



B.Sc. I Semester Degree Examination, April/May - 2024

CHEMISTRY

**DSC - 1 : Fundamentals of Chemistry
(NEP)**

Time : 2 Hours

Maximum Marks : 60

Note : Answer *all* sections.

SECTION - A

1. Answer the following sub-questions. Each sub-question carries **one** mark. **10x1=10**

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|--|---|
| (a) What is Normality ? | 1 |
| (b) What is molar mass ? | 1 |
| (c) State Aufbau's principle. | 1 |
| (d) Write the de-Broglie equation. | 1 |
| (e) What is inductive effect ? | 1 |
| (f) Write Diels-Alder reaction. | 1 |
| (g) What is Parachor ? | 1 |
| (h) What is Collision frequency ? | 1 |
| (i) Give an example for Redox indicator. | 1 |
| (j) Define post precipitation. | 1 |

SECTION - B

Answer **any four** of the following questions. Each question carries **five** marks.

4x5=20

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|--|---|
| 2. Give precautions to be taken while handling toxic chemicals, concentrated acids and organic solvents. | 5 |
| 3. Explain the significance of ψ and ψ^2 . | 5 |
| 4. Explain E_1 mechanism with example. | 5 |



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5. Write Vander Waals equation and discuss its applications in explaining the behaviour of real gases. 5
6. Explain the Determination of hardness of water. 5
7. What is Shielding Constant ? Write the Slater's rules. 5

SECTION - C

Answer **any three** of the following questions. Each question carries **ten** marks.

3x10=30

8. (a) Explain the Calibration of glass wares of Pipette, Burette and Volumetric flasks. 6
- (b) Discuss the importance and scope of Chemistry. 4
9. (a) What are quantum numbers ? Explain four quantum numbers with their significance. 6
- (b) Explain the Pauli's Exclusive principle. 4
10. (a) What is Markownikoff's Rule ? Give mechanism of addition of HBr to Propene. 6
- (b) With suitable example, explain Hyper Conjugation effect. 4
11. (a) Discuss Law of Corresponding State. 6
- (b) What is surface tension ? Explain its determination using Stalagmometer. 4
12. (a) Explain the precipitation titration by Mohr's method. 6
- (b) Explain the titration curves for weak acid with a strong base in titration. 4

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B.Sc. I Semester Degree Examination, April/May - 2024

PHYSICS

01 : Mechanics and Properties of Matter

(NEP)

Time : 2 Hours

Maximum Marks : 60

- Note :** (i) Answer **all** the sections.
(ii) Non-Programmed Scientific Calculators are allowed.

SECTION - A

I. Answer the following sub-questions. Each sub-question carries **one** mark. **10x1=10**

1. (a) Give an example for Non-inertial frame of reference.
(b) What is Coriolis force ?
(c) Define centre of mass.
(d) State Law of Conservation of angular momentum.
(e) State Perpendicular axes theorem.
(f) Write an expression for moment of inertia of a circular disc about its diameter.
(g) State Hooke's Law.
(h) Define Young's modulus of a material.
(i) Define force of Cohesion.
(j) What is Streamline flow ?

SECTION - B

II. Answer **any four** of the following questions. Each question carries **five** marks.

2. Derive an expression for length contraction. **4x5=20**
3. Deduce an expression for variation of mass with velocity.
4. Discuss conservation of energy in the case of motion of a body near the surface of the earth.
5. Derive an expression for moment of inertia of a rectangular Lamina about an axis passing through its centre and parallel to one of its side.
6. Deduce an expression for couple per unit twist of a cylinder.
7. State and prove Stoke's Law.



