Question 1

Tshepo, a 6-month-old baby presents to the paediatric outpatient department with a history of diarrhoea and vomiting for four days. He appears to be lethargic with cold hands, a rapid weak pulse and a capillary refill time of four seconds. His weight is 4.5kg and he has oedema of both legs.

a) How would classify Tshepo’s nutritional status? Give two (2) additional anthropometrical parameters that you could use to confirm your suspicion as well as the results that you expect.

b) What would your initial fluid management be? In your answer, give the type of fluid, the volume to be infused and the rate in milliliters per hour (mls/hr). (you may leave your answer in the form of a equation).

c) What principles of fluid management do you need to take into consideration in this initial phase?

Following the administration of the fluid, Tshepo becomes more alert and his capillary refill time decreases to below three seconds. He still has sunken eyes and decreased skin turgor.

d) What is your subsequent fluid management? (You don’t need to work out specific values).

Once you have initiated fluid management, you sit down with the mother to continue taking a history.

e) Give five (5) questions you could ask that lead you SPECIFICALLY to the aetiology of the gastroenteritis? For each question, link a possible organism or pathophysiological mechanism.
f) Choose five (5) of the WHO 10-steps of management for severe acute malnutrition (other than dehydration and prepare for discharge) and state how you would implement these practically. (10)

g) State how you prepare a child for discharge after being admitted for severe acute malnutrition. Give four (4) points. (4) [40]

**Question 2**

A baby with a gestational age of 33-weeks is born on a Saturday morning in the district hospital where you are working. The birth weight is 1.9kg. As you were off duty over the weekend, your first encounter with the baby is on day 3 of life. No admission book was completed by the admitting doctor over the weekend, as it was very busy. The baby looks acutely ill. The vital signs are as follows: axillary temperature 35.7°C, respiratory rate 65 breaths per minute, pulse rate 175 beats per minute, oxygen saturation 98% on 40% oxygen via nasal cannula. The baby has been receiving expressed breast milk via nasogastric tube (5mL 3 hourly) but has vomited 3 times during the last 24 hours. The baby appears lethargic and is clinically jaundiced and moderately dehydrated on examination.

a) What is the most likely cause of the baby’s clinical picture? (2)
b) Briefly discuss the role of an appropriate history in this case. (5)
c) Which special investigations are indicated? (5)

The baby is currently 60-hours-old. The total bilirubin value on a blood gas sample is 280μmol/L. According to the guidelines for management of neonatal jaundice the phototherapy value is 170 μmol/L and exchange transfusion value is 260μmol/L.

d) What are the management options for this baby? (2)

On taking a detailed history you discover the mother was diagnosed with pulmonary tuberculosis 3 weeks before delivery. Gene Xpert on sputum was positive (Rifampicin sensitive). She was then also tested for HIV and newly diagnosed as HIV positive. She reports good adherence to both her TB treatment as well as her antiretroviral treatment. She has indicated that she will exclusively breastfeed.

e) What prophylaxis does this baby require? Name the drug(s) as well as duration of treatment. (8)
f) When can BCG immunisation be given to the baby? (2)

You follow-up on the birth PCR result for the baby and it is positive.

g) Describe your management of the baby. (6)

The result of the confirmatory HIV PCR you did the day of initiation of treatment comes back as indeterminate.

h) Explain the management of an indeterminate HIV PCR result. (4)
The mother is only 17-years-old and wants to go back to school to complete matric. She does not have her own ID document yet. The father of the baby has indicated that he is not able to financially assist the mother or the baby. She has the support of her own parents, but they are also unemployed and she expresses her worry about being able to care for her newborn child. She wants to know if there is a grant she can apply for.

i) What different social grants are available for the paediatric population? (3)

j) Can the mother – as a minor herself – apply for a grant for her child? (1)

k) What steps will she need to take in order to be able to apply for a grant? (2)

Question 3

A mother brings her 9-year-old daughter, Rizqah, to your paediatric out-patients clinic complaining of a 6-month history of a cough.

a) Which aspects of the history will assist you in making a diagnosis? (8)

The mother describes a dry, irritating cough that disturbs Rizqah at night. You start by doing anthropometry on Rizqah. Her weight-for-age Z score is < -2 > -3, height-for-age Z score is < -2 > -3 and her weight-for-height Z score is < -1 > -2.

b) Interpret her anthropometry. (6)

You start your examination looking for clubbing.

c) If she was clubbed, list two (2) possible differential diagnoses. (2)

Further examination reveals enlarged nasal turbinates obstructing 50% of her nasal passages, with clear rhinorrhoea. Chest examination reveals decreased cardiac dullness and a liver border in the 7th intercostal space.

d) What is the working diagnosis at this point? (4)

e) Which medication would you prescribe? (3)

You book a follow-up appointment for Rizqah in 2-months’ time.

f) How will you assess whether the medication has had an effect? (8)

