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

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.–4)

GENETIC ENGINEERING

Subject Code : BSBT-401-18

M.Code : 77690

Date of Examination : 20-11-2023

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) Define Transformation and Transduction.

b) What is Microprojectile method?

c) What is Site directed Mutagenesis?

d) Define Gene shuffling.

e) What is Protein Engineering?

f) What is the role of microlaser in transformation?

g) What is the difference between plasmid and episome?

h) What is Gene Targeting?

i) Define Biopharming.

j) What is the principle of Phage Display technique?

SECTION-B

2. Discuss Uses and Methods of Protein Engineering.

3. Write a note on techniques of direct Transfer of DNA to plants.

4. How are Therapeutic Protein/Biopharmaceuticals produced using Transgenesis? Discuss.

5. Briefly explain Agrobacterium mediated gene transfer in plants.

6. Write a note on Transgenic Animals.

SECTION-C

7. Differentiate between Random and Site Directed Mutagenesis. Discuss strategies for Site directed Mutagenesis.

8. Deliberate on Principle, methodology and applications of Gene Targetting in animals.

9. Discuss Phage Display Technology, Methodology and applications.

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

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.–4)

PLANT TISSUE CULTURE

Subject Code : BSBT402-18

M.Code : 77691

Date of Examination : 22-11-2023

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) Mention the contribution of Gottlieb Haberlandt to plant tissue culture.

b) What is the common pH of plant tissue culture medium and why?

c) What is the difference between a disinfectant and sterilizing agent?

d) Mention the incubation conditions for the growth of plant tissue in laboratory.

e) Why is there browning of the plant tissue during its growth?

f) What are explants? Cite a few examples.

g) What is the difference between a hybrid cell and somaclonal variant?

h) What is the difference between macronutrient and micronutrient?

i) What is hybridization?

j) Differentiate between artificial and natural mediums.

SECTION-B

2. What is a somatic embryo? How it differs from zygotic embryos?

3. Why totipotency is an essential requirement in the growth of plant tissue?

4. Discuss the selection of hybridoma cells using a HAT medium.

5. What is the difference between a callus culture and suspension culture?

6. State the process of somatic cell fusion. Discuss its advantages and disadvantages.

SECTION-C

7. What is micropropagation? Discuss different stages and significance of micropropogation.

8. Briefly describe the different components of plant tissue culture medium and their significance. Also mention a few media used for growing plant tissue.

9. **Briefly describe the importance of any two plant growth regulators :**

a) Auxins

b) Cytokinin

c) Gibberellic acids

d) Abscisic acid.

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

Total No. of Questions : 09

B.Sc. (BT) (Sem.–5)

ORGANIC FARMING

Subject Code : BSBT-501-18

M.Code : 78346

Date of Examination : 17-11-2023

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) Organic agriculture

   b) Green manuring

   c) Liquid organic manures

   d) NADEP

   e) Labelling

   f) Demeter

   g) Homa farming

   h) Bulky organic manures

   i) Rhizobium

   j) Contribution of Sir Albert Howard

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SECTION-B

2. Write down role of organic farming in sustainable agriculture.

3. Discuss various ill effects of green revolution.

4. Discuss use of soil health cards.

5. Define biofertilizers. Discuss limitations of biofertilizers.

6. Write a short note on soil enzymes.

SECTION-C

7. Differentiate vermiwash and vermicompost and how will you construct vermicompost unit and what type of earthworms are used for vermicomposting? Discuss its procedure from starting to harvesting of Vermicompost, in detail. How can we use vermiwash?

8. a) What do you mean by Bio-remediation.

   b) Discuss role of micro-organisms in degradation of pesticides.

9. Discuss the harmful effects of non-judicious chemical fertilization.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.–5)

ANIMAL BIOTECHNOLOGY

Subject Code : BSBT-139-18

M.Code : 78350

Date of Examination : 28-11-2023

Time : 3 Hrs.

Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying TWO & HALF ($2\frac{1}{2}$) 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. **Describe the following:**

   a) Animal cloning

   b) Transgenesis

   c) Embryonic stem cell

   d) Indirect gene transfer method

   e) Embryo transfer technique

   f) Cause of Theileriosis

   g) Symptoms of foot and mouth disease

   h) Draw structure of any human retrovirus

   i) Examples of Human genetic engineering

   j) Somatic cell gene therapy.

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SECTION-B

2. Differentiate between adult stem cell and embryonic stem cell.
3. How are transgenic pigs produced?
4. Describe the term conservation biology in detail.
5. What is importance of artificial insemination?
6. Define the term gene therapy? What are various vectors used in it?

SECTION-C

7. Explain Microinjection method of gene transfer in animals.
8. Discuss in detail about applications of stem cell technology.
9. What are problems and ethics related to genetic modification in medicine?

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Total No. of Questions : 09

B.Sc. (BT) (Sem.–5)

HUMAN BEHAVIOUR & PSYCHOLOGY

Subject Code : BSBT-137-18

M.Code : 78348

Date of Examination : 21-11-2023

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. **Answer briefly :**

a) Define Cognitive Psychology

b) Why study of psychology is important?

c) Define perception.

d) Personality tests

e) Functions of memory

f) Introvert personality

g) Positive motivation

h) Self-actualisation

i) Elements of creativity.

j) What is 'Type A' personality?

SECTION-B

2. What are the applications of psychology to the study of human-behaviour?

3. Discuss the nature & scope of psychology.

4. Discuss the various theories of learning.

5. Explain the various models of intelligence.

6. What are the various issues involved in the assessment of intelligence?

SECTION-C

7. What are the determinants of personality? Discuss.

8. "*Prevention is better than cure when it comes to conflict*". Discuss the various conflict-handling strategies.

9. What are the environmental & genetic bases for understanding individual differences?

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Total No. of Questions : 09

B.Sc. (Bio Technology) (Sem–5)

FERMENTATION TECHNOLOGY

Subject Code : BSBT140-18

M.Code : 78351

Date of Examination : 30-11-2023

Time : 3 Hrs. Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying TWO AND A HALF 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 the uses of butyric acid?

   b) Name any two microorganisms that produce polysaccharides.

   c) What is the composition of biogas?

   d) Define activation energy of a reaction.

   e) What is the principle of ultrafiltration?

   f) Define biotransformation reactions.

   g) Name any two favour compounds of microbial origin and also mention their microbial source.

   h) What is the need of cell disruption?

   i) What is encapsulation?

   j) What are the raw materials used for ethanol production?

SECTION-B

2. Describe principles of upstream processing.

3. Discuss steroid biotransformation reactions.

4. Write a brief note on chromatographic techniques.

5. What is Michaelis-Menten equation? What is its significance?

6. What are semi-synthetic antibiotics? How are they produced?

SECTION-C

7. Write a note on products of secondary metabolism.

8. What is metabolic engineering? Describe its application in industrial biotechnology.

9. Discuss the production of biofuels and their status in transportation industry.

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B.Sc. (Bio Technology) (Sem.–5)

IPR, ENTREPRENEURSHIP BIOETHICS & BIOSAFETY

Subject Code : BSBT 141-18

M.Code : 78352

Date of Examination : 02-12-2023

Time : 3 Hrs. Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
2. SECTION-B contains FIVE questions carrying 2.5 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 the following :**

   a) Novelty

   b) GMP

   c) Patent attorney

   d) Term of patent

   e) Pre feasibility study

   f) GEAC

   g) Bioethics

   h) Stock of product

   i) Indian patent law

   j) Excise economic consideration.

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SECTION-B

2. What do you understand by industrial property? Give detail.
3. How selection of a product is important in entrepreneurship?
4. Describe the concept of containment level.
5. Write a short note on depository considerations.
6. Discuss about basic regulation of excise.

SECTION-C

7. Write in detail about intellectual property provisions of WTO.
8. What are the ethical issues against the molecular technologies?
9. Give an account of health hazards concerning Biotechnology.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.–5)

RENEWABLE ENERGY RESOURCES

Subject Code : BSBT-138-18

M.Code : 78349

Date of Examination : 23-11-2023

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. **Explain briefly :**

a) Define solar constant.

b) Why is orientation needed in concentrating type collectors?

c) What are the lift and drag forces on the blade when wind flows over it?

d) What is thermal gasification of biomass?

e) What is the function of heat carrier fluid in a geothermal system?

f) Explain the tide formation in the ocean.

g) What is ocean thermal energy conversion?

h) What are the various limitations of Magnetohydrodynamic (MHD) systems?

i) Why do high-temperature geothermal power plants use steam turbines as the prime movers?

j) Why is the need for alternate energy sources important in the current scenario?

SECTION-B

2. What is meant by Beam and Diffuse radiation?

3. Describe the primary considerations in selecting a site for wind generators.

4. Explain the difference between a geothermal power plant and a thermal power plant.

5. Explain the principle and workings of Tidal power plant.

6. The consumption pattern in a biogas plant is given below :

20 l/h from 08:00 to 12:00 hours

40 l/h from 13:00 to 16:00 hours

10 l/h from 20:00 to 24:00 hours

Determine the size of the gas holder and the required gasholder capacity.

SECTION-C

7. Write any three applications of solar energy. How does solar energy reduce greenhouse gases?

8. State the various factors to be considered while designing the biogas plant. Why is pretreatment essential before biogas production?

9. Explain the working principle of MagnetoHydrodynamic (MHD) generator. Also write down its advantages and applications.

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Total No. of Questions : 09

B.Sc. (BT) (Sem.–5)

HUMAN BEHAVIOUR & PSYCHOLOGY

Subject Code : BSBT-137-18

M.Code : 78348

Date of Examination : 21-11-2023

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. **Answer briefly :**

   a) Define Cognitive Psychology

   b) Why study of psychology is important?

   c) Define perception.

   d) Personality tests

   e) Functions of memory

   f) Introvert personality

   g) Positive motivation

   h) Self-actualisation

   i) Elements of creativity.

   j) What is 'Type A' personality?

SECTION-B

2. What are the applications of psychology to the study of human-behaviour?

3. Discuss the nature & scope of psychology.

4. Discuss the various theories of learning.

5. Explain the various models of intelligence.

6. What are the various issues involved in the assessment of intelligence?

SECTION-C

7. What are the determinants of personality? Discuss.

8. "*Prevention is better than cure when it comes to conflict*". Discuss the various conflict-handling strategies.

9. What are the environmental & genetic bases for understanding individual differences?

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Total No. of Questions : 09

B.Sc. (BT) (Sem.–5)

BIOTECHNOLOGY IN FORENSIC SCIENCES

Subject Code : BSBT142-18

M.Code : 78353

Date of Examination : 05-12-2023

Time : 3 Hrs. Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying $2\frac{1}{2}$ 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 DNA fingerprinting?

   b. Terminal ballistics

   c. Define toxicology.

   d. Give names of branches of forensic science.

   e. Enlist General characteristics of handwriting.

   f. Tools for DNA fingerprinting investigation.

   g. External ballistics

   h. Modus operandi

   i. Define eDiscovery

   j. Classify firearms.

