

() Sardar Patel University
 M. Sc. (Genetics), Forth Semester Examination
 Day and Date: Tuesday, 05-04-2016
 Time: 02:30 pm to 05:30 pm

Paper code and Subject: PS04CGEN02 - Gene Therapy and Genetic Counseling
 Total Marks: 70

- Q.1 Multiple choice questions (All are compulsory). [08]
1. Which of these is a key characteristic of a molecular marker?
 - a) It is a known gene
 - b) It is located at a known site on the chromosome
 - c) It is only useful for linkage and physical mapping studies
 - d) None of these
 2. A molecular marker which is amplified by PCR and is polymorphic by length is a(n):
 - a) Restriction fragment length polymorphism (RFLP)
 - b) Variable number of tandem repeats site (VNTR)
 - c) Amplified fragment length polymorphism (AFLP)
 - d) Single nucleotide polymorphism (SNP)
 3. _____ sequence is inserted for DNA vaccine in targeted cell.
 - a) Pathogen surface antigen
 - b) Host antibody
 - c) Monoclonal antibody
 - d) Gene for treatment
 4. Gene therapy is applicable for _____ type of diseases.
 - a) bacterial infection
 - b) chromosome aberration
 - c) physiological disorder
 - d) single gene based mutation
 5. Fluorescence-activated cell sorting is applied for _____.
 - a) microscopic examination
 - b) staining
 - c) charge based separation
 - d) culturing
 6. Oct 4 and Nanog - two transcription factors are maintaining the stem cells in _____ state.
 - a) undifferentiated
 - b) live
 - c) preserved
 - d) un-preserved
 7. Klinefelter's syndrome is caused by a nondisjunction resulting in a genotype of
 - a) YYY
 - b) XYY
 - c) XXX
 - d) XXY
 8. Prenatal diagnosis at 16 weeks of pregnancy can be performed using all of the following, except:
 - a) Amniotic fluid
 - b) Maternal blood
 - c) Chorionic villi
 - d) Fetal blood
- Q.2 Answer the following in short. (Attempt Any Seven) [14]
1. Write a notes on multilocus DNA fingerprinting.
 2. What are the advantages and disadvantages of DNA based Diagnostic methods.
 3. Explain the criteria for gene therapy.
 4. Give examples of vectors utilized for gene therapy.
 5. What is the application of ribozyme in RNAi treatment?
 6. Explain the significance of membrane protein to separate stem cells.
 7. Explain the procedure to separate HSC from peripheral blood.
 8. What are the advantages and disadvantages of DNA based Diagnostic methods.
 9. What are tumor markers?

- Q.3 (A) Discuss Polymerase chain reaction (PCR), including the components of the PCR reaction mixture. [06]
What are the parameters one must take into account while designing the primer?
- (B) Explain Single nucleotide polymorphism (SNP) along with its application. [06]
- OR
- (B) Discuss the procedure of Northern blotting in detail [06]
- Q.4 (A) Give detail note on different types of gene therapy. [06]
- (B) Explain the procedure for antisense technology for therapeutic treatment. [06]
- OR
- (B) Explain treatment procedure for Duchenne muscular dystrophy (DMD) and cystic fibrosis. [06]
- Q.5 (A) Explain methods to prevent spontaneous differentiation during stem cell culture. [06]
- (B) Describe occurrence of stem cells in adult tissues and organs. [06]
- OR
- (B) Explain the scientific advancement indicate future prospects for adult stem cells. [06]
- Q.6 (A) Explain non mendelian disorders in detail giving a suitable example. [06]
- (B) Discuss in detail what are the invasive and non-invasive methods for sample collection. [06]
- OR
- (B) Discuss the legal and ethical parameters for sample collections in detail. [06]
