

Seat No.

MAR_APR 2025 SUMMER EXAMINATION
11949 Bachelor of Computer Application(BCA) NEP 2.0
Sub. Name: RDBMS
Sub. Code: 109536/94730/91170

Day and Date: APRIL ,29-04-2025**Total Marks: 80****Time: 10:30 AM To 01:30 PM****Instructions: 1. Figures to the right indicate full marks****Special Inst.: 1) Que.No.1 and Que. No.8 are compulsory****2) Attempt any three Questions from Que. No.2 to Que. No. 7.****Q1) Solve following MCQ.****[12]**

- i. Rows of a relation are known as the _____.
 - A. Degree
 - B. Tuples
 - C. Entity
 - D. All of the above
- ii. What is the syntax for SELECT statement?
 - A. SELECT table_name FROM database_name;
 - B. SELECT column_list FROM table_name;
 - C. SELECT row_list FROM table_name;
 - D. SELECT record_list FROM table_name;
- iii. The OR operator displays a record if _____.
 - A. Any of the conditions separated by OR is true
 - B. All the conditions separated by OR is true
 - C. Any of the conditions separated by OR is not true
 - D. All the conditions separated by OR is not true
- iv. IN operator is used with which of the following clause(s)?
 - A. Select
 - B. Where
 - C. Update
 - D. Insert
- v. What is a database?
 - A. A collection of files
 - B. A collection of tables
 - C. A collection of software
 - D. A collection of web pages
- vi. Which of the following type of join returns a list of rows for which there is a

match in both of the specified tables?

- A. Outer join
- B. Full join
- C. Self join
- D. Inner join

vii. Which of the following is the correct syntax for creating an explicit cursor?

- A. cursor_name IS column_name;
- B. CURSOR cursor_name IS SELECT_statement;
- C. cursor_name CURSOR IS SELECT_statement;
- D. CURSOR cursor_name IS column_name;

viii. In how many parts does a PL/SQL sub-program is divided into?

- A. 2
- B. 3
- C. 4
- D. 5

ix. Which of the following statement is used to come out of the loop when encountered and pass the program control to the statement following the loop?

- A. BREAK
- B. CONTINUE
- C. EXIT
- D. GOTO

x. Which SQL keyword is used to sort the data returned by a SELECT statement?

- A. Group
- B. Order
- C. Group By
- D. Order By

xi. Which of the following command is used to create a database in SQL?

- A. MAKE
- B. CREATE
- C. INSERT
- D. DEVELOP

xii. What is a relation in RDBMS?

- A. Key
- B. Table
- C. Row
- D. Data Types

Q2) What is RDBMS? Write difference between DBMS and RDBMS.

[16]

- Q3)** Explain data definition language command in SQL. [16]
- Q4)** What is join? Explain different types of joins use in RDBMS. [16]
- Q5)** Illustrate different iterative control statements used in PL/SQL. [16]
- Q6)** Describe date and time Functions in SQL. [16]
- Q7)** Create table demo with fields (num, answer). Insert 10 records in demo tables with integer value for num only. Write explicit cursor to calculate square of num, if num is even and cube of num otherwise. Store the same in answer. [16]
- Q8)** Write short note (any four). [20]
- a. SQL data types
 - b. Relational Algebra
 - c. Aggregate functions
 - d. Sub queries
 - e. Branching statements in PL/SQL
 - f. Features of RDBMS

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (7824) Bachelor of Computer Application (CBCS)NEP (91170) RDBMS Part 2 SEM 3
- 2] (717) Bachelor of Computer Application (109536) RDBMS Part 2 SEM 3
- 3] (7810) B.C.A. (CBCS) (94730) RDBMS Part 2 SEM 3

Seat No. **MAR-APR 2025 SUMMER EXAMINATION****2354 Bachelor of Science****Sub. Name: Chemistry Paper V & VI****Sub. Code: 91567****Day and Date: MAY ,14-05-2025****Total Marks: 40****Time: 02.30 PM To 04:00 PM**

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

Q1) Choose the most correct alternative and rewrite the sentence.

[8]

- i. Color of the pure water is
 - A. blue
 - B. sky blue
 - C. pale green
 - D. colorless
- ii. A reagent which brings about precipitation is called
 - A. precipitate
 - B. precipitant
 - C. coagulant
 - D. flocculant
- iii. Severe corrosion takes place when percentage of humidity is
 - A. 25%
 - B. 50%
 - C. 75%
 - D. above 80%
- iv. In 'Galvanizations', the iron is coated by metal.
 - A. Ni
 - B. Al
 - C. Zn
 - D. Cr
- v. The electrostatic forces operate in chromatography type,
 - A. adsorption
 - B. ion-exchange
 - C. permeation
 - D. affinity
- vi. The diesel fuel is rated using the number.....

- A. octane
- B. cetane
- C. flash point
- D. calorific

vii. In India registered Trademarks is valid for Years.

- A. 10
- B. 100
- C. 20
- D. 5

viii. The reaction in which Oxidation takes place is called as ----- reaction.

- A. oxidation
- B. reduction
- C. neutralization
- D. deposition

Q2) Attempt any TWO.

[16]

- a. What is precipitation? Give the steps involved in precipitation & Explain any one of them. **[8]**
- b. What is corrosion? Mention all methods of protection of metals from corrosion and explain any two methods. **[8]**
- c. What is the physical analysis of water? Mention various physical parameters of water. Discuss any two of them. **[8]**

Q3) Attempt any FOUR.

[16]

- a. Write a short note on, 'Types of chromatography.' **[4]**
- b. Write a short note on, 'trademarks.' **[4]**
- c. Explain the packing of columns in adsorption chromatography. **[4]**
- d. Explain Faraday's laws of electrolysis. **[4]**
- e. Explain the term cracking. **[4]**
- f. Explain briefly the crystal growth. **[4]**

End Of Question Paper

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सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (2354) B.Sc. CBCS (NEP 2020) (91567) Chemistry Paper V & VI Part 2 SEM 3

986578

Seat No. **MAR-APR 2025 SUMMER EXAMINATION****2354 Bachelor of Science****Sub. Name: Botany Paper V & VI****Sub. Code: 91568****Day and Date: MAY ,16-05-2025****Total Marks: 40****Time: 02.30 PM To 04:00 PM**

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

Q1) Rewrite the following sentences by choosing the correct alternative**[8]**

- i. _____ is known as the father of genetics
 - A. T. H. Morgan
 - B. Gregor John Mendel
 - C. Hugo de Vries
 - D. Batson and Punnett
- ii. Repulsion and coupling are phases of _____
 - A. Mutation
 - B. Chiasma
 - C. Linkage
 - D. Multiplication
- iii. Nullisomy is represented by _____
 - A. $2n-1$
 - B. $2n-2$
 - C. $2n+1$
 - D. $2n+2$
- iv. Wheat is an example of _____ plant
 - A. haploid
 - B. diploid
 - C. allopolyploid
 - D. autopolyploid
- v. The two strands in a DNA molecule run in _____ direction
 - A. parallel
 - B. antiparallel
 - C. same
 - D. lateral
- vi. DNA replication takes place in _____ stage of the cell cycle

- A. S
- B. G1
- C. G2
- D. M

vii. A codon consist of _____ nitrogen bases

- A. three
- B. two
- C. four
- D. five

viii. During replication, enzyme _____ is responsible for separation of two strand of DNA.

