

Total No. of Questions : 5]

SEAT No. :

P1031

[Total No. of Pages : 3

[4819] - 1

F. Y. B. Sc.

BIOTECHNOLOGY

CHEMISTRY

Bb - 101 : Fundamentals of Chemistry

(2008 Pattern)

*Time :3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Draw neat and labelled diagrams wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of logarithmic table and calculator is allowed.*

**Q1)** Answer the following

**[16]**

- a). A sample of gas occupies 1.50 litre at 25°C. If the temperature is raised to 60°C, What is the new volume of the gas if pressure remains constant?
- b) Define order of reaction.If the rate expression for the reaction is.

$$\frac{dx}{dt} = K[A]^{1/2}[B] \text{ What is over all order of the reaction.}$$

- c) Why is the freezing point depression of 0.1M sodium chloride solution is nearly twice that of 0.1M glucose solution?
- d) State 'Gibb's phase rule'.
- e) What is cell constant? How is it related to conductivity?
- f) Formulate the cell, if the cell reaction is
$$2Ag_{(s)} + 2Cl^{-} + Cu^{++} \rightleftharpoons 2Ag^{Cl}_{(s)} + Cu_{(s)}.$$
- g) Explain the representation of an organic molecule using New man's projection formula.
- h) Explain the formation of covalent bond with suitable example.

**P.T.O.**

**Q2)** Attempt any four of the following **[16]**

- a) What are the assumptions of kinetic theory of gases?
- b) Derive thermodynamically.  $\Pi = CRT$
- c) What is rate of reaction ? How is the rate constant of first order reaction determined graphically?
- d) What is meant by a cooling curve? Draw and discuss the cooling curve for a two component system in which the two component are not miscible in solid state and form a eutectic mixture.
- e) What are buffer solutions? Derive Henderson's equation for basic buffer.
- f) What are the different types of overlap between S and P orbitals?. Explain with suitable examples.

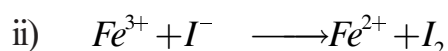
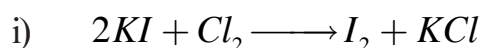
**Q3)** Attempt any four of the following **[16]**

- a) Discuss with neat diagram how is the molecular weight of solute obtained from boiling point elevation?
- b) What is hydrogen bond? Explain different types of hydrogen bond.
- c) What is half cell potential? Derive Nernst equation for the following reaction  $aA + bB \rightleftharpoons cC + dD$ .
- d) A second order with equal concentration of reactant, is 25% Completed in 30 seconds. How long will it take for 50% Completion.
- e) A solution of urea in water has boiling point of  $100.15^{\circ}\text{C}$ . Calculate the freezing point of the same solution if  $K_f$  and  $K_b$  for water are  $1.87 \text{ K kg mole}^{-1}$  and  $0.52 \text{ K Kg mole}^{-1}$  respectively.
- f) Draw and discuss the phase diagram for the lead - silver system.

**Q4)** Attempt any four of the following **[16]**

- a) Discuss the conformational isomerism in ethane using energy profile diagram. Comment on the stability of conformation.
- b) What is addition reaction? Discuss the addition of HBr to propane. What is major product?
- c) What is optical activity? Explain the necessary conditions for a molecule to be optically active.

d) Find the oxidation half reaction and reduction half reaction from the following equations.



e) 0.5 N solution of dibasic acid surrounding two platinum electrodes 2.3 Cm apart and 4.6 Cm<sup>2</sup> in area was found to offer a resistance of 25 Ohm at 30°C. Calculate the specific, equivalent and molecular conductance of the solution at the same temperature.

f) The standard electrode potential for oxidation reaction of Zn| Zn<sup>++</sup> (a =1) electrode is 0.7618 V at 25°C. Calculate the single electrode potential of same electrode when activity of Zn<sup>++</sup> ion is 0.01 at the same temperature.

**Q5)** Attempt any two of the following **[16]**

a) Discuss Debye - Huckel theory for strong electrolyte. Write the Onsagar equation.

b) Explain in details the following applications of emf measurement.

i) Solubility of sparingly soluble salts.

ii) Potentiometric determination of P<sup>H</sup>.

c) What is the principle underlying conductometric titrations? Discuss and sketch the curves which you could obtain for the titrations of.

i) Strong acid and strong base

ii) Strong base and weak acid.

Explain the significance of each curve.



Total No. of Questions : 5]

SEAT No. :

**P1046**

[4819] - 11

[Total No. of Pages :2

**S.Y. B.Sc. (Semester - I)**

**BIOTECHNOLOGY**

**Bb -211 : Genetics and Immunology**

**(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat labelled diagram wherever necessary.*

**Q1)** Attempt the following:

**[10 × 2 = 20]**

- a) Difference between transition and transversion mutations.
- b) Define Corepressor.
- c) What is an allele?
- d) Define F<sub>1</sub> & F<sub>2</sub> generations.
- e) What are stringent plasmids?
- f) Define immunoglobulin.
- g) Ig E and its significance.
- h) Immunological memory.
- i) Epitope and Paratope.
- j) Significance of MHC.

**Q2) a)** Explain in detail high frequency recombination in bacteria.

**[8]**

OR

- a) What is tryptophan operon? Enumerate the genes involved in the operon and explain the mechanism of gene regulation.
- b) What are complementary genes? With a suitable example, explain how they affect mendelian ratios.

**[7]**

OR

- b) What are transposons? Write in detail, the mechanism of transposition in Eukaryotes.

**P.T.O.**

**Q3)** Answer the following (any three):

**[3 × 5 = 15]**

- a) Differentiate between active and passive immunization.
- b) Write steps and symptoms of Inflammation.
- c) HAT - Selection.
- d) Differentiate between killed and attenuated vaccines.
- e) Clonal selection theory.

**Q4)** a) Describe in detail the humoral and cell mediated immune response. **[8]**

OR

- a) Explain various types of ELISA and write its application.
- b) Describe the fine structure of immunoglobulin molecules and write their functions. **[7]**

OR

- b) Write working principle of FACS and its application.

**Q5)** Write in brief on (any three):

**[3 × 5 = 15]**

- a) What are lethal genes? Explain with a suitable example.
- b) Define aneuploidy. Explain types of aneuploidy and discuss their biological significance.
- c) Write a short note on sexduction in bacteria.
- d) Define mutations. Discuss the mechanism of frame shift mutations and base substitutions.
- e) What is gene linkage and linkage maps? Add a note on their significance.



