



KENYATTA UNIVERSITY

EXAMINATION FOR THE DEGREE OF BACHELOR OF PHARMACY (Level IV)

PPD 410: PHARMACOGNOSY IV

1ST SEMESTER 2020/2021

TIME: 2 HOURS

INSTRUCTIONS:

1. This question paper has three sections A, B and C.
 2. Answer ALL questions.
 3. Answer questions in each section in a separate answer booklet.
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SECTION A: BIOSYNTHESIS AND CHEMOTAXONOMY

1. Name **four** functions of chemotaxonomic markers in plants. (2 marks)
2. Describe the term 'polyploidy'. (3 marks)
3. Giving suitable examples, differentiate between primary metabolism and secondary metabolism. (5 marks)
4. Explain how the Clariens reactions yield polyketides in the acetate-malonate pathway. (5 marks)
5. Describe **five** pharmaceutical applications of the products of the acetate-malonate pathway. (5 marks)
6. Discuss the application of isotopic labelling in the study of biosynthetic pathways in medicinal plants. (10 marks)
7. Outline the photosynthetic pathway in plants. (10 marks)

SECTION B: BIOTECHNOLOGY

1. Define the following terms as used in tissue culture
 - (a) Explants (1 mark)
 - (b) Callus (1 mark)
 - (c) Totipotent cell (1 mark)
2. Explain the resultant effect in a callus tissue when;
 - (a) Cytokinin levels are increased (2 marks)
 - (b) Auxin levels are increased (2 marks)

INVOLVEMENT IN ANY EXAMINATION IRREGULARITY SHALL LEAD TO DISCONTINUATION

3. Regarding protoplasts;
 - (a) What are the number of days required to synthesize new cell walls when plated in nutrients medium only. (1 mark)
 - (b) Describe protoplast fusion. (3 marks)
4. Regarding a bioreactor;
 - (a) Explain its role. (2 marks)
 - (b) Explain **five** factors to consider when designing an effective bioreactor. (10 marks)
5. Regarding recombinant DNA technology;
 - (a) Explain its role in Pharmacognosy. (3 marks)
 - (b) Explain any **two** plant cell DNA delivery methods. (4 marks)
 - (c) Describe **five** steps involved in gene transfer. (10 marks)

SECTION C: PLANT DRUGS OF ABUSE AND TOXIC PLANTS

1. Describe **five** factors that determine the toxicity of plants and medicinal products. (5 marks)
2. Regarding plant-derived ingestant allergens;
 - (a) Name **three** commonly consumed ones in Kenya and identify the plant and plant part from which they are obtained. (3 marks)
 - (b) State **two** clinical symptoms associated with their consumption. (2 marks)
 - (c) Propose ways of mitigating their adverse effects. (2 marks)
3. Discuss how plants traditionally used as poisons led to the discovery of drugs with current clinical application. (10 marks)
4. Regarding plant-derived substances of abuse;
 - (a) List **three** that are locally produced in Kenya. (3 marks)
 - (b) For each, identify the plant and plant part from which it is obtained. (3 marks)
 - (c) For each, describe the method of preparation and use. (6 marks)
 - (d) For each, describe the mechanism of addiction and the strategies of mitigating their abuse. (6 marks)