

Endocrinology

Section 1

- 1 Which is TRUE?
 - a) thyroid gland is essential for life
 - b) T_3 is more potent than T_4
 - c) RT_3 is more active than T_4
 - d) T_3 is the predominant hormone secreted by the thyroid
 - e) most of T_3 converts to T_4 in peripheral tissue

- 2 Which of the following proteins has largest capacity to bind with thyroxine?
 - a) albumin
 - b) globulin
 - c) TBG (thyroxine binding globulin)
 - d) transferrin
 - e) ferritin

- 3 Which of the following is NOT PRESENT when the thyroid gland is inactive?
 - a) abundant colloid
 - b) large follicles
 - c) flat cells lining the follicles
 - d) reabsorption lacunae
 - e) elevation of TSH

- 4 Which is TRUE, Insulin:
 - a) decreases amino acid uptake from the muscle
 - b) increases ketogenesis
 - c) increases ketone uptake by muscles
 - d) decreases protein synthesis in liver
 - e) increases protein catabolism in muscle

- 5 All of the following tissues are dependent on insulin for its glucose entry EXCEPT:
 - a) adipose tissue
 - b) skeletal muscle
 - c) smooth muscle
 - d) cardiac muscle
 - e) β cells of the pancreas

- 6 All of the following increase insulin secretion EXCEPT:
- β adrenergic stimulation
 - acetylcholine
 - glucagon
 - α adrenergic stimulation
 - arginine
- 7 Which is TRUE?
- glucagon does not increase insulin secretion
 - somatostatin increases insulin secretion
 - diazoxide stimulates insulin secretion
 - K^+ depletion increases insulin secretion
 - glucagon increases somatostatin secretion
- 8 Which is TRUE in respect to insulin secretion?
- dependent on glucose entry to β cells of the pancreas
 - Ca^{2+} is not involved
 - K^+ efflux is essential for insulin secretion
 - metformin increases the insulin secretion from β cells
 - cAMP inhibits its secretion
- 9 Which of the following increases Ca^{2+} absorption?
- oxalates
 - phosphates
 - alkalis
 - high Ca^{2+} intake
 - high protein diet
- 10 Which is TRUE?
- parathyroid hormone increases Ca^{2+} absorption from PCT (proximal convoluted tubules)
 - PTH inhibits phosphate absorption from proximal convoluted tubule
 - calcitonin stimulates osteoclasts
 - oestrogens stimulates osteoclasts
 - PTH has no effect on osteoblasts
- 11 Which is TRUE regarding calcitonin?
- stimulated by decreased gastrin
 - increases Ca^{2+} excretion via kidney
 - decreases Ca^{2+} in the blood but increases phosphate
 - increases bone resorption
 - decreases by CCK2 secretion

- 12 Somatostatin is secreted from which islet cell?
- a) A cell
 - b) B cell
 - c) C cell
 - d) D cell
 - e) F cell
- 13 Insulin secretion is inhibited by:
- a) CCK
 - b) amino acids
 - c) glucagon
 - d) somatostatin
 - e) glucose
- 14 Glucagon secretion is stimulated by:
- a) somatostatin
 - b) glucose
 - c) insulin
 - d) ketones
 - e) exercise
- 15 Regarding the adrenal glands:
- a) the adrenal medulla is essential for life
 - b) the adrenal cortex constitutes one third of the gland
 - c) the zona glomerulosa contains 17 α hydroxylase
 - d) there is severe K^+ depletion in Conn's syndrome
- 16 Regarding calcium metabolism:
- a) high calcium levels leads to tetany
 - b) 85-90% is in the skeleton
 - c) high calcium levels activate PTH
 - d) bone turnover is 80% per year in infants
 - e) chronic low calcium leads to secondary hyperparathyroidism?????
- 17 The greatest reabsorption of calcium in the kidneys occurs in the:
- a) proximal convoluted tubule
 - b) descending loop of Henle
 - c) ascending loop of Henle
 - d) distal convoluted tubule
 - e) collecting duct

