Exam Code: 103306 **Paper Code: 6152**
(40)

Programme: Bachelor of Science
Semester-VI

Course Title: Zoology (Medical Zoology)

Course Code: BSMM-6483 (I)

Time Allowed: 3 Hours **Max Marks: 30**

Note: Attempt five questions in all, selecting at least one question from each section (A to D) Fifth question can be attempted from any section. Draw diagrams wherever necessary. Each question carries 6 marks.

Section A

1. Draw a well-labelled diagram of the life cycle of Plasmodium. Explain the preventive measures of the disease caused by it. (6)
2. Give a brief account of life history, mode of infection, pathogenicity and treatment of Dracunculus. (6)

Section B

3. Write a brief account of diseases transmitted by mosquitoes. Also discuss the control measures for the control of these vectors. (6)

4. a) Discuss the life cycle of Pediculus. Write down the measures to control their population. (4)
   b) Discuss the epidemiology of endemic typhus. (2)

Section C

5. Discuss antibody-mediated immune system in detail. (6)
6. Write briefly on the following
   a. Inflammatory reaction (4)
   b. Role of macrophages in immunity (2)

Section D

7. What do you mean by vaccination? Write a note on attenuated and Heterologous vaccines. (6)
8. Define ELISA and discuss its various types. (6)

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Exam Code: 103306 **Paper Code: 6153**
(40)

Programme: Bachelor of Science
Semester-VI

Course Title: Zoology (Medical Laboratory Technology)

Course Code: BSMM-6483 (II)

Time Allowed: 3 Hours **Max Marks: 30**

Note: Attempt FIVE questions in all, selecting at least ONE from each section (A to D). Fifth question can be attempted from any section. All questions carry equal marks (6 marks each). Draw neat & well labelled diagrams wherever necessary.

Section - A

1. Write detailed account of the process of centrifugation, its principle, working & types. (6)
2. Write notes on
   a) Colorimetry
   b) Phase contrast microscopy (3+3)

Section - B

3. Discuss collection of venous & capillary blood for different haematological investigations. (6)

4. Give a detailed account of Total RBC Count & Total Leukocyte Count. (6)

Section — C

5. Give an account of
   a) Autoclave
   b) Antibiotic Sensitivity (3+3)
6. Write a detailed note on staining techniques in Bacteriology. (6)

Section — D

7. Name different types of fixatives and describe any three in detail. (6)
8. a) Write principal, theory & significance of estimation of cholesterol in blood.
   b) Discuss Liver Function Test. (3+3)

Exam Code: 103306 **Paper Code: 6154**
(20)

Programme: Bachelor of Science Semester-VI

Course Title: Microbiology (Applied Microbiology-II)

Course Code: BSMM-6343

Time Allowed: 3 Hours **Max Marks: 60**

Note:- Attempt five questions in all, selecting one 'question from each of the four sections (A-D).The fifth question may be attempted from any section. All questions carry equal marks.

Section A

1. a. Name five fermented milk products. What are the benefits of using these products. 8
   b. Write a short note on process used for production of fermented legumes. 4
2. a. Discuss the microbiology of fermentation process involved in the production of Sauerkraut. 8
   b. Explain the role played by microorganisms in ripening of cheese. 4

Section B

3. a. Discuss production of citric acid by submerged fermentation process using Aspergillus niger. 8

   b. Give name of four edible mushrooms. 4

4. a. Briefly discuss the different steps involved in industrial production of Acetic acid. 8

   b. Discuss the role played by Baker's yeast in bread production. 4

Section C

5. a How Proteases are produced in industry using microorganisms? Discuss it's applications also. 8

   b Discuss in detail the process of production of following distilled beverage: Vodka 4

6. a Briefly explain the different methods used for immobilization of enzymes. 8

   b Compare production process of red and white wine. 4

Section D

7. Discuss the microbial production of riboflavin (vitamin B2) along with it's uses. 12

8. Explain the commercial production of Penicillin 12

Paper Code: 6155

Programme	Exam Code	Course Code
Bachelor of Science (Medical)	103306	BSMM-6084 (I)
Bachelor of Science (Non-Medical)	103306	BSNM-6084 (I)

Semester-VI

Course Title: Chemistry (Molecular Spectroscopy)

(60)

Time Allowed: 3 Hours **Max Marks: 30**

Note: Candidates are required to attempt five questions in all selecting atleast one question from each section. The fifth question may be attempted from any section. Each question carries equal (6) marks.

SECTION-I

1. (a)Explain the terms chromophore and auxochrome. Also comment on the statement. "Increase in polarity of the solvent shifts $\pi \rightarrow \pi^*$band to longer wavelength but n $\rightarrow \pi^*$ and n $\rightarrow \sigma^*$ bands to shorter wavelength.

