

المستوى الثالث (لائحة الساعات المعتمدة) برنامج البيولوجيا الجزيئية
وراثة تطورية (٣٠٢ ح)

Date: 10/ 1 / 2026

Time: 2 Hours

Mark: 90

الامتحان في ورقتين

Question One (22 Marks):

Complete the following:

- With the help of1....., nucleosomes are packed together in a quasi-regular array to form a thicker, approximately 30 nanometer diameter fiber.
- In most bacteria, the two ends of the double-stranded DNA ...2.....bond together to form both a physical and genetic ...3.....
- Lateral gene transfer is the gene transferred between ...4... organisms . Often in Prokaryotes.....5... in eukaryotes .
- The rate of gene flow is directly proportional to the ...6....of an individual and is ...7..... by geographical barriers which may be natural or man-made.
- Non random mating can reinforce advantageous traits by allowing individuals with those traits to ...8.....more often with each other.
- In large populations, the allele frequency of the genes remains relatively stable because9.....
- Gene flow within a population can ...10.....the genetic variation of the population, whereas gene flow between genetically distant populations can ...11..... the genetic difference between the populations.

Question Two (18 Marks):

Mention the scientific term:

- 1-(.....) is the evolution of a new species from an ancestral species while both live in the same geographic area, without any physical barriers separating them.
- 2-(.....) The process by which unrelated species become more similar as they adapt to the same kind of environment.
- 3-(.....) describes how a cell's genetic material, or genome, is structured, encompassing both the linear arrangement of DNA on chromosomes and the three-dimensional spatial organization of those chromosomes and DNA within the cell's nucleus.
- 4-(.....) is the heritable change in populations and species over time

5-(.....) is the change in the frequency of an existing gene variant (allele) in a population due to random sampling of organisms.

6-(.....) the transfer of genetic material is from parents to offspring. It may be through sexual or asexual reproduction.

7-(.....) A trait in an organism's body that helps it to survive in its environment.

8-(.....) is a type of speciation where a new species evolves from a small, isolated peripheral population of a larger ancestral group.

9-(.....) This means there is an obstacle to mating or to fertilization if mating occurs.

Question Three (20 Marks):

What is the difference between the following with examples:

1-Cladogram and Chronogram

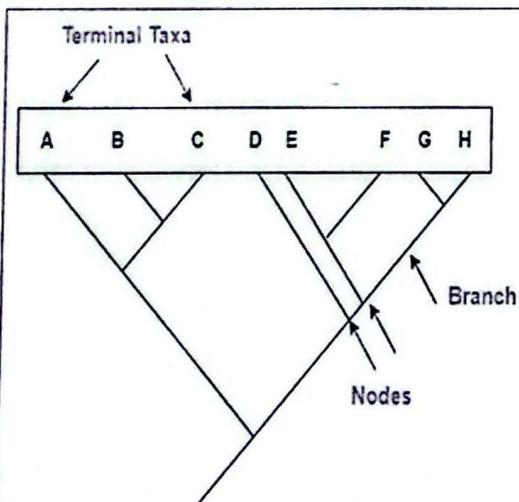
2-Disassortative and Assortative non random mating

3-The Biological Species Concept and The ecological species concept

4-Stabilizing Selection and Directional Selection.

Question Four (30 Marks):

A-Look at this tree and complete (14 Marks):



-The nodes show where the branches, or lineages,1.....

-.....2... represent speciation events, or events that result in3.....

-Within the nodes, there are two types that are ...4.... and ...5..... nodes.

-Internal Nodes are supposed to6..., whereas the External Nodes are7.....

B- Identify the following terms with drawing (16 Marks):

Monophyletic - Non Monophyletic- Paraphyletic – Polyphyletic.

With Best Wishes

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Dr. Nahed omar

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