Total No. of Questions : 5]

SEAT No. :

**P1047**

[4819] - 12

[Total No. of Pages :2

**S.Y. B.Sc. (Semester - I)**  
**BIOTECHNOLOGY**  
**Bb -212 : Cell Biology**  
**(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat labelled diagrams wherever necessary.*

**Q1)** Answer in brief:

**[10 × 2 = 20]**

- a) Define: Multipass transmembrane proteins.
- b) Enlist different types of cell shapes.
- c) Give role of clathrin coated vesicles.
- d) Comment on diplotene phase in meiosis.
- e) Write role of epithelial tissue.
- f) Define : Secondary messenger. Give one example.
- g) Give the principle of density gradient centrifugation technique.
- h) Write the role of fibronectin in ECM.
- i) Just before M phase the chromosome content becomes double, Justify.
- j) Define G<sub>2</sub> phase of cell cycle.

**Q2)** Short notes (Any three)

**[3 × 5 = 15]**

- a) Cell cycle regulation
- b) Protein targeting to lysosomes.
- c) Tissue of mesodermal origin.
- d) Neat labelled diagram of chloroplast.

**P.T.O.**

**Q3)** Attempt any three of the following:

**[3 × 5 = 15]**

- a) What are plasmodesmata? Explain its structure
- b) Write a note on phase contrast microscopy.
- c) Define apoptosis. Explain the cellular events that take place in apoptosis.
- d) Comment on axoneme structure.

**Q4)** Explain in detail structure and function of nucleus

**[15]**

OR

Explain in detail the concept of cytoskeleton, its components and functions.

**Q5) a)** Describe JAK - STAT pathway

**[7]**

b) Explain in detail generation of action potential and conduction of nerve impulse

**[8]**



Total No. of Questions : 5]

SEAT No. :

**P1048**

**[4819] - 13**

[Total No. of Pages :2

**S.Y. B.Sc. (Semester - I)**  
**BIOTECHNOLOGY**  
**Bb -213 : Molecular Biology**  
**(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat labelled diagrams wherever necessary.*

**Q1)** Answer in brief:

**[10 × 2 = 20]**

- a) Define: TATA box
- b) What is euchromatin and where it is located?
- c) Explain degeneracy of genetic code with suitable example.
- d) Write the role of DNA gyrase enzyme.
- e) What is hypochromic shift?
- f) Give the importance of know fragment
- g) Define: Frame shift mutation.
- h) What is the role of tRNA acceptor arm in protein synthesis?
- i) What are ribozymes?
- j) Enlist any four inhibitors of translation.

**Q2)** Short notes (Any three)

**[3 × 5 = 15]**

- a) Harshey and chase experiment
- b) T<sub>m</sub> of DNA
- c) Importance of Telomerase enzyme in eukaryotes.
- d) Explain Lac operon in brief.

**P.T.O.**



**Q3) a)** Explain the process of DNA replication in prokaryotes [7]

OR

Comment on different levels of eukaryotic genome. [7]

b) What are alkylating agents? Explain the mechanism of action of 5 bromo uracil in mutations. [8]

**Q4) a)** Explain the mechanism of attenuation in detail [7]

OR

Explain the mechanism of splicing of Type II introns. [7]

b) Describe different binding sites of tRNA. and explain wobble Hypothesis. [8]

**Q5)** What is post translational modification of proteins? Explain various post translational modifications of proteins. Add a note on protein transport [15]

OR

What are elongation factors? Explain elongation in translation process. Add a note on translation inhibitors



Total No. of Questions : 5]

SEAT No. :

P1032

[Total No. of Pages : 3

**[4819] - 2**  
**F.Y. B.Sc.**  
**BIOTECHNOLOGY**  
**PHYSICS**  
**Bb - 102 : Fundamentals of Physics**  
**(2008 Pattern)**

*Time :3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answers should be specific and to the point.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of calculator is allowed.*

**Q1)** Answer the following questions :

**[16]**

- a) Define magnetic flux. Give its SI unit.
- b) State Brewster' s law.
- c) Explain Fraunhofer diffraction.
- d) What are the base units in SI system?
- e) Define : Gauge pressure
- f) Define : Calorie
- g) If the efficiency of a refrigerator is 20% the find its co-efficient of performance.
- h) The maximum value of the permeability of some metals is 0.130 T-m/A. Find the value of relative permeability and susceptibility. Given  $\mu_0 4 \pi \times 10^{-7} \text{ T - m / A}$

**Q2)** Attempt any four :

**[16]**

- a) Which fields are included in the life sciences? Discuss the interrelationship between physics and life sciences.
- b) Define the standard units
  - i) Temperature
  - ii) Electric current

**P.T.O.**

- c) Define stress and explain its different types.
- d) State Pascal's principle and show that the work done on the input piston by the applied force is equal to the work done by the output piston in lifting the load placed on it.
- e) A reversible engine converts one fourth of the heat into the work. When the temperature of the sink is decreased by  $60^\circ \text{K}$ , its efficiency is doubled. Find the temperature of the source and the sink.
- f) Define the beat. Give its application.

**Q3) Attempt any four :**

**[16]**

- a) Explain the vapour compression refrigeration cycle.
- b) What is Reynold's number? Give its significance.
- c) State any four practical applications of surface tension.
- d) Explain zeroth law of thermodynamic and give its significance.
- e) Define efficiency of refrigerator. Find the efficiency of a refrigerator if co-efficient of performance is 9.
- f) Wavelength of two sound notes in air are  $65/130\text{m}$  and  $65/135\text{m}$  respectively. When each of These notes produces 3 beats per second with a third note of fixed frequency, find the frequency of third note.

**Q4) Attempt any two :**

**[16]**

- a) Show that an organ pipe at both ends produces both even and odd harmonics two open organ pipes open at both ends sounding simultaneously produce 5 beats per second. If the smaller pipe is 66 cm long then determine the length of the bigger organ pipe (speed of sound in air =  $330\text{m/s}$ )
- b) Describe a Carnot cycle with the help of neat diagram.
- c) Define:
  - i) Magnetisation.
  - ii) Magnetic dipole.
  - iii) Magnetic permeability
  - iv) Magnetic susceptibility

**Q5)**

**[16]**

- a) What is meant by LASER? Explain properties of LASER beam and give some application of LASER.
- b) State and explain Brewster's law. A ray of light is incident on the surface of a glass plate of refractive index 1.536 at polarizing angle. Calculate the angle of refraction.

OR

- a) With the help of suitable diagram explain the principle, construction and working of Pitot's tube. Derive the necessary formula.
- b) Explain the rotating cylinder method to find the viscosity of thick liquid.



