22034

No. of Printed Pages : 2

21BSC3L1LK3

B.Sc./B.C.A./B.Sc. (GMT) III Semester Degree Examination, March/April - 2023

KANNADA ಭಾಷಾಪತ್ಯ

ವಿಜ್ಞಾನ ವಿಜಯ–3

(NEP)

Time : 2 Hours | Maximum Marks : 60

ಸೂಚನೆ : ಭಾಷೆ ಮತ್ತು ಬರಹದ ಶುದ್ಧಿಗೆ ಗಮನ ಕೊಡಲಾಗುವುದು.

ವಿಭಾಗ – ಎ

1. ಕೆಳಗಿನ ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ. **10x1=10**

(a) ಸಿದ್ಧಯ್ಯ ಪುರಾಣಿಕರ ಕಾವ್ಯನಾಮವೇನು ?

(b) 'ಇನಸುತ' ಎಂದು ಯಾರನ್ನು ಕರೆಯುತ್ತಾರೆ ?

(c) 'ಕುಮಾರವ್ಯಾಸ ಭಾರತ'ಕ್ಕಿರುವ ಮತ್ತೊಂದು ಹೆಸರೇನು ?

(d) ಕಯ್ಯಾರ ಕಿಞ್ಞಣ್ಣ ರೈ ಅವರು ಬರೆದಿರುವ ಕವಿತೆಯ ಹೆಸರೇನು ?

(e) ಸಿದ್ಧಲಿಂಗಯ್ಯನವರ ಆತ್ಮಚರಿತ್ರೆ ಯಾವುದು ?

(f) 'ಹೆದರದಿರು ಮನವೆ ಹೆಮ್ಮೆಟ್ಟದಿರು ಮನವೆ' ವಚನದ ಕರ್ತೃ ಯಾರು ?

(g) 'ಕೆರೆಗೆ ಹಾರ' ಕಥನ ಗೀತೆಯಲ್ಲಿ ಕೆರೆಗೆ ಹಾರವಾದವರು ಯಾರು ?

(h) 'ಹರಳಿನ ಹಾಂಗ ಹರಳಯ್ಯ' ಯಾವ ಶಿವಶರಣರನ್ನು ಕುರಿತ ಕಥಾನಕವಾಗಿದೆ ?

(i) ಪಂಡಿತ ಸಿದ್ಧರಾಮ ಜಂಬಲದಿನ್ನಿ ಅವರ ಜೀವನ ಚರಿತ್ರೆಯನ್ನು ಬರೆದವರು ಯಾರು ?

(j) 'ಹಲಗಲಿಯ ಪದ' ಲಾವಣಿಯ ಸಂಗ್ರಹಕಾರರು ಯಾರು ?

ವಿಭಾಗ – ಬಿ

ಈ ಕೆಳಗಿನ ಪ್ರಶ್ನೆಗಳಲ್ಲಿ **ಯಾವುದಾದರೂ ನಾಲ್ಕಕ್ಕೆ** ಉತ್ತರಿಸಿರಿ. **4x5=20**

2. 'ಜಮಾ ಖರ್ಚು' ಕವಿತೆಯ ಆಶಯವನ್ನು ಕುರಿತು ಬರೆಯಿರಿ.

3. ಶಲ್ಯನು ಕರ್ಣನ ಸಾರಥಿಯಾದ ಪ್ರಸಂಗದ ಹಿನ್ನೆಲೆಯನ್ನು ಕುರಿತು ಬರೆಯಿರಿ.

4. 'ಭೂಮಿ ತೂಕದ ನಡಿಗೆ' ಕವಿತೆಯಲ್ಲಿ ಪಾರಂಪರಿಕ ಬದುಕಿನ ಗಟ್ಟಿತನ ಹೇಗೆ ಚಿತ್ರಿತಗೊಂಡಿದೆ ?

P.T.O.

5. ಗರತಿಯ ಹಾಡುಗಳಲ್ಲಿ ದಾಂಪತ್ಯದ ಸರಸ ವಿರಸಗಳು ಹೇಗೆ ಅನಾವರಣಗೊಂಡಿವೆ ?

6. ಪಂಡಿತ ಸಿದ್ಧರಾಮ ಜಂಬಲದಿನ್ನಿ ಅವರ ಹುಟ್ಟು ಹಾಗು ಬಾಲ್ಯವನ್ನು ಕುರಿತು ಬರೆಯಿರಿ

7. 'ಸ್ಥಾವರಕ್ಕಳಿವುಂಟು ಜಂಗಮಕ್ಕಳಿವಿಲ್ಲ' ಎಂಬ ವೈಚಾರಿಕ ಪ್ರಬಂಧದ ಮಹತ್ವ ಕುರಿತು ಬರೆಯಿರಿ.

ವಿಭಾಗ – ಸಿ

ಈ ಕೆಳಗಿನ ಪ್ರಶ್ನೆಗಳಲ್ಲಿ **ಯಾವುದಾದರೂ ಮೂರಕ್ಕೆ** ಉತ್ತರಿಸಿರಿ. **3x10=30**

8. ಅಭಿಮನ್ಯು, ಲಕ್ಷ್ಮಣಕುಮಾರ, ದುಶ್ಶಾಸನ ಮತ್ತು ಕರ್ಣರ ಸಾವಿನ ದುಃಖದ ನೆನಪುಗಳನ್ನು ಕವಿ ತನ್ನ ಕಾವ್ಯದಲ್ಲಿ ಹೇಗೆ ವರ್ಣಿಸಿದ್ದಾನೆ ವಿವರಿಸಿ.

9. 'ಪ್ರೇಮಾ ಸೌಧಾಗಾರ' ಕವಿತೆಯ ಆಶಯವನ್ನು ಕುರಿತು ಬರೆಯಿರಿ.

