BITS PILANI DUBAI CAMPUS
Ist SEMESTER 2006-07
TEST-1 (CLOSED BOOK)

COURSE NO: BIO UC 111 **COURSE NAME: GENERAL BIOLOGY**
DATE: 31.10.2006 **WEIGHTAGE: 20 %** **MAX MARKS: 60**

Q1. (a) List two ways by which Domain Eubacteria and Archaea differ from each other (2)
(b) Name the process involved in transport of following molecules in and out of cell (4)

- Carbon dioxide
- Na^+ ion
- Glucose
- Bacteria

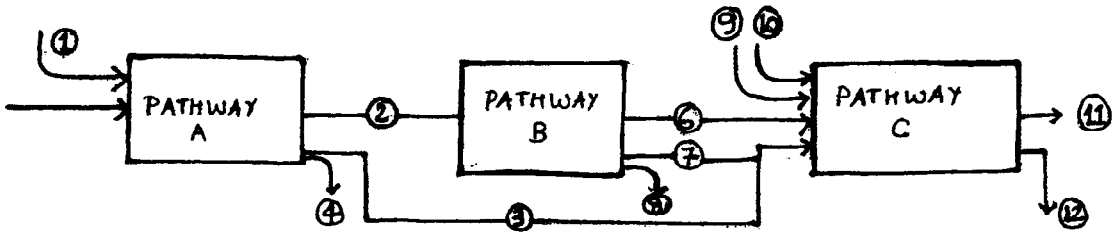
(c)Explain Enzyme competition with an example? Why it is important to cell? (8)
(d) What is HLA? Describe the role played by HLA . (6)

Q2 (a) State whether the following organelles are located in Prokaryote and Eukaryote or both?

1. Inclusions
2. Vacuoles
3. Nucleolus
4. Chromatin material
5. Peroxisomes
6. Cilia and flagella
7. Ribosome
8. Intermediate filament

(4)
(b) Differentiate between Cyclic and Non Cyclic electron transport in terms of the **Products** and the **source of electron** for the reduction of oxidized chlorophyll. (6)
(c) In what principal ways are the reactions of electron transport in photosynthesis are similar to respiratory chain in Cellular respiration? (6)
(d) Why do viruses invade only specific types of cells? Explain with the help of an example. (4)

Q3. (a) Energy yield for Glucose is less in RBC than in Nerve cells, Justify (6)
(b) Organism that live in fresh water are almost always hypertonic to their surroundings, in what way is this serious problem? How do some organisms cope with this problem? (4)
(c)Refer to the diagram below, the three boxes represents the three major biosynthetic pathways in aerobic cellular respiration. Arrows represents net reactants or products, answer the following questions (10)
(i) Arrow 1, 2 is.....
(ii)Arrow 4,8,12 could be.....
(iii)Arrow 3, 7 could be .....
(iv) Arrow 9 is.....
(v) Pathway B is.....



— GOOD LUCK —

BITS PILANI DUBAI CAMPUS

1st SEMESTER 2006-07.

TEST-2 (OPEN BOOK)

TITLE : GENERAL BIOLOGY

COURSE NO : BIOUC111 (17-12-06)

MAXIMUM MARKS :

DURATION : 5

Q1 (a) If a Heterozygous Tall and Homozygous short plant are crosse what will be the phenotype and Genotype of the offspring? (5

(b) When both the parents are heterozygous for Blood group "A" and Eye color, what is the possible outcome when they are crossed? (Blue Eye is dominant over Brown) (8)

Q2. (a) Write the major differences between Mitosis & Meiosis II (6)

(b) How the cells that are potentially dangerous to the entire body are killed before they cause serious harm? Explain (4)

(c) How age of mother is related to Trisomy? Explain (3)

(d) Calculate the no of possible combinations in gametes of organisms with following diploid chromosome no. (4)

(i) 8 (ii) 10 (iii) 16 (iv) 20

Q3. (a) How breathing is regulated during vigorous exercise? Explain (5)