Total No. of Questions : 5]

SEAT No. :

**P1049**

[4819] - 21

[Total No. of Pages :2

**S.Y. B.Sc. (Semester - II)**

**BIOTECHNOLOGY**

**Bb -221 : Environmental Biology and Biotechnology  
(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) All questions are compulsory.*
- 2) Figures to the right indicate full marks.*
- 3) Draw neat and labelled diagrams wherever necessary.*

**Q1)** Answer the following in brief:

**[10 × 2 = 20]**

- a) What is atmosphere?
- b) What is detritus food chain?
- c) Enlist two causes of air pollution.
- d) Define entrophication.
- e) What is synecology?
- f) What is bioremediation?
- g) Define homeostasis.
- h) What are seral stages?
- i) Define nudation.
- j) Define Net primary productivity.

**Q2)** Attempt any three of the following:

**[3 × 5 = 15]**

- a) Write a short note on ozone depletion.
- b) Explain Gaia's hypothesis.
- c) Write a note on Shelford's law of tolerance with examples.
- d) Briefly describe pyramid of energy.

**P.T.O.**

- Q3) a)** Explain in detail the various components of an ecosystem, describing its stratification with appropriate examples. [8]

OR

Explain the structure and energy flow in terrestrial ecosystems.

- b) Give a description of succession in the hydrosere. [7]

OR

Describe the stages involved in primary succession

- Q4) a)** What is water pollution? Elucidate the various causes and consequences of water pollution. [8]

OR

What is food spoilage? Enumerate the causes of food spoilage and prevention in meat products.

- b) With the help of diagram, describe Phosphorus/ Nitrogen cycle. (any one) [7]

- Q5) a)** Write in detail the methods involved in waste disposal. [8]

OR

What is biotransformation ? Discuss with reference to aromatic compounds and plastics.

- b) What are biosensors/ Write on their role in detection of chemical pollutants. [7]

OR

Give an account of heavy metal pollution.



Total No. of Questions : 6]

SEAT No. :

**P1050**

[4819] - 22

[Total No. of Pages : 3

**S.Y. B.Sc. (Semester - II)**

**BIOTECHNOLOGY**

**Bb - 222 : Plant and Animal Tissue Culture**

**(2008 Pattern)**

*[Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answers to both the sections should be written on separate answer sheets.*
- 3) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Answer any six in brief

**[6 × 2 = 12]**

- a) What are calliclones?
- b) Explain the principle of laminar Air flow cabinet.
- c) Give application of meristem culture
- d) What are cryoprotectants.
- e) What do you mean by 'subculture'.
- f) Differentiate between pollen and haploid culture.
- g) Define biotransformation.
- h) What is somatic embryogenesis.

**Q2)** Attempt any three of the following:

**[3 × 4 = 12]**

- a) Write a note on protoplast culture.
- b) Write a note on direct and indirect organogenesis.

**P.T.O.**

- c) Comment on role of cytokinins in PTC.
- d) Briefly discuss factors affecting haploid production using anthers or pollen.
- e) Discuss in short procedures used for the surface sterilization of explants.

**Q3)** a) What is somatic hybridization? Discuss the methodology and its applications. [8]

OR

Discuss in detail methods for germplasm conservation.

b) Discuss the methods involved in production of transgenic plants. [8]

### SECTION - II

**Q4)** Attempt in brief (Any six) [6 × 2 = 12]

- a) Enlist the names of enzymes used in tissue disaggregation.
- b) Justify the use of inverted Microscope in ATC lab.
- c) What are cell banks and cell repositories
- d) Give the names of serum substitutes used in cell culture.
- e) Name the technique used in isoenzyme analysis.
- f) Define - confluence.
- g) Write the significance of feeder layer.
- h) How conditioned media differs from complete media?



**Q5)** Write short notes on any three:

**[3 × 4 = 12]**

- a) Naming a cell line.
- b) Sterility testing.
- c) Proliferation and differentiation.
- d) Suspension culture.
- e) Uneven growth.

**Q6)** What are insect cell lines? How are these established and maintained? **[16]**

OR

- a) Write an essay on organ culture. **[8]**
- b) Compare and contrast between chromosome banding and chromosome painting. **[8]**



Total No. of Questions : 5]

SEAT No. :

**P1051**

[4819] - 23

[Total No. of Pages : 4

**S.Y. B.Sc. (Semester - II)**

**BIOTECHNOLOGY**

**Bb -223 : English**

**(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

**Q1)** Read the passage carefully and answer the questions given:

The present way of teaching the visually handicapped was invented by a frenchman called Louis Braille who became blind at an early age of three. Before this, books for the blind were written in the usual letters of the alphabet raised up by being pressed from the wrong side, so that would be felt with the fingers. But this way was not so good as the present one for, unless the letters were fairly large, their shapes would not be felt by the fingers.

Certain signs are used in the dot way or Braille method of writing. The different letters of English alphabet are made by changing the positions of the dots.

Blind boys often learn shorthand. They can sometimes take down as many as eighty words a minute. They can also type their notes very quickly.

They can weave mats and do many other things. They can play harmonium and other musical instruments. Many blind people have been great musicians. Blind girls, too, can do many useful things. They can sew, weave, do needlework and make paper flowers and baskets beautifully.

- i) What wonderful things can the blind boys do? [2]
- ii) Who was Louis Braille? [2]
- iii) What is the purpose of this text? [2]
- iv) Why was the old method of writing letters not good? [2]

**P.T.O.**

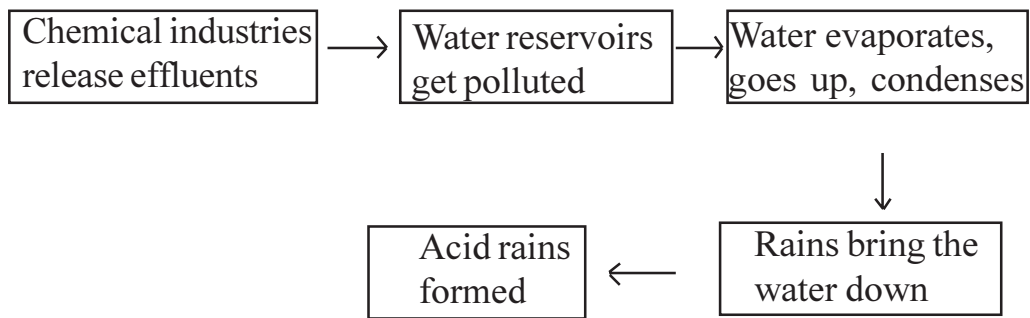
- b) Expand any one of the following ideas in fifteen sentences. [8]
- i) Perseverance is the key to success.
  - ii) Travelling broadens the mind.

