M.Sc Sem II
2012

Subject : Molecular Biology

Day : Thursday
Date : 06/04/2017

34752

Time : 02.00 PM TO 05.00 PM
Max Marks : 60 Total Pages : 1

N.B.:

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

SECTION - I

Q.1 Answer **ANY FIVE** of the following in brief: **[10]**

a) Write the names of two scientists who contributed in deciphering of genetic code. State their discovery.
b) What is hyperchromic effect?
c) Define frame shift mutation.
d) Draw the structure of phosphodiester linkage.
e) What is C-valve paradox?
f) What is TATA less promoter?

Q.2 a) Describe the structure and role of centromere. **[05]**
b) Describe the types, important features and role of histone proteins. **[05]**

Q.3 a) Enlist different DNA polymerases in bacteria and explain the role of each. **[05]**
b) Explain mismatch repair mechanism in detail. **[05]**

Q.4 Write short notes on **ANY TWO** of the following: **[10]**

a) SOS response
b) Rho factor
c) Holliday model of recombination

SECTION - II

Q.5 a) Describe the interaction of regions of sigma factor with consensus sequences of typical bacterial promoter. **[05]**
b) Write the important role of TATA binding protein with reference to transcription by RNA polymerase I, II and III. **[05]**

Q.6 Answer **ANY TWO** of the following: **[10]**

a) Give the structure of eukaryotic RNA polymerase II, describing the role of its carboxy terminal domain in synthesis of mRNA.
b) Describe the role of initiation factors in synthesis of protein in *E.coli.*
c) State the role of following in prokaryotic protein synthesis
i) EF - Tu ii) EF - Ts iii) Peptidyl transferase
iv) EF G v) Stop codon

Q.7 Answer **ANY TWO** of the following: **[10]**

a) What are splice junctions? Describe the mechanism of mRNA splicing through lariat formation.
b) Elaborate on the role of U2, U4 and U6 Sn RNA complexes in spliceosome assembly pathway.
c) Explain the mechanism of catabolite repression in lactose operon.

Q.8 Write short notes on **ANY TWO** of the following: **[10]**

a) Post translational modification of proteins
b) Wobble hypothesis
c) Leader sequence

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CHANDGAD - II (C.B.C.S.) (2012 Course) : SUMMER - 2017

Subject : Genetic Engineering & Applications

Day : Monday
Date : 10/04/2017

34753

Time : 02.00 PM TO 05.00 PM
Max Marks : 60 Total Pages : 1

N.B:

1) Q. No.1 and Q. No.5 are **COMPULSORY.**
2) Attempt **ANY TWO** questions from Q.2, Q.3 and Q.4.
3) Attempt **ANY TWO** questions from Q.6, Q.7 and Q.8.
4) Draw well labeled diagrams **WHEREVER** necessary.
5) Answer to both the sections to be written on **SEPARATE** answer sheet.

SECTION-I

Q.1 Elaborate on: **(10)**

a) Cosmid vectors.
b) M 13 mp series vectors.
c) BACs.
d) Vectors that facilitate protein export.

Q.2 Explain in brief: **(10)**

a) Characteristics of three classes of restriction endonucleases.
b) DNA modifying enzymes.
c) Different methods of labeling of DNA.
D) Cloning vectors for higher plants.

Q.3 Attempt the following: **(10)**

a) Enlist different modifications of PCR. Elaborate on any one of them.
b) Elaborate on: different methods for screening the recombinant clones.

Q.4 Answer the following: **(10)**

a) With the help of suitable diagrams explain the strategies for full length cDNA cloning.
b) Explain in detail: expression vectors w.r.t strong promoters in *E.coli*, yeast and fungi and regulation of their expression.

SECTION-II

Q.5 Compare and contrast: **(10)**

a) Sanger's method and Maxam-Gilbert method of sequencing.
b) Different vectors for cloning in yeast.

Q.6 Attempt the following: **(10)**

a) Explain in detail use of primer extension method and PCR for site directed mutagenesis.
b) Enlist different methods of transcript analysis. Elaborate on any one of them.

Q.7 Write short notes: **(10)**

a) Restriction mapping
b) Phage display
c) Reporter genes
d) Recombinant proteins from transgenic animals

Q.8 Elaborate on: **(10)**

a) Gene therapy
b) Insect resistant plants

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CHANDGAD - II (C.B.C.S.) (2012 Course) : SUMMER - 2017

Subject : Immunology

Day : Wednesday
Date : 12/04/2017

34754

Time : 02.00 PM TO 05.00 PM
Max Marks : 60 Total Pages : 1

N.B.:

1) **Q.No.1** and **Q. No.5** are **COMPULSORY**.
2) Attempt any **TWO** questions from **Q.No. 2, 3 & 4.**
3) Attempt any **TWO** questions from **Q.No. 6,7 & 8.**
4) Answer to both the sections should be written in **SEPARATE** answer book.

SECTION-I

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

a) Name the blood cells that migrate into tissues and play important role in the development of allergies.
b) Which subunits of IL-2 receptor are expressed on resting and activated T-cells?
c) Name two accessory molecules required for antigen activation by naive CTL-P.
d) Give an example of a live attenuated vaccine.
e) Expand the terms ;JAK, STAT.

Q2 Answer the following questions: **(10)**

a) Draw the diagram and describe the structure of TCR.
b) Explain the terms: isotype, allotype and idiotype.

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

a) Discuss the endocytic pathway for processing and presentation of endogenous antigens.
b) Discuss the structure and functions of different classes of immunoglobulins?

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

a) Mucosal immunity at GI
b) Role of NK cells in innate immunity
c) T dependant and T indépendant antigens

SECTION-II

Q.5 a) How are hypersensitivity reactions classified? Give one clinical example of each type. **(05)**

b) What are vaccines? Discuss various types of vaccines. **(05)**

Q.6 Answer **Any TWO** of the following: **(10)**

a) Discuss the role of CD 4- T cells in immune response
b) ELISPOT
c) Immunoelectrophoresis

Q.7 Describe **Any TWO** of the following: **(10)**

a) Soluble tumor markers
b) Neutrophils
c) Acquired immunity

Q.8 Describe the role of TCR and other accessory molecules on T-cells required for T-cell interaction with APC, B-cell and target cell. **(10)**

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