



RL-2091

Seat No. _____

M. Sc. (Sem. I) Examination

December - 2023

CHNN-401 : Chemistry

(Inorganic Chemistry) (New Course)

Time : $2\frac{1}{2}$ Hours

[Total Marks : 70]

Instructions : All questions are compulsory.

1 Answer any two of the following :

- (1) Explain VSEPR theory for NH_3 , N_2O and BF_3 .
- (2) Discuss Walsh diagram for H_2O .
- (3) Explain Bent rules with example.

2 Answer any two :

- (1) Explain stepwise and overall formation constants.
- (2) Explain the chelate effect and thermodynamic origin of metal complexes.
- (3) Discuss different types of stability constant of complexes.

3 Answer any two :

- (1) Write a short note on 'Trans Effect'.
- (2) Discuss the types of Redox reaction in complexes.
- (3) Write a note on cross reaction and Marcus-Lush theory.

4 Answer any two :

- (1) Explain crystal field splitting in T_d and O_h complexes.
- (2) Explain MO diagram for $[\text{CoF}_6]^{3-}$.
- (3) Discuss crystal field theory and its limitations for coordination compounds.

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[4470]



RL-2100

Seat No. _____

M. Sc. (Sem. I) Examination
December - 2023

Chemistry : CHNN-402

(Organic Chemistry) (New Course)

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

1 Answer any two of the following : 18

- (1) What is Annulene? Discuss the aromaticity of cyclodecapentaene and cyclododecaannulene.
- (2) Explain Huckel rule for aromatic, non-aromatic and anti-aromatic with one example.
- (3) Explain alternant and non-alternant hydrocarbons with suitable examples.

2 Answer any two of the following : 17

- (1) What is absolute asymmetric synthesis? Discuss in detail the optical activity in absence of a chiral carbon.
- (2) Difference between Stereospecific and Stereoselective reactions. Explain with suitable examples.
- (3) Explain stereochemistry of Nitrogen and Sulphur containing compounds.

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1

[Contd...

- Answer any **two** of the following :
- (1) The application of NMR spectroscopy in the detection of carbanions.
 - (2) Write a note on : Hard and Soft acid and bases.
 - (3) Describe Hammett equation and linear free energy relationship, substituent and reaction constant.
- 18
-
- Answer any **two** of the following :
- (1) Discuss the nucleophilic substitution of Allylic and Vinylic carbon.
 - (2) What is neighbouring group participation? Discuss its mechanism in the presence of different neighbour groups.
 - (3) Explain the reactivity for Aliphatic and Aromatic substrates.
- 17



RL-2118

Seat No. _____

M. Sc. (Sem. I) Examination

December - 2023

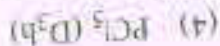
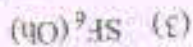
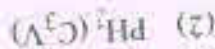
CHNN-404 : Chemistry

(Group Theory & Spectroscopy) (New Course)

Time : $2\frac{1}{2}$ Hours] [Total Marks : 70

1. Answer any two of the followings : 18

- (1) Give definition and example of following matrix :
Symmetrical, adjoint, identity, Row, Column, Null
Square
- (2) Find the 13N presentation for the following molecules



- (3) Explain the matrix representation of $C_n(Z)$ symmetry operation using position vector

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1

[Contd...

- 2 Answer any two of the followings : 17
- (1) Discuss the rules of The Great Orthogonality theorem using C_3V point group.
 - (2) What is reducible and irreducible representation? Write the reduction formula for finding irreducible representation. Find the irreducible representation of the following reducible representation. D_3h E 2C₃ 3C₂ oh 2S₃ 3σ_v
3 0 1 3 0 1
 - (3) Find the σ-hybrid orbitals for XeOF₄ (Square Pyramidal) : (C_4V) complex.
- 3 Answer any two of the followings : 18
- (1) What is spectroscopy? Describe the types of spectra.
 - (2) Explain the following terms with reference to spectroscopy.
Absorption And Emission,
Transmission And Reflection,
Refraction And Dispersion,
Polarization And Scattering
 - (3) Explain the Selection Rules For Intensity Of Spectral Line For Rotational, Vibrational And Electronic Energy Levels.
- 4 Answer any two of the followings : 17
- (1) Explain the principle of Mossbauer spectroscopy. (Give report on CHEMICAL ISOMER SHIFT (C.I.S))
 - (2) and describe the factors affecting on it.
 - (3) Explain the Mossbauer Spectra of Sodium Nitroprusside complex.



