Roll No. [ ]

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.–3)

ORGANIC CHEMISTRY

Subject Code : BSBT-301-18

M.Code : 76608

Date of Examination : 16-05-2023

Time : 3 Hrs. **Max. Marks : 60**

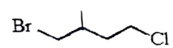
INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

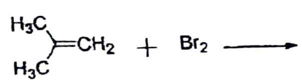
SECTION-A

1. **Write briefly :**

a. Write IUPAC name for :



b. Complete the following reaction



c. Arrange the following in the increasing order of acidity:

Phenol, 2 Methyl phenol, 2 chloro phenol.

d. Define (-M) effect.

e. What is Huckel's rule of aromaticity?

f. Write stability order of primary, secondary and tertiary carbocation.

g. Hyperconjugation involves delocalization of ________ electrons.

h. Which alcohol does not react with Lucas's reagent?

i. Write two chemical properties of alkanes.

j. Which catalyst is used to catalyze the bromination reaction of phenol?

SECTION-B

2. Explain alkenes and alkanes in detail. Which test is used to distinguish between alkane and alkenes.

3. Define Kolbe's reaction with mechanism.

4. Benzene undergoes electrophilic substitution reaction. Why? Define halogenation and sulfonation reactions of benzene.

5. What are carbenes? Define hybridization present in singlet and triplet carbene with appropriate diagram.

6. Why is resonance more stable than hyperconjugation? Explain with appropriate example.

SECTION-C

7. Define Marconicov's rule with suitable example(s). What are the limitations of Marconicov rule?

8. Define inductive effect in detail. What are the types of inductive effect? Write applications of inductive effect.

9. What are the types of organic reactions? Explain each with appropriate example.

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July-2023

Roll No. | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.–3)

INTRODUCTION TO COMPUTERS

Subject Code : BSBT-307-18

M.Code : 76614

Date of Examination : 18-05-2023

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Write briefly :**

   a. What is algorithm?

   b. Name any two latest languages used in computers.

   c. What is the need for computer software?

   d. Discuss voice response system.

   e. Define Primary storage.

   f. Write about online mode in computer.

   g. Write about Hard Disk.

   h. What is the use of Machine learning?

   i. Discuss DNA sequences.

   j. Write the need of bioinformatics.

SECTION-B

2. Write in short the functional units of Computer.

3. Discuss NCBI data model and its uses.

4. Write some output devices used in computer.

5. Explain the types of printers and their features.

6. Discuss the different ways of communication with computer.

SECTION-C

7. Give the brief introduction of Internet. Explain its use for the Biologist.

8. Discuss various mass storage devices used to store data in computer.

9. Give the introduction to sequence analysis and database searching. What is the role of computers in it?

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July 2023

Roll No. | | | | | | | | | | |

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.–3)

MOLECULAR BIOLOGY

Subject Code : BSBT-303-18

M.Code : 76610

Date of Examination : 22-05-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Write briefly :**

   a) Difference between prokaryotic and eukaryotic gene?

   b) What is a replicon?

   c) What is degeneracy in codons?

   d) Define frame-shift mutation.

   e) What are SSB proteins and their role?

   f) Which mutation is caused by UV radiation?

   g) What is Shine-Dalgarno sequence and what is its significance?

   h) What is TBP and its role?

   i) What are trans-acting genes?

   j) Difference between Operon and Regulon.

SECTION-B

2. Discuss the structure of nucleosome with diagram.
3. Describe the experiment which proved that DNA replication is semiconservative.
4. Discuss the proteins and enzymes required for transcription initiation.
5. What is induced mutation and how is it done?
6. Discuss how the antibiotics Kirromycin and Puromycin act as Translational inhibitors.

SECTION-C

7. Describe the replication initiation and termination in Prokaryotes.
8. Discuss the role of ribosomes, t-RNA and other enzymes in translation.
9. Discuss the Positive and Negative regulation of gene in gene expression.

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July-2023

Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (2018 Batch) (Sem.–3)

MOLECULAR BIOLOGY

Subject Code : BSBT-303-18

M.Code : 76610

Date of Examination : 21-12-22

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Write briefly :**

   a. What are Histone proteins?

   b. What are Introns and Exons?

   c. Structure of DNA pol-I?

   d. What are Okazaki fragments?

   e. What is Mis-sense mutation?

   f. What is a Promoter?

   g. What is a Holo-enzyme?

   h. What is the Rho factor?

   i. What are Operons?

   j. Name any two antibiotics which inhibit translation.

