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 Maxillo-Facial and Oral Surgeons of South Africa

29 June 2017

Paper 2	Physiology	(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   Knowledge of the <u>Renal system</u> is essential for the maxillofacial and oral surgeon; answer the following questions in this regard
    a)   Regarding glomerular filtration rate (GFR)
        i)   What is the normal adult range for GFR? (1)
        ii)   How is glomerular filtration rate controlled? (4)
    b)   What is the juxtaglomerular apparatus? (4)
    c)   List stimulants of renin release. (3)
    d)   Describe the production of angiotensin II. (3)
    [15]

2   Answer the following questions involving <u>Acid/Base balance or homeostasis</u>
    a)   What is a buffer? (3)
    b)   What makes an ideal buffer? (2)
    c)   Describe the role of the phosphate and ammonium buffers in renal tubular fluid. (12)
    d)   Describe the role of protein and haemoglobin as buffers. (8)
    [25]

3   Briefly discuss the following questions involving <u>functions of the blood</u>
    a)   List 5 products secreted by platelets and explain the role of each one. (10)
    b)   What are the causes of polycythaemia? (4)
    c)   Why is factor Xa so pivotal in the coagulation cascade? (1)
    [15]

4   Answer the following questions involving the <u>Cardiovascular and Respiratory systems</u>
    a)   Name five factors affecting stroke volume. (5)
    b)   Write the complete oxygen flux formula for oxygen delivery to tissues. (5)
    c)   List the non-respiratory functions of the lung. (10)
    [20]

5   Answer the following question on the physiology of the <u>Liver</u>
    a)   List five functions of the liver. (5)
    b)   List the major components of liver blood supply and indicate the contribution of each component to liver oxygen delivery. (2)
    c)   Describe the mechanism of action of protein C and protein S. (2)
    d)   What percentage of the cardiac output goes to the liver? (1)
    [10]

6   Answer the following on the physiology of Cerebrospinal fluid (CSF)
        a)   Where is cerebrospinal fluid (CSF) produced?   (2)
        b)   What is the rate of CSF production?   (1)
        c)   Where is CSF reabsorbed?   (2)
                                                                                [5]

7   The physiology of the stress response to for example surgery is important knowledge to the aspirant maxillofacial and oral surgeon. Answer the following questions in this regard
        a)   List the relevant hormones involved.   (6)
        b)   List the systemic manifestations of the stress response to surgery.   (4)
                                                                                [10]

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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   A 21-year-old woman sustains multiple injuries including fractures of the right femur, tibia and the left humerus, in a motor vehicle collision. She is admitted to the hospital, and the fractures are stabilised surgically. Soon after admission to the hospital, she is in a stable condition. Two days later, however, she suddenly becomes severely dyspnoeic with a provisional diagnosis of fat embolism

    a)   Define an embolus and list five different types of embolism.   (7)
    b)   Briefly discuss fat embolism as the most likely cause of the sudden respiratory difficulty in this patient.   (10)
    c)   Mention three predisposing factors for Deep Vein Thrombosis (DVT) in this patient.   (4)
    d)   List four major consequences of pulmonary thrombo-embolisation.   (4)
                                                                           [25]

2   a)   Discuss the oncogenic potential of Human Papillomavirus.   (10)
    b)   Define the terms "dysplasia" and "carcinoma in situ".   (5)
    c)   Briefly discuss the role of ionising and UV radiation in development of cancers of the head and neck.   (10)
                                                                           [25]

3   a)   What is a suture granuloma?   (2)
    b)   Draw an annotated diagram to demonstrate the most important histologic features of the tuberculosis granuloma.   (4)
    c)   Briefly discuss the types of diseases in the head and neck that present with granulomatous inflammation and mention the aetiology of each disease.   (14)
    d)   Briefly discuss the role of special stains in the differential diagnosis of granulomatous inflammation.   (5)
                                                                           [25]

4   a)   List the distinct morphologic patterns of tissue necrosis and give an example of each.   (12)
    b)   Tabulate three differences between necrosis and apoptosis at the cellular level.   (6)
    c)   Define the terms "metaplasia" and "atrophy" and give an example of each.   (7)
                                                                           [25]