SECTION-B

2. Write note on the comparison of different handwritings.
3. Classify injuries and give their role in medico-legal purposes.
4. Write about the chemical evidence of explosives.
5. Discuss the role and benefits of fingerprinting as a sign of personal identification.
6. Write about the application of DNA fingerprinting in forensic medicines.

SECTION-C

7. What is DNA Fingerprinting? Write a note on the search and seizure of computers.
8. Classify firearms and explosives. Elaborate on chemical evidence for explosives.
9. Discuss the role and significance of toxicological findings in forensic science.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.–5)

ANIMAL BIOTECHNOLOGY

Subject Code : BSBT-139-18

M.Code : 78350

Date of Examination : 28-11-2023

Time : 3 Hrs.

Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying TWO & HALF ($2\frac{1}{2}$) 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. **Describe the following:**

   a) Animal cloning

   b) Transgenesis

   c) Embryonic stem cell

   d) Indirect gene transfer method

   c) Embryo transfer technique

   f) Cause of Theileriosis

   g) Symptoms of foot and mouth disease

   h) Draw structure of any human retrovirus

   i) Examples of Human genetic engineering

   j) Somatic cell gene therapy.

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Dec-2023

SECTION-B

2. Differentiate between adult stem cell and embryonic stem cell.
3. How are transgenic pigs produced?
4. Describe the term conservation biology in detail.
5. What is importance of artificial insemination?
6. Define the term gene therapy? What are various vectors used in it?

SECTION-C

7. Explain Microinjection method of gene transfer in animals.
8. Discuss in detail about applications of stem cell technology.
9. What are problems and ethics related to genetic modification in medicine?

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

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (Bio Technology) (Sem–6)

DEVELOPMENTAL BIOLOGY

Subject Code : BSBT-147-18

M.Code : 79458

Date of Examination : 20-11-2023

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) Differentiate between invagination and extension.

b) Describe the types of fertilization.

c) What is the purpose of embryonic cleavage?

d) Write a short note on gastrulation.

e) Explain the concept of totipotency.

f) What are morphogenetic movements?

g) What are the primary germ layers involved in embryonic differentiation?

h) Explain the term cell fate as it pertains to embryonic differentiation.

i) Name the three germ layers involved in organ development.

j) Describe the process of cell migration during organogenesis.

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SECTION -B

2. What is neurulation? When does it occur in embryonic development?

3. Explain the concept of embryonic induction along with its types.

4. What is de-lamination? Explain the fate maps in early embryos.

5. How does epigenetics influence embryonic differentiation?

6. What is the process of limb bud development in organogenesis?

SECTION - C

7. Describe the process of Spermatogenesis and Oogenesis.

8. Write a detailed note on embryonic development stages.

9. Explain the process of Organogenesis in detail.

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Total No. of Questions : 11

B.Voc. (Child Caregiver)/B.A (J&MC)/BCA/BBA(SIM)/
B.Com. (Hons.)/BHMCT(UGC)/B.Sc. Hons.(Microbiology)/
Nutrition & Dietetics/B.Sc. AI&ML/BT/FD/G&WD/IT/MLS/
OTT/Radiotherapy Technology Sem-1

HUMAN VALUES, DE-ADDICTION AND TRAFFIC RULES

Subject Code : HVPE-101-18

M.Code : 93322

Date of Examination : 30-12-2023

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
2. SECTION-B contains FIVE questions carrying FOUR marks each and students have to attempt all the questions.
3. SECTION-C contains FIVE questions carrying SIX marks each and students have to attempt all the questions.

SECTION-A

(10 × 1 = 10)

1. Write briefly :

a) What is cyclic production?
चक्रीय उत्पादन क्या है?
ਚੱਕਰੀ ਉਤਪਾਦਨ ਕੀ ਹੈ?

b) What is Artistic-Value?
कलात्मक-मूल्य क्या है?
ਕਲਾਤਮਿਕ-ਮੁੱਲ ਕੀ ਹੈ?

c) What is Material Order ?
सामग्री आदेश क्या हैं?
ਸਾਮਗਰੀ ਆਦੇਸ਼ ਕੀ ਹੈ?

d) What is innateness?
स्वाभाविकता क्या है?
ਸਵਾਭਾਵਿਕਤਾ ਕੀ ਹੈ?

e) What is harmony in family?
परिवार में तालमेल के बारे में बताएं।
ਪਰਿਵਾਰ ਵਿੱਚ ਤਾਲਮੇਲ ਦੇ ਬਾਰੇ ਵਿੱਚ ਦੱਸੋ।

f) What is Gratitude?
कृतज्ञता क्या है?
ਕ੍ਰਿਤਗਿਅਤਾ ਕੀ ਹੈ?

g) What are the different patterns of differentiation?
भेदभाव के विभिन्न पैटर्न क्या हैं?
ਫਰਕ ਦੇ ਵੱਖ-ਵੱਖ ਪੈਟਰਨ ਕੀ ਹਨ?

h) What do you mean by Respect?
आपका सम्मान से क्या मतलब है?
ਤੁਹਾਡਾ ਆਦਰ ਤੋਂ ਕੀ ਮਤਲਬ ਹੈ?

i) How the value "Guidance" is related with Self?
मूल्य ''मार्गदर्शन' स्वयं के साथ कैसे संबंधित है?
ਮੁੱਲ ਅਗਵਾਈ ਸਵੈ ਦੇ ਨਾਲ ਕਿਵੇਂ ਸੰਬੰਧਤ ਹੈ?

j) What are the activities and needs of self and body?
आत्म और शरीर की गतिविधियां और आवश्यकताएं क्या हैं?
ਸਵੈ ਅਤੇ ਸਰੀਰ ਦੀਆਂ ਜ਼ਰੂਰਤਾਂ ਅਤੇ ਗਤੀਵਿਧੀਆਂ ਕੀ ਹਨ?

SECTION-B

(5× 4 = 20)

2. What is the need for value education in technical and other professional institutions?
तकनीकी एवं अन्य व्यावसायिक संस्थानों में मूल्यपरक शिक्षा की क्या आवश्यकता है?
ਤਕਨੀਕੀ ਅਤੇ ਹੋਰ ਪੇਸ਼ੇਵਰ ਸੰਸਥਾਵਾਂ ਵਿੱਚ ਮੁੱਲ ਦੀ ਸਿੱਖਿਆ ਦੀ ਕੀ ਲੋੜ ਹੈ?

3. What is the difference between belief and understanding?
विश्वास और समझ में क्या अंतर है?
ਵਿਸ਼ਵਾਸ ਅਤੇ ਸਮਝ ਵਿੱਚ ਕੀ ਅੰਤਰ ਹੈ?

4. Differentiate between intention and competence. How do we come to confuse between the two ?
इरादा और क्षमता के बीच क्या अंतर है? कैसे हम इन दोनों गलती करते हैं?
ਇਰਾਦਾ ਅਤੇ ਸਮਰੱਥਾ ਦੇ ਵਿੱਚ ਕੀ ਅੰਤਰ ਹੈ? ਕਿਵੇਂ ਅਸੀਂ ਦੋਵਾਂ ਵਿੱਚ ਗਲਤੀ ਕਰਦੇ ਹਾਂ?

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Total No. of Questions : 11

BBA / B.Com (Hons) / BCA / BHMCT / B.Sc. Hons. (Microbiology / AI & Machine Learning / Bio Technology / Fashion Design / Graphics & Web Designing / IT / Medical Lab Sciences / Operation Theatre Technology)/ BTTM / M.Com (Sem.–1)

HUMAN VALUES, DE-ADDICTION & TRAFFIC RULES

Subject Code : HVPE-101-18

M.Code : 75087

Date of Examination : 04-01-24

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

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is compulsory.
2. SECTION-B contains FIVE questions. Each question carry FOUR marks. Attempt All.
3. SECTION-C contains FIVE questions with internal choice. Each question carry SIX marks. Attempt All.

SECTION-A (10 × 1 = 10)

1. Answer the following :

a. What is value education?
मूल्य शिक्षा क्या है?
ਮੁੱਲ ਸਿੱਖਿਆ ਕੀ ਹੈ?

b. What is prosperity?
समृद्धि क्या है?
ਖੁਸ਼ਹਾਲੀ ਕੀ ਹੈ?

c. What do you mean by physical facilities?
भौतिक सुविधाओं से आप क्या समझते हैं?
ਭੌਤਿਕ ਸਹੂਲਤਾਂ ਤੋਂ ਤੁਹਾਡਾ ਕੀ ਮਤਲਬ ਹੈ?

d. What is coexistence?
सह-अस्तित्व क्या है?
ਸਹਿਹੋਂਦ ਕੀ ਹੈ?

e. What is an all-encompassing solution?
सर्वव्यापी समाधान क्या है?
ਇੱਕ ਸਰਵਭੌਮਿਕ ਹੱਲ ਕੀ ਹੈ?

f. What is self regulation?
स्वनियमन क्या है?
ਸਵੈ ਨਿਯਮ ਕੀ ਹੈ?

g. Differentiate between fame and respect.
प्रसिद्धि और सम्मान के बीच अंतर करें।
ਪ੍ਰਸਿੱਧੀ ਅਤੇ ਇੱਜ਼ਤ ਵਿਚਕਾਰ ਫ਼ਰਕ ਕਰੋ।

h. What is Animal Order?
जीव आदेश क्या है?
ਜੀਵ ਆਦੇਸ਼ ਕੀ ਹੈ?

i. What is Mutual Prosperity?
पारस्परिक समृद्धि क्या है?
ਆਪਸੀ ਖੁਸ਼ਹਾਲੀ ਕੀ ਹੈ?

j. What is Utility-Value?
उपयोगिता-मूल्य क्या है?
ਉਪਯੋਗਿਤਾ-ਮੁੱਲ ਕੀ ਹੈ?

SECTION-B (5 × 4 = 20)

2. Write a short note on the concept of preservation.
संरक्षण की अवधारणा पर संक्षिप्त टिप्पणी लिखिए।
ਸੰਭਾਲ ਦੀ ਧਾਰਨਾ 'ਤੇ ਛੋਟਾ ਨੋਟ ਲਿਖੋ।

3. Explain harmony in family.
परिवार मे तालमेल के बारे में बताएं।
ਪਰਿਵਾਰ ਵਿੱਚ ਤਾਲਮੇਲ ਦੇ ਬਾਰੇ ਵਿੱਚ ਦੱਸੋ।

4. How there is Recyclability and Self-Regulation in Nature?
प्रकृति में आत्म नियमन और पुनरावृत्ति कैसे है?
ਕੁਦਰਤ ਵਿੱਚ ਆਤਮ-ਨਿਯਮਤਾ ਅਤੇ ਚੱਕਰੀ-ਕ੍ਰਮ ਕਿਵੇਂ ਹੈ?