- A. gyrase
- B. dehydrogenase
- C. amylase
- D. helicase

Q2) Attempt any two of the following: [16]

- a. Describe the mechanism of crossing over and add a note on significance of crossing over [8]
- b. Define euploidy and describe various types of euploidy [8]
- c. Describe in brief the process of DNA replication in eukaryotes [8]

Q3) Write short notes on any four of the following: [16]

- a. Monohybrid cross
- b. Translocation
- c. Structure of mRNA
- d. Griffiths experiment of transformation
- e. Central dogma of molecular biology
- f. Significance of nucleic acids

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (2354) B.Sc. CBCS (NEP 2020) (91568) Botany Paper V & VI Part 2 SEM 3

994823

Seat No. **MAR-APR 2025 SUMMER EXAMINATION****2354 Bachelor of Science****Sub. Name: Chemistry Paper V & VI****Sub. Code: 91567****Day and Date: MAY ,13-05-2025****Total Marks: 40****Time: 02.30 PM To 04:00 PM**

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

Q1) Choose the most correct alternative for each of the following and rewrite the sentence again. **[8]**

- i. S.I. unit of conductance is.....
 - A. Siemen
 - B. Ohm
 - C. Mhos
 - D. none of these
- ii. is a surface phenomenon.
 - A. Adsorption
 - B. Absorption
 - C. Extraction
 - D. None of these
- iii. Entropy is a function.
 - A. state
 - B. pure
 - C. impure
 - D. none of these
- iv. According to the kinetic molecular theory of gases the average kinetic energy.....
 - A. is proportional to absolute temperature
 - B. decreases with rise in temperature.
 - C. is always constant for a given gas
 - D. is zero at zero degree celsius
- v. Lower the value of energy of activation..... is the reaction.
 - A. slower
 - B. deadly slow
 - C. faster

D. none of these

vi. has no definite shape and no definite volume.

- A. Liquid
- B. Gas
- C. Liquid crystal
- D. Solid

vii. The state of equilibrium is the state of..... probability

- A. minimum
- B. less
- C. maximum
- D. none of these

viii. As the surface area is higher, the process of adsorption is.....

- A. higher
- B. lower
- C. moderate
- D. not possible

Q2) Solve any two of the following

[16]

- a. Derive Hittorf's rule with the help of Ostwald's schematic diagram.
- b. Derive relationship between critical constant and van der Waals' constants
- c. Define Entropy, Give its Unit and Explain physical significance of entropy.

Q3) Solve any four of the following

[16]

- a. Describe any two methods for determination of order of reaction
- b. Factors affecting on adsorption.
- c. Give the postulates of kinetic theory of gases.
- d. Applications of adsorption.
- e. Conductometric titration of strong acid against strong base.
- f. If the rate of reaction gets doubled from 298 K to 308 K, calculate the energy of activation. ($R = 8.368$ joules)

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

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सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (2354) B.Sc. CBCS (NEP 2020) (91567) Chemistry Paper V & VI Part 2 SEM 3

612199

Seat No. **MAR-APR 2025 SUMMER EXAMINATION****2354 Bachelor of Science****Sub. Name: Computer Science Paper V & VI****Sub. Code: 91575/73310/77712/63611****Day and Date: MAY ,26-05-2025****Total Marks: 40****Time: 02.30 PM To 04:00 PM**

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

Q1) Solve following MCQ.**[8]**

- i.** Which of the following is not a feature of Object-Oriented Programming?
 - A. Encapsulation
 - B. Abstraction
 - C. Compilation
 - D. Inheritance
- ii.** Which of the following concepts allows a child class to use the properties of a parent class?
 - A. Encapsulation
 - B. Inheritance
 - C. Abstraction
 - D. Overloading
- iii.** What are identifiers in C++?
 - A. Reserved keywords
 - B. User-defined names for variables and functions
 - C. Operators
 - D. Constants
- iv.** What is function overloading?
 - A. Defining multiple functions with the same name but different parameters
 - B. Writing functions inside a class
 - C. Using global functions
 - D. Overwriting a function
- v.** Which of the following is not a type of constructor?
 - A. Default constructor
 - B. Parameterized constructor
 - C. Copy constructor
 - D. Static constructor

- vi.** What is operator overloading in C++?
A. Assigning multiple values to an operator
B. Defining multiple operators for a function
C. Giving special meaning to an operator for user-defined types
D. Using multiple operators in one expression
- vii.** What is an abstract class?
A. A class that cannot have objects
B. A class without member functions
C. A class with only static members
D. None of the above
- viii.** What is polymorphism in C++?
A. Creating multiple objects
B. Multiple functions with the same name
C. The ability of a function/operator to behave differently
D. A class with multiple objects

Q2) Attempt any two (Eight marks each)

[16]

- a.** What is an object in Object-Oriented Programming? Explain concept of class and object with simple example.
- b.** List and explain the types of operators available in C++ .
- c.** What is Constructor? Explain types of constructors in C++.

Q3) Attempt any four of the following (Four marks each).

[16]

- a.** Write Difference between Procedure Oriented programming and Object oriented programming.
- b.** Explain Structure of C++ Program.
- c.** Explain concept of function overloading with suitable example.
- d.** Explain Single inheritance with example.
- e.** Explain concept of Operator overloading.
- f.** Explain virtual and pure virtual function in C++.

End Of Question Paper

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सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (2354) B.Sc. CBCS (NEP 2020) (91575) Computer Science Paper V & VI Part 2 SEM 3
- 2] (2324) B.Sc. (CBCS) (73310) Computer Science Paper V & VI Part 2 SEM 3
- 3] (286) B.Sc.(Sem.) (77712) Computer Science Paper V & VI Part 2 SEM 3
- 4] (286) B.Sc.(Sem.) (63611) Computer Science Paper V & VI Part 2 SEM 3

941891

Seat No.	
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B.Com.(Part -II) (Semester -III) (NEP20)**Examination, April-2025****Fundamentals of Entrepreneurship (Paper - I)****Sub. Code : 91682/49809/50981/63109/73509/77838/97456****Day and Date : Thursday, 17/04/2025****Total Marks : 40****Time : 02:30 p.m. to 04:00 p.m.**

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

Q1) Choose the appropriate option and write it in the answer book. [8]

- 1) _____ is one who assumes the risk and management of business.

