Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

HUMAN BIOLOGICAL SCIENCE. YEAR 12. 2012.

Medical Technology and Biotechnology Test.

|  |  |  |
| --- | --- | --- |
| Test section | Possible mark | Your mark |
| Multiple choice | 10 |  |
| Short answer | 45 |  |
| Total | 55 |  |

***Multiple choice answer sheet.* Use a ball point or ink pen to mark an X** on the letter that represents the best answer from the choice of answers. Marks are not deducted for wrong answers.

|  |  |
| --- | --- |
| Question | Answer |
| 1 | A B C D |
| 2 | A B C D |
| 3 | A B C D |
| 4 | A B C D |
| 5 | A B C D |
| 6 | A B C D |
| 7 | A B C D |
| 8 | A B C D |
| 9 | A B C D |
| 10 | A B C D |

Multiple Choice Questions

1. A gene giving resistance to a root parasite is transferred from rye grass to a genetically modified type of rice. This process is an example of:

a. deletion.

b. transgenics.

c. gene probes.

d. DNA sequencing.

2. The Sanger method has been useful in which of the following?

a. Gene therapy.

b. The Human genome project.

c. Transgenics.

d. All of the above.

The following two questions relate to the use of biotechnology in law enforcement.

3. At a crime scene a small skin sample is found. It contains a small amount of valid DNA. This DNA can be replicated and a much larger sample made using which of the following?

a. DNA polymerase.

b. DNA transcriptase.

c. DNA ligase.

d. RNA ligase.

4. Once enough of the DNA has been produced from the sample at the crime scene, it can be compared to the DNA of suspects. This is done using a process called:

a. DNA cloning.

b. DNA profiling.

c. DNA transcription.

d. Gene probing.

5. A loss of dopamine producing cells leads to the disorder:

a. Alzheimer’s disease.

b. Parkinson’s disease.

c. Osteoarthritis.

d. Osteoporosis.

6. When tissue transplants occur which of the following are often done?

a. Matching of leukocyte antigens and the use of immunosuppressant drugs.

b. The Matching karyotypes and the use of anti-inflammatory drugs.

c. The matching of leukocytes antigens and the use of acetylene blocking drugs.

d. The matching of Karyotypes and the use of anti-inflammatory drugs.

7. Electro gel Electrophoresis works because:

a. DNA has a negative charge.

b. DNA can be denatured by heat.

c. DNA Strands of DNA of different length will move through the gel at different rates.

d. All of the above.

8. The reason for an increase in the incidence of osteoporosis, osteoarthritis, Alzheimer’s disease and Parkinson’s disease is:

a. An increase in obesity in Western Countries.

b. A reduction in physical activity by people in Western Countries.

c. An increase in the average lifespan of people.

d. An increase in the consumption of fatty foods and foods containing simplified sugars.

9. Which of the following is **not** a potential benefit of The Human Genome project?

1. Improved diagnosis of disease .
2. Earlier detection of genetic predispositions to disease including [breast cancer](http://en.wikipedia.org/wiki/Breast_cancer), [disorders of hemostasis](http://en.wikipedia.org/wiki/Blood_clotting), [cystic fibrosis](http://en.wikipedia.org/wiki/Cystic_fibrosis), [liver](http://en.wikipedia.org/wiki/Liver) diseases and many others.
3. Improvements in civic hygiene.
4. Gene therapy . This is the insertion of [genes](http://en.wikipedia.org/wiki/Gene) into an individual's [cell](http://en.wikipedia.org/wiki/Cell_(biology)) and [biological tissues](http://en.wikipedia.org/wiki/Biological_tissue) to treat [disease](http://en.wikipedia.org/wiki/Disease) .

10. A good source of Omega 3 oils is:

a. Dairy products.

b. Beef.

c. Fish.

d. Pork.

Short Answer Questions

1. a. Describe the cause and symptoms of Parkinson’s disease.

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(2 marks)

b. What are two **types**(not brands) of pharmaceutical used to treat Parkinson’s disease?

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1. marks)
2. DNA profiling can be used to a test a person for certain types of diseases. What do we call this type of disease and give example.

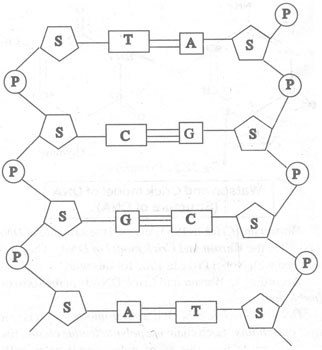
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(2marks)

1. In the diagram below what does each of the following letters stand for?

|  |  |  |  |
| --- | --- | --- | --- |
| Letter | Structure | Letter | structure |
| S |  | The structure p and S form together |  |
| P |  | G |  |
| T and A |  | A |  |

(6marks)



1. A plasmid can be described as a bacterial vector.
2. What is a plasmid?

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(1 mark)

1. What is meant by a bacterial vector?

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(1 mark)

1. Describe how Plasmids can be used to amplify a section of DNA.

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1. marks)
2. The polymerase chain reaction(PCR) has a number of uses.
3. What is the polymerase chain reaction?

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1. marks)
2. List the aims of the Human Genome project.

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(4marks)

1. List one ethical issue of the Human Genome project.

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(1 mark)

1. A section of DNA is cut out of a chromosome leaving a strand of DNA with “sticky ends”.
2. How is the section of DNA cut out of the Chromosome?

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(2 marks)

1. What is meant by “sticky ends” in this situation?

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(2 marks)

1. What makes a bionic limb different from other artificial limbs?

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(2 mark)

1. Jane has recently undergone a liver transplant. Before the operation a tissue match was done between Jane and the donor. After the operation Jane was given medication to stop her body rejecting the new Liver.
2. Under what condition would an organ transplant be considered?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

( 1 mark)

1. What is it that must be matched during tissue matching? ( do not write tissues)

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(1 mark)

1. What do we call the drugs that prevent Jane’s body rejecting the new organ?

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(1 mark)

1. Ben has Osteoarthritis. At first he was treated with Corticosteroid drugs. Eventually he was given a hip replacement.
2. What type of drugs are corticosteroids and what is their purpose?

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(2 marks)

1. Under what conditions would a joint replacement be carried out?

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(2 marks)

1. What is Osteoarthritis and what are its symptoms?

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(3 marks)

1. After falling off his bicycle Bill found that had broken his femur. Bill was only 18 and the doctor was surprised that such a large bone had been broken, so Bill was sent for a bone scan. The results of the scan showed that Bill had Osteoporosis. The doctor was very surprised about this.
2. Why would the doctor be surprised about Bill having Osteoporosis?

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(2 marks)

1. What dietary changes might the doctor suggest for Bill?

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(1 mark)

1. Primarily what group of problems does physiotherapist try to treat? Give some causes of this group of problems?

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(4marks)

**The End**