Higher Specialist Diploma

Cellular Pathology

Examination 2019

Paper 3

Discipline-specific questions

120 minutes

Attempt 3 out of 6 questions

Instructions to candidates

1. Record your candidate number, qualification title and where appropriate the discipline and examination paper number on the front sheet of the answer booklet

2. Record your candidate number and the page number in the spaces provided on the answer sheets

3. Begin each new answer on a new page

4. Write on one side of the answer sheet only

5. Each question is worth 100 marks
1. Critically appraise the value of viral demonstration in the cellular pathology discipline.

2. Discuss the types and preparation of non-gynaecological preparations and their use in diagnostic cellular pathology.

3. Critically review the expanding role of nucleic acid based molecular pathology within cellular pathology. Explain the challenges and limitations.

4. Discuss and appraise the value of proficiency testing within cellular pathology laboratories. How much is enough?

5. Discuss and debate the ‘Hub and Spoke’ model for full laboratory integration within cellular pathology.

6. Discuss the investigations undertaken on renal core biopsies for suspected glomerulonephritis.
Higher Specialist Diploma

Cellular Pathology

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Paper 4

Case studies

120 minutes

Attempt all case studies

Instructions to candidates

1. Record your candidate number, qualification title and where appropriate the discipline and examination paper number on the front sheet of the answer booklet

2. Record your candidate number and the page number in the spaces provided on the answer sheets

3. Begin each new answer on a new page

4. Write on one side of the answer sheet only

5. Each case study is worth 100 marks
1. A 59 year old male labourer reported to his GP with a raised pigmented nodular crusty skin nodule on his scalp. The lesion had grown quite quickly in size over a few weeks and was now ulcerating and bleeding. The gentleman also had high blood pressure and was complaining of feeling thirsty and was continually drinking large volumes of water. A full blood test was requested including complete liver and kidney function tests.

The skin lesion on his scalp was examined under the dermoscope and surgical removal and excision was recommended with immediate effect. A surgical marker for orientation was also recommended.

a. Describe the nature, appearance, removal and subsequent grossing of the skin lesion (20 marks)

The results from the full blood count indicated a high level of blood sugar. Evaluation of his kidney function tests also revealed higher than expected levels of fasting glucose with 140 mg/dL. with a none fasting reading of 220mg/dL. There was also evidence of polyuria.

b. What is the likely condition this gentleman is presenting with? Explain what other abnormalities you might expect to see with complications associated with this condition? (15 marks)

The gentleman’s skin lesion was processed histologically and sections for HE staining revealed the appearances below:-
Figure 1 Low power view of nodular lesion

Figure 2 High power of nodular lesion
c. Describe the histological features seen in the low power and high power images. (20 marks)

d. What is the likely diagnosis of the cutaneous lesion removed from this gentleman’s scalp and what is the sub type based on the clinical and histological appearance of the lesion? (10 marks)

e. What immunohistochemistry markers would you use to define the tumour cells and confirm the nature and proliferation rates of the atypical cells? Your answer should also include other common tumours that may be considered in the differential diagnosis (20 marks)

f. The tumour was diagnosed and the gentleman was requested to have further immunohistochemistry performed involving a predictive marker cancer marker BRAF. What is the name of this antibody? (5 marks)

g. Explain the reasoning for performing BRAF staining and the significance of a negative as well as a positive result in this gentleman’s case? What alternative technique could be used to screen for BRAF mutations? (10 marks)

**Unseen Case Study**

2. A 35 year old male, reports to his GP with painless swellings in his neck and axillae. He has pronounced fatigue and a fever with accompanying night sweats and he has lost 3kg in weight over the past two months despite no alterations to his diet or increased exercise.

The GP arranges an X-ray, CT, and PET scan. In addition blood tests are carried out and include assessments of red blood cell and white blood cell counts and liver and kidney function tests. A swollen lymph node from the axilla is first aspirated for cytological assessment and then removed for confirmatory histological evaluation.

a. Describe the process for fine needle aspiration and subsequent cytological preparation of the swollen lymph node. (15 marks)
b. Describe the macroscopic histological dissection procedure that would be carried out on the removed lymph node. (15 marks)

Following a review of the blood tests and subsequent HE stained slides from the lymph node. Large cells are seen in the lymph node with an ‘owl’s eye’ appearance and these cells contain inclusion-like nucleoli. There are also the presence of abundant neutrophils and eosinophils forming small micro-abscesses.

c. Based on the histological and cytological features described what is the likely diagnosis here and briefly describe the histological classification of this tumour. (20 marks)

d. What immunohistochemical markers should be employed to delineate the immunological profile of this tumour and support the diagnosis? (20 marks)

e. What in-situ hybridisation probe could be employed on histological sections from such a node? Explain the principles of in-situ hybridisation? (20 marks)

f. What is the lineage of the cell population causing this disease described above? Explain your answer in terms of the aetiology of the condition? (10 marks)
3.
A 28 year old female reported to her GP with a swollen and inflamed insect bite and associated rash on her left lower calf. The bite had arisen during a countryside walk through long grass. The GP requests blood tests and serum samples for enzyme immunoassay (EIA) plus indirect immunofluorescence (IIF) studies. In addition he takes a biopsy of the inflamed rash area for routine histology.

a. Describe the procedure employed for indirect immunofluorescence assessments? (20 marks)

b. What is the likely diagnosis of this condition and what would be the expected findings from EIA and IIF and what is the causative agent? (20 marks)

The results from the EIA and IIF are consistent with the suspected diagnosis but further investigations of the formalin fixed histologically processed tissue from the rash are requested.

c. Explain the clinical and histological features, including the cell types, you would see in an acute and a chronic inflammatory cutaneous lesion. (20 marks)

d. Explain what tinctorial special stains could be used to help confirm the presence of a possible causative agent here. Highlight the difficulties that can be encountered with this technique (20 marks)

The identification of a causative agent is not confirmed with the tinctorial special stain(s) described in (d). Subsequent further investigations employing immunohistochemical tests are requested.

e. Describe the antibody used to detect the causative agent in this case. What other diseases can be caused by the family of agents described above? (20 marks)