



36402

B.Sc./B.C.A/GMT IV Semester (CBCS) Degree Examination, May/June 2019

KANNADA BASIC

ಗರತಿಯ ಹಾಡುಗಳು ಮತ್ತು ಯಶೋಧರ ಚರಿತೆ

(New)

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

- 1) ಭಾಷೆ ಹಾಗೂ ಬರಹದ ಶುದ್ಧಿಗೆ ಗಮನ ಕೊಡಲಾಗುವುದು.
- 2) ಬಲಕ್ಕೆ ಬರೆದ ಅಂಕಿಯು ಪ್ರಶ್ನೆಯ ಪೂರ್ಣ ಅಂಕಗಳು.
- 3) ಮೊದಲ ನಾಲ್ಕು ಪ್ರಶ್ನೆಗಳಿಗೆ ಪ್ರಬಂಧ ರೂಪದ ವಿವರವಾದ ಉತ್ತರವನ್ನು ನಿರೀಕ್ಷಿಸಲಾಗುವುದು.

1. ಅ) ಗರತಿಯ ಹಾಡುಗಳಲ್ಲಿ ತಾಯಿಯ ಬಗ್ಗೆ ಇರುವ ಪ್ರೀತಿಯನ್ನು ವಿವರಿಸಿ. (10)

(ಅಥವಾ)

ಬ) ಪತಿಯ ಬಗ್ಗೆ ಸತಿಗೆ ಇರುವ ಭಾವನೆಗಳನ್ನು ಚಿತ್ರಿಸಿ.

2. ಅ) ಗರತಿಯ ಹಾಡುಗಳಲ್ಲಿ ಗೆಳತಿಯ ರೂಪ ವರ್ಣನೆಯನ್ನು ಕುರಿತು ಬರೆಯಿರಿ. (10)

(ಅಥವಾ)

ಬ) ಗರತಿಯ ಹಾಡುಗಳಲ್ಲಿ ಕಂಡುಬರುವ ಹಾಸ್ಯವನ್ನು ವಿವರಿಸಿ.

3. ಅ) ಹಿಂಸೆಯಲ್ಲಿ ತೊಡಗಿದ್ದ ಮಾರಿದತ್ತನ ಮನಸ್ಸನ್ನು ಅಹಿಂಸೆಯ ಕಡೆಗೆ ತಿರುಗಿಸಿದವರು ಯಾರು? ಹೇಗೆ? (10)

(ಅಥವಾ)

ಬ) ಯಶೋಧರನು ಹಿಟ್ಟಿನ ಕೋಳಿಯನ್ನು ಏಕೆ ಕೊಂದನು? ಆ ಪಾಪದ ಫಲವನ್ನು ಹೇಗೆ ಅನುಭವಿಸಿದನು?

4. ಅ) ದೂತಿಯ ಪ್ರಕಾರ ಅಮೃತಮತಿಯು ಅಷ್ಟಾವಂಕನನ್ನು ಬಯಸಿದ್ದು ಸರಿಯೆ? ಚರ್ಚಿಸಿ. (10)

(ಅಥವಾ)

ಬ) ಯಶೋಧರನು ವೈರಾಗ್ಯ ಹೊಂದಲು ಅವನ ಹೆಂಡತಿಯ ಜೊತೆಗೆ ತಾಯಿಯೂ ಕಾರಣಳಾದಳು. ಹೇಗೆ?

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5. ಅ) ತವರು ಮನೆಯ ಸವಿನೆನಪುಗಳನ್ನು ಕುರಿತು ಬರೆಯಿರಿ. (5)
(ಅಥವಾ)
ಬ) ಗರತಿಯ ಹಾಡುಗಳಲ್ಲಿ ಇರುವ ಸತಿಪತಿಯರ ಅನ್ಯೋನ್ಯ ಪ್ರೀತಿಯನ್ನು ಚಿತ್ರಿಸಿ.
6. ಅ) ಸುದತ್ತಾಚಾರ್ಯರು ಯಾರು? ಅವರ ಉಪದೇಶದ ಮುಖ್ಯ ವಿಚಾರಗಳನ್ನು ಬರೆಯಿರಿ. (5)
(ಅಥವಾ)
ಬ) ಅಮೃತಮತಿಯು ಯಾವ ಯಾವ ಪಾಪಗಳನ್ನು ಮಾಡಿದಳು? ಅದರ ಫಲ ಏನಾಯಿತು?
7. ಈ ಕೆಳಗಿನ ವಿಷಯಗಳಲ್ಲಿ ಯಾವುದೇ ನಾಲ್ಕಕ್ಕೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ. (4×5=20)
- ಚಂಡಕರ್ಮ
 - ಗೆಲತಿಯ ಸ್ನೇಹದ ಸವಿನೆನಪುಗಳು
 - ಯಶೋಧರ
 - ಸತಿಯ ಬಗ್ಗೆ ಪತಿಗೆ ಇರುವ ಭಾವನೆ
 - ಅಭಯಮತಿ
 - ತವರು ಮನೆಯ ಕಹಿನೆನಪುಗಳು
 - ಜನ್ಮ
 - ಗರತಿಯ ಹಾಡುಗಳಲ್ಲಿ ತಂದೆ

B.A/B.Sc/B.Com/BBM/BSW/GMT/BCA IV Semester

Degree Examination, May/June - 2019

ENGLISH

BASIC ENGLISH

(New CBCS 2016-2017)

Paper No:IV

Time : 3 Hours


Maximum Marks : 80

- Texts:**
1. *The Apprentice and*
 2. *Composition*

- I. Annotate any Two of the following : (2×6=12)**
- a) How was he killed? He intrigues you. He was a strange man no doubt. Or perhaps it was the times that were strange.
 - b) You are an official of the Government of India. You are educated and in comparison with the scum upstairs, even wealthy. You are no mean little crook. They cannot touch you. They have no evidence anyway.
 - c) But you are an agent of God, can you help? Can you not, by some power of yours provide me the courage to do what I know I must do.
 - d) I want to give you back your blasted charm, Ratan.
- II. Write short notes on any TWO of the following : (2×6=12)**
- a) Ratan Rathod's college days.
 - b) Ratan Rathod's father
 - c) The Secretary
 - d) Ratan Rathod's experience of his first job.
- III. Answer any TWO of the following : (2×16=32)**
- a) How does Ratan Rathod set out of his village in search of a job? What are his experiences?
 - b) Sketch the character of Ratan Rathod's wife.
 - c) What is the theme of Arun Joshi's novel 'The Apprentice'? Explain.
 - d) How does Ratan Rathod represent the ideals and illusions of his generation?

