2013

MEDICAL MOLECULAR BIOLOGY

Time Allotted : 3 Hours *Full Marks :* 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) In which year did National Institute of Health take lead in recombinant DNA (*r*DNA) research regulation ?

a) 1970 b) 1974

c) 1980 d) 1985.

ii) In which year first DNA transfer was done into bone marrow cells ?

a) 1975 b) 1980

c) 1982 d) 1987.

iii) In which year US office of Technology Assessment stressed the difference between somatic and germ-line therapy ?

a) 1982 b) 1984

c) 1987 d) 1989.

iv) In which year did NIH perform first approved gene therapy procedure ?

a) 1985 b) 1990

c) 1997 d) 2003.

v) In which year was first fatality occurred in gene therapy ?

a) 1995 b) 1999

c) 2001 d) 2003.

vi) in which year did FDA place a temporary halt on all gene therapy trials using retroviral vectors in blood stem cells ?

a) 1999 b) 2003

c) 2004 d) 2005.

vii) Some cells of blastocyst (5 to 14 days) are known as

a) Totipotent b) Pluripotent

c) Multipotent d) none of these.

viii) Cells differentiated, but can form a number of other tissues known as

a) Pluripotent b) Multipotent

c) Totipotent d) none of these.

ix) Which novel therapeutic molecule was used to treat human disease ?

a) miRNAs b) antisenseRNAs

c) shRNAs d) siRNAs.

x) Genetic Locus Repetitive behaviours of Autism are discovered on chromosome

a) 10 b) 15

c) 18 d) 22.

xi) Who performs first DNA transfer into bone marrow cells ?

a) Dr. Martin Cline b) Thein

c) Jesse Gelsinger d) none of them.

xii) Who became first fatality in gene therapy ?

a) Jesse Gelsinger b) Anderson

c) Dr. Martin Cline d) None of them.

xiii) Critical period of Brain Development principles is

a) Hearing deficits b) Visual development

c) Mylination d) None of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What is Schizophrenia ? What are the risk factors for Schizophrenia ? 2 + 3

3. What is Autism ? Write about the clinical features of Autism. 2 + 3

4. What is required for Gene Therapy to be possible ?

5. Describe with examples the types of mutagens associated with cancer.

6. How are the hematopoietic stem cells differentiated to blood cells in the bone marrow ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. Write the difference between developmental and acquired disorders. What are the causes of developmental and acquired disorders ? Write the risk factors for CNS development anomalies. Explain briefly the aspect of 'behaviour' critical to child development. 2 + 5 + 4 + 4

8. What is Gene therapy ? What are the approaches for Gene therapy ? Explain. Name three useful viral vectors for Gene

therapy. What are the Gene therapy strategies ? Explain.

2 + 4 + 3 + 6

9. Differentiate between oncogene and tumorsuppressor gene. Describe the mechanisms by which normal cellular protooncogene can be converted to oncogene. How does Retrovirus transform a normal cell to a cancerous cell ?

3 + 6 + 6

10. What is therapeutic cloning ? Describe the procedure of therapeutic cloning. How does it differ from reproductive cloning ? 5 + 7 + 3

11. Briefly describe the hallmarks of cancer proposed by Douglas Hanahan and Robert Weinberg. What is Gleevec ? Describe the mechanism of Gleevec in treatment of cancer. 8 + 2 + 5

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