SECTION - C

III. Answer **any three** of the following questions. Each question carries **ten** marks.

- 3×10=30**
8. Describe Michelson-Morely experiment with neat diagram and discuss Negative Results. **10**
9. (a) State and Prove Law of Conservation of linear momentum of a system of particles. **5**
(b) Calculate the angular momentum of disc whose rotational energy is 10 KJ and moment of inertia about the axis of rotation is $8 \times 10^{-4} \text{ kg m}^2$. **5**
10. (a) Derive an expression for moment of a hollow cylinder about an axis passing through its centre and perpendicular to its own plane. **5**
(b) State and Prove Parallel axes theorem. **5**
11. (a) What is Torsional pendulum? Give the theory of Torsional pendulum. **5**
(b) Derive an expression for workdone in twisting a wire. **5**
12. (a) Derive the expression for excess pressure on the curved surface of a liquid. **8**
(b) Give any two differences between streamline flow and turbulent flow. **2**

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B.Sc. I Semester Degree Examination, April/May - 2024

BOTANY

Microbial Diversity

(NEP)

Time : 2 Hours

Maximum Marks : 60

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- Note :** (i) Answer **all** the questions.
(ii) Draw diagram wherever necessary.
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SECTION - A

1. Answer the following questions : **10x1=10**
- (a) Define Microscopy.
 - (b) Who proposed five kingdom system of classification ?
 - (c) What is enriched media ?
 - (d) What is Lycophilization ?
 - (e) Expand ATCC.
 - (f) What is pure culture ?
 - (g) What are Plasmid ?
 - (h) What are Aplanospores ?
 - (i) Define Eubacteria.
 - (j) Name causal organism of Late blight of Potato.

SECTION - B

Answer **any four** of the following questions :

4x5=20

- 2. Write the contribution of microbiologist "Robert Koch".
- 3. What is Microbial growth ? Write its distinct phases.
- 4. Describe the structure of T-2 Bacteriophage with neat labelled diagram.
- 5. Name the causal organism, symptoms, control measures of Citrus Canker.
- 6. Explain the general characteristics of fungi.
- 7. Explain the ultrastructure of Mycoplasma with neat labelled diagram.



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SECTION - C

Answer **any three** of the following questions :

3x10=30

8. What is Sterilization ? Explain physical method of sterilization.
9. Write down the working Principle and application of Electron Microscope.
10. Explain the cultivation of Viruses, Vaccination and types.
11. Explain the Life cycle of Rhizopus with schematic representation.
12. Write a note on :
 - (a) Downy Mildew of Bajra
 - (b) Economic importance of Lichens

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**B.Sc./BCA/GMT I Semester Degree Examination,
April/May - 2024**

ಬೇಸಿಕ್ ಕನ್ನಡ

1 : ವಿಜ್ಞಾನ ವಿಜಯ - 1

(NEP)

Time : 2 Hours

Maximum Marks : 60

ಸೂಚನೆ : ಭಾಷೆ ಮತ್ತು ಬರಹದ ಶುದ್ಧಿಗೆ ಗಮನ ಕೊಡಲಾಗುವುದು.

1. ಕೆಳಗಿನ ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ.

10x1=10

- (a) ಉರಿಯ ನಡಿಗೆ ಕತೆಯನ್ನು ಬರೆದವರು ಯಾರು ?
- (b) 'ನೆನೆವುದೆನ್ನ ಮನಂ' ಎಂದು ಪಂಪ ಯಾವ ದೇಶ ಕುರಿತಾಗಿ ಹೇಳಿದ್ದಾನೆ ?
- (c) ಗೋಪಾಲಕೃಷ್ಣ ಅಡಿಗರು ಬರೆದ ಕವಿತೆಯ ಹೆಸರು ಬರೆಯಿರಿ.
- (d) 'ಆ ಬೆಟ್ಟ ಬೆಳದಿಂಗಳಲ್ಲಿ ಸುಳಿದಾಡಬೇಡ ಗೆಳತಿ' ಸಾಲನ್ನು ಬರೆದ ಕವಿಯ ಹೆಸರೇನು ?
- (e) 'ವ್ಯಾಕರಣ ತೀರ್ಥ' ಎಂಬ ಬಿರುದು ಪಡೆದ ಬಳ್ಳಾರಿಯ ಲೇಖಕರ ಹೆಸರೇನು ?
- (f) ಕರೋನಾ ಕುರಿತಾಗಿ ಲೇಖನ ಬರೆದ ಲೇಖಕರ ಹೆಸರು ಬರೆಯಿರಿ.
- (g) 'ಸ್ತ್ರೀವಾದಿ ತತ್ವ' ಲೇಖನವನ್ನು ಬರೆದವರು ಯಾರು ?
- (h) ಕನ್ನಡದ ಆತಂಕಗಳು ಲೇಖನ ಬರೆದವರು ಯಾರು ?
- (i) 'ಇರುವುದೊಂದೇ ಭೂಮಿ' ಲೇಖನ ಬರೆದವರು ಯಾರು ?
- (j) 'ನೆಗಡಿ' ಪ್ರಬಂಧ ಬರೆದವರು ಯಾರು ?

