S.Y. B.Sc Sem. IV
IV

Subject : Environmental Biotechnology

Day : Tuesday
Date : 04/04/2017

34725

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

N.B.:

1) **Q.N0.1** and **Q.No.5** are **COMPULSORY**. Out of the remaining questions attempt **ANY TWO** questions from each sections.
2) Answers to both the sections should be written in **SEPARATE** answer books.
3) Figures to the right indicate **FULL** marks.

SECTION – I

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

a) Give structure of the atmosphere.
b) What is composition of lithosphere?
c) Elaborate on abiotic factors of grassland ecosystem.
d) What is the significance of sustainable development?
e) Discuss the ecological significance of biodiversity.
f) Enlist the characteristics of biosphere.

Q.2 Answer the following: **[10]**

a) Mention the significance of biotic factors in any ecosystem.
b) Discuss various problems associated with climate change.

Q.3 Answer the following: **[10]**

a) What is meant by biogeochemical cycle? Explain any one of it.
b) Mention various types of natural resources and their current status.

Q.4 Answer the following: **[10]**

a) Define biodiversity and explain the need for its conservation.
b) Describe hydrological cycle in nature.

SECTION – II

Q.5 Answer the following: **[10]**

a) What is pollution? Give the classification of pollutants.
b) Mention the sources of solid waste generation and its management.

Q.6 Answer the following: **[10]**

a) Give significance of dissolved oxygen in detecting waste water pollution.
b) Describe the effects of radiation.

Q.7 Write short notes on the following: **[10]**

a) Biomedical waste
b) Biogas

Q.8 Discuss sources of noise pollution and add a note on noise pollution control. **[10]**

OR

Methods of air pollution monitoring techniques and add a note on effect on plants and atmosphere.

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RAIGAD - IV (CBCS - 2015 COURSE) : SUMMER - 2017

Subject : Fundamentals in Molecular Biology

Day : Friday
Date : 07/04/2017

34726

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**. Answer **ANY TWO** from questions **2, 3** and **4** from section **I** and **6, 7** and **8** from section **II**.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SEPARATE** answer books.

SECTION - I

Q. 1 Attempt **ANY FIVE** of the following: **(10)**

a) Comment on role of dna A and dna B proteins in DNA replication.
b) Comment on" direct repair" mechanism.
c) Define ORF.
d) Describe a regulatory gene.
e) Comment on the concept of an operon.
f) Define transcription factors.

Q. 2 Answer the following:

a) Write a note on the structure and function of DNA polymerase–I. **(05)**

b) Describe the reactions involved in amino-acylation or charging of tRNA molecule. **(05)**

Q. 3 Answer the following:

a) Describe the mechanism of mismatch repair. **(05)**

b) Give the important features of a typical RNA polymerase–II promoter. **(05)**

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

a) Inhibitors of translation
b) Role of DNA glycolysis and AP endonuclease in base excision repair.

SECTION - II

Q. 5 Attempt **ANY FIVE** of the following: **(10)**

a) Spliceosomes
b) TATA binding protein
c) Polycistronic mRNA
d) Abortive initiation
e) Release factors
f) State two mechanisms of termination of prokaryotic transcription.

Q. 6 Answer the following:

a) Diagrammatically represent poly (A) tail. **(05)**
b) Explain the structure and function of RNA polymerase in prokaryotes. **(05)**

Q. 7 Compare and Contrast: **(10)**

a) Prokaryotic and Eukaryotic mRNA.
b) Initiation of protein synthesis in prokaryotes and eukaryotes.

Q. 8 Explain the role of cAMP and CAP in regulation of lactose operon in detail. **(10)**

OR

Explain in brief the process of initiation and elongation in prokaryotic translation? **(10)**

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34727

RAIGAD – IV (CBCS – 2015 COURSE) : SUMMER – 2017
SUBJECT : DEVELOPMENTAL BIOLOGY

Day : Tuesday
Date 11/04/2017

Time : 10.00 AM TO 01.00 PM
Max. Marks : 60

N.B.