RL-2094

Seat No. _____

M. Sc. (Sem. I) Examination

December - 2023

Physics : CCMSPHY101CC

(Mathematical Physics - I & "C" Programming - I)

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instruction: Symbols used are usual.

- 1 (a) Attempt any **one** of the following questions **8**
- (1) State and prove Cauchy-Riemann Condition
- (2) State and prove Cauchy integral formula.
- (b) Attempt any **two** of the following questions **8**

(1) Evaluate : $I = \int_{-\pi}^0 \frac{d\theta}{5 - 4 \sin \theta}$

- (2) Discuss Laurent series with example.
- (3) State any prove Residue theorem.
- (c) Attempt any **one**: **2**

(1) What is mapping?

(2) If $f(z)$ is analytic function at z_0 , then

$\text{Res}(f(z), z_0) = \frac{1}{n!} \dots$

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[Contd...

2	(a) Attempt any one of the following questions: (1) Discuss Fourier transform and convolution. (2) Discuss solution of differential equation by Laplace transformation with suitable example.	7
8	(b) Attempt any two of the following questions: (1) A differential equation $y'' + 4y' + 4y = t^2 e^{-2t}$ with initial condition $y_0 = 0, y'_0 = 0$. Solve this by Laplace transform method. (2) Find the Laplace transform of $f(t) = \sin(at)$ and $f(t) = t^k, k > 0$. (3) Define Laplace transform. Give simple example.	8
2	(c) Attempt any one: (1) Give the Parseval's condition. (2) Laplace transform of $f(t) = \cos(at), a > 0$.	2
3	(a) Attempt any one of the following questions: (1) Write note on "dowhile" statement. (2) Discuss one dimensional array. (b) Attempt any two of the following questions: (1) Define "do" statement and write its format. (2) Write "while" statement and define. (3) Explain "jumps in loops" and continue statement. (c) Attempt any one: (1) Define multidimensional array. (2) Write "for statement".	3
2	(c) Attempt any one: (1) Define multidimensional array. (2) Write "for statement".	2

- 7 (a) Attempt any **one** of the following questions:
- (1) Write a program using single-suscripted variable to evaluate the following expressions:

$$\text{Total} = \sum_{i=1}^{10} x_i^2$$

The value of x_1, x_2, \dots, x_{10} .

- (b) Attempt any **two** of the following questions:
- (1) Discuss reading and writing strings.
 - (2) Explain string handling functions.
 - (3) What is function calls and function declaration? Explain.

2

- (c) Attempt any **one** of the following questions:
- (1) What is user defined functions?
 - (2) Give the category of functions.

- 2 (c) Attempt any **one** of the following questions:
- (1) What is user defined functions?
 - (2) Give the category of functions.

- 8 (b) Attempt any **two** of the following questions:
- (1) Discuss reading and writing strings.
 - (2) Explain string handling functions.
 - (3) What is function calls and function declaration? Explain.
- (2) Discuss elements of user defined functions and definition of functions.

The value of x_1, x_2, \dots, x_{10} .

$$\text{Total} = \sum_{i=1}^{10} X_i^2$$

- 7 (a) Attempt any **one** of the following questions:
- (1) Write a program using single-suscripted variable to evaluate the following expressions:



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Seat No. _____

M. Sc. (Sem. I) Examination

December - 2023

MSPHY-CC-102 : Physics

(Classical Mechanics - I & Electrodynamics - I)

Time : $2\frac{1}{2}$ Hours

[Total Marks : 70]

1 (a) Answer any **one** out of two : 8

(1) Explain gage transformation and generating function in detail.