SECTION-B

2. Discuss the genome organization in Eukaryotes.
3. Discuss the proteins and enzymes involved in replication initiation of Prokaryotes.
4. Discuss the enzymes required for double strand DNA damage repair.
5. Discuss what is activation of amino acid and t-RNA charging.
6. What positive regulation in gene expression?

SECTION-C

7. Discuss in detail various types of physical mutagens and their mechanism of action.
8. Describe the Translation process in eukacyotes with the help of diagram.
9. With the help of Lac operon model explain gene regulation in bacteria.

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Dec-2022

Roll No. [ ][ ][ ][ ][ ][ ][ ][ ]

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.–3)

INTRODUCTION TO COMPUTERS

Subject Code : BSBT-307-18

M.Code : 76614

Date of Examinaton : 12-12-22

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Answer briefly :**

   a) What are the basic operations of computer?

   b) What is volatile memory?

   c) What is the purpose of ALU unit in CPU?

   d) List any two protein databases.

   e) Name two tools used in phylogenetic analysis.

   f) Define analog computer.

   g) Define DNA Sequence.

   h) What are the main functions of an ALU?

   i) Define Plotters.

   j) Which generation of computer used Vacuum tubes?

SECTION-B

2. Draw a block diagram of Computer and explain its functional units.
3. What is the main difference between a floppy disk and a hard disk?
4. What are the various types of printers? Compare their features.
5. What is protein structure prediction used for and why is it difficult?
6. What is a speech output unit? What are its applications?

SECTION-C

7. Give the significance of input devices. List various input devices. Discuss at least five different input devices.
8. **Write a note on:**

   a) Bibliographic database.

   b) Genebank database.

9. Differentiate Primary Memory & Secondary Memory. Give examples of both the types.

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DEC-2022

Roll No.

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.–3)

ORGANIC CHEMISTRY

Subject Code : BSBT-301-18

M.Code : 76608

Date of Examination : 16-12-22

Time : 3 Hrs. **Max. Marks : 60**

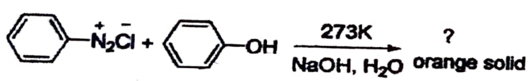
INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

a. Complete the following reaction :



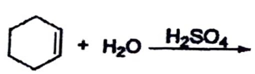
b. *'Aniline is weaker base than ammonia'*, why?

c. Write stability order of primary, secondary and tertiary carbanion.

d. What are quasi-aromatic compounds?

e. Arrange benzene, pyridine, thiophene, pyrrole and furan in decreasing order of their aromaticity.

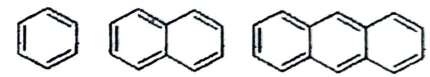
f. Complete the following reaction :



g. What is the bond length of C=C in alkenes and benzene respectively?

h. What is the effect of hyper-conjugation on stability of free radicals?

i. Arrange the following in their decreasing order of resonance energies.



j. When phenol is treated with excess bromine water, it gives.........

SECTION-B

2. Explain Reimer Tiemann reaction with mechanism.

3. What is the basic principle of aromaticity?

4. Explain nitration reaction of phenol in presence of dil. HNO_3. What is the major product? Define hydrogen bonding present in both products.

5. Explain molecular orbital diagram for benzene with suitable structure.

6. Write the structure and IUPAC name of five structural isomer of alkenes corresponding to C_5H_{10}.

SECTION-C

7. Why addition reactions are more common in alkenes and alkynes than in aromatic hydrocarbonsy?

8. Explain aldehyde and Ketone's reaction with Grignard reagent to provide primary, secondary and tertiary alcohols.

9. *'Phenols are more acidic than alcohols'*, why?

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Roll No. | | | | | | | | | |

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.–3)

IMMUNOLOGY

Subject Code : BSBT-302-18

M.Code : 76609

Date of Examination : 19-12-22

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a) Neutrophils

   b) Polymorphs

   c) Peptide binding pocket in MHCII

   d) Complement fixing antibody

   e) Humoral immunity

   f) IgG subclasses

   g) Secondary immune response

   h) Activated B cells

   i) Low affinity antibody

   j) Bursa of Fabricus

DEC-2022

SECTION-B

2. Discuss the role and Significance of lymph node.
3. Differentiate between the T dependent and T independent antigens.
4. Write a note on the structure of MHC I.
5. Explain the structure of T cell receptor.
6. Write a note on granulocytic cells of the immune system.

