Page 2

1) Define evolution. [Paragraph 2] (1 mark)

2) State the adaptation of the finch species. [Paragraph 3] (1 mark)

3) Give two advantages of the use of experimental animals. [Paragraph 5]. (2 marks)

4) Explain the effect of a mutation leading to the development of a ~~is a non~~ cancerous cell. [Paragraph 4]. (3 marks)

5) Describe the process of clinical trials of chemotherapy drugs [Paragraph 6] (4 marks)

1) a gradual change in allele frequency over time due to natural selection.

2) anatomical

3) • scientific advancements
   • easy to study
   • stops experimentation on humans

4) affects the behaviour of cell + important genes which can cause the cell to multiply and lead to cancer.

5)

Questions

1. Describe a deletion mutation, and how can it lead to a shorter polypeptide forming? (Para 4) (3)

2. Compare and contrast modern day clinical trials to those performed by Wirthing. (Para 6) (4)

3. Give the definition of 'population'. (para 6) (1)

4. Justify whether using animal experimentation is beneficial for drug testing (para 5) (4)

5. Describe what causes inflammation (para 4) (2)

Answers

1. > One DNA base is removed from a sequence
   > Causing all subsequent bases to move (frame shift)
   > formation of a stop codon too early

2. > Modern day tests on animals / isolated cells, unlike Wirthing
   > Modern day uses healthy volunteers, unlike Wirthing
   > Modern day use placebo/double blind trials, Wirthing didn't
   > Both test on patients

3. > All the ~~speci~~ individuals or a species in an area

4. > Prevents testing on humans
   > Animal systems similar to humans
   > Animals can't consent
   > Animals have rights
   > Animals don't deserve to be in pain/die

5. > Histamines (released by platlets)
   > Vasodialation of arterols
   > Increase permeability of capillaries

Page 3

1 State the meaning of the term carcinogen. (2) [paragraph 8]

2 Describe an abiotic and a biotic factor which affects cells. (2) [paragraph 9]

3 Explain how evolution arises from natural selection. (4) [paragraph 10]

4 Describe an inflammatory response. (4) [paragraph 13]

5 Explain how variation occurs in a population. (3) [paragraph 10]

1
- factor which causes a mutation in DNA
- changes a DNA base sequence
- example : ionising radiation, asbestos, tar from cigarette smoke

2
- abiotic : temperature, blood glucose concentration, available amino acids
- biotic : presence of disease (bacteria)

3
- variation in a population caused by random mutations
- selection pressure
- advantageous alleles
- organisms more likely to survive and reproduce
- offspring inherit advantageous alleles
- increased allele frequency overtime
- long-term changes in the species

4
- histamines released by damaged cells
- increased metabolic rate
- vasodilation of arterioles
- increased permeability of capillaries
- accumulation of plasma and white blood cells

5
- random mutations occur in DNA
- transcribed/translated to produce a different protein
- protein function changed
- variation in phenotype and genotype

page 3 in the article.

1. State what is meant by perturbation?.

2. Explain how smoking could increase the risk of being associated with cancer.

3. what can mutations provide cells with?

4. what does the change in temperature, gases in the air and water cause in organisms?

Answers.

1. An alteration of the function of a biological system by internal or external means.

2. The chemicals ~~be~~ you consume from smoking could increase blood pressure, this could ~~cause~~ increase chances for many diseases.

3. hyperactive growth signals, increase ability to invade surrounding tissue.

4. Diversity, new adaptive features to survive in changed environments.

Page 4 - ~~Exam~~ Questions.

Q1) How can doing things such as exercising, eating a balanced diet and not smoking be the best strategy to improve the maintenance of our tissues.

2) ~~Explain how a mutation can~~

Page 4 - Exam question

describe One type of mutation.