(2) Derive Hamilton - Jacobi equations and solve one dimensional Harmonic oscillator problem.

(b) Answer any **two** out of three : 8

(1) Using method of separation of variable, solve the system under central force field.

(2) Define Poisson bracket and give its properties.

(3) Prove : If Hamiltonian H and Quantity F are constants of motion than $\frac{\partial F}{\partial t}$ remain constant.

(c) Answer any **one** out of two : 2

(1) Explain Canonical Transformation.

(2) Define generating function.

2 (a) Answer any **one** out of two : 7

(1) Discuss free motion of a rigid body for spherical top, rigid rotator and symmetric top.

(2) Define Equilibrium and discuss different types of equilibrium.

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1

[Contd...



RL-2103

Seat No. _____

M. Sc. (Sem. I) Examination

December - 2023

MSPHY-CC-102 : Physics

(Classical Mechanics - I & Electrodynamics - I)

Time : $2\frac{1}{2}$ Hours

Total Marks : 70

1 (a) Answer any **one** out of two : 8

(1) Explain gage transformation and generating function in detail.

(2) Derive Hamilton - Jacobi equations and solve one dimensional Harmonic oscillator problem.

(b) Answer any **two** out of three : 8

(1) Using method of separation of variable, solve

(2) Define Poisson bracket and give its properties.

(3) Prove : If Hamiltonian H and Quantity

F are constants of motion than $\frac{\partial F}{\partial t}$ remain constant

(c) Answer any **one** out of two : 2

(1) Explain Canonical Transformation.

(2) Define generating function.

2 (a) Answer any **one** out of two : 7

(1) Discuss free motion of a rigid body for

spherical top, rigid rotator and symmetric top.

(2) Define Equilibrium and discuss different types of equilibrium.

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1

[Contd...

8	(b)	Answer any two out of three :
	(1)	Explain normal coordinates and normal frequencies of vibrations
	(2)	Write short note on Inertia tensor.
	(3)	Prove that the Eigen values of symmetric matrix are real.
2	(c)	Answer any one out of two :
	(1)	Give an example of Damped oscillation.
	(2)	What is small oscillation?
8	(a)	Answer any one out of two :
	(1)	Explain various cases for reflection by a perfect conductor - Oblique incidence.
	(2)	Discuss conductors and dielectrics in detail.
8	(b)	Answer any two out of three:
	(1)	Explain reflection by a perfect insulator - oblique incidence.
	(2)	Write note on polarization.
	(3)	Discuss: Reflection by a perfect dielectric - Normal incidence.
2	(c)	Answer any one out of two :
	(1)	Define surface impedance.
	(2)	Write down Maxwell's equations for homogeneous medium.
7	(a)	Answer any one out of two :
	(1)	Describe TE and TM waves
	(2)	State and Prove: Poynting's theorem.
8	(b)	Answer any two out of three :
	(1)	Discuss instantaneous and average Poynting vector.
	(2)	Calculate power loss in a plane conductor.
	(3)	Explain wave between parallel planes.
2	(c)	Answer any one out of two :
	(1)	Define TEM wave.
	(2)	What is parallel plane guides?



RL-2112

Seat No. _____

M. Sc. (Sem. I) Examination

December - 2023

MSPHY-103-CC : Quantum Mechanics-I

(Solid State Physics - I) (New Course)

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

1 (a) Attempt any one : 8

(1) Describe Schrodinger picture in detail.

(2) Explain anisotropic oscillator.

Attempt any two :

(1) Discuss Schrodinger representation.

(2) Explain transformation of dynamical variable.

(3) Describe symmetry and conservation laws.

Attempt any two :

(1) What is dynamical postulates?

(2) How dynamical state of physical system is defined?

(3) What is isotropic Oscillator?

2 (a) Attempt any one : 7

(1) Explain eigen value spectrum of angular momentum.

(2) Describe matrix representation of J in the $|m\rangle$ basis

Attempt any two :

(1) Describe identical particle with spin.

(2) Discuss non relativistic Hamiltonian with spin.

