

**B.TECH DEGREE EXAMINATIONS: MAY/JUNE 2013**

Sixth Semester

**BIOTECHNOLOGY**

BTY205: Medical Biotechnology

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. Schizophrenia is a mental disorder
  - a) due to single defective gene
  - b) due to joint effects of many genes acting together with nongenetic factors
  - c) due to increase in 5-hydroxy tryptophan
  - d) due to increase in serotonin and GABA
  
2. Marfan's syndrome
  - a) Display defect in **BUB1** gene
  - b) Display defects in **FBN1** gene
  - c) Defect in Alcohol dehydrogenase
  - d) None of above
  
3. Tumor-suppressor genes includes *p53* and *Rb*. How would a "gain-of-function" mutation likely affect the cell?
  - a) The cell would divide constantly because of the loss of cell cycle repression.
  - b) The cell would divide much less frequently because of the extra cell cycle repression.
  - c) The cell would divide normally because these genes have no effect on cell cycle control
  - d) The cell would commit suicide by apoptosis
  
4. Genomic imprinting
  - a) Epigenetic process that involves DNA methylation and histone modification
  - b) Reduced synthesis of acetylcholine
  - c) Comes from the location of the gene
  - d) A specific isoform of apolipoprotein for amyloid precursor protein
  
5. Bcr-Abl oncogene chromosomal rearrangement is diagnostic for
  - a) neurofibromatosis type 1
  - b) 1 cancer syndrome colorectal adenocarcinomas
  - c) chronic myelogenous leukemia
  - d) Burkitt's lymphoma

6. ADA deficiency
- a) is due to the lack of enzyme adenosine deaminase      b) is due to the decrease in S-adenosylhomocysteine
- c) results in the deficiency of deoxyadenosine      d) due to adenosine deaminase enzyme overproduction
7. What are the major obstacles to viral vector delivery in genetic therapy?
- a) Problems with stability of genetic effects      b) Immune response
- c) Multigene disorders      d) All of the Above
8. Gene cloning can involve inserting genes into
- a) bacteria      b) Protein
- c) humans      d) machines
9. In the treatment of chronic hepatitis B virus:
- a) Corticosteroids are always beneficial      b) 40% of patients can be expected to respond to interferon
- c) Combined treatment with acyclovir and interferon is more effective than interferon alone      d) Interferon can be associated with a rise in transaminases towards the end of therapy
10. Variable number of tandem repeats (VNTRs) in the DNA molecule are highly useful in
- a) Monoclonal antibody production      b) Recombinant technology
- c) DNA finger printing      d) Stem cell culture

**PART B (10 x 2 = 20 Marks)**

11. Explain the importance of gene hunting.
12. What is structural chromosomal abnormality?
13. Explain gain of function mutation with example
14. Explain the molecular basis of MELAS.
15. Explain the role of specific markers in detecting cancer.
16. What is amniocentesis?
17. Write a note on the role of nanobiotechnology in drug delivery.
18. How could gene therapy be used to treat cancer?
19. What is the difference between functional and positional cloning?
20. What is therapeutic cloning?

**PART C (5 x 14 = 70 Marks)**

21. a) Numerical chromosomal abnormalities. Explain in detail.  
(OR)  
b) Write the strategies used in the candidate gene approach.
22. a) Explain in detail the molecular mechanism of genomic imprinting.  
(OR)  
b) Give an account of genes associated with cancer.
23. a) Explain Non-invasive techniques of medical diagnostics.  
(OR)  
b) Give an account on the laboratory diagnosis of CML.
24. a) Explain the clinical applications of cultured stem cells.  
(OR)  
b) Give an account on cell based therapies and its clinical applications.
25. a) What are DNA vaccines? How are they made against virus? What are the benefits and future of DNA vaccines?  
(OR)  
b) What is humulin? What is the mode of action of humulin?

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