No. of Printed Pages : **2**

21BSC4L2LE4

Sl. No.

B.A./B.Com./B.Sc.(GMT)/B.B.A./B.B.M./B.C.A./B.S.W./I.M.B.A./ B.H.M. IV Semester Degree Examination, Sept./Oct. - 2024

ENGLISH

Basic English

(NEP)

Time : 2 Hours | Maximum Marks : 60

SECTION - A

I. Answer the following questions in a word, phrase or a sentence each. **10x1=10**

1. How much did a bottle of honey cost ?

2. Who bails out mandanna ?

3. Mention the Gender identity of Laxmi Narayan Tripathi.

4. Night Rain the poem Originally written in Malayalam by Sugatha Kumari who Translated it into English.

5. Mention the Country which introduced Pechakwha presentation.

6. Mention the two advantages of Group Discussion.

7. Define Facebook.

8. Define Blog.

9. Define E-mail.

10. What is an appreciation mail ?

SECTION - B

II. Answer **any four** of the following. **4x5=20**

11. Narrate how the bees attacked when the minister addressed the public at moodigere ?

12. How does the poet compare herself to a tamed cat and even her occasional meow is objected ?

13. Explain the uses of Blog.

14. Explain how to make an effective group Discussion.

P.T.O.

15. How do the Schools can be transforming as mentioned in the Ted Talk by Trish Mallines Dziko ?

16. Kavita, a student at Government First Grade College has lost her marks cards. She composes an apology mail to his head. Compose an apology mail in this context.

SECTION - C

III. Answer **any three** of the following. **3x10=30**

17. Narrate the first encounter between the Narrator, Mandanna and Lakshmana.

18. Critically appreciate the poem "Cat" that how does patriarchal society confine woman in the family ?

19. Explain the process of how to make an effective Public Speech.

20. How do you differentiate between Facebook and blog ? Explain the advantages and disadvantages of both.

21. Imagine you are an Environmental activist. How do you complain on cutting of the road side trees compose an E - mail.

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No. of Printed Pages : **2**

21BSC4C4BOL

B.Sc. IV Semester Degree Examination, Sept./Oct. - 2024

BOTANY

DSC-IV : Ecology and Conservation Biology

(NEP)

Time : 2 Hours Maximum Marks : 60

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

SECTION - A

Answer **all** the sub-questions. **10x1=10**

1. (a) Define Ecology.
(b) What is soil humus ?
(c) What are Sunken Stomata ?
(d) Give an example for artificial ecosystem.
(e) Define Ecotone.
(f) What is Natality ?
(g) What are Shola forests ?
(h) What is pollution ?
(i) Expand ICUN.
(j) Name India's largest Botanical garden.

SECTION - B

Answer **any four** of the following questions. **4x5=20**

2. Write a note on Physio-Chemical properties of soil.

3. Describe the carbon cycle.

4. Write a note on vegetation of the Western Ghats.

5. Write a note on Inter-specific interactions with examples of plant communities.

6. Write a note on threats to biodiversity.

7. What are Ecological Pyramids ? Describe the number Pyramid.

P.T.O.

SECTION - C

Answer **any three** of the following questions. **3x10=30**

8. What are ecological factors ? Write the effect of temperature and humidity on plants growth.

9. Illustrate the structure of pond ecosystem with suitable diagram.

10. Describe the methods of plant community sampling.

11. Describe the causes, effects and control measures of water pollution.

12. What is In-Situ conservation ? Write a note on National Parks and Sanctuaries.

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No. of Printed Pages : **2**

21BSC4C4ZOL

B.Sc. IV Semester Degree Examination, Sept./Oct. - 2024

ZOOLOGY

DSC 3 : Gene Technology, Immunology and Computational Biology

(NEP)

Time : 2 Hours Maximum Marks : 60

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

(ii) Draw labelled diagrams wherever necessary.

SECTION - A

Answer the following sub-questions. **10x1=10**

1. (a) What is Vector ?

(b) Expand "SCID".

(c) Define Ligase.

(d) What is Transgenic Plant ?

(e) What are Interferons ?

(f) What is Acquired Immunity ?

(g) Name any two Vaccines.

(h) Name any two diseases caused by Bacterial Infection.

(i) Define Biostatistics.

(j) What do you mean by Mode ?