1) Q.1 and Q.5 are **COMPULSORY.** Answer any **TWO** questions from Section – I and Section – II.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SEPARATE** answer book.
4) Draw neat and labeled diagrams wherever necessary.

SECTION – I

Q.1 Attempt any **FIVE** of the following: **(10)**

a) Define apoptosis.
b) Define meroblastic cleavage.
c) Define spermatogenesis.
d) What is totipotent cell?
e) What are transgenic plants?
f) Define Embryology.

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

a) Explain the stages of meiosis-II.
b) Describe the structure of hen's egg.

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

a) Differentiate between blastula of frog and blastula of chick.
b) Describe the process of activation of ovum during fertilization.

Q.4 Write short notes on any **TWO** of the following; **(10)**

a) What is apoptosis? Differentiate between apoptosis and necrosis.
b) Give an account of different types of stem cells.
c) Describe the role of genes in development.

SECTION – II

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

a) Explain the process of oogenesis.
b) Describe the structure of gastrula in chick.
c) Describe acrosome reaction and penetration during the process of fertilization.

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

a) Explain the process of implantation of human embryo.
b) Describe cloning in mammals.

Q.7 Attempt the following questions; **(10)**

a) Describe the structure of mature spermatozoa.
b) Describe the process of gastrulation in frog.

Q.8 Attempt the following questions: **(10)**

a) Define cancer. Describe teratogenesis in animals.
b) Explain the concepts of re-differentiation and trans-differentiation.

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RAIGAD - IV (2010 Course) : SUMMER - 2017

Subject : Analytical Techniques

Day : Tuesday
Date : 11/04/2017

34741

Time : 10.00 AM TO 01.00 PM
Max Marks : 80 Total Pages : 2

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SEPARATE** answer book.

SECTION-I

Q.1 A) Attempt any **ONE** of the following: **(06)**

i) What is chromatography? Explain the principle and classify the basis of various retention mechanisms.

ii) What is the principle behind centrifugation? Describe different types of centrifuges with their biotechnological applications.

iii) Describe separation of amino acids by paper chromatography? How can you separate two closely associated molecules?

B) Attempt any **TWO** of the following: **(10)**

i) Explain the various components of a pH meter with a neat labeled diagram. What special care is required to maintenance of the electrodes?

ii) Describe the Kjeldahl method for the estimation of nitrogen.

iii) Discuss the principle and procedure of flame photometric estimation of Na.

Q.2 Write short notes on any **FOUR** of the following: **(16)**

i) HPLC: merits and limitations
ii) Gravimetric estimation of iron
iii) Colorimetric estimation of inorganic phosphate
iv) Titrimetric estimation of chloride
v) Differential centrifugation versus density gradient centrifugation

SECTION-II

Q.3 A) Attempt any **ONE** of the following: **(06)**

i) What is the principle behind electrophoretic separations? Describe setup and comment on the various factors that influence them.

ii) Explain 'lyophilization' with the applications in biotechnology.

iii) What is the principle behind ion exchange chromatography? Describe setup and comment on the various factors that influence them.

P. T. O.

B) Attempt any **TWO** of the following: **(10)**

i) What are aseptic methods? Describe the operational details and applications of any one such method.

ii) Describe the various methods of food preservations with their industrial applications.

iii) Describe the theory of spectrophotometry and describe its application.

Q.4 Write short notes on any **FOUR** of the following: **(16)**

i) Gel filtration

ii) PAGE

iii) Affinity chromatography

iv) Centrifuge rotors

v) Ultra filtration

Q.5 Answer the following: **(ANY EIGHT)** **(16)**

i) What is the difference between partition and adsorption chromatography?

ii) What is the role of TEMED in electrophoresis?

iii) Draw the structure of SDS. What is its role in PAGE?

iv) What is the role of nebulizer in flame photometry?

v) Name two materials used for obtaining density gradients in centrifugal separations.

vi) What are the tonic effects of fluoride and arsenic ions from potable water?

vii) What would be the $\left[H^{+}\right]$ of a solution whose pH is 8.0?

viii) What are standard buffers? What are they used for ?

ix) What is isopycnic centrifugation?

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