UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER: MAY 2018

TITLE OF PAPER:		GENOMICS
COURSE CODE:		BIO 342
TIME ALLOWED:		THREE HOURS
INSTRUCTIONS:	1.	ANSWER SECTION A (COMPULSORY) AND ANY TWO OTHER QUESTIONS IN SECTION B.
	2.	QUESTION 1 CARRIES FIFTY (50) AND MARKS AND EACH QUESTION IN SECTION B CARRIES TWENTY FIVE (25) MARKS
	3.	ANSWER A TOTAL OF 3 (THREE) QUESTIONS
	4.	ILLUSTRATE YOUR ANSWERS WITH LARGE AND CLEARLY LABELLED DIAGRAMS WHERE APPROPRIATE
SPECIAL REQUIREMENTS:		NONE

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[PLEASE TURN OVER]

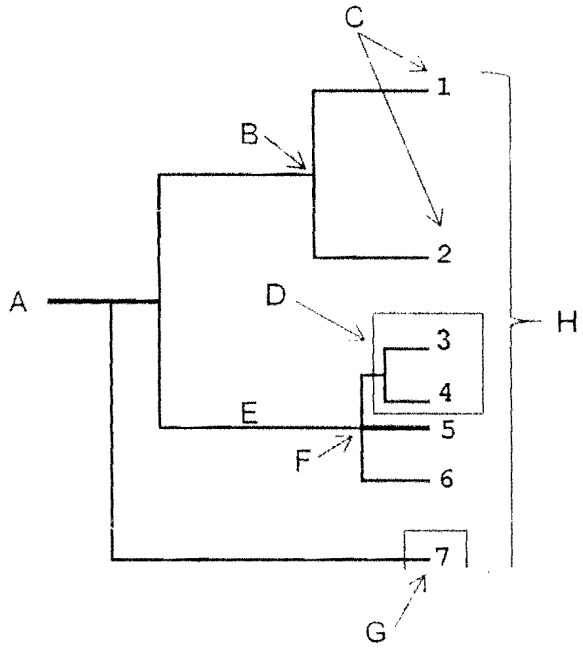
Section A: Answer ALL questions in this section

Question 1 (Compulsory)

(a) Define/explain the following terms:

(i) CpG islands, (1 mark)
(ii) Synteny, (1 mark)
(iii) Reporter gene, (1 mark)
(iv) Expressed sequence tag, (1 mark)
(v) Paralogous genes, (1 mark)
(vi) Orthologous genes, (1 mark)

(b) Shown below is a phylogenetic tree. Identify the labels A to H. (8 marks)



(c) Describe the Sanger method for sequencing DNA. (6 marks)

(d) Given that, starting from the sequencing primer, the following is the ssDNA sequence: G T A C C C G A A A T C A G G A. Sketch the expected electrophoretogram from this Sanger sequencing experiment. (5 marks)

(e) Write brief notes on the following as they relate to functional genomics:

(i) Site-directed mutagenesis, (5 marks)
(ii) RNAi, (5 marks)
(iii) Yeast two-hybrid system, (5 marks)
(iv) DNA microarrays, (5 marks)
(v) RNA sequencing. (5 marks)

[Total marks = 50]

Section B: Answer any TWO questions in this section

Question 2

Discuss the concept of genome annotation, highlighting the tools used and purpose thereof. (25 marks)

Question 3

Provide an overview of whole genome sequencing methods. (25 marks)

Question 4

Appraise the relevance of interactomics in biochemical and clinical research. (25 marks)

END OF EXAMINATION PAPER