SECTION - B

Answer **any four** of the following questions. **4x5=20**

2. Write a short note on Transgenic Cow.

3. Give a brief account of T-Lymphocytes.

4. Describe briefly about any two Protozoan Infections.

5. Explain briefly about P^{BR322}.

6. Give an account of Histogram.

7. Write a brief note on Biosensors.

P.T.O.

SECTION - C

Answer **any three** of the following questions. **3x10=30**

8. Explain in detail about the steps involved in r-DNA Technology.

9. Explain the mechanism of second line of body defence.

10. Explain Immunization schedule for children.

11. Enumerate the applications of Genetic Engineering.

12. Write a detailed note on Range and Standard Deviation.

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No. of Printed Pages : **2**

21BSC4L2LH4

Sl. No.

B.Sc./B.C.A. IV Semester Degree Examination, Sept./Oct. - 2024

HINDI

IV : The Study of Indian Language

(NEP)

Time : 2 Hours | Maximum Marks : 60

नोट : *लिखावट शुद्ध और देवनागरी लिपि में हो*

पठ्य-(1) रानी नागफनी की कहानी (2) प्रयोजन मूलक हिन्दी।

I. **किन्हीं दस** प्रश्नों को चुनकर उत्तर लिखिए। **10x1=10**

1. किसके होंट कानों तक कटे हुये थे ?

2. नागफनी को किस के हाथ में प्रेम पत्र मिलता है ?

3. नागफनी की सहेली का नाम क्या है ?

4. मुकतलाल पढ़-लिखकर क्या बनना चाहता है ?

5. नागफनी उपन्यास के लेखक कौन है ?

6. अस्तभानु किस परीक्षा में फेल हुआ था ?

7. बेडा घाट किस नदी के किनारे है ?

8. 'ख' वर्ग में किन भाषाओं को रखा गया है ?

9. राजभाषा किसे कहते हैं ?

10. राजभाषा अधिनियम का गठन कब हुआ है ?

11. करेलमुखी की शादी किसके साथ होती है ?

P.T.O.

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

1. नहीं, नये प्रेम के लिए मुझमें उत्साह ही नहीं रहा। अब सिर्फ मर जाने का उत्साह मेरे मन में है।

2. मुख्य अमात्य जी, यह मेरा मित्र है। मैं सारा काम इसकी सलाह से करता हूँ। जब मैं राजा बनूँगा तब यह आपके ही जैसा मुख्य अमात्य होगा। आप इससे क्षमा माँगिए।

3. हाँ अब तुम समझ गए 'जनरल' बीमारी वह है जिसकी दवा का स्टॉक निकालना है जिसकी दवा का स्टॉक निकालना है। यह हर एक को लेनी होगी। इसके बाद उस मरीज की जो अपनी बीमारी होगी, उसकी दवा दी जाएगी।

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

1. राजभाषा किसे कहते हैं? उसके अधिनियम के बारे में विस्तार से लिखिए।

2. अस्तभानु और मुकतलाल के मित्रता के बारे में विस्तार से लिखिए।

3. हरिशंकर परसाई के व्यक्तित्व और कृतित्व पर प्रकाश डालिए।

IV. **किन्हीं तीन** प्रश्नों का उत्तर विस्तार से दीजिए। **3x10=30**

1. बोली भाषा, विभाषा और बोलचाल की भाषा पर प्रकाश डालिए।

2. रानी नागफनी की कहानी में निहित व्यंग्य को स्पष्ट कीजिए।

3. नागफनी और करेलमुखि का मित्र प्रेम पर विवरणात्मक एक लेख लिखिए।

4. रानी नागफनी की कहानी की कथावस्तु अपने वाक्य में लिखिए।

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No. of Printed Pages : **2**

21BSC4C4CHL

B.Sc. IV Semester Degree Examination, Sept./Oct. - 2024

CHEMISTRY

DSC-IV : Inorganic and Physical 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**

(a) What is ionic bond ?

(b) Give Kapastinskii equation.

(c) State Bent's rule.

(d) What is the hybridisation of H_2O molecule ?

(e) What are bonding molecular orbitals ?

(f) What are semiconductors ?

(g) What is bond order ?

(h) Define enthalpy of a system.

(i) What is activation energy ?

(j) Define molar conductance.