ಕೆಳಗಿನ ಯಾವುದಾದರೂ ನಾಲ್ಕು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ.

4x5=20

- 2. ನಿತ್ಯೋತ್ಸವ ಕವಿತೆಯಲ್ಲಿ ವ್ಯಕ್ತವಾದ ಕರ್ನಾಟಕದ ಗತ ವೈಭವವನ್ನು ವಿವರಿಸಿರಿ.
- 3. ಉರಿಯ ನಡಿಗೆ ಕತೆಯ ಆಶಯವನ್ನು ವಿವರಿಸಿರಿ.
- 4. ತತ್ವಪದ ಎಂದರೇನು ? ವಿವಿಧ ತತ್ವಪದಕಾರರ ಚಿಂತನೆಗಳನ್ನು ವಿವರಿಸಿರಿ.



P.T.O.

5. ಸುಟ್ಟಾವು ಬೆಳ್ಳಿ ಕಿರಣ ಕವಿತೆಯಲ್ಲಿಯ ಪ್ರೇಮ ಹಾಗೂ ಕ್ರಾಂತಿಯ ಬೆಸುಗೆಯನ್ನು ವಿವರಿಸಿರಿ.
6. ಸ್ತ್ರೀವಾದಿ ತತ್ವದ ಭವಿಷ್ಯದ ಸವಾಲುಗಳನ್ನು ಕುರಿತು ಬರೆಯಿರಿ.
7. ಸತ್ಯಾಗ್ರಹ ಮತ್ತು ಸರ್ವೋದಯ ಕುರಿತು ಗಾಂಧೀಜಿಯವರ ಅಭಿಪ್ರಾಯಗಳ ಕುರಿತು ಬರೆಯಿರಿ.

ಕೆಳಗಿನ ಯಾವುದಾದರೂ ಮೂರು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ.

3x10=30

8. ಕನ್ನಡವು ಎದುರಿಸುತ್ತಿರುವ ಆತಂಕಗಳ ಕುರಿತಾಗಿ ಬರೆಯಿರಿ.
9. 'ಇರುವುದೊಂದೆ ಭೂಮಿ' ಲೇಖನದಲ್ಲಿ ಪರಿಸರ ಕಾಳಜಿ ಹೇಗೆ ವ್ಯಕ್ತವಾಗಿದೆ ವಿವರಿಸಿರಿ.
10. ಸಣ್ಣ ಮತ್ತು ಅತಿ ಸಣ್ಣ ರೈತರ ಮೇಲಾದ ಕರೋನಾ ಪರಿಣಾಮವನ್ನು ಕುರಿತು ಬರೆಯಿರಿ.
11. 'ನೆಗಡಿಯೊಂದು ಪ್ರಬಲವಾದ ವ್ಯಾಧಿ' ಎಂಬ ಹೇಳಿಕೆಯನ್ನು ಪ್ರಬಂಧದ ಹಿನ್ನೆಲೆಯಲ್ಲಿ ವಿವರಿಸಿರಿ.
12. 'ಸಮಾಜವಾದ ಶುದ್ಧ ಸಮಾಜದೆಡೆಗೆ' ಲೇಖನ ಕುರಿತಾಗಿ ಎರಿಕ್ ಪ್ರಾಂ ವಿಚಾರಗಳನ್ನು ಸಂಗ್ರಹಿಸಿ ಬರೆಯಿರಿ.