(3) Explain addition of spin and orbital angular momenta.

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[Contd...

- (c) Attempt any two :
 (1) What is Clebsch - Gordon co-efficients?
 (2) $[S, L] =$
 (3) Write formula Gyro magnetic ratio.....
 2
- 3 (a) Attempt any one :
 (1) Describe nearly free electron model.
 (2) Explain Kronig penny model.
 (b) Attempt any two :
 (1) Explain restatement of Bloch Theorem.
 (2) Describe wave equation of electron in periodic potential.
 (3) Discuss origin of energy gap.
 (c) Attempt any two :
 (1) What is first Brillouin zone?
 (2) How dynamical state of physical system is defined?
 (3) "Energy gap is a Fourier component of crystal potential" True or False.
 8
- 4 (a) Attempt any one :
 (1) Discuss intrinsic carrier concentration in energy band
 (2) Describe equation of motion of electron in
 (b) Attempt any two :
 (1) Give physical interpretation of effective mass.
 (2) Discuss thermo electric effects.
 (3) Describe Bloch Oscillation.
 (c) Attempt any two :
 (1) What is Zener Tunneling?
 (2) What is doping?
 (3) What is mobility?
 8
- 7 (a) Attempt any one :
 (1) Discuss intrinsic carrier concentration in energy band
 (2) Describe equation of motion of electron in
 (b) Attempt any two :
 (1) Give physical interpretation of effective mass.
 (2) Discuss thermo electric effects.
 (3) Describe Bloch Oscillation.
 (c) Attempt any two :
 (1) What is Zener Tunneling?
 (2) What is doping?
 (3) What is mobility?
 2



RL-2121 Seat No.

M. Sc. (Sem. I) Examination

December - 2023

MSPHY-104CC : Electronics - I

Time : Hours]

[Total Marks : 70

1 (a) Attempt any one : 8

(1) Explain biasing of the FET.

(2) Describe common source amplifier at high frequency.

(b) Attempt any two : 8

(1) Explain the common gate amplifier.

(2) A common source amplifier uses FET having drain resistance $r_d = 150 \Omega$ and $\mu = 15$ calculate the voltage gain for load resistance equal to $150 k\Omega$ and $900 k\Omega$.

(3) Explain common source A.C. amplifier.

(c) Attempt any one : 2

(1) Draw the figure of gate-bias circuit.

(2) When operating point is maintained stable?

2 (a) Attempt any one : 7

(1) Explain class B push-pull amplifier.

(2) Describe double transistor tuned amplifier.

(b) Attempt any two : 8

(1) Write a note on tuned amplifier.

(2) A class B push pull amplifier is supplied with $V_{cc} = 50$ V. The signal swings the collection voltage down to $V_{min} = 5$ V. The total dissipation in both transistor is 40 W. Find the total power and conversion efficiency.

(3) Write a note on class B power amplifier.

1 [Contd.. RL-2121]

- (c) Attempt any one :
- (1) What is the meaning of monolithic?
 - (2) Write the uses of IC 555.
- 2
- (b) Attempt any two :
- (1) Give the advantages and limitation of IC.
 - (2) Write a note on monolithic Diodes.
 - (3) Describe transistor of monolithic IC.
- 8
- 4 (a) Attempt any one :
- (1) Describe the IC 555 using as a multi vibrator.
 - (2) Explain basic monolithic integrated circuit technology.
- 7
- (c) Attempt any one :
- (1) Which condition required for RC infinite?
 - (2) When the V_R is positive?
- 2
- (b) Attempt any two :
- (1) Describe low pass R-C circuit as an integrator.
 - (2) Explain double ended P-N junction clippers.
 - (3) Discuss voltage controlled oscillator.
- 8
- 3 (a) Attempt any one :
- (1) Explain the high pass R-C circuit.
 - (2) Explain low pass R-C circuit.
- 8
- (c) Attempt any one :
- (1) What is power amplifier for β and collector current?
 - (2) Give the advantage of class A push pull power amplifier.
- 2

