FCMFOS(SA) Primary

THE COLLEGES OF MEDICINE OF SOUTH AFRICA

Incorporated Association not for gain
Reg No 1955/000003/08

Primary Examination for the Fellowship of the College of Maxillofacial and Oral Surgeons of South Africa

30 January 2018

Paper 2 Physiology (3 hours)

All questions are to be answered in the space provided.

Candidate Number:.....

Question 1

a) Name the element and the amino acid required to manufacture the thyroid hormones. (2)

b) Briefly outline the synthetic pathway of thyroid hormones that occurs within the thyroid cells and follicles (6)

c) Name two direct effects thyroid hormone has on the heart. (2)

[10]

Question 2

Briefly describe the effect of insulin on the metabolism of

a) Carbohydrate. (4)

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b) Lipids. (3)

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_____

c) Complete the following table. (3)

Glucose Transporter	Function	Major Site of Expression
GLUT 1	(1)	Placenta, blood-brain barrier, red cells, kidneys, colon.
(1)	Insulin-stimulated glucose uptake.	Skeletal and cardiac muscle, adipose tissue, other tissues.
GLUT 5	Fructose Transport.	(1)

[10]

Question 3

a) Complete the following table (4)

Area in adrenal gland	Secretes
Zona fasciculata	
Zona glomerulosa	
Zona reticularis	
Medulla	

With respect to the coagulation pathway

b) How does thrombin stabilise coagulation? (3)

_____

_____

_____

_____

c) Name three mechanisms responsible for inhibition of further coagulation. (3)

_____

_____

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[10]

Question 4

a) Complete the following table. (6)

Hormone	Site of release	Stimulus for release	Actions of both Hormones
Atrial natriuretic peptide.	(1)	(1)	
Brain natriuretic peptide.	(1)	(1)	(2)

b) Consider each statement regarding enzymes and mark whether it is true or false. (4)

i)	Enzymes are catalysts and increase the rate of chemical reactions.	True	False
ii)	Participate in chemical reactions.	True	False
iii)	Increase the free energy of activation of chemical reactions.	True	False
iv)	Are consumed in chemical reactions.	True	False

[10]

Question 5

a) Using the table below list 4 differences between smooth muscle and skeletal muscle. (4)

Smooth muscle	Skeletal muscle

b) Briefly outline the mechanism by which nitric oxide affects smooth muscle activity. (6)

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[10]

Question 6

a) List four physiological sensors of intravascular volume. (4)

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b) In the table below list the three different receptors on which antidiuretic hormone/vasopressin acts and the corresponding effects secondary to receptor stimulation. (6)

Receptor	Effect secondary to receptor stimulation

[10]

Question 7

a) The following values were obtained from a patient.

Plasma	
Sodium	145mmol/l
Urea	5.6mmol/l
Creatinine	100umol/l

Urine	
Sodium	50mmol/l
Creatinine	20mmol/l
Flow rate	0.7ml/min

Calculate the

i) Glomerular filtration rate. (2)

_____

_____

_____

ii) Urea: creatinine ratio. (1)

_____

iii) Fractional excretion of sodium. (3)

_____

_____

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_____

b) Sweat glands are innervated by the _____fibres alone. (1)

c) What does the term facilitated diffusion mean? (2)

_____

_____

_____

d) The parasympathetic divisions use only _____as a neurotransmitter in the ganglionic neurons. (1)

[10]

Question 8

Name the pancreatic exocrine hormone responsible for breakdown of

a) Proteins. (1)

_____

_____

b) Peptides. (1)

_____

_____

c) Carbohydrates. (1)

_____

_____

d) Neutral fat. (1)

_____

_____

e) Phospholipids. (1)

_____

_____

f) Cholesterol esters. (1)

_____

_____

g) Why do the pancreatic hormones not digest the pancreas itself? (2)

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h) Name two other constituents of pancreatic juice. (2)

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[10]

Question 9

a) List 4 differences between the autonomic and the somatic nervous system. (4)

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b) Draw an annotated diagram of the gastric parietal cell explaining hydrochloric [HCl] acid production. (6)

Question 10

Table A shows clinical manifestation of a single vitamin or mineral deficiency. Complete Table B by matching the vitamin and mineral deficiencies in Table B to the clinical manifestation listed in Table A (e.g. Vitamin K matches best with deficiency "a")

TABLE A

	Clinical manifestations of deficiency
a	*Prolonged INR*
b	*Pellagra*
c	*Hypothyroidism*
d	*Skin and oral ulcers*
e	*Sideroblastic anaemia*
f	*Microcytic anaemia*
g	*Pernicious anaemia*
h	*Gingivitis*
i	*Glossitis and stomatitis*
j	*Retinopathy and blindness*
k	*Alopecia*

TABLE B

	Vitamin	Clinical manifestations of deficiency (10x1)
i	Zinc	
ii	Riboflavin	
iii	Niacin	
iv	Pyridoxine	
v	Biotin	
vi	Cyanocobalamine	
vii	Vitamin C	
viii	Iron	
ix	Vitamin E	
x	Selenium	
xi	Vitamin K	

[10]

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31 January 2018

Paper 3 Pathology (3 hours)

All questions to be answered. Each question to be answered in a separate book (or books if more than one is required for the one answer)

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1 Within one hour after a gunshot wound to the abdomen, a 28-year-old man exhibits tachycardia. His skin is cool and clammy to the touch, and blood pressure is 80/30 mm Hg.

a) Define the term "shock" and list three major pathogenic categories of shock. (5)
b) Briefly discuss the three stages of hypovolaemic shock as the most likely cause of tachycardia and hypotension in this patient. (10)
c) Mention three clinical examples of septic shock and list five factors that contribute to the pathogenesis of septic shock. (7)
d) List three morphological features of shock. (3)

[25]

2 a) Discuss the oncogenic potential of Hepatitis B and C viruses. (10)
b) Define the terms “choristoma” and “hamartoma”. (4)
c) Briefly discuss three serum tumour markers that are used in clinical practice. (11)

[25]

3 a) List seven factors that influence tissue repair. (7)
b) Briefly discuss healing of a small uninfected buccal mucosal incision by first intention. (10)
c) List six diseases that present with granulomatous inflammation and mention the aetiology of each disease. (6)
d) Name four special stains that can be used in the differential diagnosis of granulomatous inflammation. (2)

[25]

4 a) List and briefly discuss the two types of pathologic calcification. (15)
b) List one exogenous, and three endogenous pigments that are synthesised within the body itself. (4)
c) Define the terms “hyperplasia” and “hypertrophy” and give examples of each. (6)

[25]