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B.Sc./B.C.A. I Semester Degree Examination, April/May - 2024

HINDI - I

The Study of Indian Language

(NEP)

Time : 2 Hours

Maximum Marks : 60

सूचना : लिखावट शुद्ध और देवनागरी लिपि में हो।

(i) काव्य पराशर (ii) कहानी कुंज।

I. किन्हीं दस प्रश्नों को चुनकर उत्तर लिखिए।

1x10=10

1. निगण्णा किस कहानी का पात्र है?
2. सलीमा की सहेली का नाम क्या है?
3. दुःखवा में कासे कहुँ कहानी के लेखक का नाम बताइये।
4. अभयकुमार किस देश के राजकुमार थे?
5. सालवती किस नदी के किनारे रहती थी?
6. सत्याग्रह कहानी के लेखक का नाम बताइए।
7. दिनकर जी का पूर्ण नाम क्या है?
8. नियम कविता के कवि कौन हैं?
9. कवि की मृत्यु के बाद रोने के लिए कौन आया था?
10. संप्रेषण को अंग्रेजी में क्या कहते हैं?
11. तावीज कहानी के लेखक का नाम क्या है?



P.T.O.

II. किन्हीं दो प्रश्नों के संदर्भ सहित व्याख्या कीजिए।**2x5=10**

1. “अनशन-वृत्त के साथ मंत्रों का जप होगा। सारे शहर में हलचल न मचा दूँ तो मोटेराम नहीं।”
2. मुझे पत्नी तो नहीं चाहिए। हाँ इस बालक की माँ को खोज रहा हूँ, जिसको प्रसव रात्री में ही उस की मानिनी माँ ने अपने सौंदर्य की रक्षा के लिए इसे फेंक दिया।
3. नहीं, इसमें शर्म की कोई बात नहीं चाँद, सूरज से उधार लेता है, समुद्र नदियों से, भारत विश्वबैंक से यही नियम है।

III. किन्हीं दो प्रश्नों के उत्तर लिखिए।**2x5=10**

1. सापेक्ष संवेदना में कवि हमें क्या संदेश देना चाहता है स्पष्ट कीजिए।
2. सालवती कहानी में व्यथित नारी संवेदना पर प्रकाश डालिए।
3. सत्याग्रह कहानी का भाव अपने वाक्यों में लिखिए।

IV. किन्हीं दो प्रश्नों के उत्तर लिखिए।**2x10=20**

1. तावीज कहानी का उद्देश्य स्पष्ट कीजिए।
2. सलीमा का चरित्र चित्रण कीजिए।
3. कवि की मृत्यु कविता का उद्देश्य स्पष्ट कीजिए।
4. नियम कविता हमें क्या संदेश देती है। स्पष्ट कीजिए।

V. हिन्दी में अनुवाद कीजिए।**1x10=10**

Food, cloth and shelter are the primary things for the civilian, we work for this purpose. If we are unable to get these things that would become uncivilised life. So, government will take responsibilities for the above hardwork is the best weapon to eradicate poverty.

ಆಹಾರ, ಬಟ್ಟೆ ಮತ್ತು ವಸತಿ ಈ ಮೂರು ವಸ್ತುಗಳು ಪ್ರಾಥಮಿಕ ಅವಶ್ಯಕತೆಗಳಾಗಿವೆ. ನಾವು ಇವುಗಳಿಗೋಸ್ಕರ ಕಠಿಣಕ್ರಮ ಪಡುತ್ತೇವೆ. ಒಂದು ವೇಳೆ ಈ ವಸ್ತುಗಳು ಸಿಗದೆ ಇದ್ದಲ್ಲಿ ಅಸಂಸ್ಕೃತರಾಗಿ ಬಾಳಬೇಕಾಗುತ್ತದೆ. ಹೀಗಾಗಿ ಸರ್ಕಾರವು ಈ ವಸ್ತುಗಳನ್ನು ಜನತೆಗೆ ಒದಗಿಸುವ ಜವಾಬ್ದಾರಿ ಹೊತ್ತಿರುತ್ತದೆ. ಈ ಕಠಿಣ ಪರಿಶ್ರಮವೇ 'ಬಡತನ'ವನ್ನು ಹೋಗಲಾಡಿಸುವ ಅಸ್ತ್ರವಾಗಿದೆ.





