OXFORD CAMBRIDGE AND RSA EXAMINATIONS

AS GCE

F222/ADVANCE NOTICE

HUMAN BIOLOGY

Growth, Development and Disease

For issue on or after:
13 MARCH 2012

MONDAY 21 MAY 2012: Afternoon

DURATION: 1 hour 45 minutes
plus your additional time allowance

MODIFIED ENLARGED

INSTRUCTIONS TO EXAMINATION OFFICER/ INVIGILATOR

Do not send this Insert for marking; it should be retained in the centre or destroyed.

READ INSTRUCTIONS OVERLEAF

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NOTES FOR GUIDANCE (CANDIDATES)

1 This Advance Notice contains two case studies, which are needed in preparation for questions 1 and 2 in the externally assessed examination F222.

2 You will need to read the case studies carefully and also have covered the learning outcomes for Unit F222 (Growth, Development and Disease). The examination paper will contain questions on the two case studies. You will be expected to apply your knowledge and understanding of the work covered in F222 to answer these questions. There are 100 marks available on the paper.

3 You can seek advice from your teacher about the content of the case studies and you can discuss them with others in your class. You may also investigate the topics yourself using any resources available to you.

4 You will NOT be able to take your copy of the case studies, or other materials, into the examination. The examination paper will contain fresh copies of the two case studies as an insert.

5 You will not have time to read the case studies for the first time in the examination if you are to complete the examination paper within the specified time. However, you should refer to the case studies when answering the questions.

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CASE STUDY 1

SCREENING FOR LUNG CANCER

Lung cancer is the most common cancer in the world. Despite progress in the detection and treatment of lung cancer, the prognosis for patients is poor. Fewer than 15% of all patients diagnosed with lung cancer survive the disease. The lung cancer patients who survive have their cancer diagnosed at an early stage. These facts indicate the need for a screening programme that can diagnose lung cancer before symptoms appear.

At the moment there is no national screening programme for lung cancer in the UK. Before any screening programme can be introduced, doctors must have a sensitive and specific test to use. The test must be simple, quick, not too expensive and not harmful. For a procedure to be introduced as an effective screening tool, it not only has to detect the disease at an early stage, but also improve both long-term survival and quality of life. Another determinant in evaluating a screening test is whether it is cost-effective. This involves looking at the cost of screening versus the effect of screening in terms of the number of years of life saved. In the past, both chest X-rays and sputum cytology were evaluated as methods to detect lung cancer, but neither of the procedures was found to improve long term survival.

By the time lung cancer causes symptoms, it is often at an advanced stage and the tumours cannot be removed by surgery. Advanced lung cancer is diagnosed by X-rays, CT and MRI scans, a bronchoscopy (looking at the airways with a narrow tube) or having a biopsy. Researchers are trying to find other tests that may help to diagnose lung cancer earlier.

A UK trial called the Lung-SEARCH study is looking at methods of detecting lung cancer at an early stage in people with chronic obstructive pulmonary disease (COPD). People with COPD have a high risk of developing lung cancer. In the trial, researchers are using two new tests which may be helpful in detecting very early signs of lung cancer. One test is called fluorescence bronchoscopy. This uses blue and white light to examine the lining of the airways. The other test is a new type of CT scan called a spiral scan. A spiral CT scan is similar to a conventional CT scan but it is performed more quickly and results in less exposure to radiation.

Other groups working on lung cancer are trying to identify accurate biomarkers (molecules in the body) for the early detection of lung cancer. Lung cancer develops over a long period of time after exposure to a carcinogen and results in the accumulation of genetic and molecular abnormalities. A good biomarker should show a significant difference between tumour and normal tissues and should correlate with cancer progression.

A study known as the MEDLUNG trial is attempting to find biomarkers that could show that lung cancer is developing before the person has any symptoms. The researchers are looking at samples of sputum, blood and lung tissue to try and find changes in cells. Another study, the CLUB trial, is also looking for biomarkers that may be linked to lung cancer. This research team is looking at blood and urine samples from people with lung cancer and people without. They hope to find differences between them. The aim of both of these studies is to find biomarkers specific to lung cancer that may be used in the future to screen people in the early stages of lung cancer.

