CS/B.PHARM (OLD)/SEM-7/PT-709B/2011-12
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 the following :   5 × 2 = 10

   i)   Probes are

      a)   single

      b)   double

      c)   single/double

      Stranded DNA fragments are used for

      a)   DNA fingerprinting

      b)   electrophoretic separation of DNA

      c)   *In situ* hybridization.

ii) Primers are oligonucleotide sequences used by

    a) RNA polymerase enzyme

    b) DNA polymerase

    c) DNA ligase.

Primers are oligonucleotide sequences used for the

    a) synthesis of complementary daughter strands

    b) ligation of 2 DNA strand

    c) synthesis of RNA from DNA.

iii) PCR is called

    a) Polymerase chain reaction

    b) polyaromatic chain reaction

    c) polychromatic chain reaction.

PCR involves

    a) amplification

    b) replication of a DNA strand billion fold, outside a cell system.

iv) Biotin auxotrophs are

    a) mutant strains

    b) recombinant strains

    c) hybrids.

Biotin auxotrophs are capable of

    a) utilizing biotin in the medium

    b) synthesis of biotin.

v) Humulin is

    a) bacterial insulin produced by *E. coli*

    b) Synthetic insulin produced by *r* DNA technology

    c) human insulin produced in *E. coli* cells.

GROUP – B

(Short Answer Type Questions)

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

2. What are RLPFs ? How are they generated ? What is the use of RLPFs in biotechnological studies ?　　$1 + 2\frac{1}{2} + 1\frac{1}{2}$

3. Differentiate between the following :

   i) DNA fingerprinting and DNA footprinting

   ii) Western blot, southern blot and northern blot techniques.　　$2\frac{1}{2} + 2\frac{1}{2}$

4. Define *c*DNA. Write short note on its role in recombinant DNA technology.　　$1\frac{1}{2} + 3\frac{1}{2}$

5. Differentiate between conventional PCR and real time PCR. What is the threshold value in a PCR amplification curve ? What is the relation between *Ct* value and abundance of the gene of interest in the sample, when it is being amplified by real time PCR ?　　$1\frac{1}{2} + 1\frac{1}{2} + 2$

6. Write short notes on micro- and nano-technology in the field of medicine.　　5

7. Write short notes on the following :

   i) Gene therapy of tumours

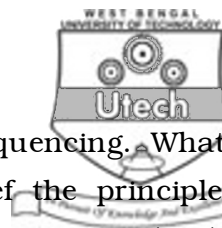   ii) Gene therapy of rheumatoid arthritis.　　$2\frac{1}{2} + 2\frac{1}{2}$

GROUP – C

(Long Answer Type Questions)

Answer any *three* questions.　　3 × 15 = 45

8. What are restriction endonucleases (R.E.) ? What are the different types of R.E. ? What is the role of R.E. in formation of recombinant plasmid vectors ? What are the characteristics of *p*B322 ?　　2 + 3 + 5 + 5

9. Describe the Sanger method of DNA sequencing. What is subtractive hybridization ? Write in brief the principle of protein separation by gel electrophoresis. $5 + 5 + 5$

10. Describe in brief the following :

    i) Industrial production of lysine using mutant stains of micro-organisms.

    ii) Production of Human factor IX in Chinese Hamster ovarian cells using rDNA technology. $7\frac{1}{2} + 7\frac{1}{2}$

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

12. What is the role of rDNA technology in production of improved quality of antibiotics ?

    15

13. What are the advantages of using transgenic plants for large scale production of bio-pharmaceuticals ? Discuss shortly about the threats imposed in using this process. $7\frac{1}{2} + 7\frac{1}{2}$

14. Write short notes on the relationship of bio-informatics and emerging advanced biotechnology in the field of medicine. 15

15. Describe the method of commercial production of

    i) Humulin by rDNA technology

    ii) Erythropoietin by rDNA technology. $7\frac{1}{2} + 7\frac{1}{2}$

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