**B.Sc/B.C.A/GMT I Semester Degree Examination,
April/May - 2024**

ENGLISH

Basic English

(NEP)

Time : 2 Hours

Maximum Marks : 60

SECTION - A

1. Answer the following questions. Each questions carries **one** mark. **10x1=10**
- (a) What is the similarity among the lunatic, the lover and the poet ?
 - (b) Where is the song of the caged bird heard ?
 - (c) What profession does Gangu take up after learning his job ?
 - (d) Who is the protagonist in 'The Death of a Hero' ?
 - (e) Translate to Kannada.
Honesty is the best Policy.
 - (f) Translate to English.
ಮಾತು ಬೆಳ್ಳಿ ಮೌನ ಬಂಗಾರ.
 - (g) What do you mean Data interpretation ?
 - (h) What is passage and write its types ?
 - (i) Use the correct form of verb :
Saanvi _____ (rites/writes) a diary daily.
 - (j) The gate _____ (is/was) opened.

SECTION - B

Answer **any four** of the following questions, Each question carries **five** marks.

4x5=20

2. What is the theme of Kamala Das's poem 'The Mask' ?
3. Draw the character sketch of Mr. Tagde in the story 'Death of a Hero' ?



P.T.O.

4. Read the following passage and answer the questions.

King Ashoka was a kind, wise and righteous ruler. He spent all his time thinking of the welfare of his subjects. He had a strong desire to make his subjects happy. His subjects could meet him at any time and in any place. He had trees planted on either side of the road; he had well dug by the roadside; he had rest houses built for both men and animals. He was respected by every one.

- What kind of a ruler was Ashoka ?
- How did Ashoka usually spend his time ?
- Write any two works of Ashoka which he did for the welfare of his subjects.
- Pick up a sentence from the passage which shows Ashoka was liberal with his subjects.
- Whom did everyone respect ?

5. Translate the following paragraph to English.

ಸಾವಿತ್ರಿಬಾಯಿ ಫುಲೆ ಭಾರತದ ಪ್ರಸಿದ್ಧ ಸಮಾಜ ಸುಧಾರಕರು, ಶೈಕ್ಷಣಿಕ ಸುಧಾರಕರು ಹಾಗೂ ಕವಯಿತ್ರಿ ತಮ್ಮ ಪತಿ ಜ್ಯೋತಿ ಬಾ ಫುಲೆಯವರೊಡಗೂಡಿ ಪುಣೆಯಲ್ಲಿ ಬಾಲಕಿಯರ ಶಾಲೆಯನ್ನು ಆರಂಭಿಸಿದರಲ್ಲದೆ ತಾವೇ ಶಿಕ್ಷಕಿಯಾಗಿ ಕಾರ್ಯ ನಿರ್ವಹಿಸಿದರು. ಅವರು ಜಾತಿ ಪದ್ಧತಿ ಮತ್ತು ಲಿಂಗ ಸಮಾನತೆಯ ವಿರುದ್ಧ ಹೋರಾಡಿದರು.

6. Fill in the blanks with appropriate verbs forms.

Gandhiji _____ to India in 1914. The great World War II had just begun. There _____ wide spread agitations for freedom all over the country. Most of the leaders _____ it the right time to strike. Gandhiji's presence _____ them a lot. So the freedom struggle _____ a definite shape on the year.

[think, take, be, return, inspire]

7. Analyse the poem: " The Lunatic, the lover and the poet".

SECTION - C

Answer **any three** of the following questions, each question carries **ten** marks.