A) Entrepreneur	B) Seller
C) Purchaser	D) Consumer
- 2) The term _____ refers to an entrepreneur that has an online business through internet.

A) Sociopreneur	B) Edupreneur
C) Net-preneur	D) Ecopreneur
- 3) Innovation theory of entrepreneurship given by _____.

A) Hagen	B) Joseph Schumpeter
C) Knight	D) David McClelland
- 4) Startup India scheme has been launched in the year _____.

A) 2018	B) 2021
C) 2023	D) 2015

- 5) Long form of MCED is_____.
- A) Maharashtra Centre for Entrepreneurship Development
 - B) Management Centre for Entrepreneurship Development
 - C) Marketing Centre for Entrepreneurship Development
 - D) Maharashtra Centre for Equipment Department
- 6) MSME act comes in force from_____.
- A) 2010
 - B) 2016
 - C) 2006
 - D) 2023
- 7) Doctor is considered as _____ entrepreneur.
- A) Trade
 - B) Service
 - C) Manufacture
 - D) Business
- 8) If investment in manufacturing sector is up to _____ then it is considered as Micro Industry.
- A) 5 Lakh
 - B) 50 Lakh
 - C) 10 Lakh
 - D) 25 Lakh

Q2) Explain entrepreneurship development process and its stages. [8]

OR

Explain the Joseph Schumpeter's theory of Innovation.

Q3) Explain the term Startup India Scheme in brief. [8]

OR

What is the importance of MSME?

Q4) Write Short answers. (any Two) [8]

- 1) Hagen's theory of Status Withdrawal
- 2) Explain the types of Entrepreneur
- 3) Functions of entrepreneur

Q5) Write Short Notes. (any Two)**[8]**

- 1) Make in India Scheme
- 2) Incubation Centre
- 3) Net-preneur

मराठी रुपांतर

- सूचना : 1) सर्व प्रश्न सोडवणे आवश्यक आहे.
- 2) उजवीकडील अंक प्रश्नाचे पूर्ण गुण दर्शवितात.
- 3) मराठी रुपांतराबाबत शंका असल्यास मूळ इंग्रजी प्रश्न पाहावेत.

Q1) योग्य पर्यायांची निवड करा व उत्तरपत्रिकेमध्ये लिहा.**[8]**

- 1) जोखीम स्वीकारणारी व व्यवसायाचे व्यवस्थापन करणारी व्यक्ती म्हणजे ----- होय.
 - अ) उद्योजक
 - ब) विक्रेता
 - क) खरेदीदार
 - ड) उपभोक्ता
- 2) -----म्हणजे आंतरजाळ्याच्या माध्यमाने ऑनलाईन व्यवसाय करणारा उद्योजक होय.
 - अ) सामाजिक उद्योजक
 - ब) शैक्षणिक उद्योजक
 - क) जाळे उद्योजक
 - ड) पर्यावरण संवर्धक उद्योजक
- 3) उद्योजकतेचा नवनिर्मिती सिद्धांत ----- यांनी दिला.
 - अ) हेगन
 - ब) जोसेफ शुंपीटर
 - क) नाईट
 - ड) डेव्हिड मॅक्लेलॅंड
- 4) स्टार्ट अप इंडिया ही योजना ----- यावर्षी सुरु करण्यात आली.
 - अ) 2018
 - ब) 2021
 - क) 2023
 - ड) 2015
- 5) MCED चे दीर्घोत्तरी रूप ----- असे आहे.
 - अ) Maharashtra Centre for Entrepreneurship Development
 - ब) Management Centre for Entrepreneurship Development
 - क) Marketing Centre for Entrepreneurship Development
 - ड) Maharashtra Centre for Equipment Department

- 6) सूक्ष्म, लघु व मध्यम उद्योग कायदा ----- साली संमत झाला.
 अ) 2010 ब) 2016
 क) 2006 ड) 2023
- 7) डॉक्टर या व्यक्तीस ----- उद्योजक म्हटले जाते.
 अ) व्यापारी ब) सेवा
 क) उत्पादक ड) व्यावसायिक
- 8) उत्पादन क्षेत्रात -----पर्यंत गुंतवणूक असल्यास त्याला सूक्ष्म उद्योग म्हणतात.
 अ) 5 लाख ब) 50 लाख
 क) 10 लाख ड) 25 लाख

Q2) उद्योजकता विकास प्रक्रिया म्हणजे काय? त्यातील अवस्था स्पष्ट करा. [8]

किंवा

जोसेफ शुंपीटर यांचा नवप्रवर्तन सिद्धांत स्पष्ट करा.

Q3) स्टार्ट अप इंडिया योजना संक्षिप्तमध्ये स्पष्ट करा. [8]

किंवा

सूक्ष्म, लघु व मध्यम उपक्रमाचे महत्त्व सांगा.

Q4) थोडक्यात उत्तरे लिहा. (कोणतेही दोन) [8]

- 1) हेगन यांचा स्थानभ्रष्टतेचा सिद्धांत
- 2) उद्योजकाचे प्रकार स्पष्ट करा
- 3) उद्योजकाची कार्ये

Q5) टिपा लिहा. (कोणत्याही दोन) [8]

- 1) मेक इन इंडिया योजना
- 2) इन्क्युबेशन सेंटर
- 3) जाळे उद्योजक

Seat	
No.	

SM - 13

Total No. of Pages : 3

B.Sc. (Part – II) (Semester – III) (CBCS) (NEP 2020)

Examination – May 2025

MATHEMATICS

DSC – C6 : Numerical Methods (Paper-VI)

Sub. Code : 91565-P6

Day and Date : Friday ,23/05/2025

Total Marks : 40

Time : 02.30 pm. to 04.00 pm.

Instruction : 1) All questions are compulsory.

2) Figures to right indicate full marks.

3) Use of non-programmable calculators is allowed.

Q. 1 Select the correct alternatives for each of the following [8]

- 1) An operator Δ is called operator.
 - a) forward difference
 - b) backward difference
 - c) central difference
 - d) shift
- 2) Solution of simultaneous non-linear equations can be obtained using
 - a) Gauss-Seidal method
 - b) Newton-Raphson method
 - c) method of false position
 - d) none of these
- 3) Numerical techniques more commonly involve
 - a) Iterative method
 - b) elimination method
 - c) reduction method
 - d) direct method

- 4) The Newton-Raphson method is also called as
 - a) Secant method
 - b) diameter method
 - c) chord method
 - d) tangent method
- 5) The number of sub-intervals required in Simpson's 3/8th rule is multiple of
 - a) 1
 - b) 2
 - c) 3
 - d) 6
- 6) By Gauss Elimination Method, solution of $x + y = 2$ and $2x + 3y = 5$ is
 - a) (1, 2)
 - b) (1, 1)
 - c) (2, 1)
 - d) none of these
- 7) In which of the following methods, we approximate the curve of the solution by the tangent in each interval.
 - a) Picard's method
 - b) Runge-Kutta method
 - c) Newton's method
 - d) Euler's method
- 8) Trapezoidal rule is derived from the Formula.
 - a) Newton-Cotes
 - b) Newton's forward interpolation
 - c) Newton's backward interpolation
 - d) inverse Lagrange's

Q.2. Attempt any TWO of the following

[16]

- 1) Find real root of the equation $x^3 - x - 1 = 0$ which lies between 1 and 2 using bisection method with accuracy $\varepsilon = 0.01$.
- 2) State and prove Lagrange's interpolation formula for unequally spaced data.
- 3) Derive Euler's formula to find a numerical solution of ordinary differential equations $\frac{dy}{dx} = f(x, y)$ with $y(x_0) = y_0$. Hence find an approximate solution of $\frac{dy}{dx} = x + y$ at $x = 0.3$ given that $y = 1$ when $x = 0$. Take $h = 0.1$.