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- IV. Write a dialogue on the following situation: A student is witness to a robbery. The police are interrogating him. (1×8=8)
- V. Expand any **ONE** of the following ideas: (1×8=8)
- Practice makes one perfect.
 - Unity is strength.
 - Where there is a will there is a way. (1×8=8)
- VI. Write a general essay on any **ONE** of the following:
- Importance of education.
 - Demonetisation.
 - Indian Universities.
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BA/B.Sc/B.Com/BBM/BSW/GMT/BCA IV Semester

Degree Examination, May/June- 2019

ENGLISH

Basic English (New CBCS (2016-17))

Paper - IV

Time : 3 Hours

Maximum Marks : 70

Texts : 1. The Apprentice and
2. Composition.

I. Annotate any TWO of the following. (2×4=8)

- a) After the contractor's son had left me that evening, the night had seemed darker than before and the world, a place without law, a planet turning in the darkness, going heaven knew where.
- b) If I was not Ratan Rathod, what was I? was I a thief, a scoundrel, was I the murderer? They said I was.
- c) There was a war on, he said, and we were all expected to do our duty, put in our very best.
- d) Ratan Rathod, you are not a good man. Whatever else the issue, you are not a good man.

II. Write short notes on any TWO of the following. (2×4=8)

- a) Ratan's mother
- b) The Cadet
- c) The Republic Day Parade
- d) Ratan's father's death.

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III. Answer any **TWO** of the following:

(2×15=30)

- a) How do the differences between the processions before independence and parades after independence provide a back ground for Ratan's transformation?
- b) Ratan is a witness to India's history in Arun. Joshi's novel 'The Apprentice'. Explain.
- c) How does Arun Joshi's novel 'The Apprentice throw light on the ground realities of patriotism?
- d) What is the crisis of character according to Ratan Rathod in 'The Apprentice'?

IV. Write a dialogue on the situation: A Teacher asks a student why he has not been regular to classes.

(1×8=8)

V. Expand any **ONE** of the following ideas :.

(1×8=8)

- a) A Stitch in times saves nine
- b) Better late than never
- c) Knowledge is power

VI. Write a general essay on any **ONE** of the following.

(1×8=8)

- a) Festivals of India
 - b) Pollution
 - c) Importance of Cleanliness.
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B.Sc/BCA/BFT/GMT2 IV Semester Degree Examination, May / June- 2019

ENGLISH

Basic English

Paper-IV

(New CBCS)2017-18

Time : 3 Hours

Maximum Marks : 70

- Texts :**
1. The Old Man and the Sea
 2. Communication and Analysis Skills.

I. Annotate any TWO of the following. (2×6=12)

- a) I may not be as strong as I think, but I know many tricks and I have resolution.
- b) Every day is a new day. It is better to be lucky. But I would rather be exact. Then when luck comes, you are ready.
- c) A man can be destroyed but not defeated.

II. Write short notes on any TWO. (2×6=12)

- a) Manolin's relationship with Santiago.
- b) Santiago's recurring dream.
- c) The Marlin.



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III. Answer any ONE of the following.

(1×10=10)

- a) Describe the relationship between Santiago and the Sea.
- b) How does Santiago prove to be a hero in Ernest Hemingway's "The Old Man and the Sea"?

IV. Answer any SIX of the following.

(6×6=36)

- a) Dress code for Job interviews.
- b) Importance of etiquette.
- c) Effectiveness of a presentation using multimedia.
- d) Aspect of impressive presentations.
- e) Use of inoffensive language.
- f) Examples of Gender bias in daily life.
- g) Importance of dress code in educational institutions.
- h) Style of Presentation.



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B.Sc./B.C.A. IV - Semester Degree Examination, May/June - 2019

HINDI (Basic)

(Study of Indian Language)

Paper - IV

Time : 3 Hours

Maximum Marks : 70

- सूचना: 1) लिखावट शुद्ध और देवनागरी लिपि में हों।
2) पठ्यपुस्तकें-1, संशय की एक रात। 2, जनसंचार माध्यम।

1. किन्हीं दो की संदर्भ सहीत व्याख्या कीजिए। (2×7=14)

- a) इतिहास के हाथों, बाण बनने से अधिक अच्छा है,
अंधेरो में - यात्रा करते हुए खो जाया।
- b) अच्छा हो, इतने संशय परंतु, कोइभि काम किया जाय, चाहे संप्रति
वह युद्ध ही हो। यह काम ही होगा।
- c) हम ने राक्षस रथ खींचे दास भावसे, बदले में नर नहीं वानर पद प्राप्त किए।
लंका में हम भोज्य पदार्थों में विकते हैं।

2. किन्हीं दो प्रश्नों के समीक्षात्मक उत्तर लिखिए। (2×10=20)

- a) नरेश मेहता जी का खंड काव्य संशय की एकरात एक मिथकीय काव्य है स्पष्ट कीजिए।
- b) संशय की एक रात कविता का उद्देश अपने वाक्यों में लिखिए।
- c) हनुमान का चरित्र-चित्रण कीजिए।

