

- Attempt part A and Part B in separate answer sheets
- Attempt all the parts of the same question together

PART-A

- Q.1** (a) List out the various characteristics of life. (4)
 (b) Describe the cell organelle which is involved in synthesis, concentration and packaging of molecules. (3)
 (c) How does primary, secondary, tertiary and quaternary structure of protein differ? (4)
 Write in tabular form
 (d) What are prions? How they cause infections? (3)
 (e) The parts of various systems were jumbled up. Identify them and arrange in order as per the table given below: (12)

Pulmonary vein , Distal convoluted tubule, Right atrium , Mega vein ,tricuspid valve, Right ventricle, collecting duct, esophagus , Pulmonary artery , Small intestine , Lungs , proximal convoluted tubule, Stomach , Left atrium, Mitral valve , large intestine , Ureter, left ventricle , Loop-of Henle, Bowman's capsule , Aorta , Glomerulus ,Anus, rectum , glottis

SYSTEM	PARTS

Q2 Explain the following

- (a) Different enzymes competing for the same substrate
 (b) Functions of lysosomes
 (c) The mechanism of nerve impulse and nerve stimulation
 (d) How are blood pH and breathing interrelated?

(4+4+4+2)

Q3. (a) Compare mitosis and meiosis in the format given below (5)

No.	Feature of comparison
1	Type of cells in which it occurs
2	No. of daughter cells produced
3	No. of times DNA replication occurs
4	Crossing over event
5	Importance

(i) Were the babies really switched / exchanged?

(ii) How do you know whether they were or they were not, justify?

(2+7)

(c) Differentiate between the following

- (i) prokaryotic and Eukaryotic cell
 (ii) Innate and acquired immunity
 (iii) Endocrine and Exocrine gland

(2x3)

PART-B

Q1 (a) Construct a table as per the following format and fill out the details. Consider a eukaryote.

Name of the process	Site within the cell where it takes place	Starting molecule / Reactant	End product
DNA replication			

(0.5x12=6)

(b) Describe briefly two types of fermentation and give examples of organisms that carry out fermentation.

(c) The sequence 5'- CGAACATATGGA - 3' contains a 6 base pair recognition site of a restriction endonuclease. Identify the sequence and write the double stranded recognition site.

(4+3)

Q. 2 (a)

- (i) Differentiate between nonsense mutation and frame shift mutation
- (ii) Differentiate between prokaryotic and eukaryotic transcription
- (iii) Genomic library and c-DNA library
- (iv) Plasmid and Phage

(3+3+3+3)

(b) If the electron transport was absent, what is the net ATP yield from the oxidation of Glucose to CO₂ and water, justify?

(c) When placed on a medium containing compound X -gal, all bacterial colonies are white in color, why? Which one of these will contain the plasmid with cloned gene? How will you find the gene of interest? Justify and explain

(d) Explain the Negative feed back control of thyroid hormone

(e) What is the mechanism of action of a steroid based hormones?

(3+5+4+2)

Q3 (a) Indicate to which branch (es) of Immune system the following statements apply. Write H for Humoral, C for Cell mediated and B for both branches

- (i) Involves class -1 MHC molecules
- (ii) Most likely responds to bacterial infection _____
- (iii) Involves T_H cells _____
- (iv) Involves B cells _____
- (v) Involves T_C cells _____
- (vi) Involves secreted antibodies _____
- (vii) Involves CD⁸ cells _____
- (viii) Involves plasma cells _____

(b) If a person gets an infection for the second time, why does the immune system respond quicker?

(c) The Hardy Weinberg concept is only theoretical. What factors do not allow it to operate in a natural gene pool?

(d) If a population of Cows have the following genotype frequencies AA=0.42%, Aa = 0.46% and aa= 0.12 % .What will be the allele frequencies? Calculate

(8+3+6+4)

GOOD LUCK

BITS, PILANI-DUBAI
DUBAI INTERNATIONAL ACADEMIC CITY
SECOND SEMESTER 2007-08
TEST-2(OPEN BOOK)

Course No: BIO UC111

Date: 27.4.2008

Course Name: General Biology

Maximum Marks: 60

Duration: 50 Min

-
- Answer briefly and to the point.
 - Attempt sub parts of each question together.
-