- (c) Attempt any one :
- (1) What is the meaning of monolithic?
 - (2) Write the uses of IC 555.
- 2
- (b) Attempt any two :
- (1) Give the advantages and limitation of IC.
 - (2) Write a note on monolithic Diodes.
 - (3) Describe transistor of monolithic IC.
- 8
- 4 (a) Attempt any one :
- (1) Describe the IC 555 using as a multi vibrator.
 - (2) Explain basic monolithic integrated circuit technology.
- 7
- (c) Attempt any one :
- (1) Which condition required for RC infinite?
 - (2) When the V_B is positive?
- 2
- (b) Attempt any two :
- (1) Describe low pass R-C circuit as an integrator.
 - (2) Explain double ended P-N junction clippers.
 - (3) Discuss voltage controlled oscillator.
- 8
- 3 (a) Attempt any one :
- (1) Explain the high pass R-C circuit.
 - (2) Explain low pass R-C circuit.
- 8
- (c) Attempt any one :
- (1) What is power amplifier for β and collector current?
 - (2) Give the advantage of class A push pull power amplifier.
- 2



RL-2092

Seat No. _____

M. Sc. (Sem. I) Examination

December - 2023

Botany : BOC - 101

(Biology & Diversity - I)

(Virus, Bacteria, Algae, Fungi & Plant Pathology) (New Course)

Time : 2 1/2 Hours

[Total Marks : 70

Instructions : (1) This question paper consists total four

questions.

(2) All questions are compulsory and carrying

18, 17, 18 and 17 marks respectively.

(3) There is no overall choice. However, an

internal choice has been provided in each

sub-questions.

(4) Illustrate your answers with necessary

diagrams, if required.

18 Answer the following as per instruction : 1

8 (a) Explain in detail : (any one)

(1) Structure of Tobacco Mosaic Virus (TMV)

(2) Chemosynthetic bacteria.

(b) Explain in brief : (any one)

(1) Ultra structure of bacterial cell.

(2) General characters of virus.

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1

[Contd...

7

8

18

- 3 Answer the following as per instruction :
- (a) Explain in detail : (any one) 8
 - (1) General characteristics of Ascomycota.
 - (2) Role of fungi in industry and medicine.
 - (5) Define : Coenobium. 18
 - (4) Carposporophyte is also known as _____
 - (3) Name the algae which is source of Agar-Agar
 - (2) What is the name of female sex organ of Chara?
 - (1) Which pigment is dominant in Phaeophyta?
- 3 Give short answers : (any three)
- (2) General characters of Rhodophyta.
 - (1) Colonial forms of thallus organization in algae.
- 6 Explain in brief : (any one)
- (2) Sexual reproduction in algae.
 - (1) Role of algae in biofertilizer and industry.
- 8 Explain in detail : (any one)
- 17 Answer the following as per instructions :
- (a) Explain in detail : (any one) 8
 - (1) Role of algae in biofertilizer and industry.
 - (2) Sexual reproduction in algae.
 - (3) Mention any two names of asexual reproduction in bacteria.
 - (4) Give any two general characters of cyanobacteria.
 - (5) Name a free living nitrogen fixing bacteria.
- 3 Give short answers : (any three)
- (1) What is the name of protein coat in viruses?
 - (2) The bacterial cell wall consists of _____
 - (3) Mention any two names of asexual reproduction in bacteria.
 - (4) Give any two general characters of cyanobacteria.
 - (5) Name a free living nitrogen fixing bacteria.

- 4 Answer the following as per instruction :
- (a) Explain in detail : (any **one**)
 - (1) Biochemical defense mechanism.
 - (2) Tikka disease of Groundnut.
 - (b) Explain brief : (any **one**)
 - (1) Describe general symptoms of plant disease.
 - (2) Bacterial blight of paddy.
 - (c) Give short answers : (any **three**)
 - (1) Write the name of casual organism of Late Blight of Potato.
 - (2) Define : Necrosis
 - (3) Disease which occur all over world and cause mass mortality are known as _____ disease.
 - (4) Write the types of dissemination.
 - (5) What is cancer?

