

**Bachelor Of Science**  
**Examination: April-2026**

| Day & Date              | Semester | Subject Name        | Time                       | Code   | Max. Marks |
|-------------------------|----------|---------------------|----------------------------|--------|------------|
| 15/04/2026<br>Wednesday | III      | Organic Chemistry-I | 11:00 AM<br>To<br>01:30 PM | 302101 | 75         |

**Note:**

- All Questions are compulsory
- All Questions carry equal marks.

**Q.1 Attempt any five of the Following.**

- a) What happen when Grignard reagent react with ketone?
- b) What happened when ethene is treated with  $KMnO_4$ ?
- c) Show the acidic strength of carboxylic acid?
- d) Uses of Acetal as a Protecting group?
- e) Discuss the resonance stabilization of phenoxide ion?
- f) Discuss the physical properties of Aldehyde & ketone?
- g) Discuss the Gattermann koch Reaction?
- h) What happened when Olifine is treated with  $OsO_4$ ?
- i) Give the oxidation of primary alcohol to carboxylic acid.

**15**

**Q.2 Attempt any Three.**

- a) Explain the Fries Rearrangement with mechanism?
- b) What happened when Aniline is treated with  $HNO_2$ ?
- c) Define the phenol? How the phenol is prepared from benzene Sulphonic Acid?
- d) Discuss the Mix and Cross Aldol condensation reaction?
- e) Explain oxidation of Primary Alcohol & Secondary Alcohol using  $CrO_3$ ?

**15**

**Q.3 Attempt any Three.**

- a) Give an account of Pinacol Pinacolone Rearrangement?
- b) Explain the Hofmann Degradation reaction with mechanism?
- c) Discuss the Sulphonation and halogenation of phenol?
- d) Discuss the basicity of amines?
- e) Write a note on Phase transfer Catalyst?

**15**

**Q.4 Attempt any Three.**

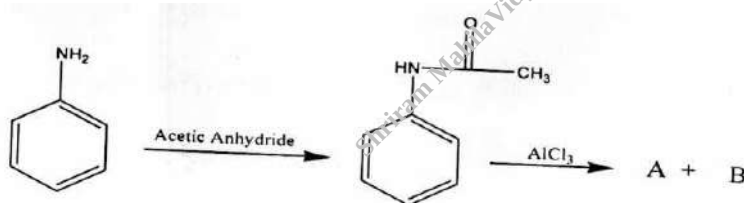
15

- Explain the Electrophilic aromatic substitution of aryl amines?
- Explain the Claisen condensation reaction?
- Explain what happened when cyclohexene is treated with  $\text{OsO}_4$ ?
- Explain when phenolic ester is treated with lewis acid justify.
- Explain the why formaldehyde & Benzaldehyde do not undergo aldol condensation reaction?

**Q.5 Attempt any Three.**

15

A)



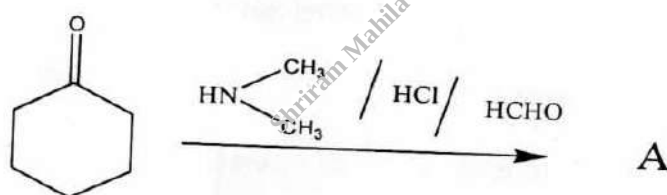
B)



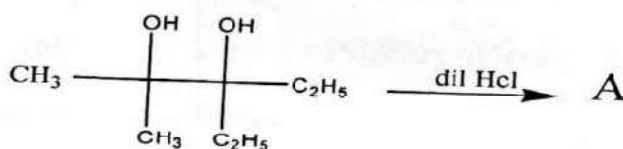
C)



D)



E)



## Bachelor of Science Examination April-2026

| Day & Date           | Semester | Subject Name              | Time                           | Code   | Marks |
|----------------------|----------|---------------------------|--------------------------------|--------|-------|
| Friday<br>17/04/2026 | III      | Physical<br>Chemistry – I | 11.00 a.m.<br>To<br>01.30 p.m. | 302102 | 75    |

**Note:** 1) All questions carry equal marks.

2) All questions are compulsory.