10. ಅಮುಗೆ ರಾಯಮ್ಮಳನ್ನು ಪರಿಚಯಿಸುತ್ತಾ ಆಕೆಯ ವಚನಗಳ ವೈಶಿಷ್ಟ್ಯತೆಯನ್ನು ಕುರಿತು ಬರೆಯಿರಿ.

11. 'ಕೆರೆಗೆ ಹಾರ' ಕಥನ ಗೀತೆಯಲ್ಲಿ ಹೆಣ್ಣಿನ ದುರಂತವಾದ ಬಗೆ ಹೇಗೆ ವಿವರಿಸಿ.

12. ಬ್ರಿಟಿಷರು ರೂಪಿಸಿದ ಕಾನೂನನ್ನು ಹಲಗಲಿಯ ಜನ ಹೇಗೆ ವಿರೋಧಿಸಿದರು ವಿವರಿಸಿ.

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21BSC3L2LE3

B.Sc./BCA/GMT III Semester Degree Examination, March/April - 2023

ENGLISH

Basic English

(NEP)

Time : 2 Hours | Maximum Marks : 60

SECTION - A

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

(a) Mention the Year of publication of 'Silence : the court is in Session'.

(b) Who is the lawyer in the play "Silence : the court is in Session" ?

(c) To whom the Speech "Give me blood I will give you freedom" is addressed to ?

(d) Where did Dr. B.R. Ambedkar deliver the "Constituent Assembly Speech" ?

(e) Define instructional presentation.

(f) What is the purpose of persuasive presentation ?

(g) Give an example of the topic for 'cause and effect' writing.

(h) What is narrative writing ?

(i) Which type of letter is used to express the dissatisfaction of a consumer ?

(j) What is enquiry letter ?

SECTION - B

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

2. Critically comment on the theme 'infanticide' in the play Silence : the court is in Session.

3. What are the views of Dr. Shalini Rajneesh on "equality and empowerment of women" ? Explain.

4. Write an example for persuasive presentation on "Should prisoners be allowed to vote" ?

5. Give a descriptive writing on your first experiment in laboratory.

6. Write a complaint letter to the merchant on "replacement of damaged laptop" you have purchased.

7. Give an example of comparative writing on "E-learning vs classroom learning".

P.T.O.

SECTION - C

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

8. "Silence : the court is in Session" is a social satire. Justify.

9. What is the historical importance of Subhashchandra Bose's speech "Give me blood, I will give you freedom" ? Explain how Subhashchandra Bose inspired the youth for freedom struggle.

10. Consider the topic "Pros and Cons of present education system for decision making presentation.

11. What are the various types of writing and explain the types ?

12. Write a letter to T.S. Furniture and services, Rajajinagar, Banglore, for placing an order for 70 office tables to set up new firm.

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No. of Printed Pages : 2

21BSC3L2LH3

B.Sc./BCA III Semester Degree Examination, March/April - 2023

HINDI

Paper No. 1 : The Study of Indian Language

(NEP)

Time : 2 Hours | Maximum Marks : 60

सूचना : *सुंदर लेखन अपेक्षित है, देवनागरी लिपि में उत्तर दें।*

Text : (i) आधुनिक हिन्दी एकांकी,

(ii) जनसंचार माध्यम और हिन्दी।

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

(a) चंदवरदाई किस एकांकी का पात्र है?

(b) नए मेहमान एकांकी की रचना किसने की है?

(c) शब्द-बेधी बाण चलाने वाले राजा का नाम क्या है?

(d) रेडियो का आविष्कार किसने किया है?

(e) प्रेमलता पात्र किस एकांकी में आता है?

(f) दोनों नए मेहमानों के नाम बताइए।

(g) बीना किसकी पत्नी है?

(h) गोरदेश के राजा का नाम बताइये।

(i) एक घूँट एकांकी के लेखक कौन है?

(j) भारत में प्रेस की स्थापना कब हुई थी?

(k) हिन्दी का पहला समाचार पत्र कौन-सा है?

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

(a) सुलतान, आवाज पर तीर मारने के लिए आँखों की जरूरत नहीं होती?

(b) भाभी, मैं जरा जल्दी से यह पुलटीस निगल लूँ अगर बड़े भैया भी आ गये तो कहीं सचमुच ही इस टकने पर न बंधवाना पड़े।

(c) खाना तो बनाना ही पड़ेगा, कोई भी हों जब आए हैं तो खाना जरूर खाएंगे, थोडा-सा बना लो।

P.T.O.

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

(a) 'रेडियो' का उद्भव, विकास पर प्रकाश डालिए।

(b) जनसंचार माध्यम का अर्थ-स्वरूप और कार्यों पर चर्चा कीजिए।

(c) 'नए मेहमान' एकांकी का सार अपने वाक्य में लिखिए।

(d) 'पृथ्वीराज की आँखे' एकांकी की आलोचना कीजिए।

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

(a) 'अंडे के छिलके' एकांकी का सार अपने वाक्यों में विस्तार से लिखिए।

(b) 'इंटरनेट' का महत्व और उसकी विशेषताओं पर प्रकाश डालिए।

(c) 'शहाजाँह की आँसू' एकांकी की आलोचना कीजिए।

(d) 'दूरदर्शन' पर एक लेख लिखिए।

5. किसी एक विषय पर निबंध लिखिए। 1x10=10

(a) राष्ट्रीय एकात्मकता

(b) आजादी का अमृत महोत्सव।

(c) जल प्रदूषण

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No. of Printed Pages : **2**

21BSC3C3PHL

B.Sc. III Semester Degree Examination, March/April - 2023

PHYSICS

03 : Wave Motion and Optics

(NEP)

Time : 2 Hours | Maximum Marks : 60

Note : *(i) Answer **all** the 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) What are progressive waves ?

(b) State the principle of Superposition of waves.

(c) What is end correction ?

(d) Define Reverberation time.

(e) What is Fresnel's biprism ?

(f) What is thin film ?