- 18 The net production of ATP per mole of glucose metabolised aerobically is:
- 8
 - 18
 - 36
 - 38
 - 42
- 19 The caloric value of protein is:
- 4.1 Kcal/g
 - 5.3 Kcal/g
 - 6.7 Kcal/g
 - 9.3 Kcal/g
 - 10.1 Kcal/g
- 20 TSN secretion is stimulated by:
- dopamine
 - somatostatin
 - cold temperatures
 - stress
 - glucocorticoids
- 21 Thyroxine (T₄) has great affinity for:
- thyroxine-binding globulin
 - transthyretin
 - thyroxine-binding pre-albumin
 - albumin
 - triiodothyronine
- 22 GLUT is an example of:
- simple diffusion
 - facilitated diffusion
 - primary active transport
 - secondary active transport
 - endocytosis
- 23 The most common cell type of the endocrine pancreas is:
- A cells
 - B cells
 - C cells
 - D cells
 - F cells

- 24 Both insulin and somatostatin:
- are released from extra-pancreatic sites
 - receptors are linked to G proteins
 - inhibit release of glucagons
 - cause K^+ uptake by cells
 - are polypeptides containing two chains linked by disulphide bonds
- 25 Aldosterone is secreted by:
- zona reticularis
 - zona fasciculate
 - zona glomerulosa
 - zona fasciculata and reticularis
 - zona glomerulosa and fasciculata
- 26 Regarding aldosterone:
- it is released in response to hypokalaemia
 - it has glucocorticoid action
 - it works via G-proteins to increase Na^+ reabsorption
 - its release results in alkaline urine
 - it is highly protein-bound
- 27 Calcitonin secretion is increased by:
- gastrin
 - CCK
 - secretin
 - glucagon
 - all of the above
- 28 All of the following bind to intracellular receptors EXCEPT:
- cortisol
 - aldosterone
 - 1,25-DHCC
 - parathyroid hormone
 - thyroxine
- 29 How many trophic hormones does the anterior pituitary produce?
- 2
 - 3
 - 5
 - 6
 - 8

- 30 All of the following are high energy phosphate compounds EXCEPT:
- a) adenosine triphosphate
 - b) glucose 6-phosphate
 - c) creatine phosphate
 - d) adenosine diphosphate
 - e) guanosine triphosphate
- 31 Under aerobic conditions, 1 mol glucose forms:
- a) 2 mol ATP
 - b) 8 mol ATP
 - c) 16 mol ATP
 - d) 38 mol ATP
 - e) 42 mol ATP
- 32 The approx ratio of fat : CHO energy stores is:
- a) 2 : 1
 - b) 4 : 1
 - c) 10 : 1
 - d) 20 : 1
 - e) 40 : 1
- 33 Nutritionally essential amino acids include:
- a) glycine
 - b) serine
 - c) lysine
 - d) glutamine
 - e) tyrosin
- 34 Uric acid is formed by the breakdown of:
- a) purines
 - b) pyrimidines
 - c) glutamine
 - d) urea
 - e) all of the above
- 35 The LDL contains which aprotein:
- a) A
 - b) B-48
 - c) B-100
 - d) C
 - e) E

- 36 Regarding cellular metabolism of cholesterol:
- a) it inhibits HMG-CoA reductase
 - b) is processed in part to other cholesterol esters by the enzyme acetyl CoA : cholesterol acyltransferase
 - c) it inhibits the formation of LDL receptors
 - d) all of the above
 - e) none of the above
- 37 Which of the following substances decreases the activity of hormone-sensitive lipase:
- a) adrenaline
 - b) thyroxine
 - c) serotonin
 - d) TSH
 - e) prostaglandin E
- 38 Chromium deficiency leads to:
- a) insulin resistance
 - b) hypogonadal dwarfism
 - c) anaemia
 - d) change in ossification
 - e) thyroid disorders
- 39 Vitamin B₁ (thiamine) deficiency leads to:
- a) anaemia
 - b) beri beri
 - c) convulsions
 - d) dermatitis
 - e) pellagra

Endocrinology

Section 1 – Answers

- 1 B
- 2 A
- 3 A
- 4 C
- 5 E
- 6 D
- 7 E
- 8 ?????
- 9 E
- 10 B
- 11 B
- 12 D
- 13 D
- 14 E
- 15 D
- 16 E
- 17 A
- 18 D
- 19 B
- 20 C
- 21 A
- 22 B
- 23 B
- 24 C
- 25 C
- 26 B
- 27 E
- 28 D
- 29 C
- 30 B
- 31 D
- 32 E
- 33 C
- 34 A
- 35 C
- 36 D
- 37 E
- 38 A
- 39 B