**Q. 1 Attempt any Five of the following. (15)**

- a) Give the difference between reversible process and irreversible process
- b) Explain Helmholtz Gibbs function?
- c) Define and explain.
  - i) Enthalpy                      ii) Internal energy                      iii) Heat Capacity
- d) Derive the relationship between Heat Capacity at constant volume and pressure.
- e) Define any three statement of second law of thermodynamics?
- f) What are Isolated, isothermal, isobaric process explain in short with examples?
- g) Define and explain the term Entropy and its unit with example?
- h) State & explain Le-Chatelier principle?

**Q. 2 Attempt any THREE (15)**

- a) Define the term molar heat capacity at constant volume and constant pressure.
- b) State and explain Hess's Law Constant heat Summation & its application.
- c) Calculate work done when 5 mole of ideal gas compressed isothermally & reversibly from  $0.02 \times 10^5$  pressure to  $2.02 \times 10^5$  at 325 K.
- d) State 1<sup>st</sup> Law of thermodynamics & derive the equation for first Law.
- e) Explain the following terms.
  - 1) Intensive Property with example
  - 2) Extensive property with example.

**Q. 3 Attempt any THREE. (15)**

- a) Explain in brief entropy changes in process of
  - i) Fusion of solid                      ii) Evaporation of liquid.
- b) Derive an expression for Carnot theorem.
- c) Derive an expression for Gibbs Helmholtz function.
- d) Derive an expression for relationship between  $\Delta H$  and  $\Delta E$
- e) Explain in detail, Why entropy as criteria of spontaneity.

**Q. 4 Attempt any THREE. (15)**

- a) Derive an expression for change in enthalpy
- b) Derive an equation for the free energy change for isothermal and isobaric process?
- c) Discuss the concept of maximum workdone. Derive the mathematical equation for  $W_{\max}$ .
- d) Give Physical significance of entropy, explain entropy as a State Function and Entropy change in physical change.
- e) Explain Carnot Cycle and its efficiency in brief

**Q. 5 Attempt any THREE. (15)**

- a) Derive the Clapeyron equation.
  - b) Derive Clausius -Clapeyron Equation and give its Application.
  - c) What are thermodynamic processes? Explain different types of thermodynamic process with examples.
  - d) What is chemical Equilibrium, explain in brief Equilibrium constant and Free energy.
  - e) Derive an expression for Van't Hoff isotherm?
-

**Bachelor of Science****Examination: April- 2026**

| Day & Date            | Semester | Subject Name         | Time                     | Code     | Max. Marks |
|-----------------------|----------|----------------------|--------------------------|----------|------------|
| Tuesday<br>07/04/2026 | III      | Physical Chemistry-I | 2:30 Pm<br>To<br>4:30 Pm | 30132111 | 50         |

**Instructions:** 1. Attempt Any Five Out of Seven.

2. All questions carry equal marks .

**Q.1 A)** Define the following terms. (5)

1. Critical solution temperature (CST)
2. Nernst distribution law
3. Lattice energy
4. Buffer solution
5. de Broglie's relation

**B.** Describe the limitations of Bohr's theory of the atom. How did the need for a new approach, specifically quantum mechanics, arise from these limitations and the introduction of concepts like the Heisenberg uncertainty Principal? (5)

**Q.2 A)** Explain the Born-Haber cycle and its applications in determining thermodynamic Properties (5)

**B.** Describe how Ostwald's viscometer is used to determine the viscosity of an aqueous solution. Explain how the viscosity of a sucrose solution varies with concentration and the underlying reasons for this variation (5)

**Q.3 A)** Explain the concept of a buffer solution and describe how an acetic acid-sodium acetate buffer resists changes in pH upon the addition of both a strong acid and a strong base. (5)

**B.** Explain pH metric titration in detail. (5)

**Q.4 A)** Describe the PH metric titration of a weak acid with a strong base, including the characteristics of its titration curve and how the dissociation constant ( $K_a$ ) of the weak acid can be determined from this titration. (5)

**B.** Compare and contrast the valence Bond (VB) theory and Molecular Orbital (MO) theory in explaining chemical bonding. (5)

**Q.5 A)** Explain the principles of both the drop number and drop weight methods for determining surface tension. Discuss how detergents affect surface tension and why? (5)

**B.** Discuss ideal solutions and Raoult's law. Explain how deviations from Raoult's law occurs in non-Ideal solutions, providing examples for both positive and negative deviations. (5)