(g) On what factors resolving power of a grating depends.

(h) What is the condition for minimum intensity by a circular aperature in fresnel diffration ?

(i) What is optical activity ?

(j) Define Stimulated emission.

SECTION - B

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

2. Write any five applications of beats.

3. Differentiate between progressive wave and standing wave.

4. Derive an expression for fringe width in an interference pattern of Young's double slit experiment.

5. Define resolving power of a grating and obtain an expression for it.

6. Describe the method of producing plane polarised light by reflection.

7. Distinguish between Zone plate and a Convex lens.

P.T.O.

SECTION - C

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

8. (a) Derive Newton's formula for velocity of sound. Discuss laplace correction for Newton's formula. **7+3**

(b) Write any three uses of Lissajous figures.

9. (a) Derive the expression for Sabine's formula. **5+5**

(b) Obtain the expression for normal modes of the string.

10. (a) Give the theory of Newton's rings by reflected light. **5+5**

(b) Explain Huygen's theory and concept of wavefront.

11. (a) Describe Fraunhofer diffraction due to a single slit and deduce the position of maxima and minima. **7+3**

(b) A plane wavefront of light of wavelength 5×10^{-5} cm falls on an aperature and diffraction pattern is observed in an eye piece at a distance of 1 meter from the aperature find the radius of the 100^{th} half period element.

12. (a) Explain the principle and working of a He-Ne laser. **7+3**

(b) Calculate the length of the solution of Concentration 50 kg m^{-3} which produces an optical rotation of 45°. The specific rotation of the solution is 0.0523 rad m^2 kg^{-1}.

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No. of Printed Pages : 2

21BSC3C3MTL

B.Sc. III Semester Degree Examination, March/April - 2023

MATHEMATICS

Ordinary Differential Equations & Real Analysis - I

(NEP)

Time : 2 Hours | Maximum Marks : 60

Note : *Answer* ***all*** *questions*

SECTION - A

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

(a) Define order of the differential equation.

(b) Solve $(P-5)(P+3)=0$.

(c) Find the complementary function of $(D^2-1)y=4$.

(d) Find the particular integral of $(D^3-3D^2+4)y=e^{3x}$.

(e) Show that the equation $(1+x^2)y''+4xy'+2y=\sec^2 x$ is exact.

(f) Write Strum Liouville boundary value problem.

(g) Write the condition for integrability of total differential equation.

(h) Define total differential equation.

(i) Compute U(P,f) for $f(x)=x$ on $[0,1]$ and $P=\left\{0, \frac{1}{3}, \frac{2}{3}, 1\right\}$ be a partition of $[0,1]$

(j) Define Oscillatory sum.

SECTION - B

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

2. Solve $x.\frac{dy}{dx}-2y=2x$.

3. Solve $(D^2-1)y = 2+5x$.

4. Solve $y'' + 2xy' + \left(x^2 + 5\right) y = xe^{\frac{-x^2}{2}}$ by changing dependent variable.

P.T.O.

5. Solve $(y^2+yz)dx+(xz+z^2)dy+(y^2-xy)dz=0$ by verifying the condition of integrability.

6. Let f be a bounded function defined on [a,b] and m, M be the infimum and supremum of f on [a, b]. Then for any partition P of [a, b] show that $m(b-a) \le L(p, f) \le U(p, f) \le M(b-a)$

7. Solve $(D^2-2D+5)y=e^{2x}.\sin x$

SECTION - C

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

8. (a) Solve $(4x+3y+1)dx+(3x+2y+1)dy=0$.

   (b) Find the general and singular solution of $x^2(y-Px)=yp^2$ by using $x^2=u$ and $y^2=v$.

9. (a) Solve $x^2\frac{d^2y}{dx^2}+x\frac{dy}{dx}+9y=\sin(3\log x)$.

   (b) Solve $Dx+7x-y=0$
   $Dy+2x+5y=0$

10. (a) Solve $\frac{d^2y}{dx^2}+\tan x.\frac{dy}{dx}+\cos^2 x.y=0$ using $z=\sin x$ by changing independent variable.

    (b) Solve $(1-x)\frac{d^2y}{dx^2}+x\frac{dy}{dx}-y=(1-x)^2, x\neq 1$ by the method of variation of parameters.

11. (a) Solve $(y^2+z^2-x^2)dx-2xy\,dy-2xz\,dz=0$.
    (b) Solve $3x^2.dx+3y^2.dy-(x^3+y^3+e^{2z})dz=0$.

12. (a) A bounded function f(x) defined on [a,b] is Riemann integrable on [a, b], if and only if for each $\epsilon > 0$ there exists a partition P of [a, b] such that : $0 < U(P, f)-L(P, f) < \epsilon$

    (b) If $f(x) \in R$ [a, b] and $\phi(x)$ is a primitive of f(x) then show that :

$$\int_a^b f(x).dx=\phi(b)-\phi(a)$$

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No. of Printed Pages : 2

21BSC3C3CHL

B.Sc. III Semester Degree Examination, March/April - 2023

CHEMISTRY

Paper No. 3 : Analytical and Organic 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) Define wave number and give its unit. **1**

   (b) Write the principle of paper chromatography. **1**

   (c) What is spectrophotometer ? **1**

   (d) What is Rf value ? **1**

   (e) State the Nernst distribution law. **1**

   (f) What are carbocations ? **1**

   (g) What is Van Deemters equation ? **1**

   (h) Define enantiomers and give an example. **1**

   (i) What is carbon ion ? **1**

   (j) What is geometrical isomerism ? **1**

SECTION - B

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

2. Explain calibration graph. **5**

3. Discuss the Instrumentation of nephelometry. **5**

4. Briefly discuss the applications of Ion-exchange chromatography. **5**

5. How does the delocalization of carbonium ion leads to Dienone phenol rearrangement ? Explain with a suitable example. **5**

6. Define mesocompound and give any two examples. **5**

7. Write a note on thin layer chromatography. **5**

P.T.O.