- Q1 (a) How cell division is controlled in mammalian cells? Explain (4)
(b) Why is water necessary for the overall process of photosynthesis? Explain (4)
(c) Why nerve cells usually don't divide throughout your life time? Explain (4)
(d) Explain the role of vitamin B₃ in the breakdown of ethyl alcohol? (3)
- Q2. (a) In humans tongue rolling and twisting are interesting dominant characteristics. When a man capable of rolling and twisting (both heterozygous) his tongue marries to a woman who neither can roll her tongue nor can twist, what could be the Phenotypes and genotypes one could expect in their off springs? Mention the ratio also. (8)
(b) Two sets of experiments were conducted
(i) Ptyalin (enzyme) subjected to starch shows the reaction but same when pre heated not reacted to starch (2)
(ii) Either pre heated or normal ptyalin has not shown any reaction to lard/blubber. Explain why? (2)
- Q3. (a) Why leaves appear to change colors during different times of the year. (2)
(b) Why FADH₂ produces fewer energy than NADH? (2)
© "Do not lie on the beach without using the sunscreen lotion with SPF30". This is the common advice given by the doctors. Why it is so? Doesn't the light of sun provide energy for life on earth? (5)
(d) . Translate the following DNA base sequence into a sequence of amino acids for a protein molecule?
5'—ACGCTATGTCACATGGTACCTAACGTAT—3' (8)
- Q4 (a) Metaphase-1 is often considered the critical difference between mitosis and meiosis. Why? Explain with diagram and in words with the significance of this stage. (5)
(b) B is dominant allele coding for black fur on rabbits and b is recessive allele coding for white fur on rabbits. Find out the genotypes of the parent in case
(i) All 100% offspring are white.
(ii) 75% off springs are black
(iii) All 100% off springs are black
(iv) 25% off springs are white
(v) 50% off springs are white (7)
- Q11. Show through calculation that total of 36ATP molecules are produced in aerobic cellular respiration of eukaryotes and 38ATP molecules in prokaryotes and why it is so? (4)

----- GOOD LUCK-----

BITS PILANI DUBAI
DUBAI INTERNATIONAL ACADEMIC CITY
SECOND SEMSTER 2007-08

TEST- 1

COURSE NO: BIO UC 111

DATE: 9.3.2008

COURSE NAME: GENERAL BIOLOGY

DURATION: 50 min

MAX MARKS: 75

- Q1. (a) List in order from smallest to largest, the levels of organizations that are studied by biologists
(b) List out different types of protein and write their functions (tabular form)
(c) List out the main characteristic features of Domain Archaea, Kingdom Fungi and Plantae (Maximum 4 points for each)
(d) List out three double membrane bound organelle and explain how double membrane bound organelle are different from single membrane bound organelle (Max. 3 points)
- Q2. (a) Define: Control processes, population adaptation and Plasmid (4+4+9+4)
(b) Name 2 diseases which are caused due to protein misfolding (3+2+2)
(c) Besides serving as energy sources what other functions are performed by Carbohydrates.
(d) How a virus cause infections explain briefly? (2 Points)
(e) Write the taxonomical hierarchy while classifying an organism with an example
(f) In which way cellulose, chitin, Glycogen and starch are similar and in which way they are different from each other. (2 points)
- Q3. (a) Following are the components /organelle which are present in a cell: (2+4+4+4)
Chloroplast, Nucleoid, cell wall, endoplasmic reticulum, Flagella, Nucleus, Centriole, Central vacuole, capsule, nuclear envelope, Cilia, Fimbriae, 70S and 80S ribosome
Using these components construct a plant cell, an animal cell and a bacterial cell in a tabular form (i.e. list out the components which are present in each cell type in a tabular form)
(b) Differentiate between
(i) DNA and RNA (3points)
(ii) Active transport and facilitated diffusion (3 points)
(iii) Smooth endoplasmic and rough endoplasmic reticulum (2 points)
- Q4. Given a continuous bag (no leaks) whose walls consist of pure lipid bilayer (4+4+4)
(i.e. Phospholipids are the only component). The bag was created in pure water (to which only phospholipids were added and formed a lipid bilayer) Therefore, the bag initially displayed an interior environment which was chemically identical to exterior environment .Sugar was added to the exterior environment after the bag formation .What will be the interior chemical environment (Its volume) of the bag following sugar addition and why , explain? (6)

-- GOOD LUCK