Q. 3. Attempt any FOUR of the following

[16]

- 1) Prove that $E = 1 + \Delta$ where Δ is forward difference and E is shift operator.
- 2) Use Picard's method to solve the equation, $\frac{dy}{dx} = -xy$ with $x_0 = 0, y_0 = 1$ upto second approximation.
- 3) Apply Gauss elimination method to solve the equations
 $2x + y + z = 10; 3x + 2y + 3z = 18; x + 4y + 9z = 16.$
- 4) Given $\frac{dy}{dx} = 1 + y^2, y(0) = 0, h = 0.2$, find $y(0.2)$ using Runge-Kutta second order method.
- 5) Use Trapezoidal rule to evaluate $\int_0^1 x^3 dx$ considering five subintervals.
- 6) Given that

x	4	4.2	4.4	4.6	4.8	5.0	5.2
Log x	1.3863	1.4351	1.4816	1.5261	1.5686	1.6094	1.6487

Evaluate $\int_4^{5.2} \log x dx$ by Simpson's 3/8th rule.

- 3) The differential equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$, where P, Q, R are the functions of x, y, z are called
- total differential equations
 - linear differential equations
 - homogeneous linear differential equations
 - simultaneous differential equations
- 4) In solving differential equation $\frac{d^2y}{dx^2} + P\frac{dy}{dx} + Qy = R$ by change of independent variable x to z is obtained by $z = \dots\dots\dots$
- $e^{-\int Pdx}$
 - $e^{\int Pdx}$
 - $e^{-\frac{1}{2}\int Pdx}$
 - $\int e^{-\int Pdx} dx$
- 5) If $\frac{d^2y}{dx^2} + P\frac{dy}{dx} + Qy = 0$ is an associated equation of second order linear differential equation, then $y = e^{-x}$ is part of solution if
- $P + xQ = 0$
 - $a^2 + aP + Q = 0$
 - $1 - P + Q = 0$
 - $1 + P + Q = 0$
- 6) Geometrical interpretation of total differential equation $Pdx + Qdy + Rdz = 0$ is that P, Q, R are proportional to at point (x, y, z) on the curve.
- d. r. s. of tangent
 - d. r. s. of normal
 - d. c. s. of tangent
 - d. c. s. of normal
- 7) If the condition of integrability is satisfied then the solution of the equation $(y + z)dx + dy + dz = 0$ is
- $e^x(y + z) = c_1$
 - $e^y(z + x) = c_1$
 - $e^z(x + y) = c_1$
 - $x + y + z = c_1$
- 8) One solution of $\frac{dx}{x(y-z)} = \frac{dy}{y(z-x)} = \frac{dz}{z(x-y)}$ is
- $xyz = c_1$
 - $xy = c_1z$
 - $yz = c_1x$
 - $zx = c_1y$

Q. 2. Attempt any Two of the following.

[16]

- 1) Define a total differential equation and prove the necessary condition for its integrability.
- 2) Define a homogeneous linear differential equation of order n and explain the method for solving it.
- 3) Explain the method for solving the equation $\frac{d^2y}{dx^2} + P\frac{dy}{dx} + Qy = R$, where P, Q and R are functions of x only, using a change of dependent variable.

Q. 3. Attempt any Four of the following.

[16]

- 1) Solve $(3x + 2)^2 \frac{d^2y}{dx^2} + 3(3x + 2) \frac{dy}{dx} - 36y = x^2 + x + 1$.
 - 2) Explain the geometric interpretation of the relationship between total and ordinary simultaneous differential equations.
 - 3) Solve $\frac{dx}{xz} = \frac{dy}{yz} = \frac{zdx}{(x+y)^2}$.
 - 4) Solve $x \frac{d^2y}{dx^2} - 2(x + 1) \frac{dy}{dx} + (x + 2)y = (x - 2)e^{2x}$.
 - 5) Solve $(yz + 2x)dx + (zx - 2z)dy + (xy - 2y)dz = 0$.
 - 6) Solve $\frac{d^2y}{dx^2} + 9y = \sec 3x$ by using the method of variation of parameter.
-

Seat No. **MAR-APR 2025 SUMMER EXAMINATION****2354 Bachelor of Science****Sub. Name: Physics Paper V & VI****Sub. Code: 91566****Day and Date: MAY ,20-05-2025****Total Marks: 40****Time: 02.30 PM To 04:00 PM**

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

Q1) Solve following MCQ.**[8]**

- i.** Coefficient of viscosity of gas corresponds to transfer of of gas.
 - A. mass
 - B. energy
 - C. momentum
 - D. temperature
- ii.** Thermo-EMF produced in a thermocouple is of the order of.....
 - A. volt
 - B. millivolt
 - C. microvolt
 - D. kilovolt
- iii.** All natural processes are
 - A. isothermal
 - B. adiabatic
 - C. irreversible
 - D. reversible
- iv.** Mean free path of a gas molecule isto the number of molecules per unit volume of the gas.
 - A. inversely proportional
 - B. momentum
 - C. energy
 - D. temperature
- v.** The mechanical equilibrium of thermodynamic system implies the uniformity of
 - A. pressure
 - B. volume
 - C. temperature
 - D. entropy

- vi. On a Reaumur scale, the boiling point of water is.....R.
 A. 100
 B. 0
 C. 80
 D. 180
- vii. Entropy is measure of.....
 A. perfect order
 B. available energy
 C. composition of matter
 D. disorder
- viii. The equation connecting pressure and volume during an adiabatic process is.....
 A. $P^\gamma V^\gamma = \text{Constant}$
 B. $P^\gamma V = \text{Constant}$
 C. $PV^\gamma = \text{Constant}$
 D. $PV = \text{Constant}$

Q2) Attempt any two of the following. [16]

- a. Discuss in detail Principle, construction and working of mercury thermometer. [8]
- b. Derive an expression for coefficient of viscosity of gas. [8]
- c. Construction and working of Carnot's heat engine and describe Carnot's cycle. [8]