SECTION-C

7. Write a note on molecular mechanisms for generation of antibody diversity.
8. Discuss any primary lymphoid organ with labeled diagram.
9. Explain the structure of antibody molecule.

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Roll No. | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Sc. (BT) (2018 Batch) (Sem.–3)

INTRODUCTION TO COMPUTERS

Subject Code : BSBT-307-18

M.Code : 76614

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Answer briefly :

Q1 What are the various characteristics of Computer?

Q2 How Computers are useful in education?

Q3 How the sizes of genomes are expressed?

Q4 Explain the function of assembler.

Q5 What is an operating system? Name any two operating systems.

Q6 What is Database?

Q7 Explain secondary storage devices. Name any two Secondary storage devices.

Q8 What is Batch Processing System?

Q9 What is the function of printer?

Q10 What is Multiple Sequence Alignment?

SECTION-B

Q11 What are the different milestones in computer hardware and software?

Q12 Define and distinguish between primary and secondary storage. What are the different types of secondary storage devices?

Q13 Write a short note on :

a) Real time Processing with example

b) Online Processing with example

Q14 Explain the working of computer with proper block diagram. Discuss various functional units of a Computer.

Q15 Write short note on :

a) Computer Algorithms

b) Generations of Computer

SECTION-C

Q16 What do you mean by output devices? Discuss any three output devices in detail.

Q17 Write a short note on :

a) Submitting DNA sequences

b) Internet and the Biologist

Q18 Discuss briefly the various applications of bioinformatics. Write about the application of bioinformatics for protein structure prediction.

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Roll No.

Total No. of Questions : 18

Total No. of Pages : 02

B.Sc. (BT) (2018 Batch) (Sem.–3)

MOLECULAR BIOLOGY

Subject Code : BSBT-303-18

M.Code : 76610

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Write briefly :

Q1 What is a Structural Gene?

Q2 What is Codon Wobbling?

Q3 What is Mis-Sense Mutation?

Q4 What is Core Particle in nucleosome?

Q5 What is Primosome?

Q6 What are Okazaki fragments?

Q7 What is TATA box?

Q8 What is a Regulon?

Q9 What are Trans-Acting Genes?

Q10 What are Polysomes?

SECTION-B

Q11 What are Histone and non-histone proteins and their role?

Q12 Discuss the initiation of replication and the factors required for the same?

Q13 Discuss the Photoreactivation and excision repair mechanism?

Q14 Discuss the various inhibitors of translation?

Q15 What is an Operon? Discuss the role of promoters and operators in gene regulation?

SECTION-C

Q16 Discuss the spontaneous and induced mutations? What is their application biotechnology?

Q17 Discuss the process of initiation and elongation of translation in prokaryotes?

Q18 With the help of Lac operon, explain the negative and positive regulation?

DEC-2020

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

Roll No. | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 18

B.Sc. (BT) (2018 Batch) (Sem.–3)

IMMUNOLOGY

Subject Code : BSBT-302-18

M.Code : 76609

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Write briefly :

Q1 What is Passive Immunity?

Q2 What are Super Antigens?

Q3 Give functions of lymph nodes.

Q4 Define First line of defense and give its significance.

Q5 What are CD factors?

Q6 What do you know about Convertase enzymes?

Q7 Define Epitope. Give its functions.

Q8 What are TCR and BCR?

Q9 Define Domain and Variable Region.

Q10 What are the subtypes of T- cells? How they differ from each other?

SECTION-B

Q11 Give comparison of specific and non-specific immunity.

Q12 What are the characteristics of an antigen to act as immunogen?

Q13 What are the functions of MHC I and MHC II molecules?

Q14 Draw the general structure of an antibody and explain it.

Q15 Explain the functions of complement system.

SECTION-C

Q16 Discuss the historical development and major milestones in immunology.

Q17 Discuss in detail the cell-mediated immunity and the role of various cells involved in it.

Q18 How the antibody diversity is generated at molecular level? Discuss.

