M.Sc Biotechnology

CHANDGAD - II (C.B.C.S.) (2012 Course) : WINTER - 2015

Sem-II

Subject : Molecular Biology

Day : Tuesday
Date : 13/10/2015

25580

Time : 10.00 AM TO 01.00 PM
Max Marks : 60 Total Pages : 1

N.B.;

1) Q. No. 1 & Q. No. 5 are **COMPULSORY**. Out of the remaining attempt any **TWO** questions from Section – I and any **TWO** questions from Section – II.
2) Answers to both the sections should be written in **SEPARATE** answer books.
3) Draw well labeled diagrams **WHEREVER** necessary.

SECTION – I

Q.1 Answer the following **(10)**

a) What is Tm value of DNA?
b) Define nonsense mutation?
c) What is DNA polymerase switch?
d) State the role of proteins encoded by XP genes?
e) What is Shine Dalgarno sequence?

Q.2
a) Explain the structure and function of telomere. **(05)**
b) Describe the types and role of histone proteins. **(05)**

Q.3 Explain the following with suitable diagrams **(10)**

a) Structure and assembly of DNA polymerase III holoenzyme complex.
b) Excision repair mechanism in *E. coli*.

Q.4 Write short notes on Any **TWO** of the following: **(10)**

a) SOS response
b) Homologous recombination
c) Replicative transposition

SECTION - II

Q.5 Attempt any **TWO** of the following: **(10)**

a) Describe the holoenzyme complex of bacterial RNA polymerase enzyme .
b) Describe the salient features of typical bacterial promoter.
c) Outline the steps involved in termination of eukaryotic transcription and modifications at two ends of primary transcript.

Q.6
a) Explain the role of TATA binding protein in eukaryotic transcription **(05)**
b) What is Rho factor? Explain its role in bacterial transcription? **(05)**

Q.7
a) Explain the role of EfTU, EfTS and EFG in bacterial protein synthesis. **(05)**
b) Explain catabolite repression mechanism giving example of lactose operon. **(05)**

Q.8 Explain the role of Any **TWO** of the following **(10)**

a) Chaperons in protein folding
b) fMet-tRNA in protein synthesis
c) SnRNA in intron splicing

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Subject : Genetic Engineering & Applications

Day : Thursday
Date : 15/10/2015

25581

Time : 10.00 AM TO 01.00 PM
Max Marks : 60 Total Pages : 2

N.B.:

1) Q. No. **1** and Q. No. **5** are **COMPULSORY**.
2) Attempt any **TWO** questions from Q. No. **2**, Q. No. **3**, Q. No. **4**.
3) Attempt any **TWO** questions from Q. No. **6**, Q. No. **7**, Q. No. **8**.
4) All questions carry **EQUAL** marks.
5) Write both sections on **SEPARATE** answer sheets.
6) Draw well labeled diagrams **WHEREVER** is necessary.

SECTION – I

Q.1 **A)** Enlist different vectors based on the following (give two examples of each) **(04)**

a) Phage M13

b) Phage λ

c) pBR322

d) 2μ plasmid in yeast

B) With suitable diagram, explain the principle of following techniques **(06)**

a) PCR

b) Southern blotting and hybridization

c) Agarose gel electrophoresis

Q.2 Write short notes on **(10)**

a) DNA polymerases

b) Phagemids and cosmids

c) Class II restriction endonucleases

d) Nick translation and random priming

Q.3 Explain in detail with suitable diagrams **(any TWO)** **(10)**

a) Applications of Ti plasmids for cloning in plant cells

b) Selectable markers for identification of recombinants. Add a note on in vitro packaging of λ DNA.

c) Different strategies for blunt end DNA ligation

Q.4 Attempt the following **(10)**

a) Elaborate on use of P element for cloning in insect cells

b) What are different methods of direct gene transfer? Add a note on their applications.

c) What are special purpose vectors? Add a note on vectors that facilitate protein purification.

d) Explain in brief importance of cDNA library.

P.T.O.

SECTION – II

Q.5 Answer the following **(Any TWO)** **(10)**

a) Compare and contrast among different yeast vectors. Add a note on YAC vectors

b) What are the advantages and limitations of producing recombinant proteins from yeast and fungi?

c) With the help of suitable diagrams, explain different methods of site directed mutagenesis.

Q.6 Write short notes **(10)**

a) Automated sequencing

b) Different methods of restriction mapping

c) Reporter genes

d) DNase I footprinting

Q.7 Explain in detail, applications of genetic engineering in **(10)**

a) Medicine

b) Agriculture

Q.8 Explain in brief: **(10)**

a) Yeast two hybrid system

b) Expression vectors

c) South-western and north-western cloning

d) Transgenic animals

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Subject : Immunology

Day : Friday
Date : 16/10/2015

25582

Time : 10.00 AM TO 01.00 PM
Max Marks : 60 Total Pages : 1

N.B.:

1) **Q. No. 1** and **Q. No. 5** are **COMPULSORY**. Out of the remaining attempt any **TWO** questions from each section.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the section should be written in **SEPARATE** answer books.
4) Neat diagrams must be drawn **WHEREVER** necessary.

SECTION-I

Q.1 Answer the following in brief. **(10)**

a) Expand the terms – TNF, HAT.
b) Define – "Innate Immunity".
c) Enlist the surface markers on 'T" cells.
d) Name the effectors cells of Humoral Immunity.
e) Why are adjuvants used?

Q.2 Answer the following questions: **(10)**

a) Describe the process of phagocytosis with reference to oxygen dependant mechanism.
b) Diagrammatically explain the structure of IgG.

Q.3 Answer the following questions: **(10)**

a) Discuss the classical pathway of complement activation.
b) What are cytokines? Describe briefly, the properties of cytokines.

Q.4 Write short notes on: **(10)**

a) Agglutination
b) Opsonization

SECTION-II

Q.5 Answer in brief. **(10)**

a) DNA vaccines
b) Tumor markers
c) BCR
d) Anaphylaxis
e) Granzymes

Q.6 Answer the following questions:

a) Discuss "Myesthenia Gravis".
b) Describe the structure and function of "MHC Class I" molecules.

Q.7 Briefly describe: **(10)**

a) Steps involved in B cell maturation.
b) Vaccination schedule in India.

Q.8 Answer in brief: **(10)**

a) Discuss the techniques of "ELISPOT" Assay.
b) Describe the techniques of autoimmunity giving one clinical example for each type.

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