- Q2) a) Complete the following table using noun, verb or adjective forms of words given: [6]

Noun	Verb	Adjective
Poverty		
	Succeed	
		beautiful
application		
	Produce	
		disagreeable

- b) Provide one word for the following group of words (any four): [4]
- i) An institution for learning.
  - ii) The one who possesses many skills.
  - iii) Any person closely attached to books or addicted to study.
  - iv) A person who is master in medical treatment of children.
  - v) The one who practices prosecution. Legal rights and judicial matters.
- c) Use correct forms of verbs and complete the sentence (any four) [4]
- i) I (See) Kumar this week.
  - ii) I (Study) English for five years
  - iii) The earth (Move) around the sun.
  - iv) He (have) a mill in this town.
  - v) I (hear) that noise yesterday.
- d) Use articles a, an, the and complete the paragraph. [2]
- \_\_\_\_\_ apple \_\_\_\_\_ day keeps \_\_\_\_\_ doctor away. This is \_\_\_\_\_ very true proverb in today's world.

- Q3) a)** Convert the following information in the form of a paragraph. of about fifteen sentences and give a suitable title [8]



- b) Write a paragraph describing the process of making online payment using your debit card, with the help of following points: [8]

[Website for purchase - select item - pay - select which card - details of the card - password - submit - receipt - save]

- Q4) a)** Write a precis of the following paragraph to its one third length. Suggest a suitable title. provide the rough draft also. [8]

Many people equate poverty with dignity they believe that poor people are virtuous, simple honest and their thinking is very high, while every rich person is necessarily cruel and bad. We must distinguish between poverty and poor people and wealth and wealthy people, Poverty is certainly bad but poor people may be good or bad, wealth is good but what rich people do with wealth may not be good. There is no point in glorifying poverty because poor people are good or honest not because they are poor, Neither are rich people bad because they are rich. Good or bad people are found everywhere, so instead of finding faults with the rich, let us try to lift the poor people out of poverty.

- b) Edit the following paragraph making corrections in spelling and punctuation. [8]

Good morning students said the teacher the students wished back today we will learn what are figures of speach said the teacher suddenly one student stood up and asked teacher what is the meaning of speech the teacher replied amol will you have some patience i will explain every thing

OR

As a press reporter prepare a report of the science day exhibition held by S.N. Desai College, Pune. [8]

- Q5) a)** As the head of department of Microbiology of your college, write a letter to a supplier placing order for the black boards and white marker boards necessary for college classrooms and laboratories. **[8]**
- b)** Form one word each with the following prefixes and suffixes **[8]**  
Prefixes : Un \_\_\_\_\_ , grand \_\_\_\_\_ , de \_\_\_\_\_ , pro \_\_\_\_\_  
Suffixes : \_\_\_\_\_ ty, \_\_\_\_\_ hood, \_\_\_\_\_ es, \_\_\_\_\_ ify



Total No. of Questions : 5]

SEAT No. :

**P1052**

[4819] - 24

[Total No. of Pages :2

**S.Y. B.Sc. (Semester - II)**

**BIOTECHNOLOGY**

**Bb -224 : Metabolic Pathways**

**(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat diagrams wherever necessary.*

**Q1)** Attempt the following in 2-3 sentences.

**[10 × 2 = 20]**

- a) What are exergonic and endergonic reactions?
- b) Give significance of glycogen.
- c) Define anabolism.
- d) What is substrate level phosphorylation?
- e) Define specific activity of enzyme.
- f) Enlist sources of free energy for cells.
- g) Define photorespiration.
- h) What is enthalpy?
- i) Enlist essential and non-essential fatty acids.
- j) What is zymogen?

**Q2)** Attempt any three :

**[3 × 5 = 15]**

- a) Write a note on cori cycle.
- b) Describe types of electron transfers in biological systems.
- c) With suitable examples, explain competitive and non-competitive enzyme inhibition.
- d) Describe in detail regulation of glyoxalate pathway.

**P.T.O.**

**Q3)** Attempt any three :

**[3 × 5 = 15]**

- a) Explain in detail, C<sub>3</sub> pathway of photosynthesis.
- b) Write a note on nitrogenase complex.
- c) Give a brief account of enzyme classification.
- d) Write a note on oxidative phosphorylation.

**Q4)** Describe in detail, synthesis of fatty acids in bacteria and plants.

**[15]**

OR

Explain in detail, glycolysis pathway. Add a note on ATP production in glycolysis.

**Q5)** Attempt any three:

**[3 × 5 = 15]**

- a) Write a note on Mitchell's chemiosmotic hypothesis.
- b) Explain mitochondrial electron transport chain.
- c) Write a note on de novo pyrimidine synthesis.
- d) Write a note on phenylketonuria (PKU).



Total No. of Questions : 8]

SEAT No. :

P1033

[Total No. of Pages : 3

[4819] - 3

F.Y. B.Sc.

BIOTECHNOLOGY

Bb - 103 : Basic Biosciences

(2008 Pattern)

*Time :3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Draw neat and labelled diagram wherever necessary.*
- 3) *Answers to the two sections should be written in two separate answer book.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**(Botany)**

**Q1)** Answer the following questions.

**[8]**

- a) Explain the term In - vitro morphogenesis.
- b) Give two biotechnologically important pteridophytes.
- c) What is heterotrophic plants.
- d) What is Runner plant? Give example.
- e) What is secondary meristem?
- f) Define phytochrome.
- g) Give two difference characteristic in Angiosperm and Gymnosperm.
- h) Give two characteristic features of plant cell.

**Q2)** Write short notes on (Any Three):

**[12]**

- a) Complex tissue.
- b) Cytokinin.
- c) Reproduction in Bryophytes.
- d) Leaf & its modifications.
- e) Cymose inflorescence.

**P.T.O.**



**Q3)** Attempt Any Two of the following. **[10]**

- a) Explain light reaction in plants.
- b) Give general principles of photoperiodism.
- c) Explain the process of development of seed with suitable diagram.

**Q4)** Attempt the following.

Give key characteristics of Gymnosperm & Describe the life cycle of Gymnosperm with suitable examples. **[10]**

OR

Describe internal organization of any two vegetative plant organs.

### **SECTION - II**

#### **(Zoology)**

**Q5)** Answer the following. **[8]**

- a) Write any two characteristics of phylum Coelenterata.
- b) Define Ectoparasite.
- c) Enlist two characteristics of Pisces.
- d) Enlist two harmful insects.
- e) What is Bee venom?
- f) Define commensalism and give example.
- g) Define sericulture.
- h) Give two key organs of circulatory system.

