



## THE COLLEGES OF MEDICINE OF SOUTH AFRICA

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Part I Examination for the Fellowship of the  
College of Pathologists of South Africa – Anatomical Pathology



04 February 2021

1 Paper only

Section A – Short Answer Questions

(3 hours)

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

- 1
- a) Name 3 basic types of cell junctions, and briefly describe the function of each type. (3)
  - b) List the 4 major phases of the cell cycle which result in cell division, with their full name and common abbreviation (excluding checkpoints). (4)
  - c) List 6 different causes of pathologic atrophy. (3)
  - d) Name and briefly define 2 different types of tissue calcification. (2)
  - e) List the 3 primary factors that lead to thrombosis (Virchow triad). (1½)
  - f) List 4 AIDS-defining opportunistic viral infections (non-tumour related). (2)
  - g) List 5 different paraneoplastic endocrinopathies. (2½)
  - h) List the 4 cardinal features of Tetralogy of Fallot. (2)
- [20]
- 2
- a) What would be the most appropriate histochemical stain for each of the following scenarios?
    - i) A 67-year-old woman with multiple myeloma and nephrotic syndrome. A kidney biopsy shows deposition of amorphous material along the glomerular basement membrane, the mesangium and the peritubular interstitium. (½)
    - ii) A 55-year-old man has diabetes mellitus. He is found to have proteinuria. A renal biopsy shows nodular thickenings of the mesangium. (½)
    - iii) A 34-year-old woman has a history of epigastric pain. Endoscopy shows an acute gastritis. A gastric biopsy demonstrates active inflammation of the gastric antrum mucosa. Helical bacteria are noted in the gastric mucus. (½)
    - iv) A 37-year-old man with chronic liver failure has dark rings encircling the irises of his eyes. A liver biopsy shows fatty change, features of an acute hepatitis, vacuolated nuclei and Mallory bodies. (½)
    - v) A 49-year-old man has new onset diabetes mellitus. He has increased pigmentation in sun exposed areas and an enlarged liver. A liver biopsy shows a yellow golden pigment in the bile duct epithelium, Kupffer cells and the periportal hepatocytes. (½)
    - vi) A 64-year-old woman has a pigmented lesion on the heel of her right foot. A biopsy shows sheets of pleomorphic cells with large nuclei and prominent nucleoli. A brown-black pigment is noted in the cytoplasm. (½)
  - b) A 34-year-old woman has a history of feeling tired and being short of breath. She is found to have a vitamin B12 deficiency, a macrocytic anaemia, antibodies towards parietal cells and a raised gastrin level. What would be the most likely findings on gastric biopsy? (2)

- c) A 22-year-old woman has had pregnancy induced hypertension. The placenta has been submitted for pathological assessment. What would be the most likely pathological findings? (2)
- d) A post-mortem examination has been requested on a 3-year-old boy that has died in the paediatric ward. The child is at the 75th percentile of his expected weight for age, has swollen extremities and a flaky paint dermatitis. What would your expected histological findings be in the following organ systems?
- Liver. (½)
  - Small intestine. (½)
  - Bone marrow. (½)
  - Lymph node. (½)
- e) A 52-year-old man has jaundice and raised serum transaminases. Liver biopsies are done. What aetiological factor is suggested by each of the following morphological features?
- Ground glass hepatocytes. (½)
  - Foci of lobular necrosis with plasma cells in the portal tracts. (½)
  - Lymphoid aggregates in the portal tracts with steatosis of the hepatocytes. (½)
  - Steatosis, intracellular hyaline material and periportal fibrosis. (½)
- f) A 2-year-old child has a loss of the red reflex of the left eye. An exenteration of the eye is done. Histology shows a malignancy consisting of small round blue cells forming rosettes.
- What is the most likely diagnosis? (½)
  - With reference to Knudson's "two-hit" hypothesis, explain the molecular differences between the familial and sporadic forms of this neoplasm. (3½)
- g) An autopsy is performed on a 58-year-old homeless man. There is a history of chronic alcohol abuse and regular attendance to his local emergency department for abdominal pain. What microscopic features would be most likely in sections of the pancreas? (2)
- h) What would be the antibody, and staining pattern, on immunofluorescence microscopy in the following conditions?
- Pemphigus vulgaris. (1)
  - Bullous pemphigoid. (1)
  - Dermatitis herpetiformis. (1)
- [20]
- 3
- Define reperfusion injury. (1)
  - Name and briefly describe 2 mechanisms of reperfusion injury. (3)
  - Which 2 organs in the body are most susceptible to reperfusion injury? (1)
  - List the 5 classes of intermediate filaments and the types of cells in which they are usually found. (5)
  - State 3 common causes of hypercalcaemia and provide 1 example for each. (3)
  - List 4 occupational carcinogens and an associated cancer. (4)
  - Briefly describe the aetiopathogenesis of immune foetal hydrops (Rhesus incompatibility). (3)
- [20]
- 4
- Define emphysema. (1)
  - List the 4 major subtypes of emphysema and give 1 cause of each. (4)
  - List 6 complications of pneumonia. (3)

- d) List the 4 molecular subtypes of breast cancer and tabulate the differences under the following headings: Molecular subtype, defining Biomarkers and Morphological (histological) types.

	Molecular subtype 1 (½)	Molecular subtype 2 (½)	Molecular subtype 3 (½)	Molecular subtype 4 (½)
Biomarker 1				
Biomarker 2				
Biomarker 3				
Biomarker 4				
	(½)	(½)	(½)	(½)
Morphological types				
	(½)	(½)	(½)	(½)

(6)

- e) Tabulate the differences between Type 1 and Type 2 Diabetes Mellitus under the headings Genetics, Pathogenesis and Pathology.

	Type 1	Type 2
Genetics	(1)	(1)
Pathogenesis	(1)	(1)
Pathology	(1)	(1)

(6)  
[20]