SECTION - B

Answer **any four** of the following questions. Each question carries **five** marks. **4x5=20**

2. Calculate the radius ratio value for square planar geometry.

3. Explain dsp^2 hybridisation with examples.

4. List out the rules for LCAO method for the formation of molecular orbitals.

5. Discuss the general properties of metals.

6. Write a note on Joule-Thomson expansion and Joule-Thomson Coefficient.

7. Explain Arrhenius theory of electrolytic dissociation.

P.T.O.

SECTION - C

Answer **any three** of the following questions. Each question carries **ten** marks. **3x10=30**

8. (a) Discuss the structure of ionic crystals of the type AX and AX_2 with example. **6**

(b) Write a note on applications of Fajan's rule. **4**

9. (a) Discuss the postulates of Sidgwick - Powell theory. **6**

(b) Explain sp^3d^2 hybridisation with example. **4**

10. (a) Draw molecular energy level diagram for O_2^- ion calculate bond order and predict the magnetic behaviour. **6**

(b) Draw the molecular orbital diagram for s-s and s-p combination of orbitals. **4**

11. (a) Explain the intermediate compound theory for catalysis. **6**

(b) Calculate the pressure-volume work performed by a system during reversible isothermal expansion of 2 moles of an ideal gas from 2 litres to 10 litres at 20°C. **4**

12. (a) State Kohlrausch's Law. Discuss the application of Kohlrausch's Law. **6**

(b) Write a note on experimental determination of kinetics of inversion of cane sugar by potentiometric method. **4**

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No. of Printed Pages : **3**

21BSC4C4MTL

B.Sc. IV Semester Degree Examination, Sept./Oct. - 2024

MATHEMATICS

DSC - 4 : Integral Transform and Partial Differential Equations

(NEP)

Time : 2 Hours Maximum Marks : 60

Note : *Answer* ***all*** *Sections.*

SECTION - A

Answer the following sub-questions, each sub-question carries **one** mark. **10x1=10**

1. (a) What is Laplace transform of t ?

(b) What is inverse Laplace transform of $\left(\frac{1}{s+4}\right)$?

(c) If $f(x)=x^3$ find the Fourier co-efficient of a_0 in $(-\pi, \pi)$.

(d) Define periodic function.

(e) Define Fourier sine transform.

(f) Write inverse formula for Fourier transform.

(g) What is the z-transform of n ?

(h) What is the inverse z-transform of $\left[\frac{z^2+z}{(z-1)^3}\right]$?

(i) Give an example of partial differential equation.

(j) A linear partial differential equation of the form is $P_p+Q_q=R$ is called _____.

SECTION - B

Answer **any four** of the following questions. **4x5=20**

2. Verify the Convolution theorem for the function $f(t)=1$, $g(t)=\sin t$ by applying Laplace transform.

3. Obtain Fourier series of $f(x)=e^{-ax}$ in $-\pi < x < \pi$.

P.T.O.

4. Find the Fourier transform of $f(x)=e^{-|x|}$.

5. Obtain the z-transform of cos nθ.

6. Solve ptanx + qtany = tanz.

7. Obtain the Fourier series expansion of the function $f(x)=\begin{cases} x \text{ in } 0<x<\pi \\ x-2\pi \text{ in } \pi<x<2\pi \end{cases}$

Hence deduce that $\frac{\pi}{4}=1-\frac{1}{3}+\frac{1}{5}+.....$

SECTION - C

Answer **any three** of the following questions. **3x10=30**

8. (a) Find the inverse Laplace transform of the function $\frac{3s^2+16s+26}{s\left(s^2+4s+13\right)}$

(b) Apply Laplace transform to solve $\frac{dx}{dt}=2x-3y;\ \frac{dy}{dt}=y-2x$ given $x(0)=8\ y(0)=3$

9. (a) Find the Fourier expansion for the function defined by $f(x)=\begin{cases} -1 \text{ in } -3<x<0 \\ 0 \text{ in } x=0 \\ 1 \text{ in } 0<x<3 \end{cases}$

(b) Obtain half range sine series of function $f(x)=x^2$ in $0 < x < \pi$

10. (a) Find the Fourier cosine transform of the function $f(x)=\begin{cases} x\ 0<x<a \\ 0 \text{ otherwise} \end{cases}$

(b) Modulation theorem : If F(x) has the Fourier transform f(s) then prove that F(x) cos(ax) has the Fourier transform $\frac{1}{2}\left[f(s-a)+f(s+a)\right]$

11. (a) Given $Z_T(u_n)=\frac{2z^2+3z+4}{(z-3)^3}$, $|z|>3$ show that $u_1=2$, $u_2=21$

(b) Solve the difference equation $y_{n+2}+y_n=0$ by using z-transform.