**Q6)** Write short notes on (Any Three): **[12]**

- a) Characteristics of phylum Echinodermata with examples.
- b) Vermiculture.
- c) Products of Apiculture.
- d) Control measures against fasciola infection.

**Q7) Answer the following (Any Two):** **[10]**

- a) Compare the brains of Vertebrates.
- b) Enlist characters of Mammals with examples.
- c) Explain importance of animal classification with examples.

**Q8) Answer the following** **[10]**

Give an illustrated account of the life cycle of Plasmodium vivax.

OR

Describe conoly organization in Honey bee.



Total No. of Questions : 7]

SEAT No. :

**P1056**

**[4819] - 31**

[Total No. of Pages : 2

**T.Y. B.Sc. (Semester - III)**

**BIOTECHNOLOGY**

**Bb -331 : Microbial Biotechnology**

**(2008 Pattern)**

*[Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Question No. 1 & 7 are compulsory.*
- 2) *Attempt any three of the remaining questions.*
- 3) *Draw neat labelled diagrams wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**Q1)** Answer the following in 2-4 lines:

**[20]**

- a) Give characteristic feature of stationary phase.
- b) What is meant by chemostat?
- c) Describe ropiness in milk.
- d) Define pathogenesis.
- e) Give the significance EDP pathway.
- f) What is auxotrophic mutant?
- g) Enlist structural genes and their products of arabinose operon.
- h) Give the significance of BOD in waste water treatment.
- i) Enlist any two chemical preservatives with their mode of action.
- j) Enlist different biological waste water treatment processes.

**Q2)** a) Describe in detail different direct methods of cell quantification. **[8]**

b) Describe EMP pathway in detail. Give its significance. **[7]**

**Q3)** a) Explain the method of screening of analogue resistant mutant used for strain improvement. **[8]**

b) Describe in detail the regulation of Lac operon. **[7]**

**P.T.O.**

- Q4)** a) Explain Hfr conjugation with neat labelled diagram. [8]  
b) Describe in detail food poisoning by clostridium botulinum. [7]
- Q5)** a) Explain the mode of action of antibiotic affecting protein synthesis. [8]  
b) Describe food preservation by high temperature. [7]
- Q6)** a) Give an overview of waste water treatment plant elaborate on primary treatment process. [8]  
b) What is GMO? Describe applications of GMO in medicine. [7]
- Q7)** Write a short notes on: [15]  
a) Normal flora of Human body.  
b) Yield coefficient.  
c) Gene mapping by transformation.



Total No. of Questions : 8]

SEAT No. :

**P1057**

[4819] - 32

[Total No. of Pages : 2

**T.Y. B.Sc. (Semester - III)**

**BIOTECHNOLOGY**

**Bb -332 : Animal and Plant Development**

**(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) Answer to each section should be written in separate answer book.*
- 2) Question No. 1 from each Section is compulsory from remaining questions attempt any two from each section.*

**SECTION - I**

**Animal Development**

**Q1)** Explain the terms with respect to animal development. **[10]**

- a) Inner mass cell
- b) Capacitation.
- c) Differentiation.
- d) Morula
- e) Gene family.

**Q2)** a) Describe the process of spermatogenesis. **[7]**

b) With an appropriate model system describe the process of gastrulation. **[8]**

**Q3)** a) Describe the role of zygotic genes in pattern formation. **[7]**

b) Describe cleavage pattern in bird and human egg. **[8]**

**Q4)** Write short note on: **[15]**

- a) Ageing
- b) Cortical granule reaction.
- c) Cell lineage

**P.T.O.**

## **SECTION - II**

### **Plant Development**

**Q5)** Explain the term with respect to plant development. **[10]**

- a) Dedifferentiation.
- b) Cell lineage in plants.
- c) Competence
- d) Hobbit gene.
- e) Megasporogenesis.

**Q6)** a) What are plant hormones? Describe the role of cytokinin in detail. **[8]**

- b) Give an account of the root apical meristem patterning. Discuss the role of any one gene involved in shoot patterning? **[7]**

**Q7)** a) Describe in detail the embryonic development in monocotyledons with suitable example. **[8]**

- b) Discuss ABC model of floral patterning in arabidopsis. **[7]**

**Q8)** Write short notes on: **[15]**

- a) Somatic embryogenesis.
- b) Embryo sac
- c) Tunica - carpus theory of meristem.



Total No. of Questions : 7]

SEAT No. :

**P1058**

[4819] - 33

[Total No. of Pages : 2

**T.Y. B.Sc. (Semester - III)**

**BIOTECHNOLOGY**

**Bb -333 : Biodiversity and Systematics**

**(2008 Pattern)**

*[Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Question 1 is compulsory.*
- 2) *Out of remaining questions attempt any four*
- 3) *Figures to the right indicate full marks.*

**Q1)** Answer the following in 2-4 lines

**[10 × 2 = 20]**

- a) Define Biological clocks.
- b) What is IUCN red data book?
- c) Define habitat.
- d) Define territory.
- e) What is meant by 'endangered species'?
- f) Define 'Biome'
- g) Explain with example mutualism.
- h) Define  $\beta$  (Beta) diversity.
- i) What is serotyping?
- j) Give importance of seed Banks.

**Q2)** a) Elaborate on the growth forms of organisms with suitable examples. **[8]**

b) Describe tools and techniques used in for animal systematics studies. **[7]**

**Q3)** a) Describe in detail ex-situ and In-situ conservation strategies. **[8]**

b) Explain communication in animals with respect to their feed habits and habitat. **[7]**

**P.T.O.**

- Q4)** a) Describe the concept of bioprospecting with special reference to plants. **[8]**  
b) Give detailed account of molecular taxonomy. **[7]**
- Q5)** a) Describe important laws/ acts implemented to aid conservation efforts in India. **[8]**  
b) Explain the significance of indices in biodiversity analysis with suitable examples. **[7]**
- Q6)** a) Explain stages of development of behaviour. **[8]**  
b) Explain altruism is considered as an important social behaviour. Give one example. **[7]**
- Q7)** Write notes on: (any three) **[3 × 5 = 15]**
- a) Ecosystem diversity.
  - b) 'Embryology' in studying animal systematics.
  - c) Uses of 'Mathematical modeling'
  - d) Types of niches





Total No. of Questions : 8]

SEAT No. :

P1034

[Total No. of Pages : 4

[4819] - 4

F.Y. B.Sc.