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Roll No. | | | | | | | | | | | |

Total No. of Questions : 09 Total No. of Pages : 02

B.Sc. (BT) (2018 Batch) (Sem.–3)

ORGANIC CHEMISTRY

Subject Code : BSBT-301-18

M.Code : 76608

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
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3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1 Write briefly :

a. What is Inductive Effect?

b. What are Carbocations?

c. Explain Resonance and the structure of benzene proposed by Kekule.

d. How free radicals generate in Achemical Reaction?

e. What is Heterolytic Fission?

f. Explain the acidic nature of alcohol and phenol.

g. What are the various types of reagents used in chemical reactions?

h. What are carbenes and give their types?

i. Explain intermediate and activated complex in a reaction.

j. What are Dienes and how they differ from alkenes?

SECTION-B

Q2 Comparison between Resonance and Electromeric effect.

Q3 Explain the mechanism of Kolbe's reaction.

Q4 Define Bond Angle and name the factors which influence the bond angle in a molecule?

Q5 Write a short note on hyper conjugation.

Q6 What is the difference between localized and delocalized chemical bond?

SECTION-C

Q7 Define Aromaticity and what is the theoretical requirement of a compound to be aromatic?

Q8 What name is given to temporary dipole-induced interactions? State the factors upon which the magnitude of these interactions depends.

Q9 Explain :

a) Formic acid and chloroacetic acid are stronger than acetic acid. why?

b) Isopropyl free radical is more stable than n-propyl free radical. Why?

c) Vinyl chloride is less reactive than alkyl chloride. Why?

d) H_2S is a gas at room temperature, while H_2O is liquid. Why?

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Roll No.

Total No. of Questions : 18 Total No. of Pages : 02

B.Sc. (BT) (2018 Batch) (Sem.–3)

IMMUNOLOGY

Subject Code : BSBT-302-18

M.Code : 76609

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
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3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

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Q1 What is Passive Immunity?

Q2 What are Super Antigens?

Q3 Give functions of lymph nodes.

Q4 Define First line of defense and give its significance.

Q5 What are CD factors?

Q6 What do you know about Convertase enzymes?

Q7 Define Epitope. Give its functions.

Q8 What are TCR and BCR?

Q9 Define Domain and Variable Region.

Q10 What are the subtypes of T- cells? How they differ from each other?

SECTION-B

Q11 Give comparison of specific and non-specific immunity.

Q12 What are the characteristics of an antigen to act as immunogen?

Q13 What are the functions of MHC I and MHC II molecules?

Q14 Draw the general structure of an antibody and explain it.

Q15 Explain the functions of complement system.

SECTION-C

Q16 Discuss the historical development and major milestones in immunology.

Q17 Discuss in detail the cell-mediated immunity and the role of various cells involved in it.

Q18 How the antibody diversity is generated at molecular level? Discuss.

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Roll No.

Total No. of Questions : 18

Total No. of Pages : 02

B.Sc. (Agriculture) (2014 to 2018) (Sem.–3)

PRINCIPLE OF AGRONOMY–I

Subject Code : BSAG-301

M.Code : 72551

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Write short notes on :

Q1. Agronomy

Q2. Tillage

Q3. Cropping system

Q4. Bt Cotton

Q5. Seed inoculation

Q6. King of fodders

Q7. Intercropping

Q8. Lopping

Q9. Consortium

Q10. Lint

2020

SECTION-B

Q11. Write down different varieties of maize fodder for its cultivation in Punjab alongwith their yield potential.

Q12. How will you control weeds in rice nursery?

Q13. Write down note on soybean – a wonder crop.

Q14. Write a short note on bed planting in soybean.

Q15. Discuss different intercroppings in maize.

SECTION-C

Q16. Write down the varieties, sowing time, seed rate, crop geometry, fertilizer requirement, chemical weeed control (one weedicide), no.of irrigations, harvesting time for rice and cotton.

Q17. Discuss the agronomic practices for successful cultivation of soybean.

Q18. Discuss the agronomic practices for successful cultivation of bajra fodder.

2020

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Roll No. | | | | | | | | | |

Total No. of Questions : 18

Total No. of Pages : 02

B.Sc. (BT) (2018 Batch) (Sem.–3)

MOLECULAR BIOLOGY

Subject Code : BSBT-303-18

M.Code : 76610

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
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SECTION-A

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Q1 What is a Structural Gene?