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3. किन्हीं दो प्रश्नों का उत्तर लिखिए।

(2×10=20)

- जनसंचार माध्यम किसे कहते हैं? उसकी प्रमुख विशेषताएँ स्पष्ट कीजिए।
- फ़िल्म, मीडिया का एक सशक्त संचार माध्यम है, समझाइए।
- इंटरनेट का उद्भव और विकास पर एक लेख लिखिए।

4. किन्हीं दो विषयों पर टिप्पणी लिखिए।

(2×5=10)

- रेडियो
- फ़िल्म
- लक्ष्मण

5. किसी एक विषय पर निबंध लिखिए।

(1×6=6)

- पर्यावरण।
- जल है तो कल है।
- विज्ञान का महत्त्व।



B.Sc. IV Semester Degree Examination, May/June- 2019

PHYSICS

Physical Optics, Fibre Optics, and Special Theory of Relativity

Paper : 4 (New)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

Write answers to Section-A questions in the first two pages only.

SECTION-A

Answer the following each of **one** mark.

(15×1=15)

1. What happens to the kinetic energy of a photo electron if the intensity of the incident radiation increases?
2. Define threshold frequency.
3. Give an example for interference of light by division of amplitude.
4. What happens to the fringe width of interference pattern if red light is replaced by blue light?
5. What are Coherent sources?
6. State the condition for bright fringe.
7. Give an example for diffraction.
8. Why the fringes formed in interference of light in air wedge are straight?
9. Define resolving power of grating.
10. Give an example for Biaxial Crystal.



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11. On what principle optical fibre does work?
12. Define acceptance angle.
13. What is achromatism?
14. What is world line?
15. Write the SI unit of specific rotation of solution.

SECTION-B

Answer any FIVE of the following.

(5×5=25)

16. Using Huygens principle verify laws of refraction.
17. Describe young's double slits experiment.
18. Derive an expression for intensity in case of Fraunhofer diffraction at a single slit.
19. Write any five applications of Optical Fibre.
20. Derive the expression for variation of mass with velocity.
21. Obtain the condition for achromatic combination of two lenses in contact.
22. Explain Huygen's theory of positive and negative crystals.

SECTION-C

Answer any FOUR of the following.

(4×10=40)

23. a) Explain experimental demonstration of photoelectric effect
- b) Describe with relevant theory on experiment to determine wavelength of monochromatic light using Bi-Prism.

(5+5)



24. a) Derive an expression for numerical aperture of an Optical fibre.
b) Derive the expression for the equivalent focal length of two thin convex lenses separated by a distance. (5+5)
25. a) Describe Michelson-Morley experiment with necessary theory.
b) Discuss the negative results of Michelson-Morley experiment. (7+3)
26. a) Derive Lorentz transformation equations.
b) The average life time of a μ -meson at rest is 2×10^{-6} sec. The μ -mesons are formed in the atmosphere and are found to travel with velocities equal to $0.998c$. What will be the average distance which they will be observed to traverse before decaying. (7+3)
27. a) Distinguish between interference and diffraction.
b) Give the Fresnel's theory of optical rotation and obtain an expression for angle of rotation. (5+5)
28. a) Describe the construction and working zone plate to show it acts as a converging lens.
b) What is the radius of first zone in zone plate of focal length 15cm for light of wavelength 5500 \AA ?. (7+3)

B.Sc. IV Semester (CBCS) Degree Examination, May/June- 2019

PHYSICS

Physical Optics, Fibre Optics and Special Theory of Relativity

Paper No. - 4

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Write the answers to Section-A in the first two pages only

SECTION - A

I. Answer the following, each of 1 mark.

(15×1=15)

1. In the interference pattern obtained by Young's double slit experiment with white light, for which colour of light the fringe width is maximum.
2. Write the expression for fringe width in case of interference at Air wedge.
3. Why two independent sodium lamps cannot produce sustained interference
4. Give an example for diffraction of light.
5. In the diffraction experiment at a single slit, what happens to the angular band width if yellow light is replaced by blue light.
6. Write the expression for resolving power of grating
7. What is dichroism?
8. A ray of light incident on a glass plate at the polarizing angle gets deviated by 24° on entering the glass plate. Find the polarizing angle.
9. Give an example for Biaxial crystal
10. What are cardinal points?
11. A plane wavefront is incident on a narrow slit. What type of diffraction takes place?
12. Why refractive index of core is greater than cladding in an optical fibre?
13. What is the mass of a particle when it moves with the velocity of light?
14. Give an example for conversion of energy into mass
15. What is Minkowski space?

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SECTION - B

II. Answer any FIVE of the following.

(5×5=25)

16. Derive the condition for maximum in the case of interference of reflected light from a thin film of uniform thickness.
17. What is zone plate? Show that a zone plate acts like a converging lens.
18. What is double refraction? Give the Huygens theory of double refraction in uniaxial crystal.
19. Distinguish between Huygen's and Ramsden's eye piece.
20. Derive the expression for acceptance angle in terms of refractive indices of core and cladding, with air medium surrounding fibre.
21. Show that simultaneity of events is relative.
22. Derive an expression for variation of mass with velocity.

