



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 therapy was done to treat

a) ADA

b) AML

c) Cystic fibrosis

d) Sickle cell anaemia.

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ii) Which type of vectors are mostly used in gene therapy 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 influence 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 injected directly into the cell using micromanipulators is called
- a) macroinjection
 - b) micromanipulator mediated DNA delivery
 - c) microfection
 - d) microinjection.

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- ix) Chemicals used for gene transfer method include
- poly ethylene glycol
 - CaCl_2
 - dextran
 - all of these.
- x) The bacteria generally used for genetic engineering in plants is
- Bacillus*
 - Pseudomonas*
 - Clostridium*
 - Agrobacterium*.
- xi) Genetic engineering is possible, because
- we can cut DNA at specific sites by endonucleases like DNAase I
 - restriction endonucleases purified from bacteria can be used in vitro
 - the phenomenon of transduction in bacteria is well understood
 - we can see DNA by electron microscope.



- xii) "Barmuda agreement" is related to
- Human Genome Project
 - Global warming
 - Hap Map Project
 - Environmental Pollution.
- xiii) Plasmid has been used as vector because
- it has antibiotic resistance gene
 - it is circular DNA which have capacity to join to eukaryotic DNA
 - Both ends show replication
 - it can move between prokaryotic.

GROUP - B

(Short Answer Type Questions)

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

- Discuss the control release mechanism.
- Write a short note on Adeno associated virus gene therapy.
- Discuss Skin Tissue Engineering.
- Describe the gene therapy approach for Cancer.
- What is therapeutic Ribozyme ? Briefly discuss about it.

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GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

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 xenotransplantation 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

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