3

6

8

17

- (b) Explain in brief : (any **one**)
- (1) Heterothallism.
- (2) Asexual reproduction in fungi.
- (c) Give short answers : (any **three**)
- (1) Sexual reproduction is absent in _____
- (2) Clamp connections are present in which class of fungi?
- (3) Member of eumycota are commonly known as _____
- (4) What is plasmogamy?
- (5) Mention the name of fruiting bodies in Basidiomycotina.

3

7



RL-2101

Seat No. _____

M. Sc. (Sem. I) Examination

December - 2023

BOC-102 : Botany

(Plant Taxonomy) (New Course)

Time : 2 $\frac{1}{2}$ Hours]

[Total Marks : 70

Instructions : (1) This question paper consists total four questions.

(2) All questions are compulsory and carrying 18, 17, 18 and 17 marks respectively.

(3) Illustrate your answers with necessary diagram, if required.

1 (a) Answer the following one out of two : 8

(1) Principles and aims of taxonomy.

(2) Importance of Herbaria and Botanical gardens.

(b) Answer the following one out of two : 7

(1) Origin and Evolution of Angiosperms.

(2) Major Categories.

(c) Answer the following three out of five : 3

(1) A group of individual of plant which are generally distinct, reproductively isolated and similar in morphological characteristics is called :

(a) Species

(b) Genus

(c) Order

(d) Family

RL-2101]

1

[Contd..

2

- Angiosperms?
- (5) Who had given the word Magnoliophyta for
- (a) Autonym (b) Basonym (c) Tautonym (d) Synonym
- (4) Which of the following is not permissible according to the rules of botanical nomenclature?
- (3) Who wrote 'Species Plantarum'?
- (2) Neotype is the one specimen or other element designated by the author as the nomenclatural type - True or False.
- (1) Name the three parts in which ICBN is divided.

3

6

8

- (c) Answer the following **three** out of five :
- (2) History of Plant Nomenclature
- (1) Principles and Bassey's system
- (b) Answer the following **one** out of two :
- (2) Principles and Typification of ICBN
- (1) Bentham and Hooker's system
- (a) Answer the following **one** out of two :
- (1) Classification and merits and demerits of
- (2) Answer the following **one** out of two :
- (1) Classification and merits and demerits of
- (2) Principles and Typification of ICBN
- (b) Answer the following **one** out of two :
- (1) Bentham and Hooker's system
- (2) Principles and Typification of ICBN
- (1) Principles and Bassey's system
- (2) History of Plant Nomenclature
- (c) Answer the following **three** out of five :
- (1) Name the three parts in which ICBN is divided.
- (2) Neotype is the one specimen or other element designated by the author as the nomenclatural type - True or False.
- (3) Who wrote 'Species Plantarum'?
- (4) Which of the following is not permissible according to the rules of botanical nomenclature?
- (a) Autonym (b) Basonym (c) Tautonym (d) Synonym
- (5) Who had given the word Magnoliophyta for Angiosperms?

- (2) The seeds of early angiosperms were undifferentiated embryo.
- (3) The Royal Botanical Garden is located at _____
- (4) What is the standard size of a plant press? :
- (5) Define : Taxonomy.

- (a) Answer the following **one** out of two : 8
 - (1) Role of Embryology and Cytology in plant taxonomy.
 - (2) General account of Flora of Gujarat state.
- (b) Answer the following **one** out of two : 7
 - (1) Flora and GIS as a tools of Taxonomy.
 - (2) Hotspots of India.
- (c) Answer the following **three** out of five : 3
 - (1) Define : Serology.
 - (2) Which parts of the world are called hot spots of biodiversity?
 - (a) Possess species not available at other place.
 - (b) Possess a greater biodiversity.
 - (c) Possess endangered species.
 - (d) None of (a), (c) or (c).
- (3) A taxon is evaluating a really young and not yet spread over the new area is :
 - (a) Palaeo-endemism
 - (b) Neo-endemism
 - (c) Relic-endemism
 - (d) Epibiotic endemism
- (4) *Chlorophytum glaucum* and *Chlorophytum glaucoides* are separated on the basis of :
 - (a) Cytology
 - (b) Embryology
 - (c) Anatomy
 - (d) Morphology
- (5) Distribution of alkaloids has proved useful in the taxonomy of Rutaceae - True or False. 3