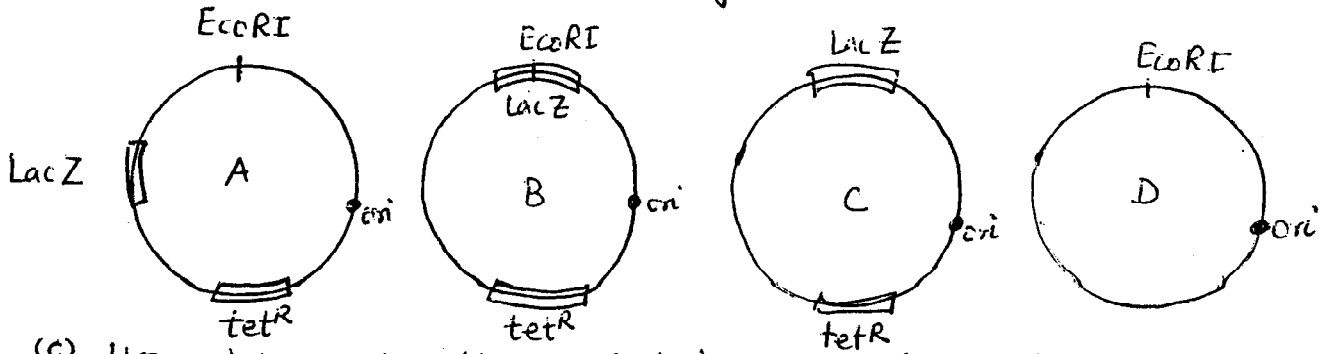
(b) Why is not advisable to exercise after taking full meal? expla (3)

(c) Food materials like rice taste sweet if chewed for long enough? (2)

(d) Write down the major differences between plasmids & phages? (6)

Q4 (a) Sometimes when a person who sits or stands for long time faints, why? (4)

(b) Which of the following plasmids would be best suited for construction of Recombinant DNA? Justify your answer (5)



(c) How does reabsorption of Carbohydrates & fats differ in our body? (3)
(Mention the steps only).

— x —

A

BITS PILANI DUBAI CAMPUS
FIRST SEMESTER 2006-07
QUIZ-2

COURSE NO: BIO UC 111 **COURSE NAME: GENERAL BIOLOGY**
DATE: 5-11-06 **DURATION: 30 min** **MAX MARKS: 30**

Q1.RNA POLYMERASE adds nucleotides to growing RNA's end from 3' or 5'.....of DNA

Q2.At what region of DNA does RNA polymerase first bind to a gene.....

Q3..... And .....are the regulatory factors help in .....
Q4. Given is a sequence of following bases (nucleotides): (2)

GCTGGCTAGTACTTTAGAGGACCAGTAATTTTTAGA
Show the sequence of bases you would expect to find on the corresponding m-RNA

.....

Q5.When there is a change in single nucleotide in the gene it is known as.....

Q6. Nonsense mutation is a type of mutation where a single nucleotide change result in .....

Q7.Write down the base sequence of START CODON and various STOP CODONS those are present on the transcribed sequence.....

Q8.Sickle cell Anemia is an example of .....

Q9.The strand of DNA that serve as a template strand for the synthesis of RNA is .....

Q10.The pre mRNA that is formed in the eukaryotic Organism contains .....

Q11.If there is mutation in the somatic cells of multicellular organism will it be carried to the next generation or not?
.....

Q12.Extrachromosomal DNA present in the bacteria is known as.....

Q13.The prokaryotic organisms have an attached protein that is known as.....
Whereas in Eukaryotic organism the attached proteins are known as.....
Q14.....is the site where assembly of amino acids for the protein synthesis take place. (2)

Q15.In prokaryotic organism transcription take place in .....and in case of Eukaryotic organisms the transcription occur in.....

Q16.If the food you eat does not contain enough carbohydrates from where the cells get energy to perform vital activities?

Q17. When does the DNA replication take place in a cell, and can it start at any point along the length of DNA? (2)

Q18.What is the function of HELICASE? (2)

Q19.The ends of chromosomes contain a special sequence of Nucleotides known as ..... (2)

Q20.The Central dogma of molecular biology is .....

Q21. Which of the following statements about Photosynthesis pigments is true?

- There is only one kind of Chlorophyll
- Chlorophyll absorbs mostly green light
- It is required in Calvin Benson cycle
- Found in thylakoid membrane

Q22.All of the following produce ATP except.....
(i)Glycolysis (ii) Krebs cycle (iii) Lactate fermentation (iv) Oxidative phosphorylation

Q23.After strenuous exercise, a muscle cell would produce increased amount of all of the following except.....

(i) ADP (ii) CO_2 (iii) Lactate (iv) Glucose (v) P_i

Q24. All of the following Statements about Respiration are correct except.....

(i) Some of the products in the breakdown of protein enter the Krebs cycle
(ii) Some of the products in the breakdown of lipids enter the Krebs cycle
(iii) Anaerobic respiration is probably a more primitive energy yielding pathway than is aerobic respiration
(iv) The purpose of Oxygen in aerobic respiration is to donate the electrons that transform $NAD^+ + H^+$ to NADH
(v) Oxygen is required to breakdown Lactate.

Q25. All of the following processes release CO_2 except.....

