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University Examinations 2012/2013

SECOND YEAR, FIRST SEMSTER, EXAMINATIONS FOR DEGREE OF BACHELOR OF
SCIENCE IN HORTICULTURE

AHS 2201: GENETICS AND CYTOGENETICS

DATE: AUGUST 2013

TIME: 1½ HOURS

INSTRUCTIONS: Answer questions *one* and any other *two* questions

QUESTION ONE – (30 MARKS)

- a) Differentiate the following:
- i. Genetics and cytogenetics (2 Marks)
 - ii. Mitosis and meiosis (2 Marks)
 - iii. Aneuploidy and polyploidy (2 Marks)
 - iv. Homozygous and heterozygous (2 Marks)
- b) With the aid of diagrams, explain the meiosis I process (8 Marks)
- c) i. What is population as used in genetics (2 Marks)
ii. Wrinkled phenotype is found in pea seeds. Explain how this phenotype is developed. (3 Marks)
- d) (i) State the three things which influence the phenotype expressed by a given organism. (3 Marks)
ii. Explain the two methods used by geneticists to distinguish homozygosity from heterozygosity condition (4 Marks)
- e) How does a nucleoside differ from a nucleotide (2 Marks)

QUESTION TWO (20 MARKS)

Explain the DNA replication process using a diagram (20 Marks)

QUESTION THREE (20 MARKS)

- a) State any three differences between DNA and RNA (6 Marks)
- b) (i) What is translation? (2 Marks)
(ii) Explain the entire translation process (12 Marks)

QUESTION FOUR

- a) Write short notes on the three types of dominance (6 Marks)
- b) Chromosome aberrations are common in cells.
 - i. What is chromosome aberrations (1 Mark)
 - ii. Give a detailed account of the various types of chromosome aberrations (13 Marks)

QUESTION FIVE (20 MARKS)

- a)
 - i. What is population genetics (2 Marks)
 - ii. State the Hardy-weinberg law of population genetics (2 Marks)
 - iii. State and explain any four factors which affect the gene frequency in a population (8 Marks)
- b)
 - i. Differentiate gene from genomics (2 Marks)
 - ii. Draw a single strand of a DNA molecule (6 Marks)