SECTION - C

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

8. (a) Derive Beer's-lambert law. 6
(b) Give any four limitations of Beer's law. 4

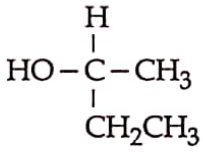
9. (a) Write any five differences between nephelometry and turbidimetry. 6
(b) What are factors affecting on column efficiency ? Explain. 4

10. (a) Define chromatography. Give any four principles of Thin layer chromatography. 6
(b) Discuss the solvent extraction procedure with a suitable example. 4

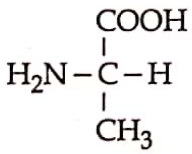
11. (a) How does free radicals stabilized by (i) Inductive effect (ii) Resonance effect. 6
(b) Discuss the effect of catalyst on reaction mechanism ? 4

12. (a) What are resolution ? Explain the diastereomeric method of seperation of enantiomers from its racemic mixture. 6
(b) Check the order of priority and assign the R/S configuration of the following. 4

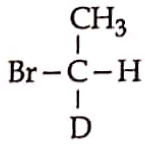
(i) 2-Hydroxybutane



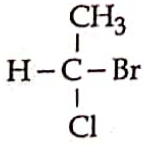
(ii) 2-Amino Propanoic acid



(iii) 2-Bromo-2-Deutoriumethane



(iv) 1-Bromo-1-Chloroethane



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No. of Printed Pages : 2

21BSC3C3ZOL

B.Sc. III Semester Degree Examination, March/April - 2023

ZOOLOGY

Molecular Biology, Bioinstrumentation and Techniques in Biology

(NEP)

Time : 2 Hours | Maximum Marks : 60

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

(ii) Draw diagrams wherever necessary.

SECTION - A

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

(a) What is recon ?

(b) What is Terminator codon ? Give any one example.

(c) What do you mean by splicing ?

(d) Define glycosylation.

(e) What is dark field microscopy ?

(f) Expand TLC and HPLC.

(g) What is Autoradiogram ?

(h) Expand PCR and ELISA.

(i) What is translation ?

(j) Name the fields in which gel-electrophoresis used.

SECTION - B

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

2. Briefly explain the properties of genetic code.

3. Write a short note on Lac-operon concept.

4. Explain the principle and applications of phase contrast microscopy.

5. List out the applications of SDS-PAGE gel-electrophoresis.

6. Give an account of thin layer chromatography.

7. Explain the translation mechanism in eukaryotes.

P.T.O.

SECTION - C

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

8. Explain the steps involved in the process of transcription mechanism in prokaryotes.

9. Explain the Role of chromatin in gene expression.

10. Describe the Applications of Fluorescence and confocal microscopy.

11. Explain the steps involved in DNA finger printing.

12. Give the detailed note on the principle and applications of centrifugation.

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20422

No. of Printed Pages : **2**

21BSC3C3BOL

B.Sc. III Semester Degree Examination, March/April - 2023

BOTANY

Paper No. III : Plant Anatomy and Developmental Biology

(NEP)

Time : 2 Hours | Maximum Marks : 60

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

(ii) Draw diagram wherever necessary.

SECTION - A

Answer **all** questions. **10x1=10**

1. (a) Name the Living Mechanical tissue.

(b) What is arenchyma ?

(c) What is concentric type of vascular bundle ?

(d) What is Isobilateral leaf give example.

(e) Expand SAM.

(f) What is Dormancy ?

(g) What is Microsporogenesis ?

(h) What is tapetum ?

(i) Define self pollination.

(j) What is Embryo ?

SECTION - B

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

2. Explain the Tunica Corpus theory.

3. Describe the Monocot stem with neat labelled diagram.

4. Write the contributions of Indian Embryologist BGL Swami.

5. Explain the structure and functions of root apical meristem.

6. Explain the TS of Anther with diagram.

7. Define ovule. Explain the types of ovule.

P.T.O.

SECTION - C

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

8. Describe the Internal structure of Boerhaavia stem with neat labelled diagram.

9. What are Complex Tissue ? Explain the elements of xylem with neat labelled diagram.

10. Describe the Microsporogenesis with neat labelled diagram.

11. What is Endosperm ? Explain the different kind of Endosperm.

12. Write short note on :

    (a) Ultra structure of Meristems.

    (b) What is root cap ? Explain origin of lateral roots.

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20121

No. of Printed Pages : 2

21BSCOEPH

B.Sc. III Semester (NEP) Degree Examination, March/April - 2023

PHYSICS (OPEN ELECTIVE)

Space Missions

Time : 2 Hours Maximum Marks : 60

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

ಗಮನಿಸಿ : ಎಲ್ಲಾ ವಿಭಾಗಗಳನ್ನು ಉತ್ತರಿಸಿರಿ.

(ii) Scientific calculators are not allowed.

ವೈಜ್ಞಾನಿಕ ಕ್ಯಾಲುಕುಲೇಟರು ಅನ್ನು ಉಪಯೋಗಿಸಬಾರದು.

SECTION - A / ವಿಭಾಗ – ಎ

10x1=10

1. Answer the following.
ಈ ಕೆಳಗಿನವುಗಳನ್ನು ಉತ್ತರಿಸಿರಿ.

(a) Name one natural satellite of Jupiter.
ಗುರುಗ್ರಹದ ಒಂದು ನೈಸರ್ಗಿಕ ಉಪಗ್ರಹವನ್ನು ಹೆಸರಿಸಿ.

(b) Define Geostationary satellite.
ಭೂಸ್ಥಿರ ಉಪಗ್ರಹಗಳನ್ನು ವಿವರಿಸಿ.

(c) When does ISRO established ?
ISRO ಅನ್ನು ಯಾವಾಗ ಸ್ಥಾಪಿಸಲಾಯಿತು ?