**Q.6 A)** Explain the dual behavior of matter and radiation, and how de Broglie's relation connects these two aspects, Discuss the implications of this concept for atomic structure (5)

**B** Explain Determination of Dissociation Constant of a Weak Acid (5)

**Q.7 A)** Explain Nernst Distribution Law and its Applications. (5)

**B.** Explain the significance of  $\Psi$  (psi) and  $\Psi^2$  (psi square) in quantum mechanics, particularly in the context of the Time- independent Schrodinger equation. How do these concepts provide a new approach to understanding atomic structure compared to Bohr's model? (5)

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**Bachelor of Science (NEP)**  
**Examination: November - 2025**

| Day & Date             | Semester | Subject Name      | Time | Code     | Max. Marks |
|------------------------|----------|-------------------|------|----------|------------|
| Saturday<br>22/11/2025 | III      | Organic Chemistry | 2Hrs | 30132112 | 50         |

**Q.1.** Attempt the following question **14**

A) Fill the blanks with appropriate answer

- Enantiomers are \_\_\_\_\_ mirror-image molecules.
- Addition of halo acid on unsymmetrical alkenes are carried out by \_\_\_\_\_ rule.
- Carbocation and carbanions are formed by \_\_\_\_\_ bond fission.
- Diastereomers are stereoisomers that possess \_\_\_\_\_ physical and chemical properties.

B) Answer the following questions (any 5) **10**

- What are the electrophiles? Explain with an example.
- Define the term Aromaticity. Explain with examples.
- Explain Diastereomers with suitable example.
- What are the carbocations? Explain with an example.
- What is the angle strain? Explain with example
- Assign the E/Z configuration to 2 butene.
- Distinguish between carbocations and carbanions with examples.

**Q.2** Attempt any 4 from the following **12**

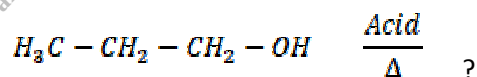
- Explain the Chair conformation Cyclohexane with structure.
- State and explain Hucke's Rule with Suitable example.
- Discuss the Ozonolysis Reaction with an example
- Discuss the preparation of alkenes from Hoffman elimination with an example.
- Explain hydroboration of alkenes.
- State and explain Sytzeff's Rule with suitable example.

**Q.3** Attempt any 4 from the following **12**

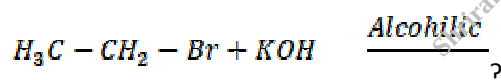
- What are the factors which are directly affects on the pka values?
- Define the term isomerism. Explain the following term

- a) configurational isomer
- b) configurational isomers
- 3. State E/Z notation rules
- 4. What are the Baeyer's strain explain with suitable examples
- 5. State and explain Markownikoff's Rule with an example.
- 6. Complete the following reactions.

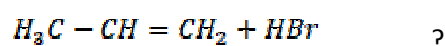
1)



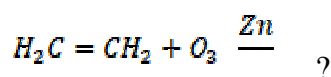
2)



3)



4)



**Q.4.** Attempt any 3 from the following

12

- 1. Discuss the Sachse Mohr theory of strain less ring w.r.t. cyclohexane.
- 2. Distinguish between configuration and conformation
- 3. Discuss the R and S configuration System with Priority rule.
- 4. How alkenes can be prepared from
  - a) Dehydration of alcohol
  - b) Dehydrohalogenation
- 5. Explain oxymercuration - Demercuration of alkenes.
- 6. What are the Diastereomers? Illustrate your answers with the help of Tartaric acid.

**\* Bachelor of Science General (NEP)**  
**Examination: April - 2026**

| Day & Date           | Semester | Subject Name          | Time                       | Code     | Marks |
|----------------------|----------|-----------------------|----------------------------|----------|-------|
| Saturday<br>11-04-26 | III      | Inorganic Chemistry-I | 02:30 PM<br>TO<br>04:30 PM | 30132113 | 50    |

Instructions: All questions compulsory and all questions carry equal marks.