Rizqah seems to be doing well until the following winter when she has seasonal ‘flu and then has a wet cough for 2 months after the viral infection. She had been seen at the local clinic and prescribed a 5 day course of amoxicillin, which had no effect on the cough. Clinically she looks well, despite this fruity wet cough. You prescribe a broad spectrum antibiotic for 2 weeks, and the cough resolves.

g) What was the diagnosis? (3)

h) Which antibiotics are appropriate choices? (4)

i) Name one (1) long-term outcome of untreated lung infections. (2)
Question 4

You are a medical officer working in the paediatric ward at a busy district hospital. In the previous year, while working as an intern, you observed that your senior colleagues, medical officers and registrars, frequently prescribed amoxicillin/clavulanic acid for children with uncomplicated upper respiratory tract infections and asthma exacerbations. Although this practice differed from what you had learnt while you were studying medicine, nobody seemed opposed to it and you have found yourself following similar prescribing patterns in recent months. A month ago, a paediatrician from the regional hospital in town conducted an antibiotic stewardship ward round in the ward where you are working. You attended the ward round and were asked questions about the antibiotics your paediatric patients were receiving.

a) List four (4) health care professionals who should ideally participate in an antibiotic stewardship ward round.

b) List three (3) aims of an antibiotic stewardship programme.

An antibiotic prescription chart was recently introduced at the hospital and this formed the basis of the discussion on the antibiotic stewardship ward round that you attended.

c) List five (5) important components that should be included as part of the prescription of an antibiotic in order to comply with good antibiotic prescribing practice and legal requirements.

d) What is the difference between an empiric and a definitive choice of antibiotic?

In your hospital, cultures (blood, urine, cerebrospinal fluid) are seldom done and if they are requested and sent to the laboratory, the results are usually not obtained or only become available after the patient has been discharged. As a result, broad-spectrum empiric antibiotics, mostly oral amoxicillin/clavulanic acid or intravenous ceftriaxone, are used in most patients just to cover all possibilities.

e) Describe the antibacterial spectrum of amoxicillin/clavulanic acid by listing the groups of organisms that this antibiotic covers.

An 18-month-old boy who attends daycare has just been admitted to your ward with a 2-day history of runny nose, a red throat and a wheezy chest. On examination, he was apyrexial and the chest was hyperinflated with mild substernal recession and scattered wheezes. The doctor who admitted him to the ward had prescribed amoxicillin/clavulanic acid.

f) What is the most likely diagnosis in this child?

g) List two (2) pathogens that commonly cause this condition.

h) List four (4) reasons why the admitting doctor may have prescribed amoxicillin/clavulanic acid for this child.

i) List five (5) disadvantages to this child being on an antibiotic.

j) List four (4) associated features that may be useful in differentiating a viral from a bacterial aetiology for an upper respiratory tract illness.

k) Why is it not appropriate to prescribe an antibiotic for most children with asthma presenting with an acute exacerbation?
l) List appropriate empiric antibiotic/s (names only, not doses, frequency etc.) for the following infections
i) Previously well 3-year-old child with bilateral otitis media not responding to antipyretics and analgesics for 48 hours. (1)
ii) Previously well 9-month-old child with a pulmonary empyema (purulent pleural effusion) on chest-x-ray and pleural drain. (2)

m) List appropriate definitive antibiotic/s for the following infections
i) Pharyngitis in a 6-year-old child. (1)
ii) Pulmonary empyema with Streptococcus pneumoniae cultured from pus. (2)

Question 5

Philip is a 19-month-old boy from Burundi. His family recently immigrated to South Africa. He presents with fever, irritability, vomiting and is lethargic. On examination, you find that he has neck stiffness and a generalised purpuric rash. He also has a weak, thready pulse, a capillary refill time of 5 seconds and a blood pressure that is normal for his age and gender.

a) State your full clinical assessment of the patient based on the information provided. (3)
b) How will you manage Philip’s immediate problem? (5)
c) Would you do you a lumbar puncture as part of your initial investigations? Explain two (2) reasons for your answer. (3)
d) What do you expect the blood and/or cerebrospinal fluid culture result to show? (1)

The next day, the Infection Prevention and Control Coordinator for the hospital contacts the ward where Philip is admitted asking for the doctor who is looking after him. You panic as you realise that you have forgotten certain critically important aspects to the comprehensive management of this case.

e) Describe three (3) aspects relating to infection prevention and control in this case. (8)

On further enquiry Philip’s mother reveals that Philip has never received any immunisations. She would like him to catch-up all the immunisations he has missed.

f) Based on the current South African national immunisation schedule
i) Which vaccines has Philip missed? (8)
ii) Describe a catch-up immunisation schedule for Philip. (6)

Philip’s mother asks you whether there is a vaccine that could have prevented the serious infection that he has just had.

g) How will you respond to her? (4)

Philip’s mother tells you that he once developed a rash around the time when he was eating eggs and she has heard that some vaccines contain egg protein and shouldn’t be given to children with egg allergy.

h) Are any of the catch-up vaccines you are planning to administer to Philip contra-indicated in light of this information? (2)