5. What are the basic guidelines of value education?
मूल्य शिक्षा के बुनियादी दिशानिर्देश क्या है?
ਮੁੱਲ ਸਿੱਖਿਆ ਦੇ ਬੁਨਿਆਦੀ ਦਿਸ਼ਾਨਿਰਦੇਸ਼ ਕੀ ਹਨ?

6. What can be the basis of undivided society-the 'world family'?
अखण्ड समाज-'विश्व परिवार' का आधार क्या हो सकता है?
ਅਣਵੰਡੇ ਸਮਾਜ-'ਸੰਸਾਰ ਪਰਿਵਾਰ' ਦਾ ਆਧਾਰ ਕੀ ਹੋ ਸਕਦਾ ਹੈ?

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5. What do you mean by your natural acceptance? Illustrate with examples. Is it invariant with the time and place?

आपकी स्वाभाविक स्वीकृति से आपका क्या अभिप्राय है? उदाहरण सहित स्पष्ट कीजिए। क्या यह समय और स्थान के साथ अपरिवर्तनीय है?

ਤੁਹਾਡੀ ਕੁਦਰਤੀ ਸਵੀਕ੍ਰਿਤੀ ਤੋਂ ਤੁਹਾਡਾ ਕੀ ਮਤਲਬ ਹੈ? ਉਦਾਹਰਣਾਂ ਨਾਲ ਸਮਝਾਓ। ਕੀ ਇਹ ਸਮੇਂ ਅਤੇ ਸਥਾਨ ਨਾਲ ਬਦਲਦਾ ਹੈ?

6. What are the basic requirements to fulfill human aspirations? Indicate their correct priority.

मानवीय आकांक्षाओं की पूर्ति के लिए मूलभूत आवश्यकताएं क्या हैं? उनकी सही प्राथमिकता बताएं।

ਮਨੁੱਖੀ ਇੱਛਾਵਾਂ ਨੂੰ ਪੂਰਾ ਕਰਨ ਲਈ ਬੁਨਿਆਦੀ ਲੋੜਾਂ ਕੀ ਹਨ? ਉਹਨਾਂ ਦੀ ਸਹੀ ਤਰਜੀਹ ਦਰਸਾਓ।

SECTION-C **(5× 6 = 30)**

7. Why is it important to study yourself? How does it help in your day-to-day life?

स्वयं का अध्ययन करना क्यों महत्वपूर्ण है? यह आपके दैनिक जीवन में कैसे मदद करता है?

ਆਪਣੇ ਆਪ ਦਾ ਅਧਿਐਨ ਕਰਨਾ ਮਹੱਤਵਪੂਰਨ ਕਿਉਂ ਹੈ? ਇਹ ਤੁਹਾਡੇ ਰੋਜ਼ਾਨਾ ਜੀਵਨ ਵਿੱਚ ਕਿਵੇਂ ਮਦਦ ਕਰਦਾ ਹੈ?

OR

Explain the process of self-exploration with the help of a suitable diagram.

एक उपयुक्त आरेख की मदद से आत्म-अन्वेषण की प्रक्रिया को समझाईये।

ਇੱਕ ਢੁੱਕਵੇਂ ਚਿੱਤਰ ਦੀ ਮਦਦ ਨਾਲ ਆਤਮ-ਅਧਿਐਨ ਦੀ ਪਰਿਕ੍ਰਿਆ ਨੂੰ ਸਮਝਾਓ।

8. How is a human-being co-existence of Self and Body? Explain Pre-Conditioning, Sensation and Natural-Acceptance.

इंसान स्वयं और शरीर का सह-अस्तित्व कैसे है? पूर्व-मान्यता, संवेदना और प्राकृतिक-स्वीकृति समझाओ।

ਮਨੁੱਖ ਸਵੈ ਅਤੇ ਸਰੀਰ ਦਾ ਸਹਿ-ਅਸਤਿਤਵ ਕਿਵੇਂ ਹੈ? ਪੂਰਵ-ਮਾਨਤਾ, ਸੰਵੇਦਨਾ ਅਤੇ ਸਹਿਜ-ਸਵਿਕਰਿਤੀ ਸਮਝਾਓ।

OR

What is the meaning and purpose of Self-Exploration?

स्वयं-अन्वेषण के अर्थ और उद्देश्य क्या हैं?

ਆਤਮ-ਅਧਿਐਨ ਦੇ ਮਤਲੱਬ ਅਤੇ ਉਦੇਸ਼ ਕੀ ਹਨ?

9. Compare the four orders in Nature on the basis of their salient aspects.

मुख्य पहलुओं के आधार पर प्रकृति में चार आदेशों की तुलना करें।

ਮੁੱਖ ਪਹਿਲੂਆਂ ਦੇ ਆਧਾਰ ਉੱਤੇ ਕੁਦਰਤ ਵਿੱਚ ਚਾਰ ਆਦੇਸ਼ਾਂ ਦੀ ਤੁਲਣਾ ਕਰੋ।

OR

What are the problems we are facing today because of operating on the basis of pre-conditioned desires?

पूर्व-मानता इच्छाओं के आधार पर परिचालन करने से हम आज क्या-क्या समस्याओं का सामना कर रहे हैं।

ਪੂਰਵ-ਮਾਨਤਾ ਇੱਛਾਵਾਂ ਦੇ ਆਧਾਰ ਉੱਤੇ ਚੱਲਣ ਕਰਕੇ ਅੱਜ ਅਸੀਂ ਕਿਹੜੀਆਂ-ਕਿਹੜੀਆਂ ਸਮੱਸਿਆਵਾਂ ਦਾ ਸਾਮਣਾ ਕਰ ਰਹੇ ਹਾਂ?

10. Critically examine the state of society today in context with fulfillment of the comprehensive human goal.

व्यापक मानवीय लक्ष्य की पूर्ति के सन्दर्भ में आज समाज की स्थिति का आलोचनात्मक परीक्षण करें।

ਵਿਆਪਕ ਮਨੁੱਖੀ ਟੀਚੇ ਦੀ ਪੂਰਤੀ ਦੇ ਸੰਦਰਭ ਵਿੱਚ ਅੱਜ ਸਮਾਜ ਦੀ ਸਥਿਤੀ ਦੀ ਗੰਭੀਰਤਾ ਨਾਲ ਜਾਂਚ ਕਰੋ।

OR

What are the five dimensions of Human Endeavour in society?

समाज में मानव प्रयास के पांच आयाम क्या हैं?

ਸਮਾਜ ਵਿੱਚ ਮਨੁੱਖੀ ਕੋਸ਼ਿਸ਼ ਦੇ ਪੰਜ ਪਹਿਲੂ ਕੀ ਹਨ?

11. How can the exchange of physical goods be mutually fulfilling? Evaluate the motivation of exchange in today's scenario.

भौतिक वस्तुओं का आदान-प्रदान परस्पर संतुष्टिदायक कैसे हो सकता है? आज के परिदृश्य में विनिमय की प्रेरणा का मूल्यांकन करें।

ਭੌਤਿਕ ਵਸਤੂਆਂ ਦਾ ਵਟਾਂਦਰਾ ਆਪਸੀ ਸੰਪੂਰਨ ਕਿਵੇਂ ਹੋ ਸਕਦਾ ਹੈ? ਅੱਜ ਦੇ ਦ੍ਰਿਸ਼ ਵਿੱਚ ਵਟਾਂਦਰੇ ਦੀ ਪ੍ਰੇਰਣਾ ਦਾ ਮੁਲਾਂਕਣ ਕਰੋ।

OR

What are the broad holistic criteria for evaluation of technologies, production systems and management models? How do they map with the comprehensive human goal?

प्रौद्योगिकी, उत्पादन प्रणाली और प्रबंधन मॉडल के मूल्यांकन के लिए व्यापक समग्र मापदंड क्या हैं? कैसे वे व्यापक मानव लक्ष्य के साथ मेल खाती है?

ਤਕਨਾਲੋਜੀ, ਉਤਪਾਦਨ ਸਿਸਟਮ ਅਤੇ ਪ੍ਰਬੰਧਨ ਮਾਡਲ ਦੀ ਪੜਤਾਲ ਕਰਨ ਲਈ ਵਿਆਪਕ ਸੰਪੂਰਨ ਮਾਪਦੰਡ ਕੀ ਹਨ? ਕਿਵੇਂ ਉਹ ਵਿਆਪਕ ਮਨੁੱਖ ਲਕਸ਼ ਦੇ ਨਾਲ ਮੇਲ ਖਾਂਦੀ ਹੈ?

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc.(BT) (Sem.–1)

BIOCHEMISTRY AND METABOLISM

Subject Code : BSBT-103-18

M.Code : 75326

Date of Examination : 13-12-2023

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. **Aswer briefly :**

a) What is the significance of peptide bond in proteins?

b) Name two common monosaccharides found in our diet.

c) What is the role of cholesterol in fluid mosaic model?

d) How do amino acids classified based on their polarity?

e) What is the primary function of glycogen in the body?

f) What are Cofactors and coenzymes?

g) What is the significance of double helical structure of DNA?

h) How do structure and function of globular proteins differ from fibrous proteins?

i) Explain the salient features of Secondary Structure of protein.

j) What are gangliosides?

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SECTION - B

2. Explain the structure of purines and pyrimidines.

3. What are metalloenzymes and how do they differ from other enzymes?

4. What are sphingolipids and how do they differ from other types of lipids?

5. Differentiate between catabolism and anabolism by giving example of glycolysis and gluconeogenesis.

6. How do prostaglandins function as local signalling molecule and what are their roles in various physiological processes?

SECTION - C

7. Explain the β-oxidation of fatty acids.

8. What are polysaccharides? Explain their structure and function in detail.

9. What are enzymes? Give their nomenclature and classification.

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Total No. of Questions : 09

B.Sc.(BT) (Sem.–1)

BASICS OF BIOSCIENCES

Subject Code : BSBT-107-18

M.Code : 75330

Date of Examination : 15-12-2023

Time : 3 Hrs. **Max. Marks : 30**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.**
2. **SECTION-B contains FIVE questions carrying $2^1/_2$ (Two and Half) marks each and students has to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying FIVE marks each and students has to attempt any TWO questions.**

SECTION-A

1. **Answer briefly :**

a) Define cell.

b) What is the function of a nucleolus?

c) What is a compound microscope?

d) What are neurons?

e) Define carbohydrates.

f) What are heterotrophic organisms?

g) Who is the father of taxonomy?

h) Define biological classification.

i) Give examples of two beneficial bacteria.

j) What are angiosperms?