**05 Marks**

**Q.1. Attempt all MCQ of the following.**

- The d-block elements are also known as:
  - Noble gases
  - Transition elements
  - Halogens
  - Lanthanides
- The gradual decrease in atomic size of lanthanides is called:
  - Lanthanide expansion
  - Lanthanide contraction
  - Atomic contraction
  - Orbital contraction
- Which of the following property is commonly shown by d-block elements?
  - High electronegativity
  - Catalytic activity
  - Low melting point
  - Non-metallic character
- A ligand is defined as:
  - An atom that accepts electron pair
  - A molecule that donates electron pair to a metal ion
  - A neutral molecule only
  - A negatively charged ion only
- The theory that explains bonding in coordination compounds is:
  - Werner's theory
  - Dalton's theory
  - Bohr's theory
  - Arrhenius theory

**15 Marks**

**Q.2. Attempt any five of the following.**

- Explain general characteristics of d-block elements.
- Describe electronic configuration and oxidation states of transition elements.
- Explain metallic, magnetic and catalytic properties of d-block elements.
- Describe general characteristics of f-block elements.
- Explain lanthanide contraction and its consequences.
- Describe oxidation states, color and magnetic properties of lanthanides.
- Explain extraction of uranium from pitchblende.

**Bachelor of Science General (NEP)**  
**Examination: April - 2026**

| Day & Date           | Semester | Subject Name          | Time                       | Code     | Marks |
|----------------------|----------|-----------------------|----------------------------|----------|-------|
| Saturday<br>11-04-26 | III      | Inorganic Chemistry-I | 02:30 PM<br>TO<br>04:30 PM | 30132113 | 50    |

**Q.3. Attempt any three of the following.**

**15 Marks**

- I. Describe separation of lanthanides by ion-exchange method.
- II. Define coordination compound, coordinate bond, coordination number and ligand.
- III. Distinguish between double salts and coordination compounds.
- IV. Explain Werner's theory of coordination compounds.
- V. Describe Valence Bond Theory (VBT) for coordination compounds.

**Q.4. Attempt any three of the following.**

**15 Marks**

- I. Explain Effective Atomic Number (EAN) rule with examples.
- II. Describe IUPAC nomenclature of coordination compounds.
- III. Explain different types of ligands with examples.
- IV. Define isomerism in coordination compounds and describe its types.
- V. Explain general features of actinides including electronic configuration and oxidation states.



## Bachelor of Science Examination April-2026

| Day & Date              | Semester | Subject Name                | Time                           | Code     | Marks |
|-------------------------|----------|-----------------------------|--------------------------------|----------|-------|
| Wednesday<br>15/04/2026 | III      | Useful & Harmful<br>insects | 02.30 p.m.<br>To<br>04.30 p.m. | 30332411 | 50    |

### Instructions:

**I) All questions are compulsory.**

**II) Draw neat and labeled diagram wherever necessary.**

**Q. 1 (A) Multiple choice Questions / True False: (05)**

- Which of the following is the generic name for honey bees?
  - Antheraea
  - Apis
  - Prawn
  - Lac nsect
- What is the primary food source for silkworm caterpillars?
  - Oak leaves
  - Cocoon plant leaves
  - Mulberry leaves
  - Cotton leaves
- Which type of insect is typically the first to arrive at a dead body and are crucial for establishing the postmortem interval?
  - Mites
  - Beetles
  - Ants
  - Flies
- What is the correct sequence of the blowfly life cycle?
  - Larva → Pupa → Egg → Adult
  - Pupa → Larva → Egg → Adult
  - Egg → Larva → Pupa → Adult
  - Adult → Larva → Egg → Pupa
- What is a common sign of a termite infestation in a wall?
  - A hollow sound when you tap on the wall.
  - Bubbling or peeling paint
  - Faint "lines" on the drywall surface
  - All of the above.

**Q. 1 (B) Define the Following/Answer in one sentence/Match the column (any 5) (05)**

- How do fleas act as vectors for the plague?
- What natural biological controls can be used to manage rhinoceros beetles in coconut groves?
- Define Post-Mortem Interval (PMI)
- What is the "waggle dance" and what is its purpose?
- What are some common uses for shellac, the refined product of lac?

**Q. 1 (C) Write Short Notes on (any 2) (10)**

- a) Describe insects of forensic importance with two examples.
- b) Explain in detail about lac culture
- c) Describe the physical characteristics of solitary versus gregarious desert locusts.
- d) Write about disease caused by screw worm fly and its control measures.