(4)

(b) State and explain Born- Oppenheimer approximation. (2)

2. (a) Discuss Fluorescence and Phosphorescence in terms of excitation of electrons? (4)

(b) Explain why Benzene is colorless but azobenzene is coloured . (2)

SECTION-II

3. (a) Explain in detail stretching and bending mode of vibration in AX_2 system. (4)

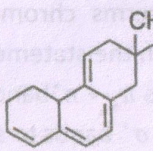
(b) How will you distinguish between the following two pair of compounds on the basis of IR Spectroscopy?

Cis-2-butene and trans-2-butene

(2)

4. (a) Discuss the relevance of Finger Print Region in structure determination of organic compounds by IR spectroscopy. Also discuss the effect of Vibrational Coupling and field effect on the position of absorption band in IR spectra. (4)

(b) Calculate λ_{max} for the following: (2)



SECTION-III

5. (a) With suitable diagram explain the working of FT-NMR Spectrometer. Also discuss the advantages of FT-NMR over CW-NMR. (4)

(b) Write note on spin lattice relaxation.

(2)

6. (a) An Organic compound having the molecular formula C_4H_8O gave the following spectral data: Deduce the structure of the compound. (4)

UV: 275 nm (ε =17)

IR = 2941-2857 (m), 1715 (s) and 1460 cm^{-1} (m)

PMR = τ 7.52 (q,2H), 7.88 (s,3H) and 8.93 (t, 3H)

(b) Why acetylenic proton absorbs upfield as compared to aromatic protons of benzene ring in proton NMR.

(2)

SECTION-IV

7. (a)Discuss reaction and mechanism of MC-Lafferty Rearrangement giving relevant example?

(4)

(b) Explain in detail fragmentation of Tropylluni ion.

(2)

8. (a) Discuss the chemical ionization in the presence of CH_4 carrier gas. How is it advantageous over electron impact (EI) ionization? (4)

(b) Explain Nitrogen rule. (2)

Paper Code: 6156

Programme	Exam Code	Course Code
Bachelor of Science (Medical)	103306	BSMM-6084 (II)
Bachelor of Science (Non-Medical)		BSNM-6084 (II)

Semester-VI

Course Title: Chemistry (Physical Chemistry)

(60)

Time Allowed: 3 Hours **Max Marks: 30**

Note: Candidates are required to attempt five questions in all selecting atleast one question from each section. The fifth question may be attempted from any section. Each question carries equal (6) marks.

SECTION-I

1. Discuss Planck's Radiation Law. How do Wien's Law and Rayleigh-Jeans Law follow from it? (6)
2. Set up and solve the Schrodinger wave equation for a particle in one dimensional box for an eigen function and eigen value of energy? (6)

SECTION-II

3. What do you mean by rigid rotator and Derive Schrodinger wave equation for rigid rotator and transform into spherical polar coordinates? (6)
4. (a) Discuss the shapes of s, p and d orbitals? (3)
   (b) How do three quantum number n, l, m follow from the solution of Schrodinger Wave equation? (3)

SECTION-III

5. What are elements of symmetry in crystallography. Describe each of them briefly? (6)
6. (a) Define space lattice and unit cell? (3)
   (b) Give the differences between crystalline and amorphous solids? (3)

SECTION-IV

7. (a) State and derive Lambert's law? (4)
   (b) Calculate the value of an Einstein of energy for radiation of wavelength 3000 A°. (2)
8. Draw Jablonski diagram depicting various process occurring in excited states. Describe all the process? (6)

Paper Code: 6157

Programme	Exam Code	Course Code
Bachelor of Science Non-Medical	103306	BSNM-6395 (I)
Bachelor of Science Computer Science	103306	BCSM-6395 (I)

Semester-VI
Course Title: Physics (Nuclear Physics)
(50)

Time Allowed: 3 Hours **Max Marks: 30**

Note: Attempt FIVE questions. selecting at least one question from each section. The FIFTH question may be attempted from any Section. Each question carries 6 marks. Candidates can use Non-Scientific calculators and logarithmic tables.

SECTION A

1. Explain Proton- Electron hypothesis of nucleus. Give at least five causes for its failure. 6
2. (a) How are nucleons held together inside the nucleus? What are main properties of those forces. 4
   (b) Write the relation between mass number and radius of the nucleus. Calculate the mass and radius of $_{13}Al^{27}$. 2

SECTION B

3. (a) What are radio — active series? Mention the important radioactive series. 3

   (b) What is radioactive dating? How is the age of a tree determined? 3

4. What is β— decay? Discuss energy spectrum curve of β - decay. Discuss law of conservation of energy and linear and angular momentum in β — decay. How it helped Pauli in predicting existence of Neutrino? 6

SECTION C

5. (a) Define Q-value of a nuclear reaction. Discuss exoergic and endoergic reactions. 3

   (b) Define following reactions by giving examples:

   (i) Spallation

   (ii) Radiative Capture 3

6. Explain the concept of compound nucleus. Also explain the virtual and bound energy levels of compound nucleus. 6

SECTIOND

7. What are main assumptions of Liquid drop model? Obtain expression for the binding energy of a nucleus based on liquid drop model. 6

8. (a) What are magic number nuclei? Give experimental evidence of nuclear magic numbers. 5

   (b) What is the parity of ${}_8O^{16}$?