12. (a) Find the complete integral of $px+qy=pq$ by Charpits method.

(b) Solve : $z^2(p^2x^2+q^2)=1$

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No. of Printed Pages : **2**

21BSC4C4BTL

B.Sc. IV Semester Degree Examination, Sept./Oct. - 2024

BIOTECHNOLOGY

DSC4 : Molecular Biology

(NEP)

Time : 2 Hours Maximum Marks : 60

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

(ii) Draw the labelled diagrams wherever necessary.

SECTION - A

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

1. (a) What is Nucleotide ?

(b) What are Ribozymes ?

(c) What is the purpose of DNA ligase in replication ?

(d) Which direction does DNA replication occur ?

(e) Give an example of a genetic disorder that results from defective DNA repair.

(f) Expand BRCA.

(g) Define Poly A Tail.

(h) What is translation ?

(i) Define Exons.

(j) Name the terminator codons.

SECTION - B

Answer **any four** of the following questions. **4x5=20**

2. Explain Griffith experiment to prove DNA as genetic material.

3. Give a detailed account on the replication model.

4. What is the significance of the BRCA genes in DNA repair ?

5. Write a short notes on RNA polymerase in Prokaryotes.

P.T.O.

6. Describe the properties of Genetic code.

7. Explain briefly about the Gene Structure in Prokaryotes.

SECTION - C

Answer **any three** of the following questions. **3x10=30**

8. Write the detailed account of Watson and Crick Model of double stranded DNA.

9. Explain the significance of DNA replication in the context of biotechnology and genetic engineering.

10. Explore the relationship between DNA repair and aging, highlighting the impact of accumulated DNA damage on cellular functions.

11. Explain in detail about the mechanism of prokaryotic transcription with the schematic representation.

12. Explain the role of Start and Stop codons in translation and how they influence the beginning and ending of Protein Synthesis.

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No. of Printed Pages : **2**

21BSC4C4PHL

B.Sc. IV Semester Degree Examination, Sept./Oct. - 2024

PHYSICS

DSC 4-IV : Thermal Physics and Electronics
(NEP)

Time : 2 Hours | Maximum Marks : 60

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

(ii) Non-programmed Scientific calculators are allowed.

SECTION - A

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

(a) State First Law of Thermodynamics.

(b) What is reversible process ?

(c) What is absolute zero of temperature ?

(d) Define degree of freedom.

(e) State the law of equipartion of energy.

(f) State Steafan's Boltzmann Law.

(g) What is Forward bias of p-n junction diode ?

(h) What is emitter in a transistor ?

(i) Write the truth table of NOR gate.

(j) Convert 111 in a decimal number.

SECTION - B

Answer **any four** of the following, each carries **five** marks. **4x5=20**

2. Explain Second Law of Thermodynamics in terms of Entropy.

3. What is Joule Thomson effect ? Find the value of Joule Thomson Co-efficient for a perfect gas.

4. State and prove Wein's displacement law.

5. Distinguish between Intrinsic and Extrinsic semiconductor.

6. Explain the working of a Half-Wave rectifier.

7. Derive an expression for voltage gain of an OP-Amp in Non-inverting mode.

P.T.O.

SECTION - C

Answer **any three** of the following, each carries **ten** marks. **3x10=30**

8. (a) Explain the construction and working of a Carnot engine. **6+4**

(b) Distinguish between isothermal and adiabatic process.

9. Derive an expression for Vander Walls gas equation. **10**

10. Explain Maxwell-Boltzmann law of distribution of velocities in an ideal gas and hence obtain expression for RMS velocity. **10**

11. (a) Explain how Zener diode act as a voltage regulator. **5+5**

(b) Explain the working of a transistor as an amplifier.

12. (a) State and prove De Morgan's Theorem. **5+5**

(b) With the help of NAND gate, explain AND and OR gates.

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