### Assignment 5

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

**1)** Typical read length for SOLiD platform of sequencing is:

- 1000-5000 bases pairs
- 350-500 bases pairs
- 150-200 bases pairs
- 50-100 bases pairs

No, the answer is incorrect.

**Score:** 0

**Accepted Answers:**
- 50-100 bases pairs

**2)** Match the following:

<table>
<thead>
<tr>
<th>A. Pyrosequencing</th>
<th>a. ddNTPs are incorporated and radioactive or fluorescent signal is detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Nano-Pore Sequencing</td>
<td>b. Fluorescence/ light signal is detected</td>
</tr>
<tr>
<td>C. Sanger Sequencing</td>
<td>c. Protons are detected</td>
</tr>
<tr>
<td>D. Ion Torrent Sequencing</td>
<td>d. Changes in the electrical current density is detected</td>
</tr>
</tbody>
</table>

- A-b; B-d; C-a; D-c
- A-c; B-d; C-b; D-a
- A-b; B-c; C-a;D-d

No, the answer is incorrect.

**Score:** 0

**Accepted Answers:**
- A-b; B-d; C-a; D-c

**3)** Deduce the correct complimentary sequence of the DNA composed of from the following sequenced fragments:

- i. CTCGGA
- ii. GATC
- iii. GGATCCT
- iv. CCTAGCG
- v. TAGCGA
- vi. CGAA
- vii. TCCTAGCGAA

1000-5000 bases pairs
350-500 bases pairs
150-200 bases pairs
50-100 bases pairs
4) Which of the statements(s) is are correct:

- Computers cannot search for sequence similarities in databases such as NCBI, whose database contains over 200 billion base pairs of sequence. (1 point)
- It is nearly impossible to identify the sequence of amino acids in proteins and thus only transcriptomics and metagenomics sequencing are done. (1 point)
- Transcriptome is analysis of total RNA produced in an organism under a specific set of conditions. (1 point)
- Gene chips work as a support to affix genes or their portions, array them in a specific pattern so that to visualize binding nucleic acids are tagged with a fluorescent dye and these can be scanned with a laser detector. (1 point)

5) Match the following:

<table>
<thead>
<tr>
<th>1. Pan genome</th>
<th>A. Common forms of mobile DNA elements which often encode antibiotic resistance or virulence factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Orthologs</td>
<td>B. The compliment of all RNA produced in an organism under a specific set of conditions.</td>
</tr>
<tr>
<td>3. Transcriptome</td>
<td>C. Genes whose similarity is the result of gene duplication at some time in the evolution of an organism.</td>
</tr>
<tr>
<td>4. Transposon</td>
<td>D. Totality of the genes present in the different strains of species.</td>
</tr>
<tr>
<td>5. Paralogs</td>
<td>E. Genes found in one organism that are similar to genes in another organism because of descent from a common ancestor.</td>
</tr>
</tbody>
</table>

- 1-A, 2-C, 3-B, 4-E, 5-D (1 point)
- 1-D, 2-E, 3-B, 4-A, 5-C (1 point)
- 1-B, 2-C, 3-E, 4-A, 5-D (1 point)
- 1-E, 2-D, 3-A, 4-B, 5-C (1 point)

6) Which are correct statement(s) related to Horizontal gene transfer:

- It is transfer of genes from one cell to another by means other than the usual (vertical) inheritance process in which the genome is transferred from mother cell to daughter cell. (1 point)
- One mechanism for horizontal gene transfer in prokaryotes is conjugation in which transfer of genetic material between two bacterial cells occurs when they are in direct contact. (1 point)
- The other mechanism is transformation in which injection of foreign DNA takes place by a bacteriophage virus into the host bacterium. (1 point)
The genetic information transferred during horizontal gene transfer can be beneficial to the recipient cell such as antimicrobial resistance, xenobiotic tolerance or the ability in using new metabolites.

No, the answer is incorrect.
Score: 0

Accepted Answers:
It is transfer of genes from one cell to another by means other than the usual (vertical) inheritance process in which the genome is transferred from mother cell to daughter cell.

One mechanism for horizontal gene transfer in prokaryotes is conjugation in which transfer of genetic material between two bacterial cells occurs when they are in direct contact.

The genetic information transferred during horizontal gene transfer can be beneficial to the recipient cell such as antimicrobial resistance, xenobiotic tolerance or the ability in using new metabolites.

7) Which of the statements are correct regarding mutations of various types:

- A silent mutation does not affect the phenotype of the cell.
- Screening is a procedure that permits the identification of nonsense mutations in bacteria.
- Frame shift mutations are caused by insertion or deletion of a single or two base pairs of a genetic code and often have serious consequences.
- Changes in the first or second base of a codon lead to amino acid sequence change of a polypeptide which is called as missense mutation.

No, the answer is incorrect.
Score: 0

Accepted Answers:
A silent mutation does not affect the phenotype of the cell.

Frame shift mutations are caused by insertion or deletion of a single or two base pairs of a genetic code and often have serious consequences.

Changes in the first or second base of a codon lead to amino acid sequence change of a polypeptide which is called as missense mutation.

8) Which of the following is not a mutagen?

- Mitomycin
- Ethidium bromide
- Nitric acid
- X-rays

No, the answer is incorrect.
Score: 0

Accepted Answers:
Nitric acid

9) _________ is mostly a plasmid encoded mechanism that can mediate DNA transfer between unrelated cells.

- Conjugation
- Transduction
- Transformation

No, the answer is incorrect.
Score: 0

Accepted Answers:
Conjugation

10) State which statements are correct:

- Conjugation
- Transduction
- Transformation
More than 70% hybridization indicates the same species but less than 45% indicates different genera.

Gel electrophoresis is used to verify that amplification of nucleic acid is successful.

Genetic drift is also a form of gene transfer but it occurs naturally with time.

The correct sequence of taxonomic ranks in descending order is: Domain, phylum, order, class, genus, family, and species.

No, the answer is incorrect.

Score: 0

Accepted Answers:
- Gel electrophoresis is used to verify that amplification of nucleic acid is successful.
- Genetic drift is also a form of gene transfer but it occurs naturally with time.