Q2 What is Codon Wobbling?

Q3 What is Mis-Sense Mutation?

Q4 What is Core Particle in nucleosome?

Q5 What is Primosome?

Q6 What are Okazaki fragments?

Q7 What is TATA box?

Q8 What is a Regulon?

Q9 What are Trans-Acting Genes?

Q10 What are Polysomes?

2020

SECTION-B

Q11 What are Histone and non-histone proteins and their role?

Q12 Discuss the initiation of replication and the factors required for the same?

Q13 Discuss the Photoreactivation and excision repair mechanism?

Q14 Discuss the various inhibitors of translation?

Q15 What is an Operon? Discuss the role of promoters and operators in gene regulation?

SECTION-C

Q16 Discuss the spontaneous and induced mutations? What is their application biotechnology?

Q17 Discuss the process of initiation and elongation of translation in prokaryotes?

Q18 With the help of Lac operon, explain the negative and positive regulation?

2020

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Sc. (BT) (2018 Batch) (Sem.–3)

INTRODUCTION TO COMPUTERS

Subject Code : BSBT-307-18

M.Code : 76614

Max. Marks : 60

Time : 3 Hrs.

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

Q1 What are the various characteristics of Computer?

Q2 How Computers are useful in education?

Q3 How the sizes of genomes are expressed?

Q4 Explain the function of assembler.

Q5 What is an operating system? Name any two operating systems.

Q6 What is Database?

Q7 Explain secondary storage devices. Name any two Secondary storage devices.

Q8 What is Batch Processing System?

Q9 What is the function of printer?

Q10 What is Multiple Sequence Alignment?

SECTION-B

Q11 What are the different milestones in computer hardware and software?

Q12 Define and distinguish between primary and secondary storage. What are the different types of secondary storage devices?

Q13 Write a short note on :

a) Real time Processing with example

b) Online Processing with example

Q14 Explain the working of computer with proper block diagram. Discuss various functional units of a Computer.

Q15 Write short note on :

a) Computer Algorithms

b) Generations of Computer

SECTION-C

Q16 What do you mean by output devices? Discuss any three output devices in detail.

Q17 Write a short note on :

a) Submitting DNA sequences

b) Internet and the Biologist

Q18 Discuss briefly the various applications of bioinformatics. Write about the application of bioinformatics for protein structure prediction.

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Total No. of Pages : 02

Total No. of Questions : 18

B.Sc. (Agriculture) (2014 to 2018) (Sem.–3)

PLANT PHYSIOLOGY

Subject Code : BSAG-302

M.Code : 72552

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

Write short notes on :

1. Senescence
2. Photorespiration
3. Commercial application of IAA
4. Water use efficiency
5. Hydroponics
6. Significance of transpiration
7. Seed dormancy
8. Loading of photosynthates
9. Micronutrients
10. Criteria to determine essentiality of mineral element

SECTION-B

11. Definition and scope of plant physiology in agriculture.

12. Discuss in detail the biochemical changes during seed development.

13. Define vernalization. Explain its mechanism and importance.

14. Explain C_3 pathway of photosynthesis

15. Explain translocation of assimilates in detail.

SECTION-C

16. Describe K^+ ion pump theory of stomatal movements in transpiration.

17. Enlist various types of photosynthetic pigments. Explain the light reaction of photosynthesis.

18. Discuss the Biosynthesis, mode of action and commercial, application of gibberellins.

Roll No.

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (2018 Batch) (Sem.–3)

ORGANIC CHEMISTRY

Subject Code : BSBT-301-18

M.Code : 76608

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1 Write briefly :

a. What is Inductive Effect?

b. What are Carbocations?

c. Explain Resonance and the structure of benzene proposed by Kekule.

d. How free radicals generate in Achemical Reaction?

e. What is Heterolytic Fission?

f. Explain the acidic nature of alcohol and phenol.

g. What are the various types of reagents used in chemical reactions?

h. What are carbenes and give their types?

i. Explain intermediate and activated complex in a reaction.

j. What are Dienes and how they differ from alkenes?

SECTION-B

Q2 Comparison between Resonance and Electromeric effect.

Q3 Explain the mechanism of Kolbe's reaction.

