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UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

FOURTH BPHARM PART II EXAMINATION – DECEMBER 2018

PH 4231 MOLECULAR GENETICS (SEQ)

TIME: TWO HOURS

INSTRUCTIONS

- There are **four (04)** questions in Part A and B of SEQ paper.
- Answer **each** part in separate booklet provided.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

Part A

1.

1.1.

1.1.1. State **two** advantages of karyotyping in cytogenetic studies. (10 marks)

1.1.2. Describe the cytogenetic disorder associated with XXY karyotype including its clinical features. (25 marks)

1.2.

1.2.1. Define the following scientific terms. (15 marks)

1.2.1.1. Dominant allele

1.2.1.2. Heterozygosity

1.2.1.3. Incomplete dominance

1.2.1.4. Dihybrid cross

1.2.1.5. Genotype

1.2.2. A homozygous yellow-seed, round shape pea plant is crossed with a heterozygous yellow-seed, homozygous round shape pea plant. Complete the Punnett square to show the genotypes of the offspring. (10 marks)

1.2.3. Briefly describe the terms mRNA processing and splicing. (10 marks)

1.3.

1.3.1. Briefly describe 'Central dogma of molecular biology' and the existing genetic information transfers. (20 marks)

1.3.2. State the mechanisms of connecting the central dogma to DNA, RNA and proteins. (10 marks)

- 2.
- 2.1. Briefly describe the several changes occurring in chromatin structure to initiate transcription. (20 marks)
- 2.2. Write a short account on transcriptional regulation in eukaryotes. (20 marks)
- 2.3. List the steps that control the gene expression in a gene. (10 marks)

Part B

- 2.4. The Genetics Disorders are due to the mutations and chromosomal alterations in their genome.
- 2.4.1. Define the terms of genome and mutation. (20 marks)
- 2.4.2. Write different types of mutations. (15 marks)
- 2.4.3. Classify the different types of genetic disorders. (15 marks)

- 3.
- 3.1. Prokaryotes are haploid, and they contain a single circular chromosome.
- 3.1.1. Define the term "Haploid". (10 marks)
- 3.1.2. What is F Plasmid? (10 marks)
- 3.1.3. What are bacteriophages? (20 marks)
- 3.2. Pedigree analysis is important in diagnosis of genetic disorders.
- 3.2.1. Define the term "pedigree" (15 marks)
- 3.2.2. Draw the symbols of following individuals and their relationships represented in a pedigree.
- 3.2.2.1. Male subject (15 marks)
- 3.2.2.2. Female subject affected with the disease concerned (15 marks)
- 3.2.2.3. Consanguineous marriage (15 marks)
4. Bacteria are mostly biochemical in nature, because the cells can't be generally seen.
- 4.1. Briefly describe the different types of bacterial mutants. (20 marks)
- 4.2. Name the experimental test that used to identify bacterial mutants. (20 marks)
- 4.3. Briefly describe the experimental test mentioned in 4.3 (25 marks)
- 4.4. Briefly describe the flow of genetic information in bacteria. (25 marks)
- 4.5. What is Okazaki fragment of DNA? (10 marks)

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