

BITS, PILANI- DUBAI
DUBAI INTERNATIONAL ACADEMIC CITY
FIRST SEMESTER 2008-2009
TEST -1(CLOSED BOOK)

COURSE NO. BIO C111

26.10.08

MAXIMUM MARKS: 75

COURSE TITLE: GENERAL BIOLOGY

DURATION: 50 Minutes

- Answer all questions in the given sequence
- Answer all the parts of the same question together at one place.

- Q1. (a) List two issues that biological research may help us to solve in near future. (3)
 (b) List out the differences between DNA and RNA. (6)
 (c) How do diffusion, Facilitated diffusion and Active transport differ? (Answer in Tabular form). (6)

- Q2. (a) Mention the similarity and differences between Centriole and Cilia (3)

(b) Explain the major steps involved or associated with the synthesis of ATP during Aerobic cellular respiration (9)

(c) How plant cell differ from animal cell when kept in hypertonic and hypotonic solutions. (4)

(d) In globular proteins, the polypeptide chain bends and folds to give a more compact shape. This is tertiary structure of protein. Name the types of bond that help to maintain the tertiary structure. Give two examples that prove that alteration in the sequence of amino acids within a protein chain will affect its function (6)

- Q3. (a) The table shows the information about some organisms and their classification. Complete the table by putting the correct kingdom for each organism described. Each kingdom may be used once, more than once or not at all. (5)

S.No.	Feature of Organism	Kingdom/Domain
1	Body composed of mass of undifferentiated cells, Heterotrophic cell with a chitin cell wall. Non Motile	
2	Body a string of tiny undifferentiated cells, Heterotrophic with a peptidoglycan cell wall, non motile	
3	Body complex, multicellular, differentiated into variety of tissues and organs, heterotrophic, No cell wall, some cells have flagella. Motile	
4	Body complex, multicellular, differentiated into variety of tissues and organs. Autotrophic, Cellulosic cell wall. Non Motile	
5.	Unicellular organisms, typically associated with Extreme environments, have introns	

- (b) Explain how activity of an enzyme can be controlled or regulated in a cell? (9)

(P.T.O.)

- (c) Methanol is oxidized by ADH (Alcohol dehydrogenase found in liver and other tissues) to the highly toxic compound Formaldehyde drinking Methanol is fatal because of the production of Formaldehyde .Methanol itself is harmless and is excreted by Kidney) ADH will also oxidize other alcohols such as Ethanol). Methanol is ingested by an individual by mistake, propose a way to treat the Individual (Underline the Concept involved). (5)
- Q4. (a) Bacteria are known for causing a number of diseases but some of the bacteria are economically important, justify giving examples. (4)
- (b) How Mitochondria and chloroplast are different from other membranous organelle.(Write in tabular form) (6)
- (c) Animals and plants store triglycerides as energy reserves, explain the advantages of storing Triglycerides as energy reserves than Carbohydrates? (4)
- (d) Calculate the total no. of ATP formed during aerobic cellular respiration and why there is a difference in no. of ATP formed during this process in prokaryotic and Eukaryotic organisms (5)

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

BITS, PILANI- DUBAI
DUBAI INTERNATIONAL ACADEMIC CITY
FIRST SEMESTER 2008-2009
TEST -2 (OPEN BOOK)

COURSE NO. BIO C111 **14.12.08** **MAXIMUM MARKS: 60**
COURSE TITLE: GENERAL BIOLOGY **DURATION: 50Minutes**

Q1 (a) If there were three different alleles, how many possible genotypes would be there? Show with an example. (6)

(b) Mr. and Mrs. Anderson both have tightly curled hair(The hair form of gene shows incomplete dominance .There are two alleles, curly and Straight .The heterozygote has wavy hair) Mrs. Anderson gave birth to a child with wavy hair . Mr. Anderson accuses Mrs. Anderson of being unfaithful to him .Is he necessarily justified? Why or why not? (9)

Q2 (a) A plasmid named as pBR322 was used as a vector for inserting gene encoding Insulin. The plasmid contain genes that code for resistance to (antibiotic) Ampicillin (Amp^R) and tetracycline (Tet^R).The tetracycline gene is cut using restriction enzyme BamHI and the gene for insulin was inserted .How will you confirm that the bacterial colonies contain plasmid with gene of interest(that have taken up insulin gene) (8)

(b) State the basic method by which the researchers have learnt to make large quantity of useful protein. (List out the Steps). (7)

Q3 (a) Why a Child can show mixture of family characteristics? Explain briefly
(b) What is the difference between cytokinesis in plants and animals?
(c) What are the consequences of not getting past G1 phase and going too fast in M phase? (5+5+5)

Q4 (a) List the ways in which Transcription in prokaryotes differs from Eukaryotes.
(b) Why Replication of DNA is important/essential for a cell?
(c) A point mutation involving a replacement or substitution of a single nitrogenous base in DNA by a different base might not always result in an error in protein production or disease justify with an example briefly. (6+3+6)

----- **GOOD LUCK** -----

BITS, PILANI-DUBAI
DUBAI INTERNATIONAL ACADEMIC CITY
FIRST SEMESTER 2008-09

COMPREHENSIVE EXAMINATION

COURSE NO.: BIO C111 **DATE** 04-01-2009

MAXIMUM MARKS: 120

COURSE NAME: GENERAL BIOLOGY

DURATION: 3 HOURS

Answer all questions in the given sequence.

Answer all parts of a question together. Part A and B to be answered in separate Answer sheets.