SECTION - C

III. Answer any THREE of the following.

(3×10=30)

23. a) Describe the construction of Michelson's interferometer. How will you use it to determine the difference between wavelengths of two D-lines of sodium.
b) A parallel beam of light of wavelength $6 \times 10^{-7} \text{m}$ is incident on a thin transparent film of refractive index 1.5 such that the angle of refraction is 45° in the film. Calculate the smallest thickness of the film which will appear dark by reflection.
(7+3)
24. a) What is diffraction? Derive an expression for intensity in case of Fraunhofer diffraction at a single slit.
b) Calculate the number of lines per meter in a grating of width 3cm which will just resolve the wavelengths of sodium lines to be 5890Å and 5896Å in the second order.
(7+3)

25. a) Give the Fresnel's theory of optical rotation and obtain an expression for angle of rotation.
- b) Light passes through two identical polarimeter tubes one after the other. The first tube contains laevorotatory solution of concentration 18 Kg/m^3 of specific rotation $0.0165 \text{ radm}^2\text{kg}^{-1}$. The second tube contains dextrorotatory solution of specific rotation $0.011 \text{ radm}^2\text{kg}^{-1}$. Find the concentration of the second solution for net rotation to be zero. (7+3)
26. a) What are Newton's rings? Show that the diameter of Newton's dark rings are proportional to square root of natural numbers.
- b) What is a chromatism? Derive the condition for achromatism of lenses in contact. (5+5)
27. a) Derive Lorentz-transformation equations.
- b) The average life time of a μ -meson at rest is 2×10^{-6} second. The μ -mesons are formed in the atmosphere and are found to travel with velocities equal to $0.998c$. What will be the average distance which they will be observed to traverse before decaying. (7+3)
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B.Sc. IV Semester Degree Examination, May/June- 2019

CHEMISTRY

Paper : IV (New)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

1. Section A contains questions from Inorganic, Organic and Physical Chemistry
2. Section B,C and D respectively contains questions from Inorganic, Organic and Physical Chemistry.
3. Answer all Sections.

SECTION-A

Answer any TEN of the following.

(10×2=20)

1. Two compounds have the empirical formula $CO(NH_3)_3(NO_2)_3$. In aqueous solution one of these compound does not conduct electricity while other does. Write the possible structures of these two compounds.
2. Draw the structures of possible optical Isomers for $Pt(en)Br_2Cl_2$.
3. Explain that $[Fe(CN)_6]^{3-}$ has only one unpaired electron while $[FeF_6]^{3-}$ has five unpaired electrons.
4. Balance the following reaction in acidic media. $ClO_2^- \rightarrow ClO_2 + Cl^-$.
5. Which acid is used to convert alkene to epoxides?
6. Complete the reaction at 450 – 470 k $C_6H_5-COCH_3 + 4[H] \xrightarrow{?} ?$
7. Which is more basic among $(C_2H_5)_3N$ and $(C_2H_5)_2NH$ and why?

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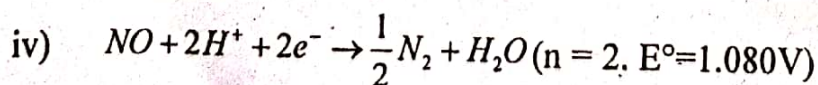
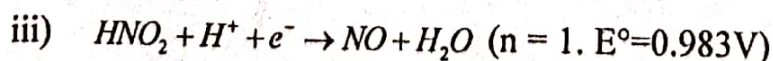
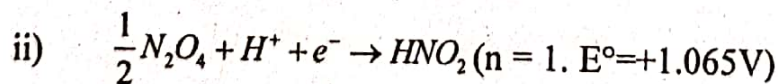
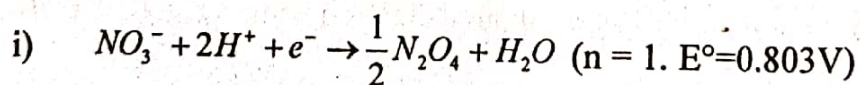
8. Write the reaction of benzene diazonium chloride with hot water.
9. Define Raoult's law.
10. Determine the number of phases and components in $KCl - NaBr - H_2O$ system.
11. Determine the number of phases and components in $CaCO_3(s) \rightleftharpoons CaO(s) + CO_2(g)$
12. Among NaCl and Urea which shows abnormal colligative property and why?

SECTION-B

Answer any TWO of the following.

(2×10=20)

13. a) Draw all the possible optical isomers of the type $Ma_2b_2c_2$ and $M(AA)_2a_2$ with an example each. (6)
- b) Give the Postulates of the Werner's theory. (4)
14. a) Explain the factors which affect the magnitude of the crystal field stabilization energy. (6)
- b) Explain structure and bonding in $[CO(NO_2)_6]^{4-}$ on the basis of valence bond theory. (4)
15. a) Draw and explain the Pourbaix diagram for iron. (6)
- b) Represent the following reduction half reactions by Latimer diagrams.



Calculate the E° value for $NO_3^- | HNO_2$ couple.

(4)

**SECTION-C**Answer any **TWO** of the following.**(2×10=20)**

16. a) Describe the mechanism of addition of sodium bisulphate and condensation of phenyl hydrazine with acetone. (6)
- b) Explain the ring opening reactions of epoxides with water, hydrochloric acid, hydrogen cyanide in acid media and ethyl alcohol in basic media. (4)
17. a) Give the diazocoupling reactions with phenol, N,N-dimethyl amine and aniline. (6)
- b) Write a note on Mannich and Wolff-Kishner reduction reactions. (4)
18. a) How are amines prepared by alkyl halides, alcohols and Gabriel's method. (6)
- b) Explain the reduction of nitro benzene in alkaline media and how azoxy benzene, azobenzene and hydrazo benzene are obtained. (4)

SECTION-DAnswer any **TWO** of the following.**(2×10=20)**

19. a) Discuss the distillation of completely miscible binary liquids with vapour pressure composition and boiling point-composition diagrams for an ideal solution with an example. (6)
- b) Explain the Phenol-water system with a labelled diagram. (4)
20. a) Discuss the phase diagram of Mg-Zn-system. (6)
- b) Write a note on desilverisation of lead by Pattinson's method. (4)
21. a) Derive the relation between elevation in boiling point of the dilute solution with molecular mass of the solute. (6)
- b) Define Van't Hoff's factor. How is it related with degree of dissociation of the solute. (4)

[P.T.O]

B.Sc. IV Semester (CBCS) Degree Examination, May/June - 2019

CHEMISTRY
(Paper - IV)

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

- 1) Section 'A' contains questions from inorganic, organic and physical chemistry.
- 2) Section B, C and D contains questions respectively from inorganic, organic and physical chemistry.
- 3) Answer all the Sections.