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SECTION-B

2. Draw a labelled diagram of a prokaryotic cell.

3. What is cell theory? Explain.

4. What is the difference between monocot and dicot plants?

5. What are the characteristics of kingdom Monera?

6. Discuss the structure and types of animal tissues.

SECTION-C

7. Write a note on cell cycle.

8. Describe the structure and function of cell membrane.

9. Describe the structural organization in plants.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc.(BT) (Sem.–1)

INTRODUCTION TO BIOTECHNOLOGY

Subject Code : BSBT-102-18

M.Code : 75325

Date of Examination : 02-01-2024

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) Applications of Marine Biotechnology

b) Traditional Biotechnology

c) GM food

d) Advantages of GM crop

e) Role of yeast in food industry

f) Microbial fermentation

g) Role of Hops in beer manufacturing

h) BT cotton

i) Role of Biotechnology in health care

j) Name two commercially important organisms along with products

SECTION-B

2) What is environment Biotechnology? Discuss its applications.

3) How can we produce fungal and insect resistant plants using Biotechnology? Write down their advantages.

4) Enlist advantages of food Biotechnology.

5) Discuss acetic acid production.

6) Write a short overview of Biotechnology research in India.

SECTION-C

7) What is Biotechnology? Give a detailed overview of various branches of biotechnology.

8) What are genetically modified crops? Discuss in detail production of BT Brinjal.

9) Discuss in detail production of Beer.

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Total No. of Questions : 09

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B.Sc.(BT) (Sem.–1)

BIOCHEMISTRY AND METABOLISM

Subject Code : BSBT-103-18

M.Code : 75326

Date of Examination : 13-12-2023

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. Aswer briefly :

a) What is the significance of peptide bond in proteins?

b) Name two common monosaccharides found in our diet.

c) What is the role of cholesterol in fluid mosaic model?

d) How do amino acids classified based on their polarity?

e) What is the primary function of glycogen in the body?

f) What are Cofactors and coenzymes?

g) What is the significance of double helical structure of DNA?

h) How do structure and function of globular proteins differ from fibrous proteins?

i) Explain the salient features of Secondary Structure of protein.

j) What are gangliosides?

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SECTION - B

2. Explain the structure of purines and pyrimidines.

3. What are metalloenzymes and how do they differ from other enzymes?

4. What are sphingolipids and how do they differ from other types of lipids?

5. Differentiate between catabolism and anabolism by giving example of glycolysis and gluconeogenesis.

6. How do prostaglandins function as local signalling molecule and what are their roles in various physiological processes?

SECTION - C

7. Explain the β-oxidation of fatty acids.

8. What are polysaccharides? Explain their structure and function in detail.

9. What are enzymes? Give their nomenclature and classification.

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Total No. of Questions : 09

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B.Sc.(BT) (Sem.–1)

INORGANIC CHEMISTRY

Subject Code : BSBT-101-18

M.Code : 75324

Date of Examination : 08-12-2023

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. **Answer briefly :**

a) What is a chemical bond?

b) Define coordination number.

c) Distinguish between geometrical and optical isomerism.

d) Define the paramagnetism.

e) Give the back bonding.

f) Explain the term hybrisation.

g) Explain the hybrisation in water molecule.

h) Discuss the significance of effective nuclear charge.

i) Which has Na or Mg or lowest IE_2 and why?

j) What do you mean by ionic radii?

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SECTION-B

2. Explain Werner's coordination theory.

3. What do you mean by Crystal field theory?

4. Explain the various types of hybrizations and shape of SF_6, BF_3 and XeF_4.

5. Explain the atomic radii pattern of Group I.

6. Explain the directional covalent bond.

SECTION-C

7. a) Define atomic radius? How do the atomic radii of elements vary move from :

   i) down a group

   ii) across a period.

   b) **Give reasons for the following :**

   i) The second ionization energy of sodium is very high as compared to first ionization energy.

   ii) Electronegativity increase along a period.

8. a) How Ionization energy changes amongst the elements in a group and in a period?

   b) Explain why the first ionization energy of Boron is less than that of Beryllium but the third ionization energy of Beryllium is much higher than that of Boron?

9. a) Explain the limitations of Valence bond theory.

   b) Explain the Hybrisation in BEF_2, $SnCl_2$, NH_4 and ICl_2.

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Total No. of Questions : 09

B.Sc.(BT) (Sem.–2)

INTRODUCTION TO MICROBIOLOGY

Subject Code : BSBT-202-18

M.Code : 75873

Date of Examination : 21-11-2023

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 natural microflora? Cite a few examples.

   b) What is tyndallization?

   c) Mention the names of any two dyes used to stain microbial cells to visualize under a light microscope.

   d) How do nitrogen fixers help in improving soil fertility?

   e) What is the difference between autotrophs and heterotrophs?

   f) Define the magnification of a microscope.

   g) How does the refractive index of the medium affect the resolution?

   h) Mention the names of any two gram-positive and gram-negative bacteria.

   i) What is the sterilizing agent? How does it differ from disinfectants?

   j) Which components of the immune system forms the first line of defense in human?

SECTION-B

2. Discuss different phases of the growth curve of a bacterial cell.

3. What are Koch's postulates? Explain them with help of a diagram.

4. What are the different parameters of bacterial classification?

5. What is antibiosis? Give its clinical significance.

6. Which sterilization method would be best for the following :

   a) Nutrient medium

   b) Antibiotic solution

   c) Scalpel

   d) Petri plates

   e) Buffer solution

SECTION-C

7. Bacteria are omnipresent and they can grow on any substrate. Comment on this statement given the nutritional biodiversity of bacteria.

8. What is the fermentation process? Discuss different bioproducts produced in fermenters with their respective microbes.

9. Discuss the principle of any two microscope :

   a) Phase contrast

   b) Fluorescence microscope

   c) Electron microscope

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Total No. of Questions : 09

B.Sc. (BT) (Sem.–2)

PHYSICAL CHEMISTRY

Subject Code : BSBT-201-18

M.Code : 75872

Date of Examination : 17-11-2023

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) Define entropy with example.

b) State Henry's law.

c) Give Gibb's Helmholtz equation.

d) What are ideal solutions? Give example.

e) Differentiate between chain and opposing reactions.

f) Explain degree of freedom phase rule.

g) What do you mean by electrochemistry?

h) Define pH. Discuss scale to measure pH.

i) What is importance of chemical kinetics in reactions?

j) Explain depression in freezing point.

SECTION-B

2. Discuss Carnot's cycle in brief and its significance.

3. Draw phase diagram for vapor pressure of ideal and non-ideal solution.

4. State thermodynamic deviation Clausius chaperson phase diagram of KI water system.

5. Define conductance. Discuss specific conductance and its dependance on electrolyte concentration.

6. Draw equation for 2nd order reactions.

SECTION-C

7. What is thermodynamic equilibrium? State first and second law of thermodynamics in detail.

8. Define Roult's law. Discuss its relation with vapor pressure of solution. What are the factors effecting solubility of gas in solutions?

9. **Elaborate the following:**

a) Hess's Law of heat summation

b) Factors affecting rate of reaction

c) Strong electrolytes.

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SECTION-C (6 × 5 = 30)

7. Right understanding in the individuals is a basis for harmony in the family. Which is the building block for harmony in society? Give your comments.

व्यक्तियों में सही समझ ही परिवार में सामंजस्य का आधार है। समाज में समरसता का आधार कौन सा है? अपनी टिप्पणियाँ दीजिये।

ਵਿਅਕਤੀਆਂ ਵਿੱਚ ਸਹੀ ਸਮਝ ਪਰਿਵਾਰ ਵਿੱਚ ਸਦਭਾਵਨਾ ਦਾ ਆਧਾਰ ਹੈ। ਸਮਾਜ ਵਿੱਚ ਸਦਭਾਵਨਾ ਦਾ ਨਿਰਮਾਣ ਬਲਾਕ ਕਿਹੜਾ ਹੈ? ਆਪਣੀਆਂ ਟਿੱਪਣੀਆਂ ਦਿਓ।

OR

What is the need of Value-Education?

मूल्य शिक्षा की क्या जरूरत है?

ਮੁੱਲ ਸਿੱਖਿਆ ਦੀ ਕੀ ਜ਼ਰੂਰਤ ਹੈ?

8. Critically examine the state of society today in context with fulfillment of the comprehensive human goal.

व्यापक मानवीय लक्ष्य की पूर्ति के सन्दर्भ में आज समाज की स्थिति का आलोचनात्मक परीक्षण करें।

ਵਿਆਪਕ ਮਨੁੱਖੀ ਟੀਚੇ ਦੀ ਪੂਰਤੀ ਦੇ ਸੰਦਰਭ ਵਿੱਚ ਅੱਜ ਸਮਾਜ ਦੀ ਸਥਿਤੀ ਦੀ ਗੰਭੀਰਤਾ ਨਾਲ ਜਾਂਚ ਕਰੋ।

OR

How is a human-being co-existence of Self and Body? Explain Pre-Conditioning, Sensation and Natural-Acceptance.

इंसान स्वयं और शरीर का सह-अस्तित्व कैसे है? पूर्व-मान्यता, संवेदना और प्राकृतिक-स्वीकृति समझाओ।

ਮਨੁੱਖ ਸਵੈ ਅਤੇ ਸਰੀਰ ਦਾ ਸਹਿ-ਅਸਤਿਤਵ ਕਿਵੇਂ ਹੈ? ਪੂਰਵ-ਮਾਨਤਾ, ਸੰਵੇਦਨਾ ਅਤੇ ਸਹਿਜ-ਸਵਿਕਰਿਤੀ ਸਮਝਾਓ।

9. Compare the Four Orders in Nature on the basis of their salient aspects.

मुख्य पहलुओं के आधार पर प्रकृति में चार आदेशों की तुलना करें।

ਮੁੱਖ ਪਹਿਲੂਆਂ ਦੇ ਆਧਾਰ ਉੱਤੇ ਕੁਦਰਤ ਵਿੱਚ ਚਾਰ ਆਦੇਸ਼ਾਂ ਦੀ ਤੁਲਣਾ ਕਰੋ।

OR

What do you mean by reaction and response? Give some examples.

