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SARDAR PATEL UNIVERSITY
M.Sc. (I Semester- CBCS) Examination
Subject: INDUSTRIAL BIOTECHNOLOGY
PS01EIBT01; Cell Biology & Genetics
Tuesday, December 4, 2012
Time: 10.30 a.m. to 1.30 p.m.

Total Marks: 70

Note: Figures in brackets indicate marks
Answer all the questions in the given answer book

Q1. Attempt all the multiple choice questions given below (8x1=8)

- (i) In electron microscope higher magnification is achieved due to:
a) shorter wave length of electrons b) high vacuum
c) longer wavelength of electrons d) more power supply
- (ii) The total DNA length in a human cell is around:
a) 1 meter b) 2 meter c) 3 meter d) 4 meter
- (iii) The synthesis of macromolecules is largely shut down during:
a) G₁ phase b) M phase c) G₂ phase d) S phase
- (iv) The cell organelle characterized by three membrane compartment is:
a) ER b) Golgi c) chloroplast d) mitochondria
- (v) The non-membranous organelle in the cytoplasm is:
a) vacuole b) peroxisome c) endosome d) microtubule
- (vi) In trihybrid back cross the phenotypic and genotypic ratio is:
a) 1:1:1:1:1:1:1:1 b) 27:9:9:9:3:3:3:1
c) 9:3:3:3:1:1:1:1 d) 1:2:1:2:4:2:1:2
- (vii) The maximum frequency of recombinations can result from crossing over between linked genes will be:
a) 100% b) 25% c) 50% d) 0%
- (viii) In humans recessive sex-linked or X-linked traits are transmitted from:
a) Fathers to grand sons and mothers to half of the sons
b) Fathers to grand daughters and mothers to all sons
c) Fathers to grand sons and mothers to all sons
d) Fathers to half grand sons and mothers to all sons

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- Q2. Answer any SEVEN of the following in brief: (7x2=14)
- i) What is the cell cycle?
 - ii) When electrons are not visible how do you observe specimens under TEM
 - iii) What are lipid rafts?
 - iv) What is meant by receptor mediated endocytosis?
 - v) Differentiate between passive and active transport
 - vi) Non-disjunction
 - vii) ABO blood groups
 - viii) Reciprocal cross
 - ix) Allopolyploidy
- Q3. (a) Write a note on dynamic structure and molecular functions of plasma membrane (6)
- (b) Differentiate the components and principle of image formation between TEM & SEM (6)
- OR
- (b) Explain in detail the different steps involved in separation of monolayers of biological membranes. (6)
- Q4. (a) Describe the role of ER and Golgi in the transport of different biological molecules (6)
- (b) Explain the molecular organization and synthesis of plant cell wall. (6)
- OR
- (b) Write a note on: (6)
- (i) Nuclear pore complex
 - (ii) Intercellular communication
- Q5. (a) Compare and contrast the structure, function and transport of metabolites across membrane compartments between chloroplast and mitochondrion (6)
- (b) Write notes on linkage & crossing over (6)
- OR
- (b) Explain gene mutations in brief. (6)
- Q6. Write notes on:
- (a) Complementary interaction of genes (6)
 - (b) Transposons and their importance (6)
- OR
- (b) Chromosomal structural changes (6)