	COLLEGE OF ENGINEERING JAZAN UNIVERSITY CIVIL ENGINEERING DEPARTMENT	Midterm Exam-1	
		Semester:20211	Date: 13/10/2020
		Subject Code: CE 261	Time: 10 to 11 AM
		Subject Title: Environmental Microbiology	Max Marks: 15
		Instructor: Mohammed Imran & Ammar Hammadi	Number of pages: 2

Student Name:			
Student ID:			
Section:		Serial Number:	

Question #	CLOs	Question Mark	Student Mark
1	<u>CLO ():</u>	<u>5</u>	
2	<u>CLO ():</u>	5	
3	<u>CLO ():</u>	5	
4	<u>CLO (na):</u>	na	na
5	<u>CLO (na):</u>	na	na
Total			

Advice to Candidates

1. Write Student Name, Student ID & Serial No. on the question paper.
2. You should write your answers clearly.
3. Pens are not allowed. Use Pencils!
4. Allocate your time wisely. Use the number of marks assigned to each problem as pointed.
5. In order to get full marks on a question, you must show ALL your work!
6. You are not allowed to use programmable CALCULATORS or smart WATCHES.
7. During an exam session, your mobile must be completely switched off. Otherwise, a default cheating case will be reported.
8. You are not allowed to use any kind of paper materials during an exam session.
9. It is a student's responsibility to ensure that there is no written texts on his desk, body or clothes, otherwise, he has to inform the invigilators.

Question 1 (CLO (.....)):Multiple Choice Questions (MCQ).

Each question carries equal marks-

5 marks

(i) Microbes are used in environmental engineering because of their

- a. High surface to volume ratio (S/V)
- b. High rate of biodegradation
- c. ✓ Both (a) and (b)
- d. None of the above

(ii) The study of virus is called-

- a. Biology
- b. Microbiology
- c. Anthropology
- d. ✓ Virology

(iii) Pigments and unsaturated fatty acids can be manufactured as by-products from-

- a. Bacteria
- b. Fungi
- c. ✓ Algae
- d. Protozoa

(iv) The microbiology is the study of-

- a. Unicellular microorganism only
- b. Multicellular microorganism only
- c. ✓ Both (a) and (b)
- d. None of the above

(v) Microorganism are classified into Prokaryotes and Eukaryotes on the basis of

- a. Size of the microorganism
- b. ✓ Cell type of the microorganism
- c. Method of experimental visualization
- d. All of the above

(vi) A microorganism in which changes in the genes takes place is known as-

- a. Metabolite
- b. Prokaryotes
- c. Eukaryotes

d. ✓ Mutant

(vii) Bacteria can live at extreme conditions and called halophiles which

means-

- a. High Temperature
- b. ✓ High NaCl
- c. Low pH
- d. No oxygen

(viii) Prokaryotic cells lack of -

- a. Cell wall
- b. ✓ Nucleus
- c. Plasma membrane
- d. All of the above

(ix) The bacteria which are able to utilize light are called-

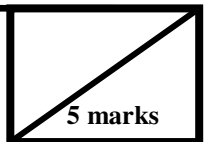
- a. Heterotrophs
- b. ✓ Phototrophs
- c. Lithotrophs
- d. None of the above

(x) A RNA is-

- a. Ribosomal Nucleic Acid
- b. Ribonucleic acid
- c. Random Nucleic Acid
- d. ✓ Ribonucleic Acid

Answers 1 –C, 2- D, 3- C, 4- C, 5 –B, 6 –D, 7- B, 8-B, 9-B, 10-D

Question 2 (CLO (.....)): Fill in the blank- Each question carries equal marks.



(i) The changes in molecules during life processes in the life systems are called ...**METABOLISM**

(ii)**ENZYMES**..... are protein catalysts of biochemical reactions.

(iii) The unit of the life is ...**CELL**.....

(iv) Bacteria and Archaea are**PROKARYOTES**.....

(v) The no. of chromosomes in human cell are.....**23 PAIRS OR 46**.....

(vi) The organisms which cannot be seen without the aid of microscope are
called.....**MICROORGANISM**.....

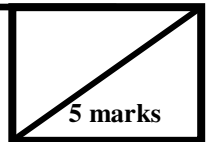
(vii) How many amino acids are used in protein synthesis? (.....**20 / TWENTY**.....)

(viii) The length of DNA in a prokaryotic cell is**1 MM**.....

(ix).....**PROKARYOTES**..... have the highest surface area to volume ratio of the
cell.

(x) The blue green algae is the**CYANOBACTERIA**.....

Question 3 (CLO (.....)): Answer the followings.



(a) **Why microbes are used in environmental engineering? (1)**

- Microbes have the highest cell surface to cell volume ratio.
- Microorganisms can perform diverse biochemical reactions, so they are useful in biotransformation and the degradation of environmental pollutants.

(b) **Write down any 4 importance of prokaryotes in civil and Environmental Engineering? (2)**

1. **Bacteria are used for the biosynthesis of useful substances in biotechnological industry**, for the production of probiotics in medicine and agriculture, for the treatment of wastewater and soil bioremediation in environmental engineering, and for bioclogging and biocementation in civil engineering.
2. **Many bacteria are harmful to human, animal, and plant health.** Therefore, the removal or killing of harmful bacteria in water, wastewater, air, or solid waste is an important task in environmental engineering.
3. **Some species of bacteria cause corrosion of metals and deterioration of materials.** Prevention of bacteria-caused corrosion of metals and biodeterioration of materials are essential tasks in civil engineering.
4. **Methanogenic archaea are used in anaerobic biodegradation of organic wastes.** Other groups of archaea do not yet have industrial scale applications in civil or environmental engineering.

(c) Compare between conjugation, transformation and transduction process (2)

- **Conjugation** is the transfer of genetic information from a donor cell that gives a portion of its total DNA to a recipient cell.
- During **transformation**, which occurs only in several prokaryotic groups, genes are transferred from one prokaryotic cell to another through the liquid medium.
- **Transduction** is the transfer of bacterial DNA from a donor cell to a recipient cell inside a virus called bacteriophage that infects a recipient bacterial cell.