आपका प्रतिक्रिया और अनुक्रिया से क्या मतलब है? कुछ उदाहरण दें।

ਤੁਹਾਡਾ ਯੁਕਤ-ਕਿਰਿਆ ਅਤੇ ਪ੍ਰਤੀ-ਕਿਰਿਆ ਤੋਂ ਕੀ ਮਤਲਬ ਹੈ? ਇਸ ਦੇ ਕੁਝ ਉਦਾਹਰਣ ਦਿਓ?

10. What is happiness and prosperity? What are the wrong notions about attaining happiness and prosperity?

सुख और समृद्धि क्या हैं? खुशी और समृद्धि को प्राप्त करने के बारे में गलत धारणा क्या है?

ਖੁਸ਼ੀ ਅਤੇ ਖੁਸ਼ਹਾਲੀ ਕੀ ਹੈ? ਖੁਸ਼ੀ ਅਤੇ ਖੁਸ਼ਹਾਲੀ ਨੂੰ ਪ੍ਰਾਪਤ ਕਰਨ ਦੇ ਬਾਰੇ ਗਲਤ ਧਾਰਨਾ ਕੀ ਹੈ?

OR

What are the problems faced due to the wrong notions about happiness and prosperity?

सुख और समृद्धि के बारे में गलत धारणाओं के कारण पेश आ रही समस्याएं क्या हैं?

ਖੁਸ਼ੀ ਅਤੇ ਖੁਸ਼ਹਾਲੀ ਦੇ ਬਾਰੇ ਗਲਤ ਧਾਰਣਵਾਂ ਦੇ ਕਾਰਨ ਕੀ ਸਮੱਸਿਆਵਾਂ ਪੇਸ਼ ਆ ਰਹੀਆਂ ਹਨ?

11. Draw the chart showing in detail, the different categories of units of nature in coexistence in space. What is your role in existence?

अंतरिक्ष में सह-अस्तित्व में प्रकृति की इकाइयों की विभिन्न श्रेणियों को विस्तार से दर्शाने वाला चार्ट बनाएं। अस्तित्व में आपकी क्या भूमिका है?

ਪੁਲਾੜ ਵਿੱਚ ਸਹਿ-ਹੋਂਦ ਵਿੱਚ ਕੁਦਰਤ ਦੀਆਂ ਇਕਾਈਆਂ ਦੀਆਂ ਵੱਖ-ਵੱਖ ਸ਼੍ਰੇਣੀਆਂ ਨੂੰ ਵਿਸਤਾਰ ਵਿੱਚ ਦਿਖਾਉਂਦੇ ਹੋਏ ਚਾਰਟ ਬਣਾਓ। ਹੋਂਦ ਵਿੱਚ ਤੁਹਾਡੀ ਕੀ ਭੂਮਿਕਾ ਹੈ?

OR

What in your opinion, is an effective way of ensuring prosperity in the family? What programs can you undertake in this respect?

आपकी राय में, परिवार में समृद्धि सुनिश्चित करने का एक प्रभावी तरीका क्या है? इस संबंध में आप कौन से कार्यक्रम अपना सकते हैं?

ਤੁਹਾਡੇ ਵਿਚਾਰ ਵਿੱਚ, ਪਰਿਵਾਰ ਵਿੱਚ ਖੁਸ਼ਹਾਲੀ ਨੂੰ ਯਕੀਨੀ ਬਣਾਉਣ ਦਾ ਇੱਕ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਤਰੀਕਾ ਕੀ ਹੈ? ਇਸ ਸੰਬੰਧ ਵਿਚ ਤੁਸੀਂ ਕਿਹੜੇ ਪ੍ਰੋਗਰਾਮ ਲੈ ਸਕਦੇ ਹੋ?

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Total No. of Pages : 03

Total No. of Questions : 09

B.Sc. (BT) (Sem.–2)

BIOSTATISTICS

Subject Code : BSBT-203-18

M.Code : 75874

Date of Examination : 23-11-2023

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. **Answer briefly :**

a) Calculate mean from the following data :

2,3,2,4,5,2,3,1,6

b) What do you mean by poison distribution?

c) Discuss F and Z residuals.

d) Define regression coefficients.

e) Derive relationship among mean, median and mode.

f) Write the advantages of randomized block design.

g) Explain Interpolation.

h) If the probability of a defective item is 0.2. Find the mean and standard deviation for the distribution of defective items in a total of 500.

i) Discuss the role of curve smoothing.

j) State linearity and shifting properties of Fourier Transformations.

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SECTION-B

2. In a shooting competition, the probability of a man hitting the target is 0.2. If he hits the target 5 times, find the probability of hitting the target :

a) only two times

b) at least two times

c) at most two times.

3. Explain various methods of Numerical Integration.

4. Prove that : $\begin{vmatrix} 1 & 1 & 1 \\ x & y & z \\ x^2 & y^2 & z^2 \end{vmatrix} = (x-y)(y-z)(z-x)$

5. What is a completed randomized design? Write its merits, demerits and applications.

6. Find the correlation between X and Y, when lines of regression are:

$x - 2y + 3 = 0$ and $4x - 5y = -1$

SECTION-C

7. **Write a note on :**

a) Graphical presentation of data

b) Design of experiments.

8. Solve the following questions :

a) The mean and standard deviation of 25 items are found to be 15 and 2 respectively. But later on, it was found that one item was taken as 20 instead of 30. Find the correct mean and correct standard deviation.

b) 5000 candidates appeared in a certain examination carrying a maximum of 100 marks. It was found that marks were normally distributed with mean 39.5 and S.D. 12.5. Determine approximately the number of candidates who secured a first-class for which a minimum of 60 marks are necessary. The portion of the area of a normal curve at a deviation Z is :

Z	1.5	1.6	1.7	1.8
Area	0.93319	0.94520	0.95543	0.96407

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

Total No. of Questions : 09

B.Sc. (BT) (Sem.–3)

ORGANIC CHEMISTRY

Subject Code : BSBT-301-18

M.Code : 76608

Date of Examination : 08-12-2023

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) Explain the resonance.

b) What are electrophiles?

c) Name two methods formation of alkanes.

d) What is the Carbocation?

e) Define the Hyperconjugation.

f) Difference between singlet carbene and triplet carbene.

g) Name any two organic reactions.

h) Why tertiary carbocation is more stable?

i) What is the geometry of carbene.

j) Give on reaction of formation of alkene along with one example.

SECTION-B

2) Explain the dehydration reaction with mechanism of alcohols.

3) Explain the acidic behavior of alcohols along with example.

4) Explain the physical properties of phenol.

5) Explain the conformation of cycloalkene.

6) Explain the Kekule structure of benezene.

SECTION-C

7) What are the Kolbe's reaction and its mechanism.

8) Explain the Free radical along with the stability of this.

9) Explain the Reimer Tiemann reaction and its mechanism.

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Total No. of Questions : 09

B.Sc. Honours (MB) (Sem.–3)

MICROBIAL GENETICS

Subject Code : BSMB303-19

M.Code : 90369

Date of Examination : 11-12-2023

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 transformation?

   b) Define mutation and its types.

   c) What is Ames test?

   d) Explain two uses of mutations.

   e) What is the difference between deletion and duplication?

   f) Explain portioning of the plasmid.

   g) Define HFT lysates.

   h) Define conjugation.

   i) Define phase genetics.

   j) Write the uses of transposons.

SECTION-B

2. What are plasmids? Explain their types.
3. Explain reversion and suppression in brief.
4. Difference between translation and transduction.
5. Discuss the basic genetics of T4 phage.
6. Discuss lytic and lysogenic switching of phage lambda.

SECTION-C

7. Define Intra and Inter-genetic suppressions.
8. Write a brief note on Eukaryotic transposable elements.
9. Discuss replication and partitioning of plasmids in brief.

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Total No. of Questions : 09

B.Sc. (BT) (Sem.–3)

IMMUNOLOGY

Subject Code : BSBT-302-18

M.Code : 76609

Date of Examination : 11-12-2023

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 are neutrohils?

b) What is the difference between T and B lymphocytes?

c) Define antibody affinity and avidity.

d) What is the role of cytotoxic T cells?

e) Draw a labelled diagram of an immunoglobulin.

f) What are cytokines?

g) What is active and passive immunization?

h) What is the first line of defence of body against invading pathogens?

i) What is the role of MALT?

j) Define phagocytosis.

SECTION-B

2. Describe the major historical developments in the field of immunology.

3. Write a brief note on secondary lymphoid organs.

4. Discuss the pathways of complement activation.

5. Explain the structure of a T-cell receptor.

6. Write a note on role and function of MHC.

SECTION-C

7. Describe different types of antigen-antibody reactions.

8. How does antibody diversity arise? Explain.

9. Write a note oh the major components of cell-mediated immunity.

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Total No. of Questions : 09

B.Sc. (BT) (Sem.–3)

MOLECULAR BIOLOGY

Subject Code : BSBT-303-18

M.Code : 76610

Date of Examination : 13-12-2023

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) Explain briefly about the organization bacterial chromatin.

b) Draw comparison between introns and exons.

c) What is genetic code?

d) What do you understand by spontaneous mutagenesis?

e) Discuss the importance of mutants in biological research.

f) What is central dogma of molecular biology?

g) What are transcription inhibitors? Give examples.

h) Give examples of DNA repair processes.

i) Explain the term operon.

j) Draw a labelled diagram showing bacterial promoter region.

SECTION-B

2. Describe the role of histone and non-histone proteins in genomic organization and its expression.

3. Provide a well-illustrated diagram showing features of DNA replication process.

4. What is translation? Explain the role of ribosomes in translation process.

5. Explain the concepts of operon and regulon. Give a brief account of bacterial operons.

6. Explain the terms chromatin, gene, genome and nucleosome.

SECTION-C

7. Explain the process of induced mutagenesis and its industrial relevance.

8. Explain in detail, the mechanisms of initiation, elongation and termination of transcription.

9. Explain the organization of lactose operon and its regulation using well labelled diagrams.

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B.Sc. (BT) (Sem.–4)

ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY

Subject Code : BSBT407-18

M.Code : 77696

Date of Examination : 29-11-2023

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) Define Magnification and Resolution.

b) What is the role of Mobile Phase in Paper Chromatography?

c) What is Reason of Raman Effect?

d) Define Beer -Lambert law.

e) What is Autoradiography?

f) What are list of factors affecting Absorption Properties of Chromophores?

g) Why are High speed centrifiigations done in vaccum and cold condition?

h) What is the difference between separating and Resolving gel?

i) What are Ion Exchangers? Give Examples.

j) What is Boundary Electrophoresis?