**Q. 2 Answer the following (any 2): (15)**

- a) Explain structure of bee hive.
- b) What are Entomophagous insects? Explain with an example.
- c) Briefly describe the life cycle and damage caused by Lemon butterfly.

**Q. 3 Answer the following (any 2): (15)**

- a) Write in brief about damage caused and control measures of rice weevil.
  - b) Name three diseases transmitted by mosquitoes along with their control measures.
  - c) What are the different stages of a silk moth's life cycle?
-

**B. Sc.****Examination: November 2025**

| Day & Date              | Semester | Subject Name             | Time                       | Code     | Max. Marks |
|-------------------------|----------|--------------------------|----------------------------|----------|------------|
| Wednesday<br>19/11/2025 | III      | Useful & Harmful Insects | 11.00 pm<br>to<br>01.00 pm | 30332411 | 50         |

**Instruction:**

- I) All Questions are compulsory.  
 II) Draw neat and labeled diagram wherever necessary.

**Q.1 A) Multiple choice Questions/ True False: 05**

1. Termites are social insects that live in organized colonies with different castes, such as workers, soldiers, and reproductives. (state true or false)
2. What happens to adult silk moths after they emerge from their cocoons?
  - a) They feed on mulberry leaves to grow
  - b) They begin the life cycle again by laying eggs
  - c) They do not have functional mouthparts and die within a few weeks
  - d) They become part of the silk production process
3. The process of rearing silkworms to produce silk is known as:
  - a) Apiculture
  - b) Sericulture
  - c) Pisciculture
  - d) Agriculture
4. What is the significance of a "larval mass" in forensic entomology?
  - a) It indicates the presence of a specific drug in the body.
  - b) Its internal temperature can be significantly higher than the ambient temperature, accelerating maggot development.
  - c) It is a sign of a new blowfly generation emerging from pupae.
  - d) It is a defense mechanism used by the larvae against predators.
5. Parasitoids are always larger than their hosts. (state true or false)

**Q.1 B) Define the Following/ Answer in one sentence/ Match the column (any 5): 05**

1. Which life stage of the rhinoceros beetle is responsible for damaging coconut fronds?
2. What is lac, and where does it come from?
3. What is moulting, and when does it occur in the insects?
4. What is DDT?
5. Name the disease whose primary vector is the rat flea and is characterized by painful, swollen lymph nodes.

**Q.1 C) Write Short Notes on (any2): 10**

1. Does the parasitoid show a narrow host range? Explain.
2. Describe Lady bird beetle as useful biocontrol agent.
3. Explain damage and control measures of red cotton bud as agricultural pest.
4. Write about life cycle of cockroach.

**Q.2 Answer the following (any 2): 15**

1. Explain in detail about parasitoid wasp.
2. Describe structure of bee hive.
3. Briefly describe the life cycle and damage caused by Lemon butterfly.

**Q.3 Answer the following (any 2): 15**

1. Briefly describe the life cycle of house fly and diseases transmitted by it.
2. "Explain the disastrous havoc caused by locusts with the help of a case study".
3. Write in detail about life cycle of lac insect and uses of lac.

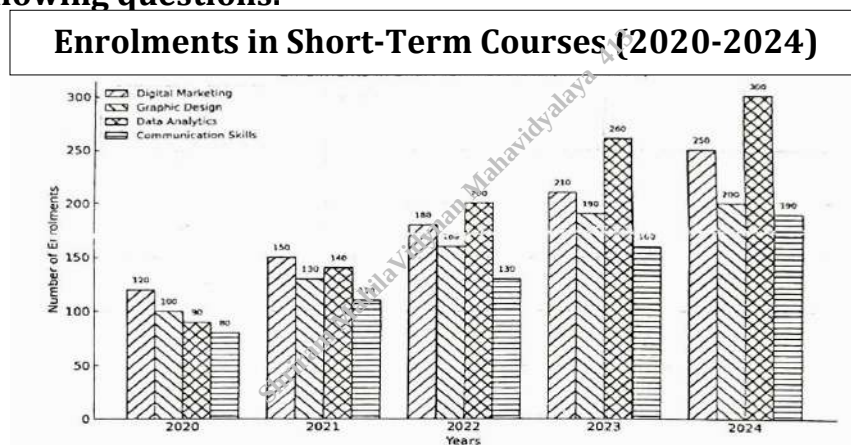
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**Bachelor of Arts (Music)**  
**Bachelor of Arts (Interior Design)**  
**Bachelor of Visual Arts (BVA)**  
**Bachelor of Arts (Fashion Design)**  
**Bachelor of Arts (Mass Communication)**  
**BACHELOR OF COMPUTER APPLICATIONS (BCA)**  
**Bachelor of Arts (B.A.)**  
**Bachelor of Science**  
**Bachelor of Science in Information Technology (B.Sc.IT)**  
**Bachelor of Science in Home Science**  
**BACHELOR OF SCIENCE IN CLINICAL LABORATORY SCIENCE (BSCCLS)**  
**Examination March -2026**