Section 2

GI/Digestion/Absorption/Metabolism

- 1 Vitamins co-transported with Na⁺ include all except:
 - a) thiamine
 - b) folate
 - c) niacin
 - d) riboflavin
 - e) pyridoxine

- 2 Fat soluble vitamins include all EXCEPT:
 - a) vitamin A
 - b) vitamin C
 - c) vitamin D
 - d) vitamin E
 - e) vitamin K

- 3 The largest daily volume of secretions in the GIT originates in the:
 - a) salivary glands
 - b) stomach
 - c) gall bladder (bile)
 - d) pancreas
 - e) intestine

- 4 Iron:
 - a) most dietary iron is in the ferrous state
 - b) most iron is absorbed in the upper small intestine
 - c) a ferritin micelle contains 1,000 atoms of iron
 - d) 90% of body iron is in haemoglobin
 - e) 10% of dietary iron is normally absorbed

- 5 Ketone bodies:
 - a) are not formed under normal conditions
 - b) are all moderately strong acids
 - c) are formed when intracellular glucose is deficient
 - d) are easily metabolised in the liver
 - e) all of the above

- 6 Regarding migrating motor complex (MMC), which is TRUE?
- it occurs mainly during food ingestion
 - it is similar to basic electric rhythm
 - it occurs usually during the fasting between the periods of digestion
 - the gastric acid secretion, bile flow, pancreatic juice secretion decreases during MMC
 - the phase I of the MMC is characterised by co-ordinated electric activity and contraction
- 7 Regarding cholera; which is TRUE?
- vibrio cholera organisms enter the enterocytes of the intestine to cause diarrhoea
 - diarrhoea is produced by interference in Cl^- channel by increasing cAMP levels
 - Na^+ / glucose co-transport systems become ineffective in cholera infection
 - the mucosal carrier of Na^+ absorption is $\uparrow\uparrow$ ed
 - the toxins stimulate the ATPase activity and decrease the G protein levels
- 8 Regarding α amylase of salivary glands, which is TRUE?
- the activator of salivary (gland) α amylase is Cl^-
 - the optimum pH for its action is pH of 2-3
 - α amylase breaks down carbohydrate to glucose
 - α amylase acts mainly on α -1-6 linkages of carbohydrate
 - α amylase acts on lipids to produce fatty acids and α glycerol
- 9 Regarding absorption of hexose, which is TRUE?
- the main absorption site is the terminal part of ileum
 - increased Na^+ concentration in the gut lumen - decreases the hexose absorption
 - glucose and Na^+ share the same co-transport or symport from intestinal lumen to enterocytes
 - glucose is transported from the enterocyte to interstitium by Na^+ dependent glucose transport (SGLT_2)
 - the fructose has the same mechanism (which is Na dependent) as hexose
- 10 Regarding protein digestion and absorption, which is TRUE?
- the pepsinogens are activated by alkaline pH
 - the chymotrypsin, trypsin, elastase are carboxy peptidase
 - the absorption of tri and di peptides depend on Na^+ dependent transport system
 - the absorption of most amino acids from the intestinal lumen depends on Na^+ dependent transport system
 - the transport of amino acids from enterocyte to blood stream does not depend on Na^+ dependent transport system

- 11 Which of the following is TRUE?
- a) vibrio cholera organism enter the enterocyte to cause diarrhoea
 - b) colipase: secreted by pancreas activate pancreatic lipase
 - c) vitamin B₁₂ and folic acid absorption depends on Na⁺ dependent co transport
 - d) Ca²⁺ absorption from the gut increases by oxalates and phytates
 - e) most of the dietary irons are in the ferrous form
- 12 Which is TRUE:
- a) TG cells secrete gastrin 17
 - b) the hormones of secretin family includes ch???? cystokinins and VIP
 - c) G₃₄ (gastrin) is the principle form, which stimulates the gastric acid secretion
 - d) gastrin 17 has a longer half-life than G₃₄
 - e) gastrin stimulates the growth of mucosa in the stomach / small intestine / large intestine
- 13 Which of the following is FALSE regarding gastrin?
- a) gastrin secretion is not inhibited by atropine
 - b) gastrin secretion is stimulated by amino acids ???? peptides
 - c) gastrin secretion is stimulated by VIP and GIP and glucagon
 - d) secretin inhibits gastrin secretion
 - e) epinephrine increases the gastrin secretion
- 14 Which of the following is TRUE regarding salivary glands?
- a) the parotid gland is the main salivary gland which contributes to total salivary content
 - b) the submandibular gland is mainly a serous gland
 - c) the parotid gland is mainly a mucous gland
 - d) the submandibular gland contributes to 70% of total salivary content
 - e) the lingual gland is a mixed gland with serous and mucous components
- 15 Regarding cholecystokinin-pancreozymin, which is TRUE?
- a) decreases the gall bladder contraction
 - b) it secretes pancreatic juice rich in enzymes
 - c) it secretes pancreatic juice rich in HCO₃⁻
 - d) it decreases the action of secretin on pancreas
 - e) it increases the gastric emptying time
- 16 Regarding secretin, which is TRUE?
- a) decreases the CCK-P₂ action on the pancreas
 - b) it secretes pancreatic fluid which are rich in enzymes
 - c) it increases the acid secretion from the stomach
 - d) it decreases the gastrin secretion
 - e) it increases the gastric emptying time