SECTION-B

2. Discuss Principle and Application of Affinity chromatography.

3. What are Preparative and Analytical Centrifuges? Discuss principle of Centrifugation.

4. Describe principle and application of Native and SDS PAGE. Differentiate between them.

5. Elaborate on Principle and application of Absorption spectroscopy.

6. Write factors affecting Migration in electrophoresis.

SECTION-C

7. Elaborate on Principle technique and application of Western Blotting.

8. Deliberate on Theory, Principle and Application of TEM and SEM.

9. Discuss Principle, Technique and Application of Phase contrast and Fluorescence Microscopy.

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B.Sc. (Bio Technology) (Sem.–4)

INDUSTRIAL BIOTECHNOLOGY

Subject Code : BSBT403-18

M.Code : 77692

Date of Examination : 24-11-2023

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 are cryoprotectants?

b) What is the difference between adsorption and absorption?

c) What is the biomass for the production of vinegar?

d) Cite any four biosafety measures in the fermentation industry.

e) What is the difference between Wine and Whisky?

f) What are agitators? Give its significance.

g) Give the name of any two plants that are in use for biodiesel production.

h) What are biocontrol agents? Give a few examples.

i) What is fermentation?

j) Which microbe is extensively used in the bakery industry and why?

SECTION-B

2. What are biofertilizers? How are they beneficial to the environment?

3. What is the difference between a batch and continuous fermentation?

4. What is bioethanol? Give its advantages and disadvantages.

5. Mention different methods for preserving microbial culture.

6. Diagrammatically explain the design and different components of a bioreactor.

SECTION-C

7. Discuss the importance of any two microbes in the industry citing their commercially important bioproducts.

8. **Discuss the production of any two :**

a) Vitamins

b) Organic acids

c) Antibiotics

d) Beverages

9. What is enzyme immobilization? What are the different methods of immobilization? Give its advantages and disadvantages.

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Total No. of Pages : 01

B.Voc.(Beauty Therapy and Aesthetics)/BA(J&MC)/ BBA/ BBA(SIM)/ B.Com. Hons./ BCA/BHMCT/ B.Sc.(Honours)/ B.Sc.(Nutrition & Dietetics)/ B.Sc.(AI&ML)/B.Sc. Biotechnology/B.Sc.(FD) /B.Sc.(Graphics & Web Designing) B.Sc.(IT)/ B.Sc.(MLS)/ BTTM (Sem.- 1)

ENGLISH

Subject Code : BTHU103-18

M.Code : 75085

Date of Examination: 01-01-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **All questions are COMPULSORY.**
2. **Q1, Q2 and Q3 carry TEN marks each.**
3. **Q4 and Q5 carry FIFTEEN marks each.**

1. Elaborate theory of communication.
2. Differentiate in detail between personal and business communication.
3. **Read the following passage carefully and answer the questions that follow :**

Certain people consciously or unconsciously cherish the desire that some part of their work and of their accomplishment will outlive their own individual life. The influence which they have exercised on the world in which they lived, the concern which they have built up, the books which they have written, the work they have laid as a part of some scientific edifice, whose completion they themselves will not live to see all such things inspire the people that some aspect of themselves will outlast their own personal existence, the artist bequeaths his pictures, the scholar his contribution of knowledge while poets and composers are primarily concerned that posterity shall take pleasure in their creations. Statesmen envisage that particular agreement in whose development they themselves had played a crucial part will preserve their names for future generations. People are not unconcerned for their posthumous reputation. An old person is distinctly preoccupied with this question and keeps a zealous watch to ensure that his achievement is properly quoted and recorded.

a) What do certain people cherish about?

b) What does a statesman envisage?

c) What do old people do?

d) Use "edifice" and "bequeaths" in your own sentences.

e) Give main idea of the passage.

4.. Write a letter to your friend about how to prevent youth from addiction to drugs. Discuss specifically what steps the society can take.

5. Draft a report on environmental pollution and how can we save the environment.

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(S17)-2503

DEC-2023

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

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.–3)

INTRODUCTION TO COMPUTERS

Subject Code : BSBT-307-18

M.Code : 76614

Date of Examination: 15-12-2023

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 Short Notes on :**

   a) Analogue computers

   b) Computer algorithms

   c) Secondary storage devices

   d) Advantages of floppy and hard disks

   e) Output devices

   f) Primary storage devices

   g) BLAST

   h) FASTA

   i) Types of data representation

   j) Uses of magnetic tapes.

SECTION-B

2. Differentiate between input and output devices.

3. Explain NCBI data model in detail.

4. Define bioinformatics and its various applications.

5. Write a detailed note on multiple sequence alignments along with its types and applications.

6. Discuss major databases in bioinformatics.

SECTION-C

7. Define computers and its uses. Discuss major milestones in hardware and software developments.

8. Define data storage and its various types and classifications in detail.

9. Explain bibliographic databases and its applications in bioinformatics in detail.

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Dec-2023

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

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. Hons. (Microbiology) (Sem.–1)

CHEMISTRY-I

Subject Code : BSMB103-19

M.Code : 78981

Date of Examination : 17-05-2023

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) Define Atom and Molecule.

b) Significance of wave function.

c) Inductive Effect.

d) Enantiomers with examples.

e) Dipole moment.

f) Flying wedge projection formula

g) Meso compounds using suitable examples

h) Erythro and Threo nomenclature.

i) Define racemic resolution.

j) Centre of symmetry

SECTION-B

2. What are isomers? Give its types using suitable examples.

3. Discuss Bhor's Atomic model along with its merits and demerits.

4. Comment on IUPAC system of nomenclature using suitable examples.

5. What is racemic modification? Give methods for performing racemic modifications.

6. Discuss on the stereochemistry of Allenes and Biphenyls

SECTION-C

7. Discuss in detail about methods used for the resolution of chiral mixture

8. Give the details of :

a) Hydrogen bonding

b) Conjugation

c) Resonance

d) Polarity of bonds.

9. Write in detail about Quantum numbers and their significance

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.–1)

INORGANIC CHEMISTRY

Subject Code : BSBT-101-18

M.Code : 75324

Date of Examination : 19-05-2023

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) **Answer briefly :**

a) What is the Effective nuclear-charge?

b) Explain the covalent bond.

c) Explain the coordination number with examples.

d) Explain the geometrical isomerism.

e) Explain the paramagnetism and diamagnetism.

f) What are Vander waal forces?

g) Explain the structure of H_2O molecule?

h) What electron affinity.

i) What is the oxidation number?

j) What is inert pair effect?

SECTION-B

2) Explain the valence bond theory and its limitations.

3) Explain the structure of SF_6 and ClF_4.

4) Explain the effect of temperature on paramagnetism.

5) Explain electronegativity and its trend in period.

6) Explain Inter and Intra molecular H-bonding.

SECTION-C

7) Explain the back bonding with examples.

8) Explain the crystal field theory.

9) Explain the Werner's coordination theory

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July-2023

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

Total No. of Questions : 09

B.Sc.(BT) (Sem.–1)

BASICS OF BIOSCIENCES

Subject Code : BSBT-107-18

M.Code : 75330

Date of Examination : 24-05-2023

Time : 3 Hrs. Max. Marks : 30

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying $2^1/_2$ (Two and Half) marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying FIVE marks each and students has to attempt any TWO questions.

SECTION-A

1. Answer briefly :

a) Oligosaccharide

b) Vertebrates

c) Anaphase

d) Phospholipids

e) Diversity

f) Neuron

g) Function of root

h) Vascular tissue in plants

i) Function of kidney

j) Shrub

SECTION-B

2. Discuss the basic features of Kingdom Monera

3. Explain the significance of Meiosis

4. Explain the morphology of flower

5. Describe the organization of Plant cell

6. Explain the role of protein in cell

SECTION-C

7. Write a note on the cell as the Basic unit of life

8. Discuss the structural organization in Animals

9. Explain the biological classification

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July-2023

Roll No. Total No. of Pages : 02

Total No. of Questions : 09

B.Sc.(BT) (Sem–1)

INTRODUCTION TO BIOTECHNOLOGY

Subject Code : BSBT-102-18

M.Code : 75325

Date of Examination : 26-05-2023

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) Traditional Biotechnology

b) Marine Biotechnology

c) Biotechnology in healthcare sector

d) BT cotton

e) GM papaya

f) Food Biotechnology

g) Food quality determinants

h) L-asparaginase

i) Alcoholic beverages

j) Beers vs. wine

SECTION-B

2. Explain the importance of biotechnology in pharmaceutical sector.

3. Give an overview of important biotechnological applications in agriculture sector.

4. Compare pros and cons of GM cotton and GM tomato. Also write a brief note on commercial aspects of GM crops in India.

5. Explain microbiological processes involved in dairy industry, value added food products and beverages.

6. Write a brief note on the fermentative production of lactic acid.

SECTION-C

7. What is biotechnology? Explain its importance in the agricultural, environmental and food sectors.

8. Discuss important microbiological procedures to obtain processed foods of high quality.

9. Define Fermentation Biotechnology. Illustrate its importance in producing enzymes and beverages.

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July-2023

Roll No. Total No. of Pages : 02

Total No. of Questions : 09

B.Sc.(BT) (Sem–1)

BIOCHEMISTRY AND METABOLISM

Subject Code : BSBT-103-18

M.Code : 75326

Date of Examination : 12-06-2023

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. **Answer briefly :**

a) What are amphibolic pathways?

b) In which compartment of cell TCA cycle occurs?

c) What is the role of cholesterol in fluid mosaic model?

d) Draw structure of Galactose.

e) Difference between Homopolysaccharides and Heteropolysaccharides.

f) What are Co-enzymes? Give explanation.

g) What are the main features of enzyme active sites?

h) Give example of any Disaccharides.

i) Explain the salient features of secondary structure of protein.

j) What are the pyrimidines?

SECTION-B

2. Write a note on regulation of glycolysis.
3. Write different classifications of enzymes.
4. Write a note on cerebrosides and gangliosides.
5. Draw well labeled structures of aromatic amino acid?
6. What are glycoproteins? Give their functions.

SECTION-C

7. Write a note on classification of protein.
8. Classify lipids along with their structures and functions.
9. Explain complete oxidation of one module of glucose.

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Roll No. Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem–2)

PHYSICAL CHEMISTRY

Subject Code : BSBT-201-18

M.Code : 75872

Date of Examination : 13-06-2023

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) Define adiabatic process.

   b) Explain why no work is done when a gas expands against vaccum?

   c) Define phase.

   d) What is condensed system?

   e) What is transport number?

   f) What is overvoltage?

   g) Explain the term order.

   h) Define mole fraction.

   i) What is isotonic solution?

   j) What is osmosis?

SECTION-B

2. What are colligative properties? What do you mean by molal elevation constant of a solvent?

3. Derive Nernst equation for measuring EMF of a cell. Calculate the degree of hydrolysis of 0.1N solution of sodium acetate (.the ionic product of water is 1·0 × 10–14 and dissociation constant of acetic acid is 1.8 × 10–5)

4. Calculate the entropy change when one mole of hydrogen is mixed with two moles of oxygen at room temperature, assuming that the gases behave ideally.