(d) When does Mangalayana-2 launched ?
ಮಂಗಳಯಾನ–2 ಯಾವಾಗ ಉಡಾವಣೆಯಾಯಿತು ?

(e) Who is the present chairman of ISRO ?
ಇಸ್ರೋದ ಪ್ರಸ್ತುತ ಅಧ್ಯಕ್ಷರು ಯಾರು ?

(f) What is Space Science ?
ಬಾಹ್ಯಾಕಾಶ ವಿಜ್ಞಾನ ಎಂದರೇನು ?

(g) Who was first person landed on moon ?
ಚಂದ್ರನ ಮೇಲೆ ಇಳಿದ ಮೊದಲ ವ್ಯಕ್ತಿ ಯಾರು ?

(h) Who is the "Father of Indian space program" ?
"ಭಾರತೀಯ ಬಾಹ್ಯಾಕಾಶ ಕಾರ್ಯಕ್ರಮದ ಪಿತಾಮಹ" ಯಾರು ?

(i) Name the first private space mission organisation.
ಮೊದಲ ಖಾಸಗಿ ಬಾಹ್ಯಾಕಾಶ ಸಂಸ್ಥೆ ಯಾವುದು ?

(j) How many satellites were carried by PSLV C-37 in 2019 ?
2019 ರಲ್ಲಿ PSLV C-37 ಎಷ್ಟು ಉಪಗ್ರಹಗಳನ್ನು ಹೊತ್ತೊಯ್ದಿದೆ ?

P.T.O.

SECTION - B / ವಿಭಾಗ – ಬಿ

Answer **any four** of the following. 4x5=20
ಈ ಕೆಳಗಿನ **ಯಾವುದಾದರೂ ನಾಲ್ಕಕ್ಕೆ** ಉತ್ತರಿಸಿರಿ.

2. Explain different types of orbits.
ವಿವಿಧ ರೀತಿಯ ಕಕ್ಷೆಗಳನ್ನು ವಿವರಿಸಿ.

3. Name five successful space programs.
ಐದು ಯಶಸ್ವಿ ಬಾಹ್ಯಾಕಾಶ ಕಾರ್ಯಾಚರಣೆಯ ಬಗ್ಗೆ ಬರೆಯಿರಿ.

4. Write a note on X-15 space mission.
X-15 ಬಾಹ್ಯಾಕಾಶ ಕಾರ್ಯಾಚರಣೆಯ ಬಗ್ಗೆ ಸಂಕ್ಷಿಪ್ತವಾಗಿ ಬರೆಯಿರಿ.

5. Explain in brief INSAT series.
INSAT ಸರಣಿಯ ಕುರಿತು ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

6. Write five applications of satellites in communication.
ಸಂವಹನ ವ್ಯವಸ್ಥೆಯಲ್ಲಿ ಉಪಗ್ರಹಗಳ ಐದು ಉಪಯೋಗಗಳನ್ನು ತಿಳಿಸಿರಿ.

7. How space technologies used in local district ?
ಸ್ಥಳೀಯ ಜಿಲ್ಲೆಯಲ್ಲಿ ಬಾಹ್ಯಾಕಾಶ ತಂತ್ರಜ್ಞಾನವನ್ನು ಹೇಗೆ ಬಳಸುತ್ತಾರೆ ?

SECTION - C / ವಿಭಾಗ – ಸಿ

Answer **any three** of the following. 3x10=30
ಈ ಕೆಳಗಿನ **ಯಾವುದಾದರೂ ಮೂರಕ್ಕೆ** ಉತ್ತರಿಸಿ.

8. (a) Write a short notes on space machines.
ಬಾಹ್ಯಾಕಾಶ ಯಂತ್ರಗಳ ಬಗ್ಗೆ ಸಂಕ್ಷಿಪ್ತವಾಗಿ ವಿವರಿಸಿ.

   (b) Write a note on artificial satellites.
ಕೃತಕ ಉಪಗ್ರಹಗಳ ಬಗ್ಗೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

9. Explain, in brief 10 major space centres of the world.
ವಿಶ್ವದ 10 ಪ್ರಮುಖ ಬಾಹ್ಯಾಕಾಶ ಕೇಂದ್ರಗಳ ಬಗ್ಗೆ ಬರೆಯಿರಿ.

10. Explain the achievement of NASA.
ನಾಸಾದ ಸಾಧನೆಗಳ ಬಗ್ಗೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

11. Write a note on Chandrayan-1 and Chandrayan-2.
ಚಂದ್ರಯಾನ–1 ಮತ್ತು ಚಂದ್ರಯಾನ–2 ಕುರಿತು ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

12. How satellites are used in (i) agriculture and (ii) weather forecasting ?
ಈ ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಉಪಗ್ರಹ ಹೇಗೆ ಬಳಸಲಾಗುವುದು ?
(i) ಕೃಷಿ (ii) ಹವಾಮಾನ ಮುನ್ಸೂಚನೆ

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10305

B.Sc. III Semester Degree Examination, March/April - 2023

PHYSICS

Paper No. III : Electricity, Vector Analysis and Electromagnetic Theory

(CBCS)

Time : 3 Hours | Maximum Marks : 70

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

(ii) Non-programmed scientific calculators are allowed.

SECTION - A

I. Answer the following. **15x1=15**

1. What is Capacity reactance ?
2. What is impedence ?
3. State Thevenin's theorem.
4. What is high pass filter ?
5. Define Kirchoff's voltage law.
6. What is resistivity ?
7. Define charge sensitivity of a moving coil galvanometer.
8. Why Helmholtz Galvanometer has 2 coils ?
9. Write the expression for quality factor of a LCR series circuit.
10. State Biot-Savart law.
11. In which circuit the current leads the applied ac voltage by 90°.
12. Cross product of two vectors is scalar or vector.
13. Define divergence of a vector.
14. Define rms value of current.
15. Define dipole moment.

