Higher Specialist Diploma

Virology

September 2024

Short-Answer Questions

60 minutes

Attempt all Four Questions

Instructions to Candidates

1. Record your candidate number and HSD discipline on the front sheet of the answer booklet.

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

3. Begin each new answer on a new page.

4. Each question is worth 25 marks.

1. A trainee biomedical scientist comes to you with a serology result of:
   HBsAg positive
   Anti HBc Total/IgG positive
   and asks you to tell them what this indicates and how to proceed.

   They also say that they have heard that Hepatitis B is a notifiable disease and asks you to explain the notification process.

2. There is an outbreak of a red rash infection, suspected to be measles in a local primary school. You are in charge of liaising with the infection control team, managing the sample collection, coordinating the transport and ensuring a rapid turnaround time for the laboratory testing. Outline your plan for achieving this.

3. Describe what you include in a tutorial for band 5 biomedical scientists to explain external quality assurance for molecular diagnostics.

4. Your Trust's Accident and Emergency department(s) are investigating the feasibility of introducing a multiplex PCR point of care analyser for respiratory infections. You have been asked to do a presentation for clinical and administration managers to help support their decision-making. Outline the points that you would include.

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Essay Paper

120 minutes

Attempt 2 out of 5 Questions

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3. Begin each new question on a new page.

4. Each question is worth 100 marks.

1. Discuss the laboratory investigation of enterovirus infections.

2. You have been asked to improve the service that your department provides to a local travel clinic. Discuss how you would ensure that the service meets the needs of the users, protocols for sampling testing and clinical advice and how you might promote the service.

3. Outline a validation and verification plan to provide a virology service to a neurology department.

4. Discuss the laboratory diagnosis of congenital infections caused by rubella virus and human cytomegalovirus.

5. Vaccination against Human Papilloma virus (HPV) was introduced in the UK in 2008. Critically evaluate its effect.

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Case Studies

120 minutes

Attempt all Case Studies

Instructions to Candidates

1. Record your candidate number and HSD discipline on the front sheet of the answer booklet

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

3. Begin each new case study on a new page

4. Each question is worth 100 marks

5. For these case study questions you are strongly advised to answer the questions as they arise during the case study to avoid later information impacting adversely on your answers to the earlier questions by presuming an "outcome"

SEEN CASE STUDY

1.

Mr BT, a 43 year old man presented in the Accident and Emergency department with symptoms of acute onset pyrexia, lethargy, fatigue, myalgia aching and nausea in the last week of June 2024. He had returned from a hiking trip in Castile-León province of Northern Spain 10 days earlier. He did not report any contact with someone known to have an infectious disease.

a. List the viral infections which would be suspected in this case and state which samples should be collected for laboratory investigations. (20 marks)

Results from the initial tests:
NO viral infections detected

BT was discharged from hospital and appeared to recover, but in mid-July he was re-admitted with recurrence of the pyrexia and nausea, along with a stiff neck, photophobia and some signs of confusion. When asked for more information about his movements on holiday, the man mentions that he was bitten by a tick while walking through a forest. He removed it and took a photograph on his phone camera. The doctor reviewing BT's case sent a copy of the photo to an entomology reference service. They identified the species of tick as *Hyalomma ,* likely to be *H.marginatum.*

b. Which viral infection would be suspected and how could this be confirmed in the laboratory? (20 marks)

c. Outline the epidemiology of this infection in Europe and globally. (20 marks)

d. Infection with this virus is associated with a 30% case fatality rate. How could BT have avoided the risk from this illness? (20 marks)

e. Discuss the epidemiology and clinical picture of another tick borne infectious disease which is prevalent in Europe. (20 marks)

UNSEEN CASE STUDIES

2.

An outbreak of diarrhoeal disease on a ward with elderly patients is reported to the laboratory by the Infection Control team. The ward has 6 four-bedded rooms, 2 two bedded rooms, and 2-single rooms. Out of 24 patients on the ward, 16 are symptomatic, as well as 4 staff members. Common symptoms are nausea, vomiting and diarrhoea.

a. What viruses do you think might be the cause of the outbreak? List in what you consider to be the order of likelihood. (15 marks)

b. Which samples would you request for laboratory investigations and from whom? (15 marks)

c. What diagnostic investigations might be used in this scenario? Give a brief critical evaluation of all available methods. (50 marks)

d. Discuss the action which the Infection Control team should take and the problems of infection control in such situations. (20 marks)

3.

A 21-year-old male patient is admitted to hospital complaining of headaches, neck pain and photophobia. The presumptive clinical diagnosis made is meningitis. CSF samples are taken for bacteriology and biochemistry. The following results are obtained:

Bacteriology:
Clear, colourless fluid
Cell count: 0 RBC 778 WBC (78% lymphocytes)
Antigen detection tests: Negative

Biochemistry:
Glucose: 582 mg/L (normal range: 0 to 700)
Protein: 3.2 mmol/L (normal range: 1.7 to 3.9)

Further clinical information obtained from the patient's GP indicates that he visited the GP five days before the onset of his current illness complaining of genital pain and a penile rash (vesicular type rash). The GP diagnosed primary genital herpes infection. No treatment was prescribed and no samples were taken for laboratory testing. A telephone call from a doctor on the admitting ward asks what virological investigations are appropriate.

a. Provide an interpretation of the laboratory results given. (20 marks)

b. What sample(s) would you request for virological analysis and why? (15 marks)

c. Critically discuss the investigations which might be used to diagnose possible viral involvement. (30 marks)

d. Suggest the most appropriate selection of tests in this case and indicate the results which you might expect. (20 marks)

e. Using the results, you gave in answer to part 'd' state the diagnosis, prognosis, treatment and management for this patient. (15 marks)