SECTION - A

Answer any Ten of the following :

(10×1=10)

1. The compound $\text{CoCl}_3 \cdot 4\text{NH}_3$ contains only one Cl^- ion that is precipitated by Ag^+ ions. Draw the structure of the compound.
2. Write the geometry of the following complex $[\text{Ag}(\text{NH}_3)_2]^+$.
3. What is the geometry of $[\text{NiCl}_4]^{2-}$ on the basis of valence bond theory?
4. What would you use (oxidant or reductant) to complete the reaction?
 $\text{ClO}_3^- \longrightarrow \text{ClO}_2$
5. What is the alternative name for epoxide?
6. Complete the reaction
 $\text{CH}_3\text{COCH}_3 + \text{NH}_2\text{OH} \longrightarrow ?$
7. Which is more basic among
P - nitroaniline and
P - toluidine
8. Give the name of an orange dye formed when benzene diazonium chloride reacts with phenol.
9. Give any example for a non ideal solution deviates negatively.
10. What are the consolute temperatures for nicotine + water system?
11. Which among NaNO_3 and NH_4NO_3 is a most efficient freezing mixtures.
12. Define moral elevation in boiling point constant.

[P.T.O]

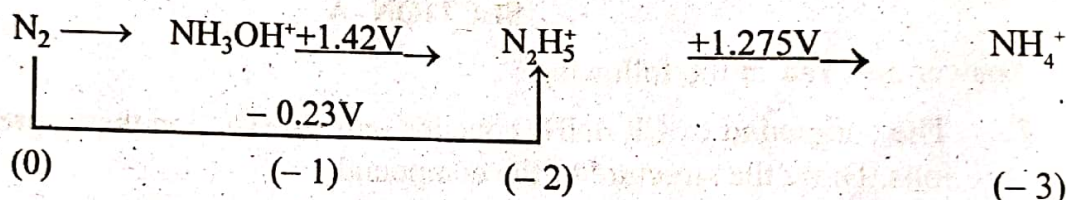


SECTION - B

Answer any Two of the following.

(2×10=20)

13. a) Draw all the geometrical isomers of the type $M(AA)_2b_2$, $M(AB)_3$ and Ma_3b_3 with an example each. (6)
- b) Applying the Werner's theory draw the structures of the following complexes. $CoCl_3 \cdot 6NH_3$ and $CoCl_3 \cdot 5NH_2$. (4)
14. a) Explain the crystal fields splitting of d-orbitals in tetrahedral complexes. (6)
- b) Explain the formation of a complex $[Ni(NH_3)_6]^{2+}$ by valence bond theory. (4)
15. a) Draw Frost diagram from the following Latimer diagram in acidic medium (6)



predict the most stable oxidation state of nitrogen.

- b) Latimer diagram for iron is given as (4)
- $$FeO_4^{2-} \xrightarrow{+2.20V} Fe^{3+} \xrightarrow{0.77V} Fe^{2+} \xrightarrow{-0.445V} Fe^0$$
- determine the value of $E^\circ FeO_4^{2-}/Fe^{2+}$

SECTION - C

Answer any Two of the following :

(2×10=20)

16. a) Describe the mechanism of Perkin's reaction. (6)
- b) Give the reaction (4)
- i) ether with halogens and phosphorous pentachloride and
- ii) epoxide addition reaction with ethyl alcohol in basic media.
17. a) With reactions explain the distinguish test between primary secondary and tertiary aliphatic and aromatic amines with nitrous acid. (6)
- b) Give the preparation of an acetaldehyde by dehydrogenation of alcohols and a ketone by hydration of alkynes. (4)
18. a) Describe the method of preparation of amines by alkyl halides, alcohols and Gabriel's method. (6)
- b) Explain the diazo coupling reactions with aniline and tertiary amine. (4)

**SECTION - D**

Answer any Two of the following :

(2×10=20)

19. a) Describe the distribution of low boiling azeotropic binary solutions with the help of vapour pressure - composition and boiling point - composition diagrams. (6)
- b) Explain the phenol water system with a labelled diagram. (4)
20. a) Explain ferric chloride - water system with a labelled phase diagram. (6)
- b) Derive Gibb's phase rule. (4)
21. a) Derive a relation between depression in freezing point and molecular mass of the solute. (6)
- b) Define Van't Hoff's factor. How it is related to the degree of association of the solute. (4)
-

B.Sc. IV Semester Degree Examination, May/June-2019
MATHEMATICS

Real Analysis and Complex Analysis

Paper No. - VII 4.1

(New)

Time : 3 Hours

Maximum Marks : 60

Instructions to Candidates:

Answer all Sections.

SECTION - A

Answer any Ten questions.

(10×2=20)

1. Define upper and lower Darboux sums.
2. Compute $L(p,f)$ and $U(p,f)$, if $f(x) = x^2$ for $x \in [0,3]$ and let $P = \{0, 1, 2, 3\}$ be the partition of $[0,3]$.
3. State Darboux theorem.
4. If P_1 and $P_2 \in f[a,b]$, then prove that $L(P_1, f) \leq U(P_2, f)$.
5. Show that $\int_a^b e^x dx = e^b - e^a$ by using fundamental theorem of calculus.
6. Define conformal transformation.
7. Verify whether $f(Z) = Z - \bar{Z}$ is differentiable or not by using Cauchy-Rieman equation.
8. Show that, $\text{amp}(Z-1) = \frac{\pi}{2}$ represents a line parallel to imaginary axis.
9. Show that $u = x^3 - 3xy^2 + 3x^2 - 3y^2 + 1$ is harmonic.