| Day & Date           | Semester | Subject Name                          | Time                           | Code     | Marks |
|----------------------|----------|---------------------------------------|--------------------------------|----------|-------|
| Friday<br>17/04/2026 | III      | Business<br>Communication<br>(B.Com.) | 02.30 p.m.<br>To<br>04.30 p.m. | 30420162 | 50    |

**Instructions: All the questions are compulsory.**

- Q.1 Study the bar graph given below showing the number of students enrolling in different short-term courses (2020-2024) and answer the following questions. (10)**



- 1 In which year was the enrolment in Data Analytics the highest? (1)
- 2 Which course had the least enrolments in 2020? (1)
- 3 What was the difference between enrolments in Graphic Design in 2021 and 2023? (1)
- 4 How many students enrolled in Communication Skills in 2024? (1)
- 5 In 2022, which course had more enrolments: Digital Marketing or Graphic Design? (1)
- 6 What was the increase in enrolments for Digital Marketing from 2020 to 2024? (1)
- 7 What was the total enrolment in all courses in the year 2021? (2)
- 8 Which course showed the maximum growth from 2020 to 2024? (2)

**Q.2 Draw a line graph with the help of data presented in the following paragraph, label the axes and give suitable title (10)**

SY BA students actively participated in variety of extracurricular activities, indicating their diverse interests and talent. Sports emerge as the most popular choice, with 48 students taking part in football, cricket, and athletics, which accounts for nearly one-third of the total participants. Cultural programs also hold a significant place, 28 students participated in cultural activities, while 22 took part in music and 18 in dance, showcasing strong artistic enthusiasm. Creative expression finds further scope as 26 students are involved in art and drawing, slightly more than the 17 students participating in literary events like essay writing, poetry, and storytelling. Students' academic engagement is evident as 20 students joined the science club and 12 participated in debate and quiz competitions. 15 students participated in theatre events, and 10 students worked for community service. Altogether, these numbers reflect a healthy balance between physical, cultural, creative, and intellectual growth.

**Q.3 Draft minutes of any ONE of the following. (15)**

**A)** Draft the Notice, Agenda, and Minutes of the Annual General Meeting of Sunrise Co-operative Bank, held on 15th October 2025. The following agenda items were discussed:

1. Appointment of Statutory Auditor
2. Approval of Annual Accounts
3. Opening of New Branch
4. Employee Welfare Fund

OR

**B)** Draft the Notice, Agenda, and Minutes of the Executive Committee Meeting of Student Council of your college, held on 22nd September 2025. The following points were discussed:

1. Planning for Inter-collegiate Cultural Fest
2. Sponsorship and Fundraising
3. Allocation of Duties

**Q.4 Write a credit letter (one out of two) (08)**

**A.** You want to purchase office chairs worth ₹75,000/- on credit from Modern Furniture Mart. Draft a letter requesting them to supply goods on 60 days' credit terms.

**OR**

- B.** You are unable to extend credit facilities to M/s. Rohan Enterprises due to their weak financial position. Draft a letter politely rejecting their request for credit.

**Q.5 Write a collection letter (one out of two) (07)**

- A.** M/s. Ravi Distributors, Pune, have not cleared their outstanding payment of ₹55,000/- despite repeated reminders. Draft a second reminder letter making a strong appeal for immediate payment.

**OR**

- B.** M/s. Khanna Textiles, Surat, have delayed their dues of ₹1,20,000/. Draft a final reminder letter from Goyal Fabrics Ltd. urging them to settle the account without further delay