

COPY

THE UNIVERSITY OF MELBOURNE

SCHOOL OF BOTANY

SEMESTER 2 ASSESSMENT, 2005

600-205 BIOTECHNOLOGY IN PRACTICE

READING TIME: FIFTEEN (15) MINUTES

WRITING TIME: TWO (2) HOURS

THIS PAPER HAS FOUR (4) PAGES

Authorised Materials:

No specific materials are authorised.

Instructions to Invigilators:

Students need one 14-page script book.

Instructions to Students:

This exam paper has 4 pages.

You should attempt **ALL** questions. Note that there are two parts (A and B) to some questions. Answer either A or B.

Each question will take approximately 20 minutes to answer and all questions have the same value.

The exam is worth 60% of the final assessment for this subject.

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QUESTION 1

Answer either Part A or Part B.

Part A

The year 1980 saw both the issuing of the Cohen-Boyer patent to Stanford University and the passage of the Bayh-Dole act into legislation in the US. What are the Cohen-Boyer patent and the Bayh-Dole act and how did they change the way science was done in publicly funded research institutions like universities?

OR

Part B

What is a patent and why are they valuable?

Your answer should include the following information:

- i) What a patent provides the patent holder
- ii) What conditions must be fulfilled for a patent to be awarded
- iii) An outline of the structure of a patent
- iv) How biotechnology companies use patents
- v) An example of a commonly held myth about patents and why this myth is false.

Your answer to this question should refer to a complete patent, not a provisional patent.

QUESTION 2

Answer either Part A or Part B.

Part A

Establishing a new biotechnology company requires a number of different skills and sources of advice to ensure that the business runs efficiently and effectively. Describe five areas in which new biotechnology companies need particular advice or skills and why these areas are important to the business.

OR

Part B

The development and growth of a new biotechnology company often requires investment by a Venture Capital (VC) fund.

- i) What is a VC fund and what is its broad strategy?
- ii) At what stage in the development of a biotechnology company is the VC fund likely to invest?
- iii) What (in addition to money) can the VC fund bring to support their investment in the company?
- iv) VC funds often make staged investments in biotechnology companies. What is a staged investment and what advantages does this have over making a single investment?

QUESTION 3

Answer either Part A or Part B.

Part A

What (according to Joseph Schumpeter) is an entrepreneur? What particular advantages do entrepreneurs have in the market? What is distinctively different about entrepreneurs in the biotechnology sector to entrepreneurs in other sectors of the economy?

OR

Part B

There are many phases in the transition of a scientific idea to a commercial product. Describe the difference between activities in the research and development (R&D) phase and the new product development (NPD) phase.

QUESTION 4

Answer either Part A or Part B.

Part A

Outline how gene technology is regulated in Australia.

OR

Part B

Outline the functions of the Australian Therapeutics Goods Administration.

QUESTION 5

Answer either Part A or Part B.

Part A

The Australian biotechnology company Starpharma has invested in polyvalent dendrimers as its platform technology. VivaGel, a treatment for sexually transmitted infections, is in Starpharma's product pipeline. Explain what is meant by the expressions "platform technology" and "product pipeline" and how the two are connected.

OR

Part B

What are the objectives of the Australian Government's Cooperative Research Centre program? Name a CRC and describe one of the products it is developing.

QUESTION 6

Answer either Part A or Part B.

Part A

Commercialisation is a process for generating value from the efforts of scientific research and development. Value can be measured in many ways, including the generation of cash, jobs, improved environmental outcomes, social benefits and health benefits. For BOTH of the following technologies, describe two instances of:

- i) Ways in which the technology can generate measurable value, and why?
- ii) Groups that will benefit most from the value that is generated from the technology, and why?

Technology 1: A new variety of wheat has been developed that increases the yield per hectare by 10% and simultaneously reduces demand for water by 20%. In all other ways, the wheat behaves like traditional wheat crops.

Technology 2: A new pharmaceutical drug has been developed that will prevent an infection which, if untreated, will subsequently lead to the development of cancer in more than 30% of infected individuals. The new drug is 80% effective and has no known side effects. Men and women are equally at risk of infection.

OR

Part B

Organisations that are most effective at developing new biotechnology products will have implemented good project management practices to ensure that their investment in research and development is being used efficiently. When you think about project management in a biotechnology company, please describe:

- i) What project management means
- ii) What are the benefits of preparing a product development strategy
- iii) Five important sections of a product development strategy and what they include.

END OF EXAMINATION