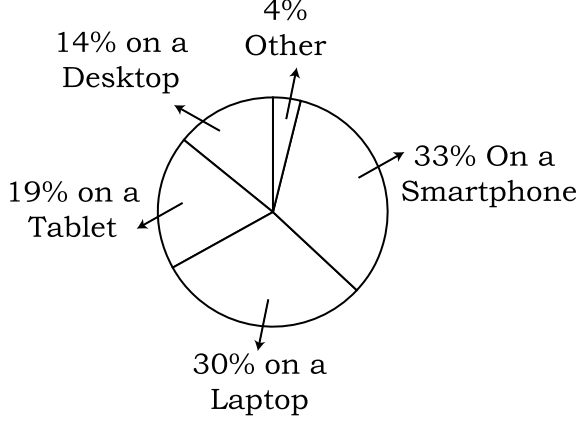
3x10=30

- Maya Angelou contrasts a free bird with a caged bird. Justify.
- Explain the Significance of the title 'The child'.



10. Write a detailed report on the following Pie Charts.

The Pie Chart below illustrates how internet users aged 16+ prefer to access the internet at home and in other places.



11. (a) Translate the following paragraph into English.

ಮೊಬೈಲ್ ಎಂಬುದು ಒಂದು ಎಲೆಕ್ಟ್ರಾನಿಕ್ ವಸ್ತು, ಇಂದಿನ ಜಗತ್ತಿನಲ್ಲಿ ಮೊಬೈಲ್ ಎಂಬ ಯಂತ್ರ ಮನುಷ್ಯನ ಜೀವನಕ್ಕೆ ಕಡ್ಡಾಯವೆಂಬಂತೆ ಬಿಂಬಿತವಾಗಿದೆ. ಏಕೆಂದರೆ, ಭಾರತದ ಒಟ್ಟು ಜನಸಂಖ್ಯೆ 134 ಕೋಟಿ ಅದರಲ್ಲಿ 70 ಕೋಟಿ ಜನರ ಹತ್ತಿರ ಮೊಬೈಲ್ ಇರಬಹುದು. ಏಕೆಂದರೆ ಪ್ರತಿಯೊಬ್ಬರೂ ಇಂದು ಮೊಬೈಲ್ ಬಳಸುತ್ತಿರುವುದು ಕಂಡು ಬರುತ್ತದೆ. ಮೊಬೈಲ್ ಇಲ್ಲದೆ ಜೀವನವಿಲ್ಲ ಎಂಬಂತೆ ನಿರ್ಮಾಣವಾಗಿ ಬಿಟ್ಟಿದೆ.

(b) Translate : English to Kannada

The environment and the purity has been neglected by the man. It's pollution is the result of man greed to use natural wealth. By which air, water and food etc. have been polluted. The problem of pollution is increasing day by day with rising population, industrialisation and urbanisation.

12. Do as directed.

(a) Fill in the blanks with correct forms of verbs.

- I shall meet you _____ (later/latter)
- The news is _____ good to be true (to/too)
- I am on leave for a _____ (Week/Weak)
- She was very good _____ (Sight/Site)

(b) Identify Transitive and Intransitive verbs in the given sentences.

- The horse kicked the man
- The ship sank rapidly
- He spoke the truth

(c) Identify the finite and infinite verbs.

- Tommy is angry
- A child came to wish me on my birthday
- They will go

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B.Sc. I Semester Degree Examination, April/May - 2024

ELECTRONICS
DSC 1 : Basic Electronics
(NEP)

Time : 2 Hours

Maximum Marks : 60

Note : Answer *all* sections.

SECTION - A

1. Answer the following sub-questions. **10x1=10**
- (a) Define passive components.
 - (b) What is the unit of capacitance ?
 - (c) What is phase in A.C circuits ?
 - (d) Define Network and Junction.
 - (e) What is Valence electron ?
 - (f) What is knee voltage ?
 - (g) Expand the term LED.
 - (h) What is transistor ?
 - (i) Define Donor in semiconductor.
 - (j) Expand JFET.