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Paper Code: 6158

Programme	Exam Code	Course Code
Bachelor of Science Non-Medical	103306	BSNM-6395 (II)
Bachelor of Science Computer Science	103306	BCSM-6395 (II)

Semester-VI

Course Title: Physics (Radiation and Particle Physics)

(50)

Time Allowed: 3 Hours **Max Marks: 30**

Note: - Attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Each question carries 6 marks. Students can used non-scientific calculator and logarithmic table.

SECTION A

1. Derive Bethe-Bloch formula for the loss of energy of a heavy charged particle passing through matter. (6)

2. Discuss the process of photoelectric effect, pair production and Compton scattering. (6)

SECTION B

3. Discuss the principle, construction and working of a semiconductor detector. Compare its advantages and disadvantages with scintillation detector. (6)
4. What is Cherenkov radiation? Using a suitable diagram, explain the principle and working of any one type of Cherenkov detector. (6)

SECTION C

5. Describe the principle, construction and working of a betatron. (6)
6. Discuss in detail the process of particle acceleration in a linear accelerator. (6)

SECTION D

7. List various properties of quarks and antiquarks? Giving suitable examples, explain how mesons and baryons are formed from quarks. (6)
8. (a) Discuss with an example the conservation law of baryon number, lepton number and charge conjugation. (3)

   (b) Which conservation law is violated in the following interaction?

   (i) $\mu^+ \longrightarrow e^+ + \gamma$

   (ii) $n \longrightarrow p + e^-$

   (iii) $\pi^0 \longrightarrow \gamma + \gamma + \gamma$ (3)

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Exam Code: 103306 **Paper Code: 6159**
(40)

Programme: Bachelor of Science
Semester--VI

Course Title: Botany (Ecology)

Course Code: BSMM-6075 (I)

Time Allowed: 3 Hours **Max Marks: 30**

Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any-Section. Each question carry equal marks. (6 each)

Section 1

1. Discuss the development of soil and soil profile?
2. Discuss the morphological, physiological and anatomical adaptation of hydrophytes?

Section 2

3. Discuss the qualitative characteristics of community?
4. Describe the process of ecological succession?

Section 3

5. Describe the following -
   A. Growth curves
   B. Ecological pyramids
6. Explains the biogeochemical cycle: -
   (A) carbon cycles
   (B) Nitrogen cycle

Section 4

7. Writes a note on biogeographical regions of India?
8. Explain the forest vegetation of india?

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MoR. 21.05.2024

Exam Code: 103306 **Paper Code: 6160**
(40)

Programme: Bachelor of Science
Semester-VI

Course Title: Botany (Economic Botany)

Course Code: BSMM-6075 (II)

Time Allowed: 3 Hours **Max Marks: 30**

Note: Attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. All questions carry equal marks. Draw labelled diagrams wherever necessary.

Section-1

1. What are Vegetable oil? Describe the morphology and uses of any oil yielding plant. (6)
2. Give brief account on sugarcane with special reference to its morphology and various uses. (6)

Section-2

3. Write a short note on the following:-
   A) Fruit and uses of Coriandrum sativum.
   B) Morphology of ginger. (3+3)

4. Give a general account on morphology of any two spices studied by you. (6)

Section-3

5. What are medicinal plants? Give the medicinal properties of any three medicinal plants. (6)
6. Draw well labelled diagrams of the following: Flower bud of clove, capsule of Papaver sommferum, Indian gooseberry plant. (6)

Section-4

7. Describe the morphology, processing and uses of Rubber yeilding plant. (6)
8. Write down the morphology, method of cultivation and processing of a beverage. (6)

Exam Code: 103306 **Paper Code: 6161**

Programme: Bachelor of Science (Semester – VI)

Course Title: Food Science and Quality Control

(Vocational) (Food Plant Layout and Management)

Course Code: BSMM-6255

Time Allowed: 3 Hours **Max Marks: 60**

Note: Attempt five questions in all, selecting at least one question from each section. The Fifth Question may be attempted from any section. Each Question carries 12 marks.

Section- A

Question 1. Discuss the importance of the selection process of types of equipment and service facilities in food plants. (12)

Question 2. Explain in detail about management setup in a food plant. How cost of maintenance affect the margin of profit in the food industry? (12)

Section- B

Question 3. Explain the role of consumer research in the food industry and how it is becoming a major focus area for every sector, discuss. (12)

Question 4. Describe in detail the major factors that affect food patterns across India. (12)

Section- C

Question 5. What role do food innovations play in the upliftment of the food industry and what are the basic trends that need to be taken care of while designing new food, discuss. (12)

Question 6. What are the major factors that affect post-harvest losses in food crops and can they be minimized? (12)

Section- D

Question 7.How urbanization has affected the traditional foods of India. What steps must be taken for the revival of traditional food culture in our area, explain. (12)

Question 8. What are the steps in new product development, discuss. (12)