(i)Krebs cycle (ii) Alcoholic fermentation (iii) Conversion of Pyruvate to alcohol (iv) Oxidative phosphorylation (v) Conversion of Pyruvate to Acetyl CoA

GOOD LUCK

BITS-PILANI, DUBAI CAMPUS

FIRST SEMESTER- 2006-07

COMPREHENSIVE EXAMINATION

COURSE NO: BIO UC 111 COURSE NAME: GENERAL BIOLOGY

DATE: 24.12.2006 DURATION: 3 Hrs. MAX MARKS: 120

NOTE:

- Answer all the questions only in sequential order.
- Answer all the parts of the same question together.

Q1.(a) **List out the following:**

(i) Various lines of evidence used by Scientist to trace evolutionary history of an organism. (4)

(ii) Various Blood vessels that enter and leave the Heart. (4)

(iii) Various syndromes that result due to non disjunction of chromosomes? (3)

(b)Explain/discuss/ justify

(i)When you hard boil an egg, the clear liquid part surrounding yolk becomes white and solid, discuss? (3)

(ii) You are suffering from Scarlet fever and your doctor prescribed you a sulfa drug .After some time you recover and the pathogen dies? Explain the phenomenon (3)

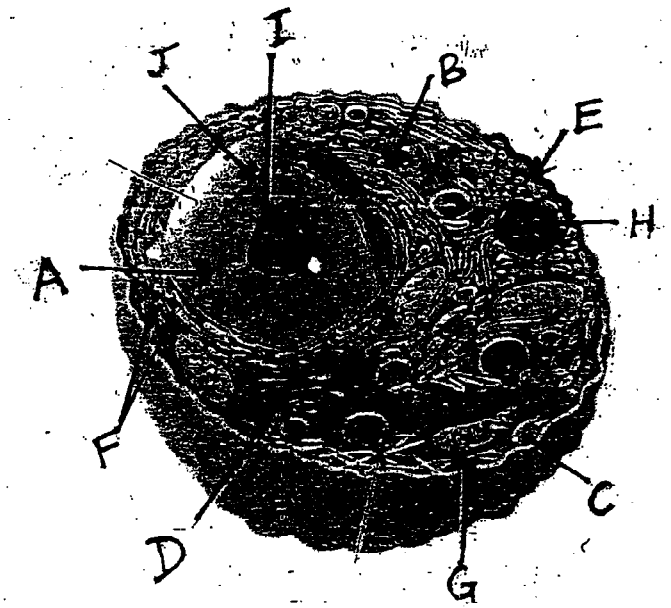
(iii).The cells in your body are genetically same, but they do not have the same function, justify with an example (4)

(iv) The skin swells and reddens after a honey bee bites a person, why? (4)

(v) You stop smelling perfume on your dress while the person approaching you still smells it? (2)

(vi) The left Ventricle possesses a thicker wall than the right ventricle? (2)

Q2. (a)Identify the marked parts in the given figure. (5)



(b)Match these sites with the given function/reaction listed below. (3)

(i) Protein synthesis (ii) Ribosome Synthesis (iii) Glycolysis

(iv) Phagocytosis (v) Formation of glycoproteins from proteins.

Q3.(a)In which stage of photosynthesis do these events occur? (Write **L** for light and **D** for dark)

(i) Production of ATP (ii) Consumption of ATP(iii) Production of NADPH (iv) Evolution of O_2 (3)

(b) Identify the biochemical pathways in which the following reactions occur (write **P** for photosynthesis, **R** for aerobic respiration, **B** for both and **N** for none) (6)

(i) Production of ATP (ii) Chemiosmosis (iii) Fermentation (iv) Photolysis of water

(v) Carboxylation of PEP (vi) Evolution of oxygen.

Q4 (a) Briefly write the mechanism of action of the following (4)

(i) Methotrexate (ii) Doxorubicin (iii) Chlorambucin (iv) Vinblastin

(b)What is turnover no.? How does it change with substrate concentration? (4)

(c) What is splicing? Why is it important in Eukaryotes and not in prokaryotes? (5)

(d)How polar bears are able to survive under extremely low temperature? (3)

(e) What are chromosomal mutations? Do these have any connection with the Bleeders disease (Hemophilia), if so, explain how? (4)

Q5 (a) Genomic library of Drosophila contains about 40,000 clones, how a scientist will find the cloned gene of his interest from such a big library, describe? (6)

(b) How a recombinant vaccine is prepared for Hepatitis B virus and how it protects an individual against the infection when injected? (6)

(c) A sample of 208 individuals was tested for the presence of M and N alleles .Following is the genotype frequency of the individuals: (6)

L^ML^M = 119
L^ML^N = 76
L^NL^N = 13

Calculate the frequency of M and N alleles.