Q4 Define Bond Angle and name the factors which influence the bond angle in a molecule?

Q5 Write a short note on hyper conjugation.

Q6 What is the difference between localized and delocalized chemical bond?

SECTION-C

Q7 Define Aromaticity and what is the theoretical requirement of a compound to be aromatic?

Q8 What name is given to temporary dipole-induced interactions? State the factors upon the magnitude of these interactions depends.

Q9

and chloroacetic acid are stronger than acetic acid. why?

radical is more stable than n-propyl free radical. Why?

reactive than alkyl chloride. Why?

temperature, while H_2O is liquid. Why?

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc.(BT) (2013 to 2017) (Sem.–3)

BIOPHYSICS

Subject Code : BSBT-203

M.Code : 47036

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION A

Q1. Fill in the Blanks :

a) Resolving power of microscope……

b) On increasing the wavelength of light, resolution of microscope……

c) ……ion channels are responsible for depolarization of cardiac muscles.

d) On the retina of eye……image is formed.

e) ……radiation is the least penetrating.

f) Roentgen is unit of……

g) Insulating sheath on axon ……

h) Efflux of……ions causes hyperpolarization of cell.

i) Nodes of ranvier provide……type of conduction.

j) Speed of light is……m/s.

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SECTION-B

Q2. Differentiate between striated and non-striated muscles with diagrams.

Q3. Explain α,β,γ radiations with suitable examples.

Q4. Describe in brief any four crystal systems with diagrams.

Q5. Explain with diagram conduction of action potential by neuron.

Q6. Explain in brief the rhodopsin cycle of vision.

SECTION-C

Q7. Explain the depolarization, repolarization and hyperpolarization stages of cardiac cell.

Q8. Define Diffraction. Explain Bragg's law.

Q9. With the help of ray diagram explain the working of compound microscope.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (2018 Batch) (Sem.–3)

INTRODUCTION TO COMPUTERS

Subject Code : BSBT-307-18

M.Code : 76614

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Answer briefly :**

   a) What are digital computers?

   b) Name any two latest languages used in computers.

   c) What is the need for computer software?

   d) Discuss types of monitors.

   e) Define Primary storage.

   f) Write about online mode in computer.

   g) What are the specification of Hard Disk?

   h) What is the use of Joystick?

   i) Discuss NCBI data model.

   j) What is genebank?

SECTION-B

2. Write the functioning of functional units of Computer.
3. What is importance of DNA sequence?
4. What is source data automation?
5. Explain the types of printers and their features.
6. Discuss the different ways of communication with computer.

SECTION-C

7. Give the brief introduction of Internet. Explain its use for the Biologist.
8. Discuss various mass storage devices used to store data in computer. Which are latest Storage devices?
9. Give the introduction database searching and sequence alignment with the help of computers.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (2018 Batch) (Sem.–3)

MOLECULAR BIOLOGY

Subject Code : BSBT-303-18

M.Code : 76610

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a. Describe the structure of Nucleosome.

   b. What causes dimerization of Thymine?

   c. What is sigma factor?

   d. What is the role of Rho factor in transcription?

   e. Differentiate Induced and spontaneous mutations.

   f. Which is the sense strand of DNA?

   g. What is the role of promoter in a gene?

   h. What are Base analogues?

   i. What is the function of DNA polymerase?

   j. How does penicillin work as antibiotic?

SECTION-B

2. Describe initiation of transcription in *E.coli*.
3. Describe Replication process as it occurs on Leading strand of DNA.
4. What are the characteristics of Genetic code?
5. Discuss Catabolite repression of Lac operon.
6. Explain photoreactivation for repair of mutated DNA.

SECTION-C

7. Explain the process of Translation in prokaryotes.
8. Discuss positive regulation of Lac operon.
9. a. Write the activities of chemical mutagens.

   b. How is excision repair of damaged DNA carried out by cell *invivo*?

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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc.(BT) (2014 to 2017) (Sem.–3)

BIOCHEMISTRY-II

Subject Code : BSBT-209

M.Code : 47040

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Define :**

   a) Isozymes

   b) Extremozymes

   c) Energy rich metabolites

   d) Ketogenesis

   e) Active site

   f) Fatty acids

   g) Biogenic amines

   h) Bile pigments

   i) Porphyrins

   j) Heme

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SECTION-B

2. What are the factors affecting enzyme activity?
3. Write a note on Allosteric enzymes.
4. What is Electron Transport Chain? Discuss its significance.
5. List regulatory steps of Krebs cycle.
6. Write a note on assimilation of atmospheric nitrogen.