- 17 VIP:
- a) it causes contraction of the intestinal tract including the sphincters
 - b) it increases the secretion of water and electrolytes from the intestine
 - c) it increases the acid secretion of the stomach
 - d) it constricts the blood vessels
 - e) VIP decreases the action of acetylcholine on salivary glands
- 18 Which is TRUE, regarding acid secretion?
- a) histamine increase acid secretion by increasing intracellular Ca^{2+} level
 - b) prostaglandins increases adenylyclase activity and increases Ca^{2+} a Ca^{2+} secr
 - c) gastrin increases the acid secretion by increasing the hist H^+ release from enterochromaffin cells
 - d) gastrin increases the acid secretion by increasing cAMP
 - e) acetylcholine acts via histamine receptors
- 19 What stimulates glucagon secretion?
- a) free fatty acids
 - b) GABA
 - c) somatostatin
 - d) α agonists
 - e) acetylcholine
- 20 The renal threshold for glycosuria is:
- a) 18mg/dL
 - b) 1.8mg/dL
 - c) 180mg/dL
 - d) 80mg/dL
 - e) 160mg/dL
- 21 Which effect of insulin occurs in seconds?
- a) + protein synthesis
 - b) - phosphorylase
 - c) increased transport of K^+ into insulin sensitive cells
 - d) + glycolysis
 - e) + gluconeogenesis
- 22 Osteoclasts are derived from:
- a) osteocytes
 - b) fibroblasts
 - c) basophils
 - d) osteoblasts
 - e) monocytes

- 23 Defective osteoclasts leads to:
- a) osteogenesis imperfecta
 - b) osteopetrosis
 - c) osteomalacia
 - d) osteoporosis
 - e) rickets
- 24 The total amount of fluid entering the intestine per day is:
- a) 200ml
 - b) 7000ml
 - c) 2000ml
 - d) 8800ml
 - e) 9000ml
- 25 K^+ is actively reabsorbed from the GIT lumen in the:
- a) duodenum
 - b) jejunum
 - c) ileum
 - d) proximal colon
 - e) distal colon
- 26 Which part of the GIT does NOT display the basic electrical rhythm?
- a) oesophagus
 - b) antrum of stomach
 - c) duodenum
 - d) ileum
 - e) descending colon
- 27 What inhibits gastrin secretion?
- a) atropine
 - b) secretin
 - c) adrenaline
 - d) amino acids
 - e) calcium
- 28 Which GIT hormone stimulates enzyme-rich pancreatic juice secretion?
- a) gastrin
 - b) cholecystinin
 - c) secretin
 - d) VIP
 - e) glucagon

Section 2 – Answers

GI / Digestion / Absorption / Metabolism

- | | |
|----|------|
| 1 | B |
| 2 | B |
| 3 | B |
| 4 | B |
| 5 | C |
| 6 | C |
| 7 | B |
| 8 | A |
| 9 | C |
| 10 | D |
| 11 | B |
| 12 | E |
| 13 | C |
| 14 | D |
| 15 | C, B |
| 16 | D |
| 17 | B |
| 18 | C |
| 19 | E |
| 20 | C |
| 21 | C |
| 22 | E |
| 23 | B |
| 24 | E |
| 25 | E |
| 26 | A |
| 27 | B |
| 28 | B |