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

- a. Explain molecular collision. [4]
- b. Write a note on thermodynamic equilibrium. [4]
- c. Explain the concept of entropy. [4]
- d. Write a note on temperature scales. [4]
- e. Write a note on first law of thermodynamics. [4]
- f. Write a note on types of thermometers. [4]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

747923

Seat No. **MAR-APR 2025 SUMMER EXAMINATION****2354 Bachelor of Science****Sub. Name: Zoology Paper V & VI****Sub. Code: 91569****Day and Date: MAY ,19-05-2025****Total Marks: 40****Time: 02.30 PM To 04:00 PM**

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

Q1) Select the correct answer from the following and rewrite the complete sentences. **[8]**

- i.** Proteins are made up of
 - A. Amino acids
 - B. Fructose
 - C. Fatty acids
 - D. Enzymes
- ii.** The excess glucose is converted into
 - A. Proteins
 - B. Glycogen
 - C. Lipids
 - D. Hormones
- iii.** FAD is.....
 - A. Co-factor
 - B. An enzyme
 - C. Apoenzyme
 - D. Coenzyme
- iv.** Glycogen is stored in.....
 - A. Stomach
 - B. Muscle
 - C. Adipose tissue
 - D. Brain
- v.** Gluconeogenesis occurs in.....
 - A. Adipose tissue
 - B. Muscles
 - C. Kidney
 - D. Brain
- vi.** The removal of amino group (NH₂) from amino acid is

- A. Decarboxylation
- B. Deamination
- C. Dehydration
- D. Dephosphorylation

vii. Lipids are made up of.....

- A. Fatty acids
- B. Glucose
- C. Amino acids
- D. Vitamins

viii. Enzymes are made up of

- A. Fats
- B. Minerals
- C. Proteins
- D. Glucose

Q2) Attempt any two of the following

[16]

- a. What is Glycolysis? Describe pathway of Glycolysis.
- b. Describe Pentose Phosphate Pathway.
- c. Describe β -oxidation cycle

Q3) Attempt any four of the following

[16]

- a. Biological significance of carbohydrates
- b. Transamination
- c. Classification of proteins
- d. Urea Cycle
- e. Lock and Key Hypothesis
- f. Coenzymes

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

Seat No. **MAR-APR 2025 SUMMER EXAMINATION****2354 Bachelor of Science****Sub. Name: PHYSICS -VI (WAVES AND OPTICS)****Sub. Code: 91566/73301/77703/63602/49902****Day and Date: MAY ,21-05-2025****Total Marks: 40****Time: 02.30 PM To 04:00 PM**

Instructions: 1. All questions are compulsory
 2. Figures to the right indicate full marks

Q1) Select the correct alternative:**[8]**

- i. Viscous force F is related to area A of the fluid layer as.....
- $F \propto 1/A$
 - $F \propto 1/A^2$
 - $F \propto A^2$
 - $F \propto A$
- ii. Phase velocity of a wave is
- $v = \frac{\omega}{k}$
 - $v = \frac{k}{\omega}$
 - $v = \frac{d\omega}{dk}$
 - $v = \frac{dk}{d\omega}$
- iii. The sound waves of frequencies.....are called ultrasonic waves.
- Less than 20 Hz
 - Greater than 20 Hz but less than 20 kHz
 - Greater than 20 kHz
 - less than 100Hz
- iv. Lissajous figures are produced by superposition of two
- SHM'S
 - Collinear SHM'S
 - perpendicular SHM'S
 - Perpendicular SMS with frequencies which can be expressed as simple integrated ratios
- v. Unit of the intensity level is
- decible
 - erg/cm²/s

- C. Joule/m²/s
- D. all the above

- vi. Waves travelling on a string are.....
- A. Transverse waves
 - B. Longitudinal waves
 - C. Pressure waves
 - D. Matter waves
- vii. Viscosity is..... force acting on the liquid layer.
- A. Tangential.
 - B. Radial
 - C. Sum of tangential
 - D. Tangential and radial
- viii. The CGS unit of coefficient of Viscosity is.....
- A. erg
 - B. dyne
 - C. poise
 - D. erg/cm

Q2) Attempt any TWO of the following:

- a. What is superposition principle? Show that it is valid for linear differential equation. [8]
- b. Explain the principle, construction and working of piezoelectric generator. [8]
- c. Derive Poiseuilles formula for rate of flow of liquid through a capillary tube. [8]

Q3) Attempt any FOUR of the following:

- a. What is viscosity? Explain with examples. [4]
- b. Distinguish between laminar and streamline effect. [4]
- c. Derive the expression for the velocity of transverse waves travelling along a stretched string. [4]
- d. Discuss the applications of ultrasonic waves. [4]
- e. Explain in detail the moving coil loudspeaker. [4]
- f. Discuss transducers and their characteristics. [4]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (286) B.Sc.(Sem.) (49902) Physics Paper V & VI Part 2 SEM 3
- 2] (2354) B.Sc. CBCS (NEP 2020) (91566) Physics Paper V & VI Part 2 SEM 3
- 3] (2324) B.Sc. (CBCS) (73301) Physics Paper V & VI Part 2 SEM 3
- 4] (286) B.Sc.(Sem.) (77703) Physics Paper V & VI Part 2 SEM 3
- 5] (286) B.Sc.(Sem.) (63602) Physics Paper V & VI Part 2 SEM 3

Seat No. **MAR-APR 2025 SUMMER EXAMINATION****2354 Bachelor of Science****Sub. Name: Botany Paper VII & VIII****Sub. Code: 94261****Day and Date: MAY ,16-05-2025****Total Marks: 40****Time: 10:30 AM To 12:00 PM**

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

Q1) Select the correct alternative from the following**[8]**

- i. Chlorophyll b is considered as pigment.
 - A. accessory
 - B. non accessory
 - C. essential
 - D. critical
- ii. Lalbagh garden is located in
 - A. Delhi
 - B. Rajasthan
 - C. Bangalore
 - D. Kolhapur
- iii. is an example of CAM plant.
 - A. Maize
 - B. Sugarcane
 - C. Mango
 - D. Aloe vera
- iv. The lower part of the graft combination is termed as
 - A. scion
 - B. rootstock
 - C. bud
 - D. node
- v. plants can survive under extreme desert environment.
 - A. CAM
 - B. C3
 - C. C4
 - D. All of these
- vi. T budding is also known as

- A. patch budding
- B. shield budding
- C. marcottage
- D. gooty

vii. Kreb cycle is also called as

- A. C4
- B. Kelvin cycle
- C. TCA
- D. CAM

viii. Air layering is also known as

- A. grafting
- B. layering
- C. gooty
- D. trimming

Q2) Attempt any TWO of the following.

[16]

- a. Define photosynthesis. Describe photosynthetic pigments.
- b. What is budding? Describe T and Patch budding with labelled diagram.
- c. Define home gardening. Describe different types of home gardening in brief.