BIOTECHNOLOGY

Bb - 104 : Mathematics And Statistical Methods For  
Biologists

(2008 Pattern)

*Time :3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of non programmable scientific calculator is allowed.*
- 4) *Solve each section on separate answer paper.*

**SECTION - I**

**(Mathematics)**

**Q1)** Attempt each of the following:

**[5 × 2 = 10]**

- a) Find the adjoint of matrix.

$$A = \begin{bmatrix} 3 & 4 & 5 \\ 4 & 2 & 3 \\ -6 & 1 & 3 \end{bmatrix}$$

b) Find  $\lim_{x \rightarrow 0} \frac{6^x - 3^x}{4^x - 1}$

- c) Find real and imaginary part of

$$\frac{3-i}{2+i} + \frac{3+i}{2-i}$$

- d) Define linearly independent and linearly dependent vectors.

**P.T.O.**

- e) Determine the order and degree of the differential equation.

$$\frac{dy}{dx} + \frac{3}{\frac{dy}{dx}} = 5$$

**Q2)** Attempt any four of the following:

**[4 × 2½ = 10]**

- a) Show that :  $\lim_{n \rightarrow \infty} \frac{2n^2 - 5}{3n^2 + 7n} = \frac{2}{3}$
- b) If  $u = y \cdot \log(xy)$  then find  $\frac{\partial^2 u}{\partial x \partial y}$
- c) Solve the differential equation.  $\cos y \, dx + (1 + e^{-x}) \sin y \, dy = 0$ .
- d) Reduce the matrix  $A = \begin{bmatrix} 3 & 3 & 5 \\ 2 & 2 & 3 \\ 4 & 4 & 13 \end{bmatrix}$  to row echelon form and hence find  $\rho(A)$ .
- e) Show that  $W = \{(x, y, z) \mid y = x + z + 2\}$  is subspace of  $\mathbb{R}^3$
- f) Find the modulus and arguments of  $Z = (-1 + i)^3$ .

**Q3)** Attempt any two of the following:

**[2 × 5 = 10]**

- a) Show that the following matrix is not diagonalizable:

$$A = \begin{bmatrix} 2 & 1 & 0 \\ 0 & 1 & -1 \\ 0 & 2 & 4 \end{bmatrix}$$

- b) Solve the differential equation:  $4xy \, dx + (x^2 - y^2) \, dy = 0$
- c) Find the value of:  $(1 + i\sqrt{7})^5 + (1 - i\sqrt{7})^5$

**Q4)** Attempt any one of the following:

[1 × 10 = 10]

- a) Determine the Eigenvalues and Eigen vectors of the following matrix A.

$$A = \begin{bmatrix} 6 & 8 & 8 \\ 3 & 5 & 4 \\ 1 & -2 & -1 \end{bmatrix}$$

- b) Find the stationary points and examine for maximum and minimum value for the function.  $f(x, y) = x^2 + y^2 + 3xy$ .

### SECTION - II

**Q5)** Attempt the following:

[5 × 2 = 10]

- a) The temperatures (in °c) at a particular place measured on ten consecutive days of the month of May were:

45, 39, 38, 42, 41, 42, 42, 43, 44, 41. (Figures are rounded to the nearest integer).

Find the mode of the above data.

- b) Define variance of a discrete series.  
c) Define the term median.  
d) Explain, what is partial correlation.  
e) Explain the term 'sample space' of a random experiment with an illustration.

**Q6)** Attempt any four of the following:

[4 × 2½ = 10]

- a) Following data relates to the number of years lived together by the Indian married couples in a city before they were divorced.

Number of years	0-5	5-10	10-15	15-20	20-25
Number of couples	30	20	17	10	8

Find the average number of years lived together by the couples before the divorce.

- b) A motor car dealer knows from his experience that the probability that a person visiting his show room will book a car is 0.40. What is the probability that at least one person among the 5 that visit his showroom will book a car?
- c) Following are the number of years lived by a group of 10 persons after attaining 70 years of age. 1.5, 2.7, 6.8, 5.4, 9.6, 8.2, 3.6, 4.9, 7.8, 1.8. Calculate the standard deviation of the data.
- d) Define poisson distribution. State a real life situation where it is applicable.
- e) State the test statistic used in chi - square test for goodness of fit.

**Q7)** Attempt any two of the following: **[2 × 5 = 10]**

- a) Write a note on Scatter diagram.
- b) The systolic blood pressure of a person is known to be normally distributed with mean 120 & standard deviation 5. Calculate the probability that a randomly selected person has systolic blood pressure between 110 to 130.
- c) Using the following data calculate the value of co-efficient of correlation between X and Y.  $\sum X = 436, \sum Y = 246, \sum X^2 = 19262$

$$\sum Y^2 = 6702 \quad \sum XY = 10417.$$

Comment on your result.

**Q8)** Attempt any one of the following **[1 × 10 = 10]**

- a) Explain the technique of one way ANOVA.
- b) Explain any two tests of hypothesis that you have studied.



Total No. of Questions : 7]

SEAT No. :

**P1059**

[4819] - 41

[Total No. of Pages : 2

**T.Y. B.Sc. (Semester - IV)**

**BIOTECHNOLOGY**

**Bb -341 : Large Scale Manufacturing Process**

**(2008 Pattern)**

*[Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Question No. 1 is compulsory.*
- 2) *Answer any four questions from remaining.*
- 3) *Neat labelled diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**Q1)** Answer the following in 2-4 lines

**[10 × 2 = 20]**

- a) What is bioprocess? Give two examples.
- b) Define Nabla factor used in sterilization of media.
- c) What is the role of chromium in fermentor construction material?
- d) Give two disadvantages of immortalized enzymes.
- e) What are on line sensors?
- f) Define SOP.
- g) Name two commonly used nitrogen sources used in fermentation media.
- h) Define continuous fermentation.
- i) What is cross- flow filtration?
- j) Define Amortized cost.

