KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS

2009/2010 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE

COURSE CODE: **BOTA 426**

COURSE TITLE: **CELL AND MOLECULAR BIOLOGY**

STREAM: **Y4S2**

DAY: **MONDAY**

TIME: **9.00 – 11.00 A.M.**

DATE: **22/03/2010**

INSTRUCTIONS:
Answer **ALL** the questions in **SECTION (A)** and any **TWO** (2) questions in **SECTION (B)**

PLEASE TURN OVER

SECTION A: ANSWER ALL QUESTIONS (40 MARKS)

1. a) Distinguish between the following terms:

   i) Plasmosome and Spliceosome
   ii) Telomere and Centromere
   iii) Nonsense mutation and Signal transduction **(6 mks)**

   b) State the function of the following:
   i) Caspases ii) G1/S checkpoint iii) *BamH1* enzyme **(3 mks)**

   c) Fill in the table below: **(3 mks)**

GM Variety	**GM Property**	**Modification**
Cotton	Pest resistant	
Golden rice		Three new genes added from daffodils and bacterium
	Production of polygalacturonase (PG) is suppressed, retarding fruit softening after harvesting	A reverse copy of PG is added into plant genome

2. a) Draw the structures of: i) Guanosine 5'-monophosphate ii) tRNA **(4 mks)**

   b) State the types and functions of RNA polymerases. **(4 mks)**

   c) Give reasons why eukaryotic genomes are large and complex. **(4 mks)**

3. a) Describe briefly the nature of eukaryotic ribosome. **(5 mks)**

   b) Describe the mechanism of regulation of cell cycle. **(5 mks)**

   c) Explain how chromatin structure is involved in regulation of gene expression. **(6 mks)**

SECTION B: ANSWER TWO QUESTIONS ONLY (30 MARKS)

4. a) Describe the process of gene replication **(5 mks)**

   b) Explain how Ti plasmid can be used to transform plant cells. **(5 mks)**

   c) Discuss the advantages and disadvantages of genetic engineering. **(5 mks)**

5. a) Describe the protocol of DNA isolation for gene cloning. **(5 mks)**

b) Describe the process of gene transcription and processing. **(10 mks)**

6. a) Describe the process of gene translation. **(7 mks)**

b) Describe the post-translational processing of proteins. **(8 mks)**