[P.T.O]



10. Show that $f(z) = u + iv$ is analytic. If $u = \frac{1}{2} \log(x^2 + y^2)$ and $v = \tan^{-1}\left(\frac{y}{x}\right)$.
11. Evaluate $\int_C \frac{\cos \pi z}{(z-1)} dz$, where C is $|z| = \frac{3}{2}$.
12. Evaluate $\int_0^{1+i} (x^2 - iy) dz$ along $y = x^2$.

SECTION - B

Answer any Two of the following.

(2×5=10)

13. Prove that a constant function defined on a closed interval is Riemann integrable.
14. If $f \in R[a, b]$ and m, M are respectively the infimum and supremum of $f(x)$ on $(a, b]$ then prove that $m(b-a) \leq \int_a^b f(x) dx \leq M(b-a)$.
15. If $f(x)$ is Riemann integrable and $\phi(x)$ is primitive of $f(x)$, then prove that $\int_a^b f(x) dx = \phi(b) - \phi(a)$.

SECTION - C

Answer any Three questions..

(3×5=15)

16. State and prove the C-R equations in Polar form.
17. Show that $f(z) = \sin hz$ is an analytic function and find its derivative using C-R equations.
18. Find the analytic function $f(z) = u + iv$ given that $V(x, y) = x \sin x \sin hy - y \cos x \cos hy$.
19. Show that $v = r \sin \theta + \frac{\cos \theta}{r}$ ($r \neq 0$) is harmonic. Find the analytic function, whose imaginary part is $v(r, \theta)$ by Milne-Thomson's method.

SECTION - D

Answer any Three questions.

(3×5=15)

20. State and prove Cauchy's integral theorem.

21. Evaluate $\int_c \frac{z}{(z^2+1)(z^2-9)} dz$, where 'c' is the circle $|z|=2$.22. Evaluate $\int_c (\bar{z})^2 dz$ around the circle $|z-1|=1$.23. Find the Bilinear transformation which maps the points $z=0, -i, 2i$ into $w=5i, \infty, -i/3$.
Also find invariant points of the transformation.

B.Sc. IV Semester Degree Examination, May/June - 2019

MATHEMATICS

Special Functions & PDE - II

Paper : (4.2) (New)

Time : 3 Hours

Maximum Marks : 60

Answer all sections

Section - A

Answer any ten questions.

(10×2=20)

1. Show that $P_n(-x) = (-1)^n P_n(x)$.
2. Find the value of $P_2(x)$.
3. Show that $J_{\frac{1}{2}}(x) = \sqrt{\frac{2}{\pi x}} \sin x$.
4. Show that $J'_0(x) = -J_1(x)$.
5. Show that $H'_n(x) = 2xH_n(x) + H_{n+1}(x)$.
6. Show that $H_{2n}(0) = (-1)^n \frac{(2n)!}{n!}$.
7. Show that $L_n(0) = 1$.
8. Write down the laguerre polynomial and it's series solution.
9. Form partial differential equation from $z = (x-a)^2 + (y-b)^2$ by eliminating arbitrary constants a and b.
10. Solve, $p \tan x + q \tan y = \tan z$.
11. Solve, $p^2 q^3 = 1$.
12. Solve $\sqrt{p} + \sqrt{q} = x + y$.

[P.T.O.]



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Section - B

Answer any five questions :

(5×5=25)

13. Expand $f(x) = x^3$ in a series of the form $\sum_{r=0}^{\infty} C_r P_r(x)$.

14. Prove that $\int_{-1}^1 P_m(x)P_n(x).dx = \frac{2}{2n+1}$ if $m = n$.

15. Prove that $\frac{d}{dx}[x^n J_n(x)] = x^n J_{n-1}(x)$.

16. Prove that $H'_n(x) = 2nH_{n-1}(x), n \geq 1$.

17. Prove that $L'_n(x) = -\sum_{r=0}^{n-1} L_r(x)$.

18. Solve, $z^2(p^2x^2 + q^2) = 1$.

19. Solve, $z^2(p^2 + q^2 + 1) = 1$.

Section - C

Answer any three questions.

(3×5=15)

20. Show that $(2n+1)P_n(x) = P'_{n+1}(x) - P'_{n-1}(x)$.

21. Show that $\int J_3(x)dx = -J_2(x) - \frac{2}{x}J_1(x)$.

22. Prove that $\int_0^{\infty} e^{-x} L_n(x)L_m(x)dx = \begin{cases} 0 & \text{if } m \neq n \\ 1 & \text{if } m = n \end{cases}$

23. Find the complete integral of $p(1+q^2) + (b-z)q = 0$ by charpit's method.

24. Solve $(bz - cy)\frac{\partial z}{\partial x} + (cx - az)\frac{\partial z}{\partial y} = (ay - bx)$.

B.Sc. IV Semester Degree Examination, May/June - 2019

MATHEMATICS-VIII

TOPOLOGY AND REAL ANALYSIS (Old)

PAPER NO : 4.1

Time : 3 Hours

Maximum Marks : 60

Instructions to candidates:

Answer all the sections

SECTION - A

Answer any Ten of the following.

(10×2=20)

- 1) Define discrete and indiscrete topology on a set.
- 2) Prove that $[a,b]$ is not an open set in (R,u) .
- 3) If A is closed and B is open then prove that $A-B$ is closed.
- 4) Define closure of a set with an example.
- 5) Define T_1 -space and subbase of the topology.
- 6) Define base for a topology with an example.
- 7) Define compliment of a fuzzy subset.
- 8) Define α -cut set and strong α -cut set of fuzzy set A with an example each.
- 9) Define partition of a closed interval.
- 10) Compute $L(P,f)$ and $U(P,f)$, if $f(x) = x^2$ for $x \in [0,3]$ and let $p = \{0,1,2,3\}$ be the partition of $[0,3]$
- 11) State fundamental theorem of integral calculus.
- 12) Prove that the lower Riemann integral cannot exceed upper Riemann integral.