**Q2) a)** Explain Biotransformation with a suitable example and mention the advantages and disadvantages of biotransformation. **[8]**

b) Describe Encapsulation and Adsorption method of enzyme immobilization. **[7]**

**P.T.O.**

- Q3)** a) Explain with the help of a flow diagram, the large scale production of any one vitamin with reference to: [10]
- i) Production strain.
  - ii) Fermentation medium and environmental conditions used.
  - iii) Downstream processing.
- b) What is whole broth processing? Comment on its application. [5]
- Q4)** a) Compare and contrast between Batch and continuous sterilization. [8]
- b) Explain the role of precursors and inducers in fermentation media. [7]
- Q5)** a) Discuss the different methods of pressure measurement and control during fermentation. [8]
- b) What is quality control in fermentation industry? What are the responsibilities of quality control department? [7]
- Q6)** a) Define  $K_L a$ . Describe any two methods of determining  $K_L a$ . [8]
- b) Describe the different designs of impellers used in a bioreactor. [7]
- Q7)** Write short notes on (any three) [15]
- a) LAL test.
  - b) Diagrammatically represent Air Lift fermentor.
  - c) Mass balance
  - d) SCP



Total No. of Questions : 8]

SEAT No. :

**P1060**

[4819] - 42

[Total No. of Pages : 2

**T.Y. B.Sc. (Semester - IV)**

**BIOTECHNOLOGY**

**Bb - 342 : Biotechnology in Agriculture and Health  
(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) Answer to each section should be written in separate answer book.*
- 2) Question No. 1 and Q. 5 are compulsory.*
- 3) From remaining questions attempt any two from each section.*

**SECTION - I**

**(AGRICULTURE)**

**Q1)** Define or explain the following term: **[10]**

- a) Hybrids
- b) Cryoprotectants
- c) Green house technology
- d) Copyrights
- e) Haploids

**Q2)** a) Enlist methodologies of gene transfer in plants. Explain any two methods in detail. **[8]**

b) Metabolic engineering is significant for large scale production of secondary metabolites. Justify. **[7]**

**Q3)** a) What is Patent ? Explain the characteristics of patent in detail. **[8]**

b) What are RFLP markers? Explain how QTL are used for selective breeding **[7]**

**P.T.O.**

- Q4)** Write short notes on: **[15]**
- a) DNA Banking
  - b) Micropropagation
  - c) Risk assessment of GM food.

**SECTION - II**

**(HEALTH)**

- Q5)** Attempt the following: **[10]**
- a) Enlist the applications of organ culture.
  - b) What is serum free media?
  - c) What is tissue engineering?
  - d) What is micromanipulation?
  - e) What are molecular markers?

- Q6)** a) Enlist molecular diagnostic techniques and explain the method and applications of any one technique. **[7]**
- b) What are recombinant products? Describe any two recombinant products with respect to their production and applications. **[8]**

- Q7)** a) Write the objectives of Human Genome Project. Add note on ethics related to HGP. **[8]**
- b) Explain how monoclonal antibodies may be used for treating diseases? **[7]**

- Q8)** Write short notes on: **[15]**
- a) Subunit vaccines.
  - b) Role of biosensors in diagnostics.
  - c) Scale up of suspension culture.





Total No. of Questions : 7]

SEAT No. :

**P1061**

[4819] - 43

[Total No. of Pages : 2

**T.Y. B.Sc. (Semester - IV)**

**BIOTECHNOLOGY**

**Bb - 343 : Recombinant DNA Technology**

**(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) Question. 1 is compulsory attempt any four out of the remaining questions*
- 2) Figures to the right indicate full marks.*
- 3) Draw neat & labelled diagrams wherever necessary.*

**Q1)** Answer the following in 2-4 lines:

**[20]**

- a) Mention the role of DNA ligase in genetic engineering .
- b) Explain the role of phenol and isoamyl alcohol in DNA isolation.
- c) Enlist any four milestones in genetic engineering.
- d) Give four examples of type II restriction endonucleases.
- e) What is blue-white screening of transformants?
- f) What are  $\lambda$  - replacement vectors?
- g) Why nylon membranes are preferred over nitrocellulose membranes?
- h) Define molecular markers and give two examples.
- i) Name two probe labels used in recombinant DNA technology.
- j) Why pBR 322 is used as a vector in genetic engineering?

**Q2)** a) Explain in detail the method used for construction of genomic library.**[8]**

b) Describe various methods of nucleic acid purification. **[7]**

**P.T.O.**

**Q3)** Write short notes on: **[15]**

- a) Restriction mapping
- b) Shuttle vectors
- c) Linkers and adaptors

**Q4)** a) Explain various steps of polymerase chain reaction **[10]**

- b) Discuss various methods of transfection of eukaryotic cells with foreign DNA. **[5]**

**Q5)** a) Give a comparative account of different DNA polymerases used in RDT. **[8]**

- b) Explain guidelines for release of RDT products. **[7]**

**Q6)** a) Explain with diagram the method used for site directed mutagenesis. **[8]**

- b) Write principle and applications of southern blotting in genetic engineering. **[7]**

**Q7)** Describe in detail sanger's method of DNA sequencing. **[15]**



Total No. of Questions : 5]

SEAT No. :

P1035

[Total No. of Pages : 2

[4819] - 5

F.Y. B.Sc.

BIOTECHNOLOGY

Bb - 105 : Fundamentals of Biological Chemistry

(2008 Pattern)

*Time :3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*

**Q1)** Attempt the following:

**[16]**

- a) Define Anomers. Give example.
- b) Write MM equation.
- c) What is the relation between pH and pKa.
- d) Give the structure and use of Sanger's reagent.
- e) Define iodine number and give its significance.
- f) What are allosteric enzymes? Give example.
- g) Name the coenzymes of Niacin and Riboflavin.
- h) List out two functions of proteins.

**Q2)** Answer any four of the following:

**[16]**

- a) Differentiate between DNA and RNA.
- b) Draw the titration curve of glycine and interpret the results.
- c) Write note on formation of macromolecules in life.
- d) Explain nucleophilic substitution reaction with suitable example.
- e) Give the structure of Glucose in Fischer and Haworth formula.

**P.T.O.**

**Q3)** Attempt any four of the following: [16]

- a) Write note on rancidity of lipids.
- b) How is peptide bond formed ? Give its features.
- c) Define Amphipathic lipids. How do they behave in water.
- d) What are bile salts? Give their significance.
- e) Write the principle and significance of dialysis.

**Q4)** Attempt any two of the following : [16]

- a) Describe the principle, procedure and applications of Ion exchange chromatography.
- b) Classify carbohydrates with suitable examples.
- c) Discuss the features of primary, secondary and tertiary structure of proteins.

**Q5)** Attempt any two of the following: [16]

- a) Discuss the features of Watson and Crick model of DNA.
- b) Explain the structure, biochemical function of Thiamin and give its deficiency disorders.
- c) Classify enzymes into six major classes and give examples.



Total No. of Questions : 5]

SEAT No. :

P1037

[Total No. of Pages : 2

[4819] - 6

F.Y. B.Sc.