P.T.O.

SECTION - B

II. Answer **any five** of the following. **5x5=25**

16. Write a note on colour coding of resistor.

17. State and explain maximum power transform theorem.

18. Derive an expression for current and impedance in RL Series circuit using J. notation.

19. Give the theory of a moving coil galvanometer.

20. Prove that div curl A=0.

21. Derive an expression for electrostatic deflection sensitivity of a CRO.

22. Write a note on Poynting vector.

SECTION - C

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

23. (a) Explain with necessary theory for the determination of self induction of a coil using Anderson's bridge. **5+5**

(b) An inductance of 10 mH and a resistance of 50 ohm are connected in series to a 220 V, 50 Hz ac mains. Calculate the value and phase of the current.

24. (a) Define the terms average value and rms value of a.c. current and obtain the expression for rms value of a.c. current. **5+5**

(b) Give the physical significance of divergence of a vector field.

25. (a) Explain the procedure of finding Thevenin's equivalent circuit. **5+5**

(b) Explain how voltage, current frequency and phase of the signals are measured using CRO.

26. (a) State and explain Amper's circuit law. **7+3**

(b) A galvanometer has coils of radius 11×10^{-2} m and number of turns $70\sqrt{5}$. Calculate the current through the coils which produces a deflection of 45°.
$B_H = 0.32 \times 10^{-4}$ T

27. (a) Explain physical significance of Maxwell's equations. **5+5**

(b) Describe Hertz experiment to produce electromagnetic waves.

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No. of Printed Pages : **2**

10250

30323

B.Sc. III Semester Degree Examination, March/April - 2023

MATHEMATICS-V

Paper No. 3.1 : Algebra-III

(CBCS)

Time : 3 Hours | Maximum Marks : 60

Note : *Answer* ***all*** *the sections.*

SECTION - A

Answer **any ten** of the following. **10x2=20**

1. Define ring with zero divisor and without zero divisor.

2. State all invertiable elements in the $M_2(z)$.

3. Define Sub ring and give example.

4. Define ideal.

5. If $(z,+,\cdot)$ be a ring of integers and $(2z,+,*)$ be a ring of even integer $*$ defined by $a*b=\frac{ab}{2}$ then $f: z \to 2z$ defined by $f(x)=2x \; \forall x \in z$.

6. If $f: R \to R'$ is an isomorphism of rings then prove that isomorphic image of a ring with unity is a ring with unity.

7. Define vector subspace and give example.

8. Let $V=R^3$ the vector space of all ordered triplets of real number over the field of real numbers. Show that the subset $W=\{x, 0, 0 \mid x \in R\}$ is a subspace of R^3.

9. Show that the vector $e_1=(1, 0, 0 \ldots\ldots 0)$, $e_2=(0, 1, 0 \ldots\ldots 0)\ldots\ldots$ $e_n=(0, 0 \ldots\ldots 1)$ of the vector space $V_n(R)$ are linearly independent.

10. Determine whether the set $\{(1, 2, 1), (3, 4, -7), (3, 1, 5)\}$ is a basis of $V_3(R)$.

11. If $T: V_1(R) \to V_3(R)$ is defined by $T(x)=(x, x^2, x^3)$, verify whether T is linear or not.

12. Define Rank of linear transformation.

P.T.O.

SECTION - B

Answer **any three** of the following. **3x5=15**

13. The ring $(Z_n, +_n, X_n)$ is an integral domain and hence a field iff 'n' is prime integer.

14. A non empty subset S of a ring is subring of R iff $a \in S, b \in S \Rightarrow a - b \in S$
$a \in S, b \in S \Rightarrow ab \in S$.

15. The homomorphism f of a ring R onto a ring R' is an isomorphic iff $\text{Ker} f = (0)$.

16. State and prove the fundamental theorem of Ring Homomorphism.

SECTION - C

Answer **any three** of the following. **3x5=15**

17. If any vector space V over a field F:

(a) $C \cdot 0 = 0 \; \forall \; C \in F$

(b) $0 \cdot \alpha = 0 \; \forall \; \alpha \in V$

(c) $(-C)\alpha = -C(\alpha) = (C - \alpha) \; \forall \; C \in F \; \forall \; \alpha \in V$

18. Show that the vector $(2, -5, 3) \in V_3(R)$ is not in L(S) where $S = \{(1, -3, 2), (2, -4, -1), (1, -5, 7)\}$.

19. The set $\{(x_1, x_2, x_3), (y_1, y_2, y_3), (z_1, z_2, z_3)\}$ of vector of the vector space $V_3(R)$ is linear dependent iff $\begin{vmatrix} x_1 & x_2 & x_3 \\ y_1 & y_2 & y_3 \\ z_1 & z_2 & z_3 \end{vmatrix} = 0$

20. Find the dimension and basis of the subspace spanned by the vectors (2, 4, 2), (1, −1, 0), (1, 2, 1) and (0, 2, 1) in $V_3(R)$.

SECTION - D

Answer **any two** of the following. **2x5=10**

21. Find the linear transformation $T : R^2 \to R^3$ such that $T(-1,1) = (-1, 0, 2)$ and $T(2, 1) = (1, 2, 1)$.

22. Find the matrix of the linear transformation $T : V_2(R) \to V_3(R)$ defined by $T(x, y) = (x + y, x, 3x - y)$ with respect to a standard bases.