Q6 (a) Give a schematic presentation of the events how B Lymphocytes and T lymphocytes handles a situation in which a virus has infected a cell of your body? (8)

(b) Briefly write about the structure and function of Human kidney (major parts & function). Include a description of how hormones interact with kidney to regulate water balance. (4)

(c) Describe negative feedback loop involved in the maintenance of homeostasis (5)

(d) Consider a family where both the parents are heterozygous for sickle cell anemia , the mother is color blind and father has normal vision .Give the expected proportion of phenotypes for the children in the family. (Sickle cell anemia is lethal in homozygous recessive condition and color blindness is an X linked trait) (8)

(2x5=10)

Q7(a) Distinguish between:

(i) DNA Polymerase & Ligase
(ii) Sensory & Motor Neurons
(iii) Asthma &Emphysema
(iv) Multiple allelism & Polygenic inheritance
(v)Cerebrum and cerebellum

(b)What are neurotransmitters? What is their significance? (2)

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

BIO

BITS PILANI DUBAI CAMPUS
FIRST SEMSTER 2006-07
QUIZ-1

COURSE NO: BIO UC 111 **COURSE NAME: GENERAL BIOLOGY**
DATE: 19.9.2006 **TIME: 30 min.** **WEIGHTAGE: 10 %** **MAX MARK: 30**

Name: **ID.No.** **Sec.No:**

Q1. The process of maintaining a constant/stable internal environment in the body is known as.....

Q2 Which of the following is NOT a function of neutral fat?

(A) insulation
(B) shock absorption
(C) energy storage
(D) regulate rates of chemical reaction

Q3. The three molecules bonded to form a nucleotide are ..... and Nucleotide is a functional monomer of .....

Q4. Which of the following series of sugars is made up entirely of complex carbohydrates?

(A) Starch, glycogen, cellulose
(B) Starch, sucrose, lactose
(C) Glycogen, glucose, galactose
(D) Cellulose, glucose, fructose

Q5. Proteins are made up of.....that are joined together by.....

Q6. Which one of the following is NOT a lipid?

(A) neutral fat
(B) Phospholipid
(C) Polypeptide
(D) Testosterone

Q7. Which of the following represents a generative process?

(A) Enzymes
(B) Individual adaptation
(C) Nutrient uptake
(D) Cell division

Q8 Which of these is an example of metabolic process?

(A) Digestion of food molecule
(B) Migration of birds to safer places
(C) Increase in number of organisms
(D) Change in fur color when days become shorter

B10

Q9. Which of these is a correct sequence from most complex to simple forms?

(A) Non living material, cell, tissue, organ system, organ, non living material
(B) Organ system, organism, organ, non living material, tissue, cell
(C) Organism, organ system, organ, tissue, cell, nonliving material
(D) Cell, tissue, organ system, organ, organism, non living material

Q10. When dealing with responsive process

(A) Organisms grow
(B) Metabolic processes decrease
(C) Population evolve through time
(D) Individual coordinate activities

Q11.....is an essential fatty acid, which .....and should be .....

Q12. The chief characteristic of the steroid molecule is the

(A) Phospholipid side-chains.
(B) Double carbon atoms on both sides
(C) Interlocking carbon rings.
(D) Open-ended ring structures.

Q13. Which statement(s) about cholesterol is/are true?

(A) Cholesterol is found in the animal cell membrane as well as in the bile (produced by the liver).
(B) Cholesterol is necessary for the production of steroids and vitamin D.
(C) The human body manufactures some cholesterol
(D) All of the above.

Q14. If the primary function of a protein is to maintain the shape of the cell, that protein is known as.....

Q15. Pea nut butter can be formed by the process of.....

Q16 Phospholipids molecule differ from True fat in .....

Q17.Write down the names of purines and pyrimidines present in DNA and RNA and the pairing between them (3)

DNA RNA

PURINES
PYRIMIDINES
PAIRING

Q18.Write down the different types of RNA formed in a cell

Q19. The coiled, condensed form of DNA is known as .....

B 10

Q20. The improper folding of protein can result in .... disease

Q21.Glycoproteins & immunoglobulin help in .....

Q22. Artificial analogue of OXYTOCIN is .....

Q23.write down two examples of proteins that belong to Quaternary level of protein Structure.

Q24.Expand the following: LDL, VLDL, HDL, DPT, MMR (2)

Q25. Which association is correct? (2)

(A) Nucleic Acid:RNA Protein:enzymes Lipid:insulin Carbohydrate:glucose

(B) Nucleic Acid:DNA Protein:insulin Lipid:testosterone Carbohydrate:cellulose

(C) Nucleic Acid:Enzymes Protein:insulin Lipid:testosterone Carbohydrate:glucose

(D) Nucleic Acid:RNA Protein:enzymes Lipid:cellulose Carbohydrate:glycerol

Q26.Sickle cell anemia is caused due to.....

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