BIOTECHNOLOGY

Bb - 106 : BIOPHYSICS AND INSTRUMENTATION

(2008 Pattern)

*Time :3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Draw neat labelled diagrams wherever necessary*
- 3) *Figures to the right indicate full marks.*

**Q1)** Answer the following:

**[16]**

- a) State energy of an electron in Bohr's orbit.
- b) Define: i) Natural radioactivity ii) Artificial radioactivity
- c) State different series in origin of spectral lines of hydrogen atom.
- d) What are electromagnetic waves?
- e) What is entropy? Give units of entropy.
- f) State the principle of centrifugation.
- g) State Lamberts — Beer's law.
- h) Give the types of channels present in membrane.

**Q2)** Answer any four of the following:

**[16]**

- a) Discuss the process of passive transport in detail.
- b) Write a short note on clinical thermometer.
- c) The series limit wavelength for Balmer series of hydrogen spectrum is  $3645^{\circ}\text{A}$ . Calculate the value of Rydberg constant.
- d) Describe Hertz experiment to demonstrate electromagnetic wave in brief.
- e) Write short note on ECG.
- f) Describe the general features of the spectra of alkali (Na) atoms.

**P.T.O.**

**Q3)** Answer any four of following: **[16]**

- a) Explain TEM with neat labelled diagram.
- b) What is pH? Explain construction of pH meter.
- c) Write a short note on Gibbs free energy.
- d) Describe briefly methods to produce radionuclides.
- e) Explain the limitations of Bohr's atomic model.
- f) Explain the characteristics of electromagnetic waves.

**Q4)** Answer any two of the following: **[16]**

- a) Discuss the organisation of plasma membrane.
- b) Explain principle and explain working of thermistor thermometer.
- c) Discuss vibrational spectra of simple harmonic oscillator.

**Q5)** a) Explain principle, construction and working of IR spectrometer. **[8]**

b) Write in detail about Liquid Drop Model of the nucleus. **[8]**

OR

a) State and explain the basic postulates of Bohr's atomic model and derive an expression for radius of stationary orbit. **[8]**

b) Describe energy conversion in Mitochondria and Chloroplast. **[8]**



Total No. of Questions : 5]

SEAT No. :

**P1036**

[Total No. of Pages : 2

**[4819] - 7**

**F.Y. B.Sc.**

**BIOTECHNOLOGY**

**Bb - 107 : Microbiology**

**(2008 Pattern)**

*Time :3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

**Q1)** Answer the following:

**[8 × 2 =16]**

- a) What is commensalism? Give one example.
- b) What is enriched media? Give one example.
- c) What is differential staining? Give one example.
- d) Define pure culture.
- e) Give importance of heat fixation in bacterial smear preparation.
- f) Give use of nichrome wireloop in microbial laboratory.
- g) Give two discoveries made by Josef Lister.
- h) Enlist different colony pattern depending on elevation.

**Q2)** Answer the following (Any four)

**[4 × 4 =16]**

- a) Describe 'Swan neck' experiment of Louis Pasteur.
- b) Draw neat labelled diagram of typical eukaryotic cells.
- c) A sewage water sample was analyzed and the following data was obtained.
  - i) Volume of sample plated:0.1ml
  - ii) Dilution of sample :  $10^8$
  - iii) Number of colonies obtained: 90Calculate CFU of the sample.

**P.T.O.**

- d) Describe the principle of Gram staining.
- e) Write a note on: Endomycorrhiza.
- f) Classify bacteria on the basis of pH requirement for their growth.

**Q3) Answer the following. (Any Four) [4 × 4 = 16]**

- a) Enlist different methods of preservation at low temperature and describe in detail 'Lyophilization'.
- b) Explain in brief spread plate method for isolation of bacteria.
- c) Describe the life cycle of Todd phage.
- d) State the salient feature of Bergy's manual.
- e) Enlist different methods for quantification of cell growth. Explain any one in detail.
- f) What is disinfectant? Describe mechanism of action of alcohol a disinfecting agent.

**Q4) Answer the following. (Any Two) [2 × 8 = 16]**

- a) Distinguish between prokaryotic & eukaryotic cells.
- b) Describe in detail ultrastructure of flagella.
- c) Describe a process of biofilm formation and give it's significance.

**Q5) Answer the following. (Any One) [1 × 16 = 16]**

- a) Classify viruses depending on genetic material they contain.
- b) What is meant by macroelements, microelements and trace elements? Describe in detail their role in designing the media.





Total No. of Questions : 5]

SEAT No. :

P1038

[Total No. of Pages : 2

[4819] - 8

F.Y. B.Sc.

BIOTECHNOLOGY

Bb - 108 : Use of Computers

(2008 Pattern)

*Time :3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Draw neat and labeled diagrams whenever necessary*
- 3) *Figures to the right indicate full marks.*

**Q1)** Attempt all of the following.

**[8 × 2 = 16]**

- a) Distinguish between Data and Information.
- b) What is cellular topology?
- c) Define Bioinformatics.
- d) What is WWW?
- e) Define the following terms:
  - i) RAM.
  - ii) ROM.
- f) Write note on menu bar.
- g) List the features of Windows operating systems.
- h) State true or false.
  - i) Search engine is use to search file on harddisk.
  - ii) UNIX is a multiuser. singletasking operating system.

**Q2)** Attempt any four of the following.

**[4 × 4 = 16]**

- a) Explain OSI model.
- b) What do you mean by Computer? Explain with block diagram.
- c) What is PubMed? Explain PubMed services.
- d) Define Algorithm. State characteristics of an algorithm.
- e) Explain OCR and OMR in details.
- f) What are the characteristics of Computer?

**P.T.O.**

**Q3)** Attempt any four of the following.

**[4 × 4 = 16]**

- a) Write a short note on the following:
  - i) Firewall.
  - ii) Trojan Horse.
- b) Write a short note on Input devices.
- c) What is computer network? What are goals of computer network?
- d) Describe various Bioinformatics tools.
- e) Differentiate between Workstation and Personal Computer.
- f) Write note on evaluation of Computer.

**Q4)** Attempt any two of the following.

**[2 × 8 = 16]**

- a) Write note on MS-Excel as a spreadsheet.
- b) What is DOS? Explain any four internal commands.
- c) What is PowerPoint? Explain view menu of PowerPoint. Also write the steps to Create custom slide show.

**Q5)** Attempt the following.

**[16]**

- a) Write an algorithm and draw a flowchart to find factorial of a number.

OR

Write an algorithm and draw a flowchart to find digit sum of specified number.

Eg. If No =123 then digit sum=1+2+3=6.

- b) Distinguish between static hashing and dynamic hashing.

OR

What is DBMS? Explain types of databases on the basis of their functions and Data Model.