23. State and prove Rank-nullity theorem.

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No. of Printed Pages : 3

10299 **30353**

B.Sc. III Semester Degree Examination, March/April - 2023

MATHEMATICS

Paper No. VI - 3.2 : Differential Equation-I

(CBCS)

Time : 3 Hours | Maximum Marks : 60

Note : *Answer* ***all*** *the sections.*

SECTION - A

Answer **any ten** of following. **2x10=20**

1. Find the order and degree of the equation $\sqrt{1+\frac{dy}{dx}} = \frac{d^2y}{dx^2}$.
2. Form the differential equation of family of curves $y = e^x (A \cos x + B \sin x)$.
3. Solve $\frac{dy}{dx} + xy = xy^3$.
4. Show that the equation $\cos x\, dx + e^y \sin x\, dy = 0$ is exact and hence solve it.
5. Find the orthogonal trajectories of family of parabola $y^2 = 4ax$.
6. Solve $(D^3 + 6D^2 + 3D - 10)y = 0$.
7. Solve $(D^3 + 1)y = 3 + 5e^{2x}$.
8. Find particular Integral of $(D^3 + 1)\, y = \cos^2\left(\frac{x}{2}\right)$.
9. Find the general and singular solution of $y = px + \frac{a}{p}$.
10. Solve $P^2 - 13P + 42 = 0$.
11. Show that the equation $(1+x^2)\frac{d^2y}{dx^2} + 3x\frac{dy}{dx} + y = 0$ is exact.
12. Solve $\frac{dx}{y^2} = \frac{dy}{x^2} = \frac{dz}{x^2y^2z^2}$.

P.T.O.

SECTION - B

Answer **any three** of following. **5x3=15**

13. Solve $x^2 \frac{dy}{dx} + xy = y^2x^2$.

14. Solve for y : $y = x+2\tan^{-1}p$.

15. Solve Bernoulli's equation $x^3 \frac{dy}{dx} - x^2y = -y^4 \cdot \cos x$

16. Solve $(y^4+2y)dx+(xy^3+2y^4-4x)dx=0$.

17. Reduce $(x^2-1)p^2-2xyp+y^2-1=0$ to Clairaut's equation and find its general and singular solution.

SECTION - C

Answer **any three** of following. **5x3=15**

18. Solve $(D^2+3D+2)y = e^{2x}\sin x$.

19. Solve $x^2 \frac{d^2y}{dx^2} + 5x\frac{dy}{dx} + 4y = x\log x$.

20. Verify condition of Integrability and Solve $(2y-z)dx+4dy-2dz = 0$.

21. Solve simultaneous equation $D^2x-3x-y = e^t$ and $Dy-2x = 0$.

22. Solve $\frac{dx}{x^2+y^2+yz} = \frac{dy}{x^2+y^2-xz} = \frac{dz}{z(x+y)}$.

SECTION - D

Answer **any two** of following. **5x2=10**

23. Solve $x\frac{d^2y}{dx^2} - (2x+2)\frac{dy}{dx} + (x+2)y = (x-2)e^{2x}$ by finding the part of CF.

24. Solve $\frac{d^2y}{dx^2} + (2\cos x + \tan x)\frac{dy}{dx} + y\cos^2 x = \cos^4 x$ by change of independent variables.

25. Solve $x^2\frac{d^2y}{dx^2} - 2x(1+x)\frac{dy}{dx} + 2(1+x)y = x^3$ by reducing it to normal form.

26. Show that the equation $(2x^2 + 3x)\frac{d^2y}{dx^2} + (6x+3)\frac{dy}{dx} + 2y = e^x(x+1)$ is exact and solve it.

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36322

10423

B.Sc. III Semester Degree Examination, March/April - 2023

Chemistry - III

(CBCS)

Time : 3 Hours | Maximum Marks : 70

Notes : *(i)* ***Section A*** *contains questions from Inorganic, organic and physical chemistry.*

(ii) ***Section B*** *contains questions from Inorganic chemistry.*

Section C *contains questions from organic chemistry.*

Section D *contains questions from physical chemistry.*

*(iii) Answer all sections **A**, **B**, **C** and **D**.*

SECTION-A

Answer **any ten** of the following : **10x1=10**

1. Why copper becomes green when exposed to moist air for a long time ? 1

2. Write Nernst distribution law for molecular association. 1

3. What is the product of oxidation of a secondary Alcohol ? 1

4. How many 'd' electrons are in Chromium ? 1

5. Write BET Equation. 1

6. Define third law of thermodynamics. 1

7. Which of the following element is not Lanthanide ? 1
   (i) Er (ii) Pu (iii) Tm (iv) Tb

8. Which poistion of the nitro group makes the phenol more acidic ? 1

9. How will you distinguish phenol and ethyl alcohol. 1

10. State Compton effect. 1

11. What are aliphatic monocarboxylic acids ? Give an example. 1

12. Which of the following products are obtained when Na_2CO_3 is added to a solution of copper sulphate ? 1

P.T.O.

SECTION-B

Answer **any two** of the following : **2x10=20**

13. (a) What is Lanthanide contraction ? Explain the cause and its consequence on electronegativity and basicity of oxides and hydroxides. **6**
    (b) Write a note on symbiosis. **4**

14. (a) Define HSAB principle. Give the characteristic properties of Hard and Soft Acids and Bases. **6**
    (b) Define catalytic properties of transition elements. **4**

15. (a) Discuss the comparative treatment of elements of second and third transition series with their analogous of first transition series with respect to : **6**
        (i) Ionic radii
        (ii) Magnetic properties
        (iii) Oxidation states
    (b) Discuss in brief variable oxidation states of actinides. **4**

SECTION-C

Answer **any two** of the following : **2x10=20**

16. (a) How phenol is prepared from Dow and Cumene process ? **6**
    (b) Give any three methods of preparations of carboxylic acids. **4**

17. (a) Write the structural formula for all alkyl halides of the molecular formula C_4H_9Br. Name each according to common and IUPAC system. **6**
    (b) Explain the mechanism of Reimer-Tiemann reaction. **4**

18. (a) Explain the mechanism of pinacol-pinacolone reaction. **6**
    (b) Write the distinguish tests for primary, secondary and tertiary alcohols by dichromate test. **4**

SECTION-D

Answer **any two** of the following : **2x10=20**

19. (a) Define third law of thermodynamics and explain the Nernst heat theorem. **6**
    (b) Explain De-Broglie hypothesis. **4**

20. (a) Define and explain photoelectric effect. **6**
    (b) Derive the expression for the molecular dissociation of the solute in one of the solvent. **4**

21. (a) Derive Schrodinger's fundamental wave equation. **6**
    (b) State and explain Carnot's theorem. **4**

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No. of Printed Pages : **2**

Sl. No. 20222

21BSCOEBO

B.Sc. III Semester Degree Examination, March/April - 2023

BOTANY

Mushroom Cultivation (OE)

(NEP)

Time : 2 Hours | Maximum Marks : 60

I. Answer **all** the following questions. **10x1=10**
ಈ ಕೆಳಗಿನ ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ.

1. (a) Mycelium.
ಮೈಸಿಲಿಯಂ.