5. Derive the rate equation for first order reaction.

6. Explain carnot's cycle

SECTION-C

7. Derive the relationship between elevation in boiling point and relative lowering of vapour pressure.

8. List three criteria for phase equilibrium of a multi component system and one component system.

9. What is conductivity water/, parallel reactions, opposing reactions and chain reactions?

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July 2023

Roll No. [redacted]

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (Bio Technology) (Sem–2)

BIOSTATISTICS

Subject Code : BSBT-203-18

M.Code : 75874

Date of Examination : 02-06-2023

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 do you understand by Sample? Enlist the different methods of sampling.

   b) Give characteristics and properties of normal distribution curve.

   c) What are derivative curves?

   d) What are the differences between correlation and regression coefficients?

   e) Define Null Hypothesis and level of significance.

   f) Define randomization.

   g) What do you understand by Curve Smoothening? Give its purpose.

   h) What are the advantages of graphical representation of data?

   i) What do you understand by Precision? Enlist the methods used to measure precision of statistical tests?

   j) What do you mean by Matrices manipulations?

SECTION-B

2. **Evaluate the determinant :**

$$\begin{vmatrix} y^2+z^2 & xy & xz \\ xy & z^2+x^2 & yz \\ zx & zy & x^2+y^2 \end{vmatrix}$$

3. Distinguish between Binomial and Poisson Distribution.

4. Explain Trapezoid rule of Numerical integration.

5. Find the means of X and Y variables and the coefficient of correlation between them from the following two regression equations :

$$4X - 5Y + 33 = 0$$

$$20X - 9Y - 107 = 0$$

6. Write a note on F and Z residuals.

SECTION-C

7. a) Calculate mean and standard deviation of following data

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students	2	4	8	12	16	6	8	4

   b) Describe the methods of averages and least squares.

8. **Write notes on :**

   a) Fourier Transformation

   b) Polynomial Interpolations

9. a) Write a detailed note on 'ANOVA'.

   b) Describe different types of 'Design of Experiments'.

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July 2023

Roll No.

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (Bio Technology) (Sem–2)

BIOSTATISTICS

Subject Code : BSBT-203-18

M.Code : 75874

Date of Examination : 02-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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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 do you understand by Sample? Enlist the different methods of sampling.

   b) Give characteristics and properties of normal distribution curve.

   c) What are derivative curves?

   d) What are the differences between correlation and regression coefficients?

   e) Define Null Hypothesis and level of significance.

   f) Define randomization.

   g) What do you understand by Curve Smoothening? Give its purpose.

   h) What are the advantages of graphical representation of data?

   i) What do you understand by Precision? Enlist the methods used to measure precision of statistical tests?

   j) What do you mean by Matrices manipulations?

SECTION-B

2. **Evaluate the determinant :**

$$\begin{vmatrix} y^2+z^2 & xy & xz \\ xy & z^2+x^2 & yz \\ zx & zy & x^2+y^2 \end{vmatrix}$$

3. Distinguish between Binomial and Poisson Distribution.

4. Explain Trapezoid rule of Numerical integration.

5. Find the means of X and Y variables and the coefficient of correlation between them from the following two regression equations :

$$4X - 5Y + 33 = 0$$

$$20X - 9Y - 107 = 0$$

6. Write a note on F and Z residuals.

SECTION-C

7. a) Calculate mean and standard deviation of following data.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students	2	4	8	12	16	6	8	4

   b) Describe the methods of averages and least squares.

8. **Write notes on :**

   a) Fourier Transformation

   b) Polynomial Interpolations

9. a) Write a detailed note on 'ANOVA'.

   b) Describe different types of 'Design of Experiments'.

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July-2023

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

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

B.Sc.(BT) (Sem.–2)

INTRODUCTION TO MICROBIOLOGY

Subject Code : BSBT-202-18

M.Code : 75873

Date of examination : 30-05-23

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. Biogenesis

   b. Microbial flora of healthy human

   c. Gram Staining

   d. Mesophiles and Extremophiles

   e. Amoebic dysentery

   f. Sterilization and Pasteurization

   g. Generation time

   h. Sporulation process in microbes

   i. Aflatoxins

   j. Role of Nitrogenase in nitrogen fixation.

(S2)-2514

SECTION-B

2. Describe the Koch postulates.
3. Explain the working principle of Scanning electron microscope.
4. Describe the salient features of viruses.
5. Explain the host defense mechanisms against pathogens with examples.
6. Describe the different phases of microbial growth with the help of diagram:

SECTION-C

7. Discuss the contributions of Antony Van Leeuwenhoek and Louis Pasteur in Microbiology.
8. What do you mean by true fungi? What are the unique features of slime molds that distinguish them from true fungi?
9. What are monoauxic, diauxic and synchronous growth? Describe different methods used for measurement of growth of microorganisms.

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Roll No. Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem–2)

PHYSICAL CHEMISTRY

Subject Code : BSBT-201-18

M.Code : 75872

Date of Examination : 13-06-2023

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) Define adiabatic process.

   b) Explain why no work is done when a gas expands against vaccum?

   c) Define phase.

   d) What is condensed system?

   e) What is transport number?

   f) What is overvoltage?

   g) Explain the term order.

   h) Define mole fraction.

   i) What is isotonic solution?

   j) What is osmosis?

SECTION-B

2. What are colligative properties? What do you mean by molal elevation constant of a solvent?

3. Derive Nernst equation for measuring EMF of a cell. Calculate the degree of hydrolysis of 0.1N solution of sodium acetate (the ionic product of water is 1.0×10^{-14} and dissociation constant of acetic acid is 1.8×10^{-5})

4. Calculate the entropy change when one mole of hydrogen is mixed with two moles of oxygen at room temperature, assuming that the gases behave ideally.

5. Derive the rate equation for first order reaction.

6. Explain carnot's cycle

SECTION-C

7. Derive the relationship between elevation in boiling point and relative lowering of vapour pressure.

8. List three criteria for phase equilibrium of a multi component system and one component system.

9. What is conductivity water?, parallel reactions, opposing reactions and chain reactions?

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Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] Total No. of Pages : 02

Total No. of Questions : 09

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

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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.

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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 Pages : 02

Total No. of Questions : 09

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 :

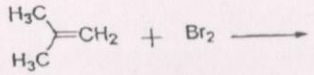
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

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

B.Sc. (BT) (Sem.–4)

ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY

Subject Code : BSBT-407-18

M.Code : 77696

Date of Examination : 19-05-2023

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) Describe the applications of TLC.

b) What are rate zonal centrifuges?

c) What is PEGE?

d) Define isoelectric focussing

e) Define chemical shift

f) What is Beer-Lambert law?

g) What is the principle of SDS-PAGE?

h) Define Raman effect

i) What is analytical centrifuge?

j) Name two fluorophores used in fluorescence microscopy

SECTION-B

2. What is autoradiography? Describe its principle and applications.

3. Discuss the applications of absorption microscopy. What are the factors affecting absorption properties of a chromophore?

4. Write a note of Western blotting

5. Describe the technique and instrumentation of NMR spectroscopy

6. What is phase contrast microscope? Describe its construction and working.

SECTION-C

7. Discuss in detail the technique of HPLC.

8. Describe construction and working of SEM.

9. What are the factors affecting sedimentation of a particle in a centrifuge? Describe different types of centrifuges.

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

Total No. of Questions : 09

B.Sc. (BT) (Sem.–4)

PLANT TISSUE CULTURE

Subject Code : BSBT402-18

M.Code : 77691

Date of Examination : 24-05-2023

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) Cellular totipotency

   b) Role of 2,4-D

   c) Suspension culture

   d) Explant selection

   e) Cell culture

   f) Embryogenesis

   g) Cloning

   h) HAT Selection

   i) Somatic cell fusion

   j) Organ micro-culture

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SECTION-B

2. Write down about the steps involved in surface sterilization of an explant.

3. Describe the composition of media and its sterilization.

4. Write short note on selection of hybrid clones.

5. What are the steps involved in callus culture? Explain in detail.

6. Write short note on monoclonal antibodies production.

SECTION-C

7. Write short note on aseptic tissue transfer and somatic embryogenesis.

8. Explain the role of growth hormones in culture media.

9. Describe the process of plant micropropagation in detail.

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Roll No

Total No. of Pages: 02

Total No. of Questions: 09

Bachelor of Science (Bio Technology)(Sem. – 4)

INDUSTRIAL BIOTECHNOLOGY

Subject Code: BSBT403-18

M Code: 77692

Date of Examination : 26-05-23

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 good Laboratory practices?

b) Which organisms are exploited for the production of biofertilizers? Why they are better options as compared to chemical fertilizers?

c) why E.coli is considered a good experimental microbe for industries?

d) what is an ideal growth medium?

e) what are the raw materials used for the production of penicillin and streptomycin antibiotics?

f) Name any aerobic fermentation process and the microbe involved in it.

g) Why Hop plant is added while manufacturing beer.

h) What is the importance of immobilization of enzymes?

i) Why cryopreservation is done of microbial cultures?

j) Define OTR and its importance.

SECTION-B

2. Name any one fermented beverage and schematically describe its production process.
3. How the fungal cultures are preserved commercially?
4. What are industrial biocatalyst and their applications in food industries?
5. Define biofuels.Which substrates are used for their production? Discuss.
6. How ideal growth medium is prepared?

SECTION-C

7. Give in detail the role of microbes in industries.
8. What do you know about the design and operation of fermentors?
9. Explain the scope and applications of environmental biotechnology.

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Total No. of Questions : 09

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B.Sc. (BT) (Sem.–4)

GENETIC ENGINEERING

Subject Code : BSBT-401-18

M.Code : 77690

Date of Examination : 17-05-2023

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. Define genetic engineering.

   b. Draw a labeled diagram of Biolistic gun or Microprojectile gun.

   c. Give the structure and properties of liposomes.

   d. Explain the principle of PCR.

   e. Write briefly on the properties of chimeric proteins.

   f. Outline features of transgenic animals.

   g. How do transgenic plants differ from wild type plants?

   h. Describe the significance of stem cell research in human health.

   i. Enlist the important human therapeutic proteins and their functions.

   j. What is the role of Agrobacterium tumefaciens in rDNA technology?