PART- A

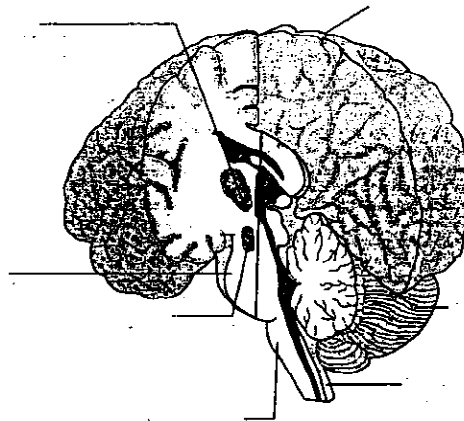
Q1. (a) Draw a table in the answer sheet and write the pathways in which the listed molecules are involved. (4)

No.	Product/Molecule	Pathway
1	Carbon Dioxide	
2	Ethanol	
3	Glucose	
4	Acetyl	
5	Phosphoglyceraldehyde 3 phosphate	
6	RuBP	
7.	Citric acid	
8.	Cytochrome	

(b) Briefly explain major steps involved in process of Photosynthesis. (5)

(c) Elucidate the effects of pH and temperature on Enzyme activity. (6)

Q2 (a) Label the various parts given in the figure below and list out the function for each of these parts. (7)



(b) Based on the characteristics of life can you classify Viruses as living? Justify (2)

(c) Differentiate between the following: (Tabular form only) (6)

(i) Humoral and Cell Mediated Immune response

(ii) Replication of DNA and Transcription

(iii) Active and passive transport

Q3. (a) How the human body maintains homeostasis for the following (8)

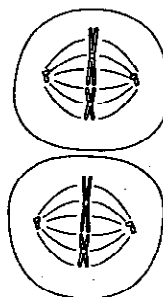
(i) Water

(ii) Thyroxine

- (b) List out the various categories of proteins and mention their function. (3)
- (c) Two brands of cooking oils are available in market. A contain 22% saturated fatty acids, B contains 15% of Saturated fatty acids .Which one would you prefer buying and Why? (4)

Q4. (a) List out the various applications of R-DNA technology. Explain stepwise how you can prepare a Recombinant vaccine for hepatitis B in the lab? (6)

(b) Figure below shows the result of an animal cell that has undergone meiosis I



- (i) State which stage of Meiosis II is shown?
- (ii) Describe the next stage of meiosis II
- (iii) What happens before the start of meiosis to the nuclear membrane and Centrioles?
- (iv) Name and explain two ways in which meiosis can, lead to variation. (1+1+1+3)
- (c) Why drug streptomycin used to fight bacterial infection does not affect the human cells (3)

PART- B

Q1. (a) Draw a table in the answer sheet and list out one major function for each of the following (6+3)

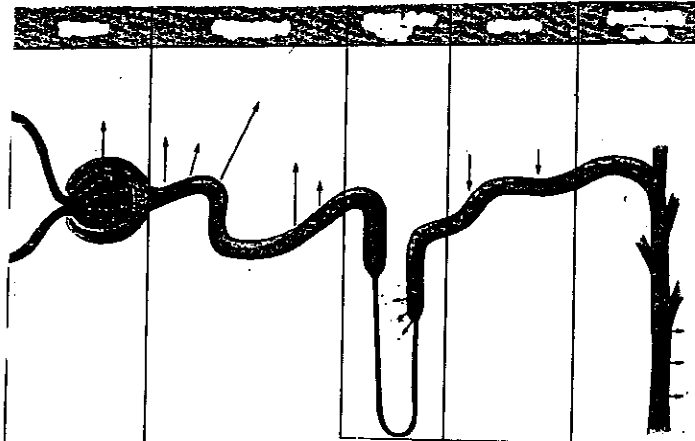
No.	Component	Function
1	DNA Polymerase	
2	DNA ligase	
3	Restriction Endonuclease	
4	Lysosomes	
5	Antigen Presenting Cells	
6	Plasmid	
7.	Natural Killer cells	

(b) Give an example for the following

No.		Example
1	Regulatory protein	
2	Neurotransmitter	
3	Co-enzyme	
4	Polygenic Inheritance	
5	Co dominance	
6	X -Linked character	
7.	Polysaccharide	

(c) Chloroplasts and mitochondria have evolved from intracellular symbiotic bacteria. How the structure of these organelle accounts for this hypothesis? (4)

Q2 (a) Label the various parts given in the figure below and list out the function for each of these parts. (7)



(b) During the cell Cycle if S- Phase is absent, do you think mitosis would proceed and why? (3)

(c) Differentiate between the following: (Tabular form only) (8)

- (i) Phages and Plasmid
- (ii) Genomic and c-DNA library
- (iii) Gene Mutation and chromosomal mutations
- (iv) Artery and Vein

Q3. (a) How Phagocytes destroy the invading bacteria. (3)

(b) An inherited difference among North American whites is the ability to taste a compound called Phenylthiourea. It is either bitter or tasteless. The ability to Taste (T) is dominant. The individuals are either normal colored (C) dominant or albino skin colored. These alleles for tasting and skin color segregate independently and not part of Sex chromosomes. If a couple in which father has genetic make up TTCc and mother has TtCc, what is the probability that they have a son who is non taster having albino skin color. (8)

(c) How will you separate a mixture of DNA fragments cleaved by Restriction Endonuclease? (3)

Q4. (a) (i) When B cells encounter antigen to which it is targeted, it divides rapidly and produces _____

(ii) Which types of T cell lyses cells that that have been infected with Viruses _____

(iii) Immune system is terminated or decreased by _____

(iv) Which type of surface marker is present on every nucleated cells of body? (1X4)

(b) List out the important features of a plasmid. (3)

(c) Define complement proteins or complement system, how do they help in giving protection against infections? (4)

(d) How body protects itself against a viral infection. Make a flow chart or explain schematically. (4)

GOOD LUCK