D2.1 Cell cycle and cancer (HL)

What the Cell · DP Biology · worksheet · HL statements D2.1.12–17

Name _____ **Date** _____ **Total** _____ / 40

About 40 minutes, or one section at a time. The number of marks shows how many separate points to make.

Section A: Recall

9 marks

1 **State** two places where cells proliferate for growth. D2.1.12 **[2]**

2 **State** the phase of the cell cycle in which DNA is replicated. D2.1.13 **[1]**

3 **State** two processes, other than DNA replication, that happen in interphase. D2.1.14 **[2]**

4 **Define** oncogene. D2.1.16 **[1]**

5 **Define** metastasis. D2.1.17 **[1]**

6 **State** two differences between benign and malignant tumours. D2.1.17 **[2]**

Section B: Understanding

15 marks

7 **Explain** how skin is kept in good repair by cell proliferation. D2.1.12 **[3]**

8 **Explain** how cyclins control the progress of a cell through the cell cycle. D2.1.15 **[3]**

9 **Compare** the effects of mutations in proto-oncogenes and in tumour suppressor genes. D2.1.16 **[4]**

10 **Explain** why interphase is described as metabolically active. D2.1.14 **[2]**

11 **Explain** how a secondary tumour forms. D2.1.17 **[3]**

Section C: Working with evidence

10 marks

All data in this section are invented for practice. The patterns are realistic.

12 D2.1.13, D2.1.17

Samples of tissue were examined under a microscope, and the number of cells in mitosis was counted out of 500 cells in each sample.

Tissue	Cells in mitosis (out of 500)
Normal skin, basal layer	15
Benign skin growth	20
Malignant skin tumour (melanoma)	65
Normal liver	1

a **Calculate** the mitotic index of the malignant tumour, as a percentage. **[1]**

b **Compare** the mitotic index of the three skin samples. **[2]**

c **Explain** why normal liver has a very low mitotic index. **[2]**

d **Suggest** why a doctor might use the mitotic index to help decide treatment. **[2]**

e **Explain** why counting 500 cells is better than counting 50. **[1]**

f **Suggest** two pieces of information, other than the mitotic index, that would show the melanoma is malignant. **[2]**

Section D: Longer answer

6 marks

13 **Explain** how mutations in cell-cycle control genes can lead to cancer. D2.1.15–17 **[6]**