(b) Name the Kingdom of mushroom.
ಅಣಬೆಯ ಸಾಮ್ರಾಜ್ಯವನ್ನು ಹೆಸರಿಸಿ.

(c) What is Spawn ?
ಅಣಬೆಬೀಜ ಎಂದರೇನು ?

(d) Expand P.D.A.
ಪಿ.ಡಿ.ಎ. ಯನ್ನು ವಿಸ್ತರಿಸಿ.

(e) Mention the raw material used for mushroom cultivation.
ಅಣಬೆ ಬೇಸಾಯದಲ್ಲಿ ಬಳಸುವ ಕಚ್ಚಾ ವಸ್ತುವನ್ನು ತಿಳಿಸಿರಿ.

(f) Name the methods of mushroom preservation.
ಅಣಬೆಯನ್ನು ಸಂಸ್ಕರಿಸುವ ವಿಧಾನಗಳನ್ನು ಹೆಸರಿಸಿ.

(g) Name the mushroom disease caused by bacteria.
ಬ್ಯಾಕ್ಟೀರಿಯಾದಿಂದ ಉಂಟಾಗುವ ಅಣಬೆ ರೋಗವನ್ನು ಹೆಸರಿಸಿ.

(h) Name any one medicinally important mushroom.
ಔಷಧಿಯ ಗುಣವನ್ನು ಹೊಂದಿರುವ ಯಾವುದಾದರೂ ಒಂದು ಮುಖ್ಯ ಅಣಬೆಯನ್ನು ಹೆಸರಿಸಿ.

(i) Name the vitamin abundantly found in mushroom.
ಅಣಬೆಯಲ್ಲಿ ಹೇರಳವಾಗಿರುವ ಜೀವಸತ್ವವನ್ನು ಹೆಸರಿಸಿ.

(j) Name any one dish prepared from mushroom cultivation.
ಅಣಬೆಯಿಂದ ತಯಾರಿಸುವ ಯಾವುದಾದರೊಂದು ಆಹಾರ ಪದಾರ್ಥವನ್ನು ಹೆಸರಿಸಿ.

P.T.O.

II. Answer **any four** of the following questions. **4x5=20**
ಈ ಕೆಳಗಿನ **ಯಾವುದಾದರೂ ನಾಲ್ಕು** ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ.

2. Write a note on history of mushroom cultivation.
ಅಣಬೆ ಬೇಸಾಯದ ಇತಿಹಾಸವನ್ನು ಕುರಿತು ಬರೆಯಿರಿ.

3. Write a note on facilities required for spawn production.
ಅಣಬೆ ಬೀಜ ಉತ್ಪಾದನೆಗೆ ಅಗತ್ಯವಿರುವ ಸೌಲಭ್ಯಗಳ ಬಗ್ಗೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

4. Describe the Spawn Sterilization methods.
ಅಣಬೆ ಬೀಜದ ಕ್ರಿಮಿಶುದ್ಧೀಕರಣದ ವಿಧಾನಗಳ ಕುರಿತು ಬರೆಯಿರಿ.

5. Write a note on disease management in mushroom cultivation.
ಅಣಬೆ ಕೃಷಿಯಲ್ಲಿ ರೋಗ ನಿರ್ವಹಣೆ ಕುರಿತು ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

6. Write a note on nutritional value of mushroom.
ಅಣಬೆಯ ಪೌಷ್ಟಿಕಾಂಶದ ಮೌಲ್ಯದ ಬಗ್ಗೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

7. Describe the long and short storage methods of mushroom.
ಅಣಬೆಯ ದೀರ್ಘ ಮತ್ತು ಅಲ್ಪಾವಧಿಯ ಶೇಖರಣಾ ವಿಧಾನಗಳನ್ನು ವಿವರಿಸಿ.

III. Answer **any three** of the following questions. **3x10=30**
ಈ ಕೆಳಗಿನ **ಯಾವುದಾದರೂ ಮೂರು** ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ.

8. Describe the life cycle of mushroom.
ಅಣಬೆಯ ಜೀವನ ಚಕ್ರವನ್ನು ವಿವರಿಸಿರಿ.

9. Describe the mother spawn preparation and multiplication method.
ಅಣಬೆಯ ತಾಯಿ-ಬೀಜ ತಯಾರಿಕೆ ಮತ್ತು ಅದನ್ನು ದ್ವಿಗುಣಗೊಳಿಸುವ ವಿಧಾನವನ್ನು ವಿವರಿಸಿ.

10. Write a note on milky mushroom cultivation.
ಹಾಲಣಬೆಯ ಕೃಷಿಯ ಬಗ್ಗೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

11. Write a note on health benefits of mushroom.
ಅಣಬೆಯ ಆರೋಗ್ಯ ಪ್ರಯೋಜನಗಳ ಕುರಿತು ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

12. Describe the mushroom preservation methods.
ಅಣಬೆ ಸಂರಕ್ಷಣೆ ವಿಧಾನಗಳನ್ನು ವಿವರಿಸಿರಿ.

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