SECTION - B

- Answer **any Four** questions. **4x5=20**
2. What is fixed Resistors ? Explain in brief.
3. Explain the following terms :
- (i) Amplitude
 - (ii) Time period
 - (iii) Voltage
 - (iv) Peak factor
 - (v) Complex number
4. State KCL and KVL in network theorems.
5. Explain the working of P-type semiconductor.
6. Explain the construction and working of LED and write applications.
7. Explain the working principle of PNP transistor.



SECTION - C

Answer **any Three** questions.

3x10=30

8. Explain the construction of carbon composition color code resistor with color code chart.
9. Derive the expression for RMS value of a sinusoidal wave form.
10. State and prove maximum power transformer theorem.
11. With neat circuit diagram explain Pn junction diode in forward and reverse bias and draw V-I characteristics curve.
12. Explain the CB, CE and CC configurations of transistors.

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B.Sc. I Semester Degree Examination, April/May - 2024

BIOTECHNOLOGY

Bt-1 : Cell Biology and Genetics

(NEP)

Time : 2 Hours

Maximum Marks : 60

Note : (i) Answer **all** Sections.

(ii) Draw the labelled diagrams wherever necessary.

SECTION - A

1. Answer the following sub-questions in **one** word or **one** sentence each. **10x1=10**

- (a) What are microtubules ?
- (b) Who discovered Golgi Complex ?
- (c) What is Karyokinesis ?
- (d) Expand SAT-Chromosome.
- (e) What do you mean by back cross ?
- (f) Crossing of two white flowers gives a coloured flower, this shows which gene interaction ?
- (g) What is the unit of genetic map ?
- (h) Define silent mutation.
- (i) What is sex index ratio ?
- (j) Mention the types of Polyploidy.



SECTION - B

Answer **any four** of the following questions.

4x5=20

2. Explain the singer and Nicholson model of plasma membrane with a neat labelled diagram.
3. Write a short note on polytene chromosome with a neat labelled diagram.
4. Briefly explain the law of incomplete dominance by taking the example of *Mirabilis jalapa*.
5. Write the differences between linkage and crossing over.
6. Explain the XX-XY and XX-XO types of sex determination.
7. Describe the cell cycle with the schematic representation.

SECTION - C

Answer **any three** of the following questions.

3x10=30

8. Write the detail account of the ultra structure of Nucleus with a neat labelled diagram.
9. Describe the classification of chromosomes based on their position of centromere.
10. Explain the multiple allelism by taking the example of blood groups in human beings.
11. Give the detail account of the types of mutation.
12. What is sex determination ? Give an account of genetically controlled sex determination mechanisms.

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B.Sc. I Semester Degree Examination, April/May - 2024

ZOOLOGY

Cytology, Genetics and Infectious Diseases

(NEP)

Time : 2 Hours

Maximum Marks : 60

Note : (i) Answer **all** the questions.
(ii) Draw diagrams wherever necessary.

SECTION - A

Answer the following sub-questions in **one word** or in **one sentence** each. **10x1=10**

1. (a) Define Exocytosis.
(b) What is Electron Transport System ?
(c) Mention two chemical differences between DNA and RNA.
(d) Name the types of Cell Signaling.
(e) What is Pedigree and Sibs ?
(f) Define Dosage compensation.
(g) What are Sex-influenced Genes ? Give example.
(h) Define Cytoplasmic Inheritance.
(i) Mention the vector of Trypanosoma.
(j) Write the Karyotype of Down's and Turner's Syndrome.

SECTION - B

Answer **any four** of the following questions.

4x5=20

2. Explain the structure and functions of Ribosomes with labelled sketch.
3. Sketch and explain Clover leaf model t-RNA.
4. Briefly explain XX-XO type of Sex-determination with suitable example.
5. Write a short note on Maternal Genetic effect.
6. Sketch and label Wuchereria.
7. What are Chromosomes ? Classify the chromosomes based on their position of Centromere.



SECTION - C

Answer **any three** of the following questions.