Q3) Attempt any FOUR of the following.

[16]

- a. Mughal garden
- b. Kranz anatomy
- c. Anaerobic respiration
- d. Tongue grafting
- e. Cyclic photophosphorylation
- f. Scope of nursery

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (2354) B.Sc. CBCS (NEP 2020) (94261) Botany Paper VII & VIII Part 2 SEM 4

Seat No. **MAR-APR 2025 SUMMER EXAMINATION****2354 Bachelor of Science****Sub. Name: Chemistry Paper VII & VIII****Sub. Code: 94259****Day and Date: MAY ,14-05-2025****Total Marks: 40****Time: 10:30 AM To 12:00 PM**

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

Q1) Choose the correct alternative and rewrite the sentence again.**[8]**

- i. Strainless rings are...
 - A. planar
 - B. coplanar
 - C. linear
 - D. puckered
- ii. According to Baeyer the stability of cycloalkanes with increasing ring size.
 - A. increases
 - B. decreases
 - C. does not change
 - D. anything can happen
- iii. Fructose is.....
 - A. aldopentose
 - B. ketopentose
 - C. ketohexose
 - D. none of these
- iv. is a non-reducing disaccharide.
 - A. Galactose
 - B. Lactose
 - C. Invert sugar
 - D. maltose
- v. The reaction by which benzene diazonium salt is prepared is called.....
 - A. Sandmeyer reaction
 - B. Gatterman reaction
 - C. Diazotisation reaction
 - D. none of these

- vi. Acid amides are the acid derivatives formed by replacing the hydroxy (-OH) group with
A. Amino (-NH₂)
B. Alkoxy (-OR)
C. Acloxy (COR)
D. (-X)
- vii. Coupling of naphthanoic acid with diazotised forms Congo Red.
A. benzene
B. aniline
C. p-toludine
D. benzidine
- viii. HVZ reaction is useful to prepare
A. halo acids
B. aromatic acids
C. acid anhydrides
D. none of these

Q2) Attempt any TWO of the following [16]

- a. How will you arrive at the configuration of D (+) glucose? [8]
- b. Give different methods for the preparation of amines. and give reactions of amines. [8]
- c. Explain the structure of the carbonyl group and explain reactivity of carbonyl group. [8]

Q3) Attempt any FOUR of the following [16]

- a. Represent conformations of ethane using
a) Fisher Projection b) Sawhorse projection [4]
- b. Write a short note on "Sandmeyer reaction". [4]
- c. Briefly explain Cannizaro's Reaction. [4]
- d. Write a short note on "Mutarotation". [4]
- e. What are unsaturated acids? Give two examples. [4]
- f. Explain the methods of preparation of cinnamic acid. [4]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (2354) B.Sc. CBCS (NEP 2020) (94259) Chemistry Paper VII & VIII Part 2 SEM 4

685233

Seat No. **MAR-APR 2025 SUMMER EXAMINATION****2354 Bachelor of Science****Sub. Name: Computer Science Paper VII & VIII****Sub. Code: 94268/78917/78966/63711****Day and Date: MAY ,26-05-2025****Total Marks: 40****Time: 10:30 AM To 12:00 PM****Instructions: 1. All questions are compulsory
2. Figures to the right indicate full marks****Q1)** Rewrite the following sentences by choosing correct alternative.**[8]**

- i. Process of removing an element from stack is called _____.
A. Create
B. Push
C. Evaluation
D. Pop
- ii. The number of edges from the root to the node is called _____ of the tree.
A. Height
B. Depth
C. Length
D. Width
- iii. _____ is the advantage of the array data structure.
A. Elements of mixed data types can be stored.
B. Easier to access the elements in an array
C. Index of the first element starts from 1.
D. Elements of an array cannot be sorted
- iv. _____ operations involves accessing each element in a data structure.
A. Insertion
B. Traversing
C. Sorting
D. Merging
- v. A variant of linked list in which last node of the list points to the first node of the list is _____.
A. Singly linked list
B. Doubly linked list
C. Multiply linked list
D. Circular linked
- vi. _____ is the maximum number of children that a node can have in a binary

tree.

- A. 3
- B. 4
- C. 2
- D. 1

vii. _____ is not the type of the Queue.

- A. Linear Queue
- B. Circular Queue
- C. Double ended Queue
- D. Single ended Queue

viii. _____ is a valid traversal of a Binary Search Tree (BST).

- A. Inorder traversal
- B. Preorder traversal
- C. Postorder traversal
- D. All of the above

Q2) Attempt any two of the following.

[16]

- a. What is Stack? Describe the various operations of a stack . **[8]**
- b. Explain the concept of Linked List. Describe the different types of linked lists. **[8]**
- c. What is searching? Explain linear searching technique in detail. **[8]**

Q3) Attempt any four of the following.

[16]

- a. What is Sorting? Explain how bubble sort works. **[4]**
- b. Discuss following with reference to trees with diagram . **[4]**
(i) External node (ii) Degree (iii) Sibling (iv) Height
- c. What is a queue? What are the applications of queue? **[4]**
- d. What are enqueue and dequeue operations? **[4]**
- e. Describe the different types of Binary Trees . **[4]**
- f. Differentiate linear and non-linear data structure **[4]**

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (2354) B.Sc. CBCS (NEP 2020) (94268) Computer Science Paper VII & VIII Part 2 SEM 4
- 2] (286) B.Sc.(Sem.) (78966) Computer Science. Paper VII & VIII Part 2 SEM 4
- 3] (2324) B.Sc. (CBCS) (78917) Computer Science. Paper VII & VIII Part 2 SEM 4
- 4] (286) B.Sc.(Sem.) (63711) Computer Science Paper VII & VIII Part 2 SEM 4

837842

Seat No. **MAR-APR 2025 SUMMER EXAMINATION****11669 Bachelor of Arts NEP 2.0****Sub. Name: Hindi-VI DSC-C28****Sub. Code: 78836/49348/73436/93477/55057 /62348****Day and Date: MAY ,21-05-2025****Total Marks: 40****Time: 10:30 AM To 12:00 PM****Instructions:**

Special Inst.: 1. सभी प्रश्न अनिवार्य हैं।
2. दाईं ओर लिखे अंक प्रश्नों के गुण दर्शाते हैं।

