Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Sc.(H)(BT)/SEM-6/MBT-603/2013

2013

MEDICAL BIOTECHNOLOGY

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 × 1 = 10

i) First successful gene theraphy was done to treat

a) ADA

b) AML

c) Cystic fibrosis

d) Sickle cell anaemia.

ii) Which type of vectors are mostly used in gene theraphy clinical trials ?

a) Retrovirus

b) Pox virus

c) Vaccinia virus

d) Adeno-associated virus.

iii) Who coined the term "Genome" ?

a) Winkler

b) Bateson

c) Johansson

d) Mendel.

iv) Which delivery system designed for long term administration ?

a) Traditional drug dosing

b) Controlled delivery dosing

c) Any of these

d) None of these.

v) Which proteins of adenovirus infleuncing apoptosis

a) E1A

b) E1B19

c) both of these

d) none of these.

vi) Which vector used in gene therapy has proved useful in the treatment of sickle cell disease ?

a) Retrovirus

b) Adenovirus

c) Adeno-associated virus

d) Herpes virus.

vii) CFTR gene present in the chromosome number

a) 7

b) 11

c) x

d) 2.

viii) DNA solution injucted directly into the cell using micromanipulators is called

a) macroinjection

b) micromanipulator mediated DNA delivery

c) microfection

d) microinjection.

ix) Chemicals used for gene transfer method include

a) poly ethylene glycol

b) $CaCl_2$

c) dextran

d) all of these.

x) The bacteria generally used for genetic engineering in palnts is

a) *Bacillus*

b) *Pseudomonas*

c) *Clostridium*

d) *Agrobacterium*.

xi) Genetic engineering is possible, because

a) we can cut DNA at specific sites by endonucleases like DNAase I

b) restriction endonucleases purified from bacteria can be used in vitro

c) the phenomenon of transduction in bacteria is well understood

d) we can see DNA by electron microscope.

xii) "Barmuda agreement" is related to

a) Human Genome Project

b) Global warming

c) Hap Map Project

d) Environmental Pollution.

xiii) Plasmid has been used as vector because

a) it has antibiotic resistance gene

b) it is circular DNA which have capacity to join to eukaryotic DNA

c) Both ends show replication

d) it can move between prokaryotic.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Discuss the control release mechanism.

3. Write a short note on Adeno associated virus gene therapy.

4. Discuss Skin Tissue Engineering.

5. Describe the gene therapy approach for Cancer.

6. What is therapeutic Ribozyme ? Briefly discuss about it.

GROUP – C

(Long Answer Type Questions)

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

7. What is metastasis of cancer cell ? Describe the role of selectin & integrins in cancer progression. Write a short note on cell adhesion molecule. 2 + 8 + 5

8. Define vectors for Somatic Gene Therapy. How to construct retroviral genome for Gene therapy ? What are the advantages of Adeno-associated viral vector system in Gene therapy ? What are the advantages and disadvantages of non-viral vector system in Gene Therapy ? 4 + 3 + 3 + 5

9. Write the role of DNA molecular conjugate in Gene Therapy. Explain how ex vivo Gene therapy can treat ADA deficiency in patients with SCID. Write a short note on in vivo Gene therapy. 5 + 5 + 5

10. What is Xenotransplantation ? What do you mean by chimera ? What is the difference between chimera and mosaic ? Why pig may be the better choice of donor for xenotransplanation in human ? What is hyper-acute rejection ? What is nanomedicine ? 2 + 1 + 2 + 2 + 2 + 3 + 3

11. What are the advantages and disadvantages of tissue engineering ? Explain various approaches of Cancer Gene Therapy. 5 + 10