SECTION-C

7. Discuss the pathway of cholesterol biosynthesis.
8. Write about steps in Glycolysis and its regulation.
9. Elaborate on the mechanism of regulation of ATP synthesis.

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Roll No. Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (2014 to 2017) (Sem.–3)

TECHNIQUES IN BIOTECHNOLOGY-I

Subject Code : BSBT-207

M.Code : 47038

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Write briefly :**

   a) Which sterilization technique is used for :

      i) Antibiotics solution

      ii) Inoculating loop

   b) Who is the father of Microbiology?

   c) What is the mobile and stationary phase in paper chromatography?

   d) Mention the culture condition for growing mesophilic bacteria.

   e) What is buffer?

   f) What is the difference between light microscope and electron microscope?

   g) What is PCR?

   h) Give the names of isotope of phosphorous and sulphur used in radioisotopy.

   i) Give the principle of visible spectroscopy.

   j) What is the difference between genomics and proteomics?

SECTION-B

2. Describe the set up and principle of dissecting microscope.
3. What is the advantage of using HPLC over thin layer chromatography?
4. What is hybridization? Mention the techniques which involve this process?
5. Brief the method for quantitative estimation of nucleic acid.
6. Give the principle and application of ion exchange chromatography.

SECTION-C

7. Write short note on **any two** :

   a) X-ray crystallography

   b) Electrophoresis

   c) Spectrophotoflorimetry

   d) Nanotechnology

8. What are the different methods of sterilizations used in microbiology? Discuss their mechanism of action and application.
9. Discuss about some industrial important microoragnism and their applications.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc.(BT) (2014 to 2017) (Sem.–3)

ORGANIC CHEMISTRY

Subject Code : BSBT-201

M.Code : 47034

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

a) Define Resonance Energy. How does it affect the stability of the molecule?

b) Explain that aryl halides are less reactive than alkyl halides.

c) What are free radicals? Discuss the structure of a simple alkyl free radical.

d) What is isotope labeling? Discuss its importance in determining the mechanism of an organic reaction.

e) Explain briefly radical polymerization with suitable example.

f) What do you understand by (4+2) cycloaddition reactions?

g) Draw the orbital structure of acetylene.

h) Although benzene contains three double bonds, it resists addition reactions. Why?

i) Why phenol has smaller dipole moment than methanol?

j) How will you convert an acid chloride into anilide?

SECTION-B

2. Spectroscopic measurements indicate that both the C-O bonds in sodium formate and all the C-C bonds have the same bond lengths of 1.27 Å and 1.39 Å respectively. Explain.

3. Out of $(CH_3)_3C^+$ and $(CD_3)_3C^+$, which carbocation is more stable and Why?

4. What is Lederer-Manasse reaction? Give its mechanism. Using this reaction, how will you explain the formation of Bakelite from phenol and formaldehyde?

5. Dehydration of 1-butanol and 2-butanol give the same mixture of alkenes. Explain.

6. Comment on the statement "*Delocalization alone is not a sufficient criterion for a molecule to exhibit aromaticity*".

SECTION-C

7. a) Discuss briefly the conformations of cycloalkenes.

   b) Briefly discuss the methods of preparation of conjugated dienes.

8. a) Write a detailed note on allylic halogenation.

   b) Though benzene is an unsaturated hydrocarbon yet it fails to give Baeyer's test. Explain.

9. a) How will you prepare phenols from Grignard's reagent?

   b) How will you prepare n-valeric acid from acetoacetic ester and benzoic acid from benzene (using nitrile synthesis)?

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Roll No.

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (2018 Batch) (Sem.–3)

IMMUNOLOGY

Subject Code : BSBT-302-18

M.Code : 76609

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

a) What weakens the immune system? What are the signs of weak immune system?

b) Who is the father of immunology?

c) Define specific and non-specific immunity.

d) Describe the role of spleen in immune system.

e) What is the difference between antibody affinity and avidity?

f) What do you mean by complement fixation?

g) What is HLA?

h) What are cytokines?

i) Define immunomodulation.

j) What are Peyer's patches?