1) Describe ~~the~~ One way in which a mutation can occure resulting in the protein not being able to function

2) give 2 ways / things a person can do ~~to~~ to improve the maintenance of their tissues.

and One Advantage

3) State One limitation of DeGregoris research upon groups of young and old mice ~~and how this can be~~ instead of humans.

4)

Answer 1 :

Answer 2 :

- Exercising regularly
- Eating a balanced diet
- Not smoking.

Questions (P.4)

Q1. Compare and contrast Witherng's drug trials with modern trials (3m)

Q2. Devise an investigation to test different types of antibiotics or antibiotic resistance (5m)

Q3. Explain the risk of overuse of antibiotics (3m)

Q4. Give an exaple of intraspecific competition (1m)

Q5. How can information be reviewed by the scientific community (2 m)

Answers

Q1. Both found an active ingredient
Both tested on a small group of ill patients.
Both determined optimum dosages

Wilhelm didn't use placebos or double blind trials whereas modern testing does
Only modern testing uses preclinical trials
Only modern testing uses trials on healthy volunteers

Q5. Peer Review, Scientific Journals
Scientific conferences

Q4. Water, space, Food

Q3. Overuse can cause ~~xxxx~~ non-resistant strains to die
this would mean resistant strains would face less competition for space and resources
this in turn would allow them to replicate and the antibiotic used would no longer be able to treat the infection.

Q2. Independant: Different types of antibiotic (if named in question) / Different concentrations of antibiotic
Dependant: Area of zone of inhibition
Controls:

Page 5

Q1) Compare & contrast bactericidal & bacteriostatic antibiotics. (4marks)

Q2) Describe how the medical community may discuss new discoveries/ scientific revolutions. (2 marks)

Q3) Describe how clinical trials test for side effects of new drugs (1 mark)

Q4) Except for testing for side effects, give 2 other variables drug developers test for. (2 marks)

Q5) Explain what hospital protocals can be implemented to reduce spread of infectious diseases. (4 marks)

Q1) Both target bactenia & aim to eliminate them, but they have different ways of working. Bactericidal cause cell lysis/bursting, which thus causes the bacteria cell to stop growing and to die. Bacteriostatic prevent the cell from ~~rep~~ cell division, thus it can't replicate.

Q2) Through publishing scientific journals and holding scientific conferences.

Q3) This is through testing the drug on healthy volunteers during Phase II.

Q4) Toxicity and efficacy/effectiveness and dosage.

Q5) Isolate the infected individuals to slow transmission.
Vaccinate (patients and) staff
Ensure disinfecting is a regular protocol.
Ensure bedding is washed at high temps/disposed.

Questions about the article (page 5)

1. What causes competition within a population?
2. ~~What are~~ Describe the stages of clinical trials
3. What does it mean when cells become resistant?
4. ~~When~~ How is there variation within a population?
5.

4.

1. Selection pressures

2. pre clinical trials = testing on animals & cells/tissues to assess the safety + determine toxicity

   Stage 1 = testing on a small group of healthy people to look for side effects + determine the right dosage

   Stage 2 = testing on a small group of people with the disease to test the effectiveness + check for side effects

   Stage 3 = large group of both healthy people + people with the disease to see if there is any improvement + adverse effects

   ↳ placebo + double blind trials

3. no longer respond to treatment

4. Mutations

5.

6 | 7

1. State what is meant by metastasizing (2 marks)
2. Describe how the immune system fights off pathogens (4 marks)
3. Explain two ethics for using mice in experiments (4 marks)
4. Explain what is involved in clinical trials (2 marks)
5. ~~Name possible side effects~~
5. Name possible side effects of drugs. (2 marks)
6. Explain what a prostate cancer is (2 marks)

Ans

1. The spread of cancer cells from the place where they ~~they~~ first formed.

Page 617

① Define metastasized.

② How did Gratenby's lab investigate the anti-cancer drug approach?

③ What is meant by "Silver bullet"?

(i) The Spread of malignant cells

(ii) By using mathematical models and computer simulation.