Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Pharm (NEW)/SEM-6/PT-610B/2011

2011

ADVANCED PHARMACEUTICAL 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 : $10 \times 1 = 10$

i) Which macromolecule do you isolate from a cell in the first step of making a genomic DNA library ?

a) RNA b) DNA

c) Both of these d) None of these.

ii) Which of the following diseases can be cured with gene therapy ?

a) Atherosclerosis b) Bubble boy syndrome

c) Haemophilia d) All of these.

iii) Intones are present in the DNA of

a) prokaryotes b) eukaryotes

c) both (a) and (b) d) bacteria.

iv) DNA amplification by the polymerase chain reaction uses

a) *Thermus aquaticus* DNA polymerase

b) DNA topoisomerase

c) RNA polymerase

d) DNA helicase.

v) Which are enzymes that catalyse addition of nucleoside triphosphate $3^{/}$ – OH terminals of single strands of pre-existing polynucleotide (primers) with release of pyrophosphate ?

a) Transcriptases b) Polymerases

c) Map kinases d) None of these.

vi) Micro-organisms used for commercial production and high yield percentage of chloramphenicol by submerged fermentation is

a) *Streptomyces griseus*

b) *Streptomyces venezuela*

c) *Streptomyces aureofaciens*

d) *Streptomyces kanamyceticus*.

vii) Reverse transcriptase

a) makes a DNA copy of an RNA molecule

b) makes an RNA copy of an RNA molecule

c) makes an RNA copy of a DNA molecule.

viii) Functional genomics deals with

a) identification of genes and their respective functions

b) predictions related to functions of proteins

c) *in vitro* assays and clinical trials

d) measurement of the levels of gene expression in different tissues.

ix) Okazaki fragments are joined with each other by

a) DNA ligase

b) Endonuclease

c) DNA gyrase

d) Topoisomerase.

x) The improvement of an industrially useful microbial strain can be achieved through

a) somanoclonal variation

b) genetic recombination

c) mutation

d) all of these.

xi) Humulin is

a) bacterial insulin produced by E.coli using *r*DNA technology

b) synthetic insulin produced by *r*DNA technology

c) human insulin produced by *E.coli* using *r*DNA technology

d) human insulin expressed in mammalian cells.

xii) Which of the following is an ultrasound contrasting agent ?

a) Carbon nanotube

b) Perfluorate filled nanosomes

c) Dendrimers

d) None of these.

GROUP – B
(Short Answer Type Questions)

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

2. Differentiate between *c*DNA and genomic DNA.

3. Define the following :

a) Bioinformatics

b) Biosensor

c) Biofuels

d) Biochips

e) Biofilms.

4. Why *Taq* polymerase is used in PCR ? Describe the role of *Ampicillin* resistance gene and *Lac Z* gene in *gene cloning* vector.

5. Describe the role of Gene Therapy in the treatment of *Sickle cell anemia*.

6. What are the advantages associated with use of plants as expression system in large scale production of biopharmaceuticals ?

GROUP – C
(Long Answer Type Questions)

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

7. a) Write in short the different steps of PCR.

   b) Mention the advantages, limitations and applications of PCR technology.

   c) Write a short note on genomic DNA library.

   3 + (2 + 2 + 2) + 6

8. Differentiate between the following :

   a) Western blot, southern blot and northern blot techniques.

   b) DNA fingerprinting and DNA footprinting.

   c) Expression system and expression vector. 5 + 5 + 5

9. Define DNA vaccine. What are the key components of DNA vaccines ? Describe the modes of delivery of DNA vaccine. What are the advantages of DNA vaccine over other attenuated vaccine/inactive vaccine ? 1 + 3 + 6 + 5

10. What is transgenic animal ? What are the different methods for creating transgenic animals ? What are their applications ? 2 + 8 + 5

11. a) Briefly enumerate the role of nanotechnology in cancer therapy.

    b) Briefly write down the method of commercial production of erythropoietin by *r*DNA technology.