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SECTION-B

2. What are specific functions of MHC molecules?
3. Describe the different components of immune system.
4. What is complement system? Describe pathways of complement activation.
5. Differentiate between T-dependent and T-independent antigens.
6. Describe the contributions of different scientists in the development of immunology.

SECTION-C

7. Describe the differentiation of T-cells. What are the different subsets of T-cells?
8. What are the different lines of defense of body?
9. Describe the mechanism of humoral immune response.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc.(BT) (2014 to 2017) (Sem.–3)

BIOPHYSICS

Subject Code : BSBT-203

M.Code : 47036

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

SECTION-A

1. Explain briefly :

   a) How is blood pressure controlled in arteries?

   b) What is the total refractive power of eye?

   c) Define secondary messenger with example.

   d) What is a biophoton?

   e) What is a reciprocal lattice?

   f) What is z line in sarcomere?

   g) Give application of cobalt 60.

   h) Define atomic packing factor.

   i) Explain the term- kinesiology.

   j) Define Bragg's law.

SECTION-B

2. Explain the architecture of skeletal muscle and the sliding filament theory of muscle contraction. 5

3. Explain the mechanism for the perception of sensory event. 5

4. Explain the formation, emission and propagation of electromagnetic wave. 5

5. a) The half-life of U-238 undergoing α-decay is 4.5×10^9 years. What is the activity of 1g sample of U-238? 3

   b) What is a source of gamma rays? 2

6. a) The magnetic field in a plane electromagnetic wave is given by $B_y = 2 \times 10^{-7} \sin (0.5 \times 10^3 x + 1.5 \times 10^{11} t)$ T. What is the wavelength and frequency of the wave? 3

   b) What do you understand by term -dual nature of light? 2

SECTION-C

7. Explain the factors affecting diffusion potential when a membrane is permeable to numerous different ion. Discuss resting membrane potential, gradient potential and action potential in a neuron. 3+7

8. Discuss the biological and chemical aspect of radioisotope use including tracer principle, radiopharmaceuticals and mechanism of localization of radiopharmaceutical in a target organ. 10

9. Explain the underlying physics of XRD technique. What factors determine the number of peaks obtained in XRPD? How will you determine the crystal structure from XRD data? 10

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Roll No. | | | | | | | | | |

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (2018 Batch) (Sem.–3)

ORGANIC CHEMISTRY

Subject Code : BSBT-301-18

M.Code : 76608

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a) Acetylene has garlic order why?

   b) Is 1,3 butadiene is more stable than 1,4-pentadiene?

   c) Define aromaticity.

   d) Why terminal alkynes are acidic?

   e) Give two industrial applications of ethylene.

   f) What are delocalized bonds?

   g) Explain the Markownikoff's rule.

   h) What are carbon free radical?

   i) Out of boat or chair conformation of cyclohexane which is more stable.

   j) What is resonance?

SECTION-B

2. Explain the aromaticity.

3. What is hypercongujation?

4. Explain the kekule structure.

5. Explain the carbocation and their methods of formation.

6. Discuss the mechanism of addition of a halogen acid to an alkene.

SECTION-C

7. What is carbene? Discuss their formation as well as their relative stability order.

8. Explain the Inductive and electromeric effects.

9. Explain the mechanism of following reactions :

   a) Kolbe's reaction.

   b) Reimer Tiemann reaction

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Roll No. [ ]

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc.(BT) (2014 to 2017) (Sem.–3)

IMMUNOLOGY–I

Subject Code : BSBT-205

M.Code : 47037

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1) **Answer briefly :**

a) Null cells

b) Polymorphs

c) Affinity

d) Naïve cells

e) Complement pathway

f) Bursa of Fabricus

g) Innate Immune system

h) Spleen

i) CDR

j) Heavy Chain

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SECTION-B

2. Elaborate on the features of the immune response.
3. Explain the process of B Cell Maturation.
4. Discuss lymphocyte trafficking.
5. How are antigens recognized by T cells?
6. Write a note on the heterogeneity of the lymphoid cells.

SECTION-C

7. Write a note on the molecular mechanism of generation of antibody.
8. Discuss the functions of the Antibody.
9. Explain the lymphatic system and its functions.

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