SECTION - B

Answer any Four of the following.

(4×5=20)

- 13) Let (X, τ) be a topological space. \mathfrak{F} be family of all closed sets of X . Then prove that
 - a) Any intersection of members of \mathfrak{F} is a member of \mathfrak{F} .
 - b) Union of any two (hence a finite number of members of) \mathfrak{F} is a member of \mathfrak{F} .

[P.T.O.]



- 14) Let (X, τ) be a topological space. A subset A of X is open iff A' is closed.
- 15) Let (X, τ) be a topological space. A, B be subsets of X then prove that
- $A \subset \bar{A}$
 - \bar{A} is closed
 - A is closed iff $A = \bar{A}$
- 16) Let (X, τ) be an indiscrete space. Let A be non empty proper subset of X find $A^\circ, (A')^\circ, \partial(A)$.
- 17) Define Hausdorff space and prove that every discrete space is a Hausdorff space.
- 18) Prove that every T_2 - space is a T_1 - space.

SECTION - C

Answer any **Four** of the following:

(4×5=20)

- 19) Let X be a set and A be a fuzzy subset of X . Let $\alpha, \beta \in [0, 1]$ then prove that
- $\alpha \leq \beta \Rightarrow \beta_A \subset \alpha A$
 - $\alpha \leq \beta \Rightarrow \alpha_A \cup \beta_A = \alpha_A$
 $\alpha_A \cap \beta_A = \beta_A$
- 20) Let $f: X \rightarrow Y$ be a function. A be a fuzzy subset of X . B be fuzzy subset of Y then prove that $f^{-1}(1-B) = 1 - f^{-1}(B)$.
- 21) Prove that every monotonic function is R- integrable in $[a, b]$.
- 22) If f^{-1} is a bounded function and integrable in $[a, b]$ prove that $m(b-a) \leq \int_a^b f(x) dx \leq M(b-a)$ if $a \leq b$.
- 23) If $f \in R[a, b]$ then prove that $|f| \in R[a, b]$.
- 24) If $f, g \in R[a, b]$ then prove that $(f+g) \in R[a, b]$ and $\int_a^b (f+g)(x) dx = \int_a^b f(x) dx + \int_a^b g(x) dx$.



**B.Sc. IV Semester Degree Examination, May/June - 2019****MATHEMATICS****Algebra - III****Paper No: 4.1(OLD)**

Time : 3 Hours

Maximum Marks : 60

Instructions to Candidates:

Answer all the sections.

SECTION - A

Answer any Ten questions.

(10×2=20)

1. If every element of a group of G is its own inverse then prove that G is abelian.
2. Prove that order of every element of a finite group is finite.
3. Find the order of the elements of the multiplicative group $G = \{ 1, -1, i, -i \}$
4. Show that every quotient group of an abelian group is abelian.
5. Define a field and give an example.
6. Show that intersection of any two sub rings of a ring R is again a sub ring of R .
7. Define a vector space.
8. Is the subset $W = \{x_1, x_2, x_3 / x_1^2 + x_2^2 + x_3^2 \leq 0\}$ a subspace of $V_3(R)$.
9. In a vector space V over the field F show that $C_1\alpha = C_2\alpha$ and $\alpha \neq 0 \Rightarrow C_1 = C_2$
10. If the vectors $(1, 2, k)$ $(0, 1, k-1)$ and $(3, 4, 5)$ are linearly dependent vectors of R^3 find k .
11. Determine whether the set $\{(1, 1, 2)$ $(1, 2, 5)$ $(5, 3, 4)\}$ is a basis of $V_3(R)$.
12. Express the vectors $(3, 5, 2)$ as linear combination of the vectors $(1, 1, 0)$ $(2, 3, 0)$ $(0, 0, 1)$ of $V_3(R)$.

[P.T.O.]



SECTION - B

(3×5=15)

Answer any **three** of the following:

13. A subset H of a group G is a subgroup of G iff $HH^{-1} = H$.
14. State and prove Lagrange's theorem.
15. Show that a subgroup H of a group G is normal in G if and only if $gHg^{-1} = H \forall g \in G$.
16. Let f be a homomorphism of a group G into group G with Kernel K . Then show that $f(G)$ is isomorphic to factor group G/K .

SECTION - C

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

(2×5=10)

17. If R is a ring such that $a^2 = a, \forall a \in R$ then show that
 - i) The additive inverse of each element of R is itself.
 - ii) $a + b = 0 \Rightarrow a = b$
18. Prove that every field is an integral domain.
19. Define sub ring and show that intersection of any two sub rings of a ring R is again a sub ring of R .

SECTION - D

Answer any **three** questions.

(3×5=15)

20. Prove that a non-empty subset W of a vector space V over a field F is a subspace of V if and only if
 - i) $\forall \alpha, \beta \in W \Rightarrow \alpha + \beta \in W$
 - ii) $C \in F, \alpha \in W \Rightarrow C\alpha \in W$
21. Show that the vectors $\{(1, 1, 0) (1, -1, 0) (1, 1, -1)\}$ forms a basis of \mathbb{R}^3 .
22. If $T: V_2(\mathbb{R}) \rightarrow V_2(\mathbb{R})$ is defined by $T(x, y) = (3x+2y, 3x-4y)$ verify whether T is linear transformation.
23. Find the range space, Kernel rank and nullity of the linear transformation $T: V_2(\mathbb{R}) \rightarrow V_2(\mathbb{R})$ defined by $T(x, y) = (x + y, x)$. Also verify the rank nullity theorem.