- 4 (a) Answer the following **one** out of two : 8
- (1) Salient features of Capparaeae and Boraginaceae.
 - (2) Geographical distribution, systematic position, floral variation and economic importance of Lamnaceae.
- 6 (b) Answer the following **one** out of two : 6
- (1) Spikelet and Cyathium inflorescence.
 - (2) Floral formula and floral diagram of *Azadirachta indica* and *Calotropis procera*.
- 3 (c) Answer the following **three** out of five : 3
- (1) Which of the following family includes *Curcumbrycae*?
 - (a) Euphorbiaceae
 - (b) Amaranthaceae
 - (c) Liliaceae
 - (d) Casuarinaceae
 - (2) Give the scientific name and family of *Brahmi*.
 - (3) Draw the labelled diagram - *Androynophore*.
 - (4) Pollinia are seen in which family?
 - (5) Give the correct classification of Casuarinaceae.



RL-2110

Seat No. _____

M. Sc. (Sem. I) Examination

December - 2023

BOC-103 : Botany

(Cell Biology) (New Course)

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

1 (a) Answer the following long answer question: 8

(one out of two)

(1) Describe structure and function of plasma

membrane

(2) Write note on ultra structure and function

of mitochondria.

(b) Answer the following short notes : 7

(one out of two)

(1) Explain structure and function of micro-

bodies.

(2) Write note on structure and function of

Endoplasmic reticulum.

(c) Answer the following - Objective type questions : 3

(three out of five)

(1) Define plasmodesmata.

(2) Name the sub units of prokaryotic

Ribosomes.

(3) What is the main function of lysosomes?

(4) Name the well accepted model for plasma

membrane

(5) Which reaction occur in grana part of

chloroplast?

RL-21101

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[Contd...

- 2
- (a) Answer the following - Long answer question: 8
 (one out of two)
 (1) Write brief note on Cytoskeleton.
 (2) Explain the stages of mitosis cell division.
- (b) Answer the following - short notes: 6
 (one out of two)
 (1) Describe briefly programmed cell death.
 (2) Write note on cytokinesis and cell plate formation.
- (c) Answer the following - Objective type questions: 3
 (three out of five)
 (1) Define the term karyokinesis.
 (2) Define the term Apoptosis.
 (3) Mention two functions of flagella.
 (4) What is Amitosis cell division?
 (5) Name the various phases of cell cycle.
- 3
- (a) Answer the following - Long answer question: 8
 (one out of two)
 (1) Describe structure and function of nucleus.
 (2) Write note on chromosome structure and packaging of DNA.
- (b) Answer the following: Short notes: 7
 (one out of two)
 (1) Write note on heterochromatin and euchromatin.
 (2) Structure and function of polytene chromosome.
- (c) Answer the following - Objective type question: 3
 (three out of five)
 (1) The puffs or balbiani rings is present in which chromosomes?
 (2) Name the control centre of eukaryotic cell.
 (3) What is function of nucleolus?
 (4) What is karyotype?
 (5) What is telomere?

- 4 (a) Answer the following : Long answer question : 8
- (one out of two)
- (1) Write note on experimental approaches for cell staining.
- (2) Describe various types of light microscopy.
- 6 (b) Answer the following - Short notes : 6
- (one out of two)
- (1) Write short note on cell fractionation.
- (2) Write note on Fluorescent microscopy.
- 3 (c) Answer the following - Objective type question : 3
- (three out of five)
- (1) Give the full form of FISH and GISH.
- (2) Name the types of immuno techniques.
- (3) What is full form of SEM and TEM?
- (4) Name any one fluorescent dye.
- (5) Define in situ hybridization?

