Olabisi Onabanjo Univ. ity, Ago-iwe
Department of Biochemistry
First Semester B.Sc (Hons) Biochemistry Degree Examination
2014/2015 Session
BCH 311: Microbial Genetics

Instruction: Answer question ONE and any other Two questions Time allowed : 3hrs

1. (a) (i) Distinguish between (i) a promoter and an enhancer sequence /site in relation to the bacteria genome (ii) a coding strand and a nonsense strand (iii) sense RNA and antisense RNA)

(ii) Give the properties of prokaryotic RNA polymerase

(iii) Draw the structure of the prokaryotic promoter region

(iv) What effects , if any, do the following antibiotics have on protein synthesis in th bacteria : streptomycin, tetracycline, puromycin, chloramphenicol, erythromycin

2. (a) What do you understand by the terms (i) *ori C* (ii) DNA primase (iii) Okazaki fragments (iv) discontinuous DNA synthesis (v) Type I DNA topoisomerase (vi) leading strand (vi) DNA helicase (vii) 3' → 5' exonuclease activity

(b) Describe as much as you can the process of DNA replication in prokaryotes

(c ) What proteins and DNA sequences determine the specificity of gene transcription in prokaryotes

3. (a) What do you understand by the term operon?

(b) Discuss briefly on the lactose operon

(c) How is the lactose operon regulated in the absence of the sugar lactose or any other inducer

4. (a) (i) What do you understand by the term mutagenesis (ii) Give any three common chemical mutagens in the laboratory

(b) Distinguish between (i) gene mutation and chromosomal aberrations (ii) point mutation and frame shift mutations

(c ) Describe or Illustrate (with the aid of a sketch) the different types of point mutation

(d) Is there any relationship between mutation and evolution? Discuss.

5. (a) What do you understand by the term (i) genetic recombination (ii) competence

(b) Distinguish between (i) homologous or general recombination and site-specific recombination (ii) transposable elements and insertion sequences

(c) New DNA may enter a bacterium through three major mechanism. Discuss