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B.Sc. IV Semester (CBCS) Degree Examination, May/June - 2019

BOTANY

Ecology and Environmental Biology

Paper No. - IV

(New)

Time : 3 Hours

Maximum Marks : 70

I. Answer the following questions.

(15×1=15)

1. What are decomposers?
2. What is endemic species?
3. Give examples for grazing food chain.
4. Define Soil conservation.
5. Define Hydrosere.
6. Define Energy flow.
7. Define afforestation.
8. Define food web.
9. Define Ecosystem.
10. What is velamen tissue?
11. What is lentic & Lotic ecosystem?
12. Mention any two nitrogen fixing organisms.
13. Define Ammonification.
14. What are epiphytes?
15. What is Mulching?

[P.T.O]

II. Answer any FIVE of the following.

16. Define food chain. Explain its types.
17. Mention the morphological & Anatomical features of epiphytes.
18. Write the differences between renewable & non-renewable resources.
19. Explain the Aim & Scope of Ecology.
20. Explain the Nitrogen cycle.
21. Explain the forest ecosystem briefly.
22. What is Quadrant? Explain its types.

III. Answer any THREE of the following.

(3×10=30)

23. Define Wildlife conservation. What are the various steps taken to conserve wildlife.
 24. Describe the vegetation of Karnataka briefly.
 25. Explain the carbon cycle with labeled diagram.
 26. Define ecological pyramids. Explain its types.
 27. What is ecological succession? Describe the various stages of xerosere succession.
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36425

B.Sc. IV - Semester (CBCS) Degree Examination, May/June - 2019

ZOOLOGY

(Animal Physiology and Bio-Chemistry)

Paper - Z-4

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

- 1) Answer All the Questions.
- 2) Draw labelled diagrams wherever necessary.

SECTION - A

Answer any **Five** of the following.

(5×2=10)

1. Expand SAN and AVN.
2. What is myoneural junction?
3. What are amphoteric molecules? Give an example.
4. What are the end products of glycolysis?
5. Define acromegaly.
6. Mention the functions of amylase and Invertase.

SECTION - B

A. Answer any **Four** of the following.

(4×5=20)

7. Explain the structure of sarcomere
8. Write a note on blood components.
9. Explain briefly about the chemical digestion of lipids.
10. Draw a neat labelled diagram of multipolar neuron and its properties.
11. Enumerate gonadal hormones and their functions.
12. Draw a neat labelled diagram nephron and its functions.

[P.T.O]

B. Answer any Two of the following.

13. Write a note on biological importance of proteins
14. Explain briefly about the Vit-D
15. Describe the factors affecting enzyme activity.

SECTION - C

(2×10=20)

A. Answer any Two of the following:

16. Describe the origin and conduction of heart beat.
17. Enumerate the hormones secreted by hypophysis cerebri and their functions.
18. Explain in detail about the transportation of gases.

B. Answer any One of the following.

(1×10=10)

19. Write a note on fat soluble vitamins.
20. Write a note on Glycolysis and Kreb's cycle.



10909

B.A./B.Com./B.Sc./BBM (Non-Comp) IV Semester

Degree Examination, May/June - 2019

COMPUTER SCIENCE

Computer Applications

(Paper - 4.3)

(New)

Time : 3 Hours

Maximum Marks : 80

SECTION - A

Answer any TEN of the following :

(10×2=20)

1. What is Multimedia?
2. What is Animation?
3. Expand LAN.
4. Write any two browser programs.
5. Who is the developer of C language?
6. Name any two Relational operators.
7. Write the syntax of variable declaration.
8. Write the syntax of scanf() statement.
9. Name the different types of loop statements.
10. What is Array?
11. Name the types of Array.
12. Name the types of functions.

[P.T.O

(2)

SECTION - B**(3×5=15)**

Answer any **THREE** from the following :

13. Name the different opportunities in Multimedia.
14. What is constant? Write the types of constants.
15. Write the difference between While and Do While statements.
16. Write a C program to find sum of two numbers.
17. Write a C program to find Simple Interest.

SECTION - C**(3×15=45)**

Answer any **THREE** from the following :

18. What is Internet? Explain its uses.
 19. Explain While statement with an example.
 20. What are loop statements? Explain any one with suitable example.
 21. What is string? Explain String handling functions.
 22. Explain function with arguments and no return values with an example.
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B.A./B.Com./BBA/BBM/B.Sc (Non-Comp)
IV Semester (CBCS) Degree Examination, May/June - 2019

COMPUTER SCIENCE

Computer Applications

Paper - 4.3

Time : 3 Hours

Maximum Marks : 70

SECTION - A

Answer any **Ten** questions. Each question carries **two** marks. (10×2=20)

1. Who devolved C language?
2. Name any two components of C language.
3. What is identifier?
4. Name any two relational operators in C.
5. Evaluate $Y=(4+3*2) + (6-8/4)$.
6. Name any two unformatted input statement in C.
7. Write the syntax of printf() function
8. Convert 28 to binary.
9. Define truth table.
10. Find 1's complement of 1010101
11. What is network?
12. Expand LAN.

SECTION - B

Answer any **Four** questions. Each question carries **five** marks. (4×5=20)

13. What is variable? Write the syntax of variable declaration.
14. What is data type? Write fundamental data types in C.
15. With example explain logical operators in C.
16. Write a C program to find simple interest.
17. With truth table write a note on OR gate.



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18. Define the following:

- a) WWW
- b) Internet
- c) Browser

SECTION - C

Answer any Three questions. Each question carries Ten marks.

(3×10=30)

- 19. Write basic structure of C program with suitable example.
 - 20. What is constant? With example explain different types of constants.
 - 21. Write a C program to find sum and average of given three numbers.
 - 22. Perform the following.
 - a) Convert decimal 156.625 to octal.
 - b) Subtract 1101 - 1010 using 1's complement method.
 - 23. What is e-mail? Explain any two types of networks.
-