Q1) निम्नलिखित बहुविकल्पी प्रश्नों का सही विकल्प चुनकर वाक्य फिरसे लिखिए।**[10]**

i. 'संशय की एक रात' खंडकाव्य की कथावस्तु सर्गों में विभाजित है।

- A. एक
- B. दो
- C. तीन
- D. चार

ii. 'संशय की एक रात' खंडकाव्य की कथा पर आधारित है।

- A. महाभारत
- B. दशरथ जातक
- C. रामकथा
- D. सूरसागर

iii. राम के अनुसार रघुकुल के दुखों के लिए जिम्मेदार है।

- A. रावण
- B. कौसल्या
- C. खुद राम
- D. भरत

iv. दक्षिण प्रदेश सामंतों को अधिकृत करके युद्ध का बीज ने बोया है।

- A. रावण
- B. राम
- C. दशरथ
- D. हनुमान

v. 'संशय की एक रात' में रस की प्रधानता है।

- A. रौद्र
- B. हास्य
- C. शांत
- D. शृंगार

vi. 'संशय की एक रात' खंडकाव्य का उद्देश्य का विरोध करते हुए शांति स्थापित करना है।

- A. भ्रष्टाचार
- B. युद्ध
- C. क्लेश
- D. आंदोलन

vii. नरेश मेहता ने राम को मानव के रूप में चित्रित किया है।

- A. प्राचीन
- B. आधुनिक
- C. सामाजिक
- D. मध्यकालीन

viii. 'संशय की एक रात' इस रचना के कवि है।

- A. श्री.नरेश मेहता
- B. महादेवी वर्मा
- C. धूमिल
- D. भूषण

ix. मध्य रात में राम की छाया से बात करते हैं।

- A. रावण
- B. सीता
- C. दशरथ
- D. जनक

x. राम के मन में उठे संशय को मिटाने का प्रयास करते हैं।

- A. जनक
- B. लक्ष्मण
- C. भरत
- D. शत्रुघ्न

Q2) निम्नलिखित अवतरणों में से किन्हीं दो की ससंदर्भ व्याख्या कीजिए।

[10]

a. "हाय आज तक मैं निमित्त ही रहा
कुल के विनाश का
लेकिन अब नहीं बनूँगा कारण
जन के विनाश का।"

[5]

b. "राम तुम चाहते हो सत्य
ओ अधिकार युद्ध साधन के बिना।
प्रति बार रावण द्वार से
तुम्हारे दूत लौटे
फिर भी युद्ध अस्वीकार तुमको।"

[5]

c. "मुझे ऐसी जय नहीं चाहिए
बाण बिद्ध पाखी सा विवश
साम्राज्य नहीं चाहिए,
मानव रक्त पग धरती आती

[5]

सीता भी नहीं ।"

- Q3)** निम्नलिखित लघुत्तरी प्रश्नों में से किन्हीं दो के उत्तर लिखिए । [10]
- a. नरेश मेहता का कृतित्व स्पष्ट कीजिए । [5]
- b. 'संशय की एक रात' खंडकाव्य के विभीषण का चरित्र-चित्रण कीजिए । [5]
- c. 'संशय की एक रात' खंडकाव्य के हनुमान का चरित्र-चित्रण कीजिए । [5]
- Q4)** निम्नलिखित में से किसी एक दिर्घोत्तरी प्रश्न का उत्तर लिखिए । [10]
- a. 'संशय की एक रात' खंडकाव्य में चित्रित समस्याएँ स्पष्ट कीजिए । [10]
अथवा
'संशय की एक रात' खंडकाव्य की कथावस्तु लिखिए ।

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (388) B. A.(Semester) (62348) HINDI PAPER VI Part 2 SEM 4
- 2] (3140) B.A. (C.B.C.S) (NEP-2020) (93477) Hindi-VI DSC-C28 Part 2 SEM 4
- 3] (388) B. A.(Semester) (49348) HINDI PAPER VI Part 2 SEM 4
- 4] (3129) B.A. (C.B.C.S) (73436) Hindi-VI DSC-C28 Part 2 SEM 4
- 5] (388) B. A.(Semester) (55057) HINDI PAPER VI Part 2 SEM 4
- 6] (388) B. A.(Semester) (78836) Hindi-VI DSC-C28 Part 2 SEM 4

B. Sc. (Part II) (Semester IV) (CBCS (NEP 2020))
Examination, April - 2024.
MATHEMATICS : DSC-D6: Integral Calculus (Paper-VIII)
Sub. Code: 94260

Day and Date : Friday, 23-05-2025

Total Marks : 40

Time : 10.30 a.m. to 12.00 p.m.

Instructions : 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Q. 1) Select the correct alternative for each of the following. [8]

a) For $m > 0$, $\Gamma m =$ ____ .

- i) $\int_0^\infty e^{-x} x^m dx$ ii) $\int_0^\infty e^{-x} x^{m-1} dx$ iii) $\int_0^1 e^{-x} x^m dx$ iv) $\int_0^1 e^{-x} x^{m-1} dx$

b) The value of $\Gamma(n+1) =$ ____ .

- i) n ii) $(n+1)\Gamma n$ iii) $n(n+1)$ iv) $n\Gamma n$

c) $\beta(m, n) =$ ____ $\forall m, n > 0$.

- i) $\beta(m, 0)$ ii) $\beta(0, n)$ iii) $\beta(n, m)$ iv) $\beta(m+1, n+1)$

d) The value of $\beta\left(\frac{3}{2}, \frac{3}{2}\right) =$ ____ .

- i) $\frac{\pi}{4}$ ii) $\frac{\pi}{8}$ iii) $\frac{3\pi}{32}$ iv) π

e) If $I(a) = \int_0^1 \frac{x^a - 1}{\log x} dx$, then $I'(a) =$ ____ .

- i) $\log(a+1)$ ii) $\frac{1}{a+1}$ iii) $\frac{1}{\log(a+1)}$ iv) $-\frac{1}{a+1}$

f) The value of $\operatorname{erf}(-x) =$ ____ .

- i) $\operatorname{erf}(x)$ ii) $-\operatorname{erf}(-x)$ iii) $-\operatorname{erf}(x)$ iv) $\operatorname{erfc}(x)$

g) The value of $\int_1^2 \int_0^{\frac{1}{2}} y dy dx =$ ____ .

- i) $\frac{1}{8}$ ii) $\frac{1}{6}$ iii) $\frac{2}{3}$ iv) $\frac{7}{3}$

h) The area bounded by the curve $y = \phi(x)$, the x-axis, the line $x = a$ and $x = b$ ($a < b$) is given by ____ .

i) $\int_a^b \int_0^{\phi(x)} y \, dx \, dy$

ii) $\int_a^b \int_0^{\phi(x)} y^2 \, dx \, dy$

iii) $\int_a^b \int_0^{\phi(x)} dx \, dy$

iv) none of these

Q. 2) Attempt any **TWO** of the following.

[16]

a) State and prove duplication formula of gamma function.

b) If $f(x, \alpha)$, $\frac{\partial}{\partial \alpha} f(x, \alpha)$ be continuous functions of x and α , throughout $[a, b]$, where a and b are functions of α then show that

$$\frac{d}{d\alpha} \left[\int_a^b f(x, \alpha) \, dx \right] = \int_a^b \frac{\partial}{\partial \alpha} f(x, \alpha) \, dx + f(b, \alpha) \frac{db}{d\alpha} - f(a, \alpha) \frac{da}{d\alpha}.$$

c) Change the order of integration and evaluate $\int_0^5 \int_{2-x}^{2+x} dy \, dx$.