SECTION-B

2. Draw a well labeled diagram of a typical bacterial plasmid

3. Explain the principle of electroporation technique. Also discuss the procedure of obtaining recombinants using electroporation

4. Define the term mutagenesis. How do you generate mutants using random mutagenesis?

5. What are transgenics? Explain heterologous expression of genes in transgenic mice

6. Give an overview of the methods for developing transgenic plants

SECTION-C

7. Explain important methods of microbial gene transfer using suitable diagrams.

8. Describe the role of PCR technique in site directed mutagenesis and generation of mutants.

9. Write a detailed note on the production of human therapeutic proteins in transgenic animals.

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Roll No. | Total No. of Pages : 02

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B.Sc. (BT) (Sem–5)

ORGANIC FARMING

Subject Code : BSBT-501-18

M.Code : 78346

Date of Examination : 14-06-2023

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) Green manuring

   b) Soil enzymes

   c) Liquid organic manures

   d) NADEP

   e) Soil health card

   f) Bulky organic manure

   g) Homa fanning

   h) Bio-pesticide

   i) Consortium

   j) Contribution of Sir Albert Howard.

SECTION-B

2. Define organic farming. Discuss concept of organic farming.

3. Write a short note on phytoremediation.

4. a) Rock phosphate can be used in organic farming, comment.

   b) Composite variety seedscan be used in organic farming, comment.

5. Discuss use of soil health cards

6. Write a short note on degradation of pesticides by micro-organisms.

SECTION-C

7. Differentiate between vermiwash and vermicompost and how will you construct vermicompost unit and what types of earthworms are used for vermicomposting. Discuss its procedure from starting upto harvesting of Vermicompost, in detail. How can we use vermiwash?

8. a) Write-down the advantages and disadvantages of organic agriculture.

   b) Discuss in detail about role of micro-organisms in degradation of pesticides.

9. a) Discuss the harmful effects of non-judicious chemical fertilization.

   b) Define sustainable agriculture. How organic farming will help in sustainable agriculture.

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

B.Sc (Bio Technology) (Sem–5)

FERMENTATION TECHNOLOGY

Subject Code : BSBT140-18

M.Code : 78351

Date of Examination : 09-06-2023

Time : 3 Hrs. Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying TWO AND A HALF 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 the difference between simple and complex reactions?

b) Write the advantage of enzyme immobilization?

c) What are the various processes involved in the upstream process?

d) What is the difference between centrifugation and ultracentrifugation?

e) Name a few microbes that are involved in the production of fragrances.

f) Outline the production of propionic acid.

g) Write the substrate for biodiesel production.

h) Site a few examples of anti-cancerous agents.

i) What is fermentation?

j) Write the advantage of bio-fuels over conventional fuels?

SECTION-B

2. What are biochemicals? Give few examples.

3. What are the different types of cell immobilization?

4. What is Km? What are the different factors that affect Km?

5. Write the different chemotherapeutic agents and their applications.

6. What is the difference between primary and secondary metabolites? Cite a few examples.

SECTION-C

7. Write the steps involved in ethanol production from agricultural wastes. What are the different downstream processes used for ethanol purification?

8. **Write a brief note on any two :**

a) Steroid fermentation

b) Ion exchange chromatography

c) Biodiesel

d) Microbial insecticides.

9. What is biogas? How is it produced from agricultural waste?

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

B.Sc. (BT) (Sem.–5)

HUMAN BEHAVIOUR & PSYCHOLOGY

Subject Code : BSBT-137-18

M.Code : 78348

Date of Examination : 07-06-2023

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) Define cognitive psychology.

b) Why study of psychology is important?

c) Define perception.

d) What is memory?

e) Write the nature of intelligence.

f) Individual differences.

g) Personality tests.

h) Functions of memory.

i) Introvert personality.

j) What is the use of personality tests?

SECTION-B

2) Discuss the various theories of learning.

3) Discuss the nature & scope of psychology.

4) Explain the various models of intelligence.

5) What are the various issues involved in the assessment of intelligence?

6) What are the environmental & genetic bases for understanding individual differences?

SECTION-C

7) Discuss the features and attributes of perception.

8) Explain the environmental bases of individual differences.

9) Discuss the various sub fields of psychology. What are the applications of psychology to the study of human-behavior?

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Total No. of Pages : 02

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B.Sc. (BT) (Sem–5)

BIOTECHNOLOGY IN FORENSIC SCIENCES

Subject Code : BSBT142-18

M.Code : 78353

Date of Examination : 05-06-2023

Time : 3 Hrs. Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying $2\frac{1}{2}$ 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 chronic injury.

   b) What does forensic handwriting analyst do?

   c) What are class 4 weapons?

   d) What do you mean by ballistics?

   e) Why are fingerprints important in forensic science?

   f) What is DNA profiling?

   g) Define cyber security.

   h) Define electronic discovery.

   i) What is forensic anthropology?

   j) What is the role of modus operandi in crime records?

SECTION-B

2. How are forensic evidences preserved?
3. What is the role of DNA fingerprinting in forensic investigation?
4. Describe forensic toxicology.
5. What is meant by seizure of digital evidence?
6. Which tests are used to identify the type of explosives?

SECTION-C

7. Write a note on tools and techniques in forensic science.
8. Discuss the organization and necessary elements of a forensic science laboratory.
9. Describe the role of computers in forensic science.

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

B.Sc. (BT) (Sem.-6)

BIOTECHNOLOGY & HUMAN WELFARE

Subject Code : BSBT-148-18

M.Code : 79459

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 THREE questions carrying TEN mark each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

a) Biofertilizers

b) Xenobiotic compounds

c) Recombinant vaccines

d) DNA fingerprinting

e) Microbial polysaccharides

f) Monoclonal antibodies

g) Human genome project

h) Penicillin

i) Gene therapy

j) Chemical pesticides

SECTION-B

2. How are microbes helpful in abatement of pollution

3. Write a note on symbiotic nitrogen fixation

4. What are the substrates used for industrial production of ethanol

5. Describe production and use of biodegradable polymers.

6. How is biotechnology helpful in diagnosis of human diseases

SECTION-C

7. Describe the role of biotechnology in criminal investigation

8. Write a note on microbial production of therapeutic agents

9. What is the scope of protein engineering ? Describe the techniques of protein engineering

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

B.Sc. - Honours (Microbiology) (Sem.–6)

PLANT MICROBIAL INTERACTIONS

Subject Code : BSMB605-20

M.Code : 92521

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 a brief note on the following :

   a) Mutualism

   b) Phylosphere

   c) Mycorrhizae

   d) Phytohormones

   e) Dairy Products

   f) Microorganisms as food

   g) Endotoxins

   h) Nutrients

   i) Microbial interactions

   j) Plant disease

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SECTION-B

2. Give an account on Toxicology of microbes in relation to dairy products.
3. Write a brief note on plant defense mechanism against microbes.
4. Write a short note on Nitrogen fixation.
5. Give an account on role of bactericidal agents for plants.
6. Discuss important plant pathogenic organisms.

SECTION-C

7. Discuss future prospects challenges and limitations of plant microbial interactions.
8. Give an account on various plant extract and their role in antifungal agents.
9. Discuss multitude functions of microbial consortia in rhizosphere with emphasis on phytohormones.

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B.Sc (BT) (Sem.–6)

TECHNICAL WRITING

Subject Code : BSBT-601-18

M.Code : 79456

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) How do we define technical writing?

b) What is persuasion?

c) What points should we keep in mind while collecting material?

d) What points should we keep in mind while describing any mechanism?

e) What are primary sources?

f) What is a rough draft?

g) What is plagiarism?

h) Elaborate one technical writing style.

i) What is a research report?

j) List two important points to write an outline.

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SECTION-B

2. Elaborate audience analysis.

3. How do we arrange description of process?

4. Discuss Job Application procedure.

5. Discuss important elements of a formal report.

6. Elaborate research techniques.

SECTION-C

7. Elaborate different aspects of technical writing.

8. Write an application for the post of a Manager in a reputed company. Draft your resume. Imagine all details.

9. Discuss professional ethics in detail.

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Total No. of Questions : 09

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B.Sc. (Bio Technology) (Sem.–6)

PLANT BIOTECHNOLOGY

Subject Code : BSBT151-18

M.Code : 79462

Date of Examination : 20-05-2023

Time : 3 Hrs.

Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.s
2. SECTION-B contains FIVE questions carrying TWO and HALF 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) Hybrid cell

   b) Nitrogenase

   c) Pluripotent

   d) Haploid

   e) Stem cell

   f) Differentiation

   g) Meristem culture

   h) Embryogenesis

   i) Microspore culture

   j) Biocontrol of pathogens.

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SECTION-B

2. Write a short note on callus culture

3. What do you understand by diploidization? Explain

4. Explain plant growth promoting bacteria with suitable example

5. Give the applications of somaclonal variation

6. Discuss the briefly somatic hybridization

SECTION-C

7. Explain the process of micropropagation along with its advantages

8. Give an account of protoplast isolation and culture techniques

9. Write short notes on anther culture and nitrogen fixation

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B.Sc (Bio Technology) (Sem.–6)

BIOINFORMATICS

Subject Code : BSBT149-18

M.Code : 79460

Date of Examination : 25-05-23

Time : 3 Hrs. Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
2. SECTION-B contains FIVE questions carrying TWO AND A HALF 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) Applications of bioinformatics

   b) Local alignment

   c) Identity in sequence alignment

   d) Genomics

   e) Motif

   f) Biological databases

   g) FASTA

   h) Protein folding

   i) Pairwise alignment

   j) Neural network.

SECTION-B

2. Enlist the factors affecting the choice of template selection during homology modeling.
3. Give a short note on Smith-Waterman algorithm.
4. Discuss protein threading approach.
5. Give the applications of bioinformatics in computer aided drug designing.
6. Write a note on scoring matrices.

SECTION-C

7. Explain various approaches used in multiple sequence alignment.
8. What is phylogeny? What are the various methods for phylogenetic analysis?
9. Elaborate Chou-Fasman and GOR methods for predicting secondary structure.

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B.Sc. (Bio Technology) (Sem–6)

DEVELOPMENTAL BIOLOGY

Subject Code : BSBT-147-18

M.Code : 79458

Time : 3 Hrs.

Date of Examination : 27-05-2023

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) Spermatogenes

b) Meroblastic cleavage

c) Secondary embryonic induction

d) Gastrulation

e) Function of placenta

f) Fate maps

g) Neurulation

h) Function of placenta

i) Emboly

j) Plasticity

SECTION-B

2. Discuss briefly the different types of morphogenetic processes involved in development of organism.
3. What are fate maps? Write down the methods to construct the fate maps.
4. Classify eggs based on the amount of yolk.
5. Write a short note on types of embryonic induction.
6. Describe briefly about organogenesis.

SECTION-C

7. Write a detailed note on types of embryonic differentiation.
8. Illustrate the stages of oogenesis with the help of diagram.
9. Write in detail about formation and differentiation of primary germ layers.

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