DEC23-03-8888
M.SC Semester-I Examination
OCT-2023
Botany-BOE-103 Biodiversity

Time : 2 Hours

Total Marks : 35

Instructions:

1. All questions are compulsory and internal choice is provided.

2. There shall be one section in the questions paper of 35 marks

3. Illustrate your answer with necessary diagrams

Attempt any one out of two

1. Define biodiversity and explain the types of biodiversity

2. Describe the process of species extinction?

Attempt any one out of two

1. What are the factors affecting the loss of biodiversity?

2. What is genetic diversity and illustrate the law of genetic diversity?

Attempt any one out of two

1. What is the role of biotechnology in biodiversity conservation?

2. What is the role of education institute in biodiversity?

Attempt any one out of two

1. Describe the ex-situ and in-situ conservation by using appropriate

examples?

2. What are the current practices used for biodiversity conservation in

India?

Attempt any seven out of ten

1. Write the botanical names of any two medicinal plants and their

uses?

2. Name the major ecosystems of the world?

3. Define species diversity?

4. Write the uses of rattans and canes?

5. What are critically endangered species?

6. What is IPR?

7. Describe NBPPGR

8. Briefly describe Chipko Movement?

9. Define biopiracy?

10. What is biodiversity conservation?



RL-2119 Seat No. _____

M. Sc. (Sem. I) Examination

December - 2023

BOC-104 : Botany : Paper - 104

(Genetics & Evolution) (New Course)

Time $2\frac{1}{2}$ Hours [Total Marks : 70]

Instructions :

- (1) All questions are compulsory.
- (2) Figures to the right indicate marks of sub-questions.
- (3) Illustrate your answers with neat and labelled diagram if required.

1 (a) Answer the following question in brief : (any one) 8

(1) Fine structure of gene.

(2) Plasmid inheritance in *Mirabilis jalapa*.

(b) Write short note : (any one) 7

(1) Male sterility in *Zea mays*.

(2) Initiation and termination codons.

(c) Answer the following question in very short : 3

(any three)

(1) Which is equivalent of a structural gene-Muton/Cistron/Recon

(2) Define - Split genes.

(3) Who discovered genetic code?

(4) Define - Extra chromosomal inheritance.

(5) What is meant by fine structure of gene?

RL-2119]

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- 2 (a) Answer the following question in brief: (any one) 8
- (1) Substitution mutation.
 - (2) Ac-Ds system.
 - (b) Write short note: (any one)
 - (1) Physical mutagens.
 - (2) Oncogenes.
- (c) Answer the following questions in very short: 3
- (any three)
- (1) Which enzyme catalyzes the transposition of an IS element?
 - (2) Give the type of n on-composite transposon.
 - (3) What is the result by point mutation?
 - (4) A=T is replaced by C=G; which type of mutation occurs?
 - (5) Explain proto-oncogenes.
- 3 (a) Answer the following question in brief: (any one) 8
- (1) Structural chromosomal aberration.
 - (2) Polygenic inheritance.
 - (b) Write short note: (any one)
 - (1) Incomplete linkage.
 - (2) Additive factors.

- 4 (a) Answer the following question in brief: (any one) 8
- (1) Concepts of variation;
 - (2) Experiment of Miller (1953)
 - (3) Write short note: (any one) 6
 - (1) Anaerobic metabolism
 - (2) Concept of Oparin;
- (c) Answer the following question in very short: 3
- (1) Give the intermediate products of the reaction in Millers experiment
 - (2) Which are co-acervate chemicals according to Oparin concept?
 - (3) Which is the book in which Darwin published the theory of evolution?
 - (4) Which is the most critical factor for evolution according to Darwin?
 - (5) What is the abiotic synthesis of polymers?
- (a) Answer the following question in brief: (any one) 8
- (1) Multiple alleles arise from the same allele by mutation - True or False?
 - (2) Crossing over takes place in _____ stage of meiosis.
 - (3) There are 4 pairs of chromosomes in a Drosophila. _____ Linkage groups present in it.
 - (4) Repulsion and coupling are two faces of _____
 - (5) Which type of ratio is obtained by supplementary factor?