Q. 3) Attempt any **FOUR** of the following.

[16]

a) Prove that $\Gamma n = \int_0^\infty e^{-x^2} x^{2n-1} \, dx$, $n > 0$.

b) Evaluate $\int_0^1 x^5 (1-x^3)^{10} \, dx$.

c) Prove that $\operatorname{erfc}(x) + \operatorname{erfc}(-x) = 2$.

d) Show that $\int_0^1 \frac{x^a - 1}{\log x} \, dx = \log(1+a)$, $a > 1$.

e) Change to polar coordinates and evaluate $\int_0^a \int_y^a \frac{x}{x^2 + y^2} \, dy \, dx$.

f) Evaluate $\iint (x+y-1)^2 \, dx \, dy$ over the region bounded by $x=0, y=0$ and $x+y=1$.



Seat No. **MAR-APR 2025 SUMMER EXAMINATION****2354 Bachelor of Science****Sub. Name: Physics Paper VII & VIII****Sub. Code: 94258/78908/78957/63702/49992****Day and Date: MAY ,21-05-2025****Total Marks: 40****Time: 10:30 AM To 12:00 PM**

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

Q1) Select the correct alternative from the following**[8]**

- i. The bending of light around the edge of an obstacle is called.....
 - A. interference
 - B. refraction
 - C. diffraction
 - D. reflection
- ii. Newton's formula is given by.....
 - A. $x_1 f_1 = x_2 f_2$
 - B. $x_1 x_2 = f_1 f_2$
 - C. $x_1 f_2 = x_2 f_1$
 - D. $x_1 / x_2 = f_1 / f_2$
- iii. Nicol prism is used as
 - A. a polarizer
 - B. an analyser
 - C. both polarizer and analyser
 - D. none of the above
- iv. In Fraunhofer diffraction with respect to the obstacle.....
 - A. both source and screen are at finite distance
 - B. both source and screen are effectively at infinity
 - C. source is at finite distance and screen is at infinity
 - D. screen is at finite distance and source is at infinity
- v. The fringes obtained in wedge shaped thin film are of.....
 - A. increasing thickness
 - B. decreasing thickness
 - C. varying thickness
 - D. equal thickness

vi. In general, the relation between first and second focal lengths is.....

- A. $f_1/f_2 = -\mu_1/\mu_2$
- B. $f_1/f_2 = -\mu_2/\mu_1$
- C. $f_1/f_2 = \mu_1/\mu_2$
- D. $f_1/f_2 = \mu_2/\mu_1$

vii. Resolving power of prism is.....

- A. $t. (d\lambda)/d\mu$
- B. $\sqrt{t. (d\mu)/d\lambda}$
- C. $\sqrt{t. (d\lambda)/d\mu}$
- D. $t. (d\mu)/d\lambda$

viii. Elliptically polarised light is produced by using.....

- A. a polariser
- B. quarter wave plate
- C. a polariser and quarter wave plate
- D. a half wave plate and polariser

Q2) Answer the following (Any Two)

[16]

- a. Define lateral, axial and angular magnifications of system and hence obtain a relationship between them. [8]
- b. Derive an expression for the resolving power of a prism. [8]
- c. How Newton's rings are formed? Obtain expression for the radius of n^{th} dark ring. [8]

Q3) Answer the following (Any Four)

[16]

- a. Give the comparison between a zone plate and a convex lens. [4]
- b. State the conditions to obtain steady interference bands. [4]
- c. State the laws of rotation of plane of polarization. [4]
- d. With neat ray diagram, explain the term double refraction. [4]
- e. Explain Lloyd's single mirror experiment to measure the wavelength of monochromatic source. [4]
- f. When a plane wavefront of white light is incident normally on a plane diffraction grating, the principal maximum of green light is found to be formed in a direction of 18.64° from incidence direction, in the first order spectrum. If [4]

wavelength of green light is $5400 \text{ \AA}$, calculate the grating element.

End Of Question Paper

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सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (286) B.Sc.(Sem.) (78957) Physics Paper VII & VIII Part 2 SEM 4
- 2] (2354) B.Sc. CBCS (NEP 2020) (94258) Physics Paper VII & VIII Part 2 SEM 4
- 3] (286) B.Sc.(Sem.) (63702) Physics Paper VII & VIII Part 2 SEM 4
- 4] (286) B.Sc.(Sem.) (49992) Physics Paper VII & VIII Part 2 SEM 4
- 5] (2324) B.Sc. (CBCS) (78908) Physics Paper VII & VIII Part 2 SEM 4

Seat No.

MAR-APR 2025 SUMMER EXAMINATION**2354 Bachelor of Science****Sub. Name: Zoology Paper VII & VIII****Sub. Code: 94262****Day and Date: MAY ,19-05-2025****Total Marks: 40****Time: 10:30 AM To 12:00 PM**

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

Q1) Select the correct alternative from the following and rewrite the sentence.**[8]**

- i. Breeding birds are reared
 - A. in cages
 - B. on litter
 - C. on ground
 - D. in open spaces
- ii. Pebrine disease of silkworm is caused by.....
 - A. Flavivirus
 - B. Poly hydrosis virus
 - C. Nosema bombycid
 - D. Behauveria virus
- iii. ,Egg cluster of *Pyrilla purpusilla* is covered by.....
 - A. Soil
 - B. gum secreted by host plant
 - C. fluffy material secreted by itself
 - D. excreta
- iv. Relapsing fever should be treated by.....
 - A. cough syrup
 - B. combiflam
 - C. antivenene
 - D. antibiotic
- v.is also called as primary or final host.
 - A. Intermediate host
 - B. Definitive host
 - C. Natural host
 - D. Reservoir host
- vi. Typhoid fever spreads through.....

- A. polluted air
- B. contaminated water by typhoid bacteria
- C. contaminated water and food by typhoid bacteria
- D. fecal and oral route of infected person

vii. BCG vaccine is used to prevent.....

- A. TB
- B. Typhoid
- C. Dysentery
- D. leprosy

viii. Treponema pallidum bacterium has..... shaped cells.

- A. cork screw
- B. rod
- C. oval triangular
- D. triangular

Q2) Attempt any two of the following.

[16]

- a. Describe types of silkworms.
- b. Give an account of management of broilers.
- c. Describe epidemiology of typhoid fever.

Q3) Attempt any four of the following.

[16]

- a. Widal test
- b. Chandrika
- c. Egg processing
- d. Commensalism
- e. Syphilis
- f. Economic importance of silk

End Of Question Paper

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1] (2354) B.Sc. CBCS (NEP 2020) (94262) Zoology Paper VII & VIII Part 2 SEM 4