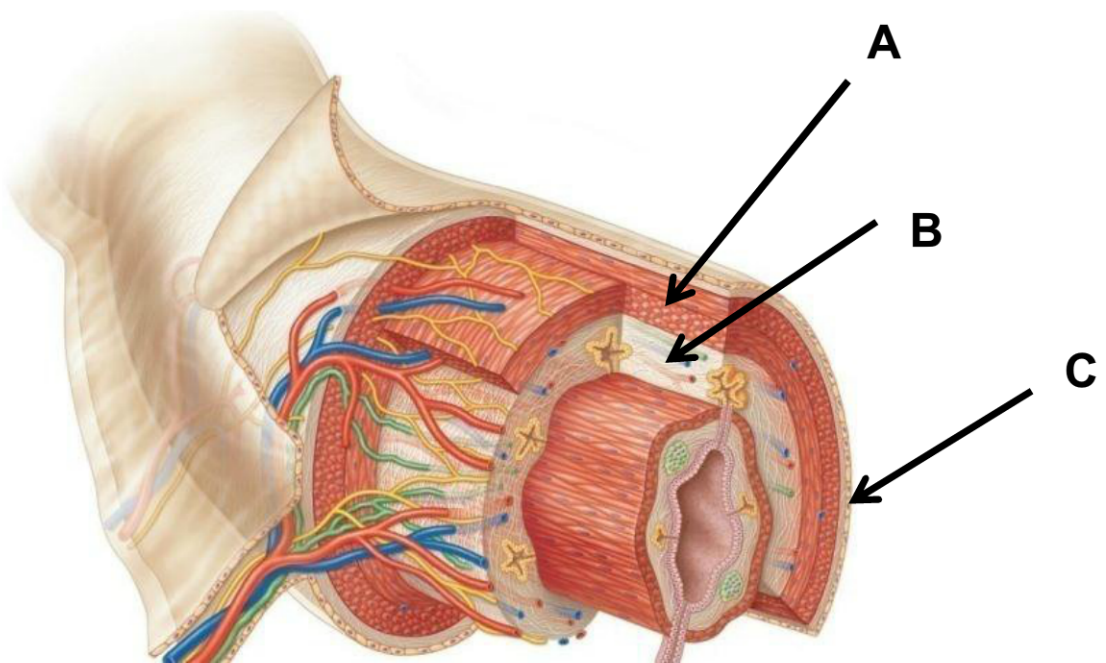


43. Please label the structures indicated by arrows (0.5 mark each proper label; 2.5 marks total):

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44. Please label the following structures (1,5 mark):



45. Describe briefly, in a point form, five (5) major actions of insulin (5 marks)

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46. Please define three (3) of the following terms (1 mark each correct answer, 3 marks total):

USE THE NEXT PAGE!!!

1. Chylomicron
2. Gluconeogenesis
3. Portal circulation
4. Glycolysis
5. Peristalsis

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BONUS (2 marks):NEXT PAGE

List four(4) most typical signs and symptoms of hypothyroidism in neonates (new born babies) .