It would be wonderful to have a screening tool to detect lung cancer in the earlier, more treatable stages. However, we must not lose sight of the fact that preventing and stopping smoking is the main way to reduce the incidence of lung cancer.

References:

1. **Lung cancer screening http://www.cancerhelp.org.uk/type/lung-cancer/about/lung-cancer-screening**
2. **Lung cancer research http://info.cancerresearchuk.org/utilities/atozindex/atoz-lung-cancer**
3. **Early detection of lung cancer: biomarkers http://erj.ersjournals.com/content/21/39_suppl/36s.full**

All web references correct at time of production.

Other references should also be researched.

CASE STUDY 2

PREGNANCY BLOG: COUNTDOWN TO DELIVERY

Anna is looking forward to the birth of her first child. Read about the care she has had during her pregnancy in her countdown blog to delivery day.

Week 4: Tuesday 10th October 2009

I couldn't wait any longer, I had to do the test! When Steve came home I gave him a card with the test inside. He was stunned.
Went to the doctor's to register that I'm pregnant.
Rang the midwife to make my first appointment .....for the 2nd November.....seems ages away.

Week 8:

Well, I had my first appointment with Mandy, the midwife, today. It was really nice to speak to her as it seemed to make everything more real. She took my blood pressure and discussed my diet..... and said that I should take supplements of folic acid and vitamin D. Mandy told me that I'll also have some blood tests done and checked my immunity to rubella.
I now need to book a scan. Feeling really tired now, must sleep.....

Week 12:

Steve had the day off work to come with me for the scan. I was told to drink a pint of water before I left home.....and then had to carry on drinking whilst the lady at reception went through some paper work. Next came the jelly on the belly .....

Mandy asked if she could push a bit harder to get a clear image of the baby .....a bit concerning after all the water I'd drunk! She pointed out all the parts of the body and concluded that I was 13 weeks pregnant, not 12 weeks.
Our first encounter with our baby.....tears of happiness.

Week 16:

Mandy monitored the heart beat and I heard the baby's heart beat for the first time – AMAZING!
Have been offered a gestational diabetes test ..... Mandy picked up that I have an increased risk of developing it. Have agreed .... best to know and avoid complications... but hoping all is well.

Week 20:

The only thing I'm craving at the moment ..... pickled onions!
Getting really excited about my second scan tomorrow.
Got up and drank my water – not as much as last time! Had to go to a different department for the 20 week scan .... they had a more in-depth look to make sure the baby was growing properly. It seemed to go on forever. The sonographer kept going over the same area time and time again. My mind started racing.....was something wrong?
At the end she printed out a picture and said that the baby was growing well but that I may have a problem with the placenta.... as it's very low lying. So I have to go back for another scan at 34 weeks. I'm keeping an open mind.... my friend had the same problem and hers moved.

Week 28:

Went to AquaNatal this week ..... it was really good. Mandy found the heartbeat easily this time .....it was really loud and strong, 142 beats per minute. Such a relief to find out I don't have gestational diabetes but my blood tests have shown that my haemoglobin is low, below 10.5 grams per 100 ml of blood. Mandy says not to worry but to consider taking iron supplements. The baby's been moving around so much this week that sometimes I find myself just sitting, staring at my belly, watching it move all over the place and wondering what's going on in there.

Week 32:

Mandy measured my bump. She said that my bump size is slightly over the average but that this is fine and shows the baby is growing well. I still can't believe how quick it's all gone and that I'm finishing work already.

Week 36:

Appointment with Mandy every week now. I mentioned to her that my feet and ankles are really swollen. She checked my blood pressure and tested my urine for protein..... both were fine so there is nothing to worry about. Mandy said it's just the amount of extra fluid and blood that my body is trying to cope with at the moment.

Week 40:

Didn't sleep very well Sunday night. My mind is racing about all sorts of things. Had what is supposed to be my last appointment before baby with Mandy. I said I don't feel ready yet, she said if I make it to next Monday she'll book me in for an induction the following Tuesday.
Well today is my due date, 3rd July 2010 .....I'm ready.....I'm waiting!

References:

1. **Antenatal care**
   http://www.patient.co.uk/printer.asp?doc=40000185
2. **Antenatal care**
   http://www.nice.org.uk/CG62

All web references correct at time of production.

Other references should also be researched.

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