3x10=30

8. Describe the Life cycle and Pathogenecity of Giardia.
9. Describe the inheritance of ABO Blood group in Human beings.
10. State Law of Independent Assortment. Explain it by taking Guinea Pig as an example.
11. What is Cell Division ? Describe the different stages of Mitosis with labelled diagrams.
12. Describe the following :
 - (a) Oxidative Phosphorylation.
 - (b) Structure and functions of Microtubules.

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B.Sc. I Semester Degree Examination, April/May - 2024

MATHEMATICS

DSC-1 : Fundamentals of Algebra and Calculus

(NEP)

Time : 2 Hours

Maximum Marks : 60

Note : Answer **all** the Sections.

- Note :**
- (i) Answer **all** the questions from **Section - A**.
 - (ii) Answer **any four** questions from **Section - B**.
 - (iii) Answer **any three** questions from **Section - C**.

SECTION - A

1. Answer the following sub-questions. Each sub-question carries **one** mark. **10x1=10**
- (a) Define symmetric matrix.
 - (b) Define rank of the matrix.
 - (c) Define consistency and inconsistency of a system of linear equation.
 - (d) Find the value of λ which the system has non-trivial solution $7x+4y+3z=0$, $x+2y+\lambda z=0$ and $x+3y+2z=0$.
 - (e) Define pedal equation of a polar curve.
 - (f) Write the formula for angle between radius vector and tangent.
 - (g) Evaluate : $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x \log(1+x)}$
 - (h) State Cauchy's mean value theorem.
 - (i) Find the 5th derivative of $y=e^{2x}$.
 - (j) State Leibnitz theorem for the nth derivative of a product.

SECTION - B

Answer **any four** of the following questions carries **five** marks each.

4x5=20

2. Using Cayley-Hamilton's theorem find A^{-1} if $A = \begin{bmatrix} 3 & 1 \\ -1 & -2 \end{bmatrix}$.
3. Find the Eigen value and Eigen vector of matrix $A = \begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$.
4. Show that the curve $r=a^n \cos n\theta$ and $r=b^n \sin n\theta$ intersect orthogonally.



5. Evaluate : $\lim_{x \rightarrow 1} \left[\frac{x}{x-1} - \frac{1}{\log x} \right]$.
6. Verify Roll's theorem for the function $f(x) = x^2 - 4x + 8$ in the interval $[1, 3]$.
7. Find the n^{th} derivative of $y = e^{ax} \sin(ax + b)$.

SECTION - C

Answer **any three** of the following questions, each question carries **ten** marks.

3x10=30

8. (a) Find the rank of the matrix by reducing into normal form. **6**
- $$A = \begin{bmatrix} 0 & 1 & -3 & -1 \\ 1 & 0 & 1 & 1 \\ 3 & 1 & 0 & 2 \\ 1 & 1 & -2 & 0 \end{bmatrix}$$
- (b) If 'A' is a symmetric matrix then show that KA is also symmetric matrix. **4**
9. (a) Test for consistency and solve **5**
- $$\begin{aligned} x + y + z &= 6 \\ x - y + 2z &= 5 \\ 3x + y + z &= 8 \end{aligned}$$
- (b) Find the non-trivial solution of the system **5**
- $$\begin{aligned} x + 3y - 2z &= 0 \\ 2x - y + 4z &= 0 \\ x - 11y + 14z &= 0 \end{aligned}$$
10. (a) Find the Pedal Equation for $r^n = a^n \cos n\theta$. **5**
- (b) Derive the formula for Radius of curvature $\int = \frac{(1 + y_1^2)^{3/2}}{y_2}$. **5**
11. (a) Expand $e^{\sin x}$ using Maclaurin's theorem upto the term containing x^4 . **5**
- (b) Verify the Cauchy's mean value theorem $f(x) = x^2 + 3$, $g(x) = x^3 + 1$ in $[1, 3]$. **5**
12. (a) If $y = a \cos(\log x) + b \sin(\log x)$ show that $x^2 y_{n+2} + (2n+1)xy_{n+1} + (n^2+1)y_n = 0$. **5**
- (b) Find the n^{th} derivative of $\sin x \cdot \sin 2x \cdot \sin 3x$. **5**

