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2B3N24024 (Pages : 1) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester Integrated M.Sc Geology Degree Examination, November 2024

BCH3C03 – Organic Chemistry

(2022 Admission onwards)

Time: 2 hours Max. Marks: 60

Section A (Short answers)
(Answer questions up to 20 marks. Each question carries 2 marks)

1. Write a method of preparation of benzene diazonium chloride.
2. Differentiate between rectified spirit, absolute alcohol, and denatured spirit.
3. State and explain isoprene rule.
4. Phenol is stronger acid than an alcohol. Why?
5. Name the electrophiles in nitration and sulphonation reactions of benzene.
6. Compare the reactivity of aldehydes and ketones in nucleophilic addition reaction.
7. Give any four applications of DNA fingerprinting.
8. Define isoelectric point.
9. How carboxylic acid is prepared from Grignard Reagent ?
10. State Huckel's rule of aromaticity.
11. How meso-tartaric acid differs from racemic tartaric acid ?
12. Give two physical methods to distinguish geometrical isomers.

[Ceiling of marks: 20]

Section B (Paragraph)
(Answer questions up to 30 marks. Each question carries 5 marks)

13. Explain Huckel's rule of aromaticity, with suitable examples.
14. Draw the conformations of cyclohexane and explain their stabilities
15. Write a note on optical isomerism.
16. Explain the term hyperconjugation with illustrative examples.
17. Give an example for the alkylation of benzene and give its mechanism .
18. Give any five synthetic applications of benzene diazonium chloride.
19. Write a short note on the different classification of amino acids.

[Ceiling of marks: 30]

Section C (Essay)
(Answer any one. Each question carries 10 marks)

20. (a) Explain the source, structure, and uses of Piperine.

    (b)How phenolphthalein prepared? Mention its uses.

21. Discuss the significance of various electron displacement effects in organic molecule.

(1 x 10 = 10 Marks)

2B3N24102 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester Integrated M.Sc Geology Degree Examination, November 2024

BPH3C03 – Mechanics, Relativity, Waves & Oscillations

(2022 Admission onwards)

Time: 2 hours Max. Marks : 60

Section A – Short Answer type.
(Answer all questions in 2 or 3 sentences, each correct answer carries a maximum of 2 marks)

1. What is meant by Galilean invariance?
2. State the postulates of special relativity.
3. How did the Michelson – Morley experiment invalidate the concept of ether?
4. What are fictitious forces?
5. Explain anharmonic oscillations.
6. Explain uncertainty principle.
7. What is meant by time dialation?
8. Explain the significance of mass energy relation.
9. What is a centre of mass reference? Why is it called zero momentum frame?
10. Distinguish between phase velocity and group velocity.
11. State and explain the law of conservation of linear momentum.
12. Write down Schrodinger equation .Explain the symbols.

(Ceiling – 20)

Section B – Paragraph / Problem type.
(Answer all questions in a paragraph of about half a page to one page, each correct answer carries a maximum of 5 marks)

13. Derive the Galilean transformation equations.
14. Prove that for a harmonic oscillator average potential energy and average kinetic energy are equal.

15. A particle of mass 10 g is at rest in an inertial frame. Consider a frame rotating at an angular speed of 10 radians per second in which the body is at a distance of 5 cm from the axis of rotation. Find the Coriolis and centrifugal forces on the body in the rotating frame.

16. A rod is moving with velocity 0.6C with respect to the laboratory. If an observer situated in laboratory measures is length 1 meter, Calculate its proper length.

17. A stone of mass 100 g is revolved at the end of a string of length 50 cm at the rate of 2 revolutions per second. Determine its angular momentum. If the stone makes only one revolution per second after 25 seconds, find the torque applied.

18. What are eigen values and eigen functions? Illustrate with examples.

19. Calculate the de Broglie wavelength of a 1000kg automobile travelling at 100 m/s.

(Ceiling – 30)

SECTION C – Essay type

(Essays - Answer in about two pages, any one question. Answer carries 10 marks)

20. State the postulates of special theory of relativity and hence derive the Lorentz transformation equations.

21. Derive an expression for the energy density of a plane progressive wave.

(1 x10 = 10 marks)

59

1M3N24132 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester Integrated M.Sc Geology Degree Examination, November 2024

GLO3IB03 – CRYSTALLOGRAPHY AND MINERALOGY

(2023 Admission onwards)

Time: 2 hours Max. Marks: 60

(Draw neat sketches, wherever necessary)

PART – A
Answer *all* questions.
Each question carries Two marks.
Ceiling -20 Marks

1. What basis the crystal systems are made?
2. How to estimate the interfacial angle?
3. Differentiate crystalline and amorphous materials?
4. What is the characteristic property of Enantiomorphous forms?
5. How mineral differ from mineraloid?
6. Explain interstitial solid solution?
7. What are the electrical properties of minerals?
8. Write a short note on isomorphism with example.
9. Define holohedral and hemihedral forms?
10. What do you mean by crystal coordination?
11. Distinguish between simple substitution and coupled substitution?
12. What is twinning?

PART – B

Answer *all* questions.
Each question carries Five marks.
Ceiling -30 Marks

13. Describe various Symmetry elements present in crystals.
14. The interceptions made by a unit face by a-axis, b-axis, c-axis is 2, 3, 6 units respectively. Find out the miller indices of the face that intercept by a-axis, b-axis, c-axis is 1, 1, 3 units respectively.
15. Write about the Symmetry elements and forms present in *Normal class*of the hexagonal system with diagram.
16. What is solid solution series and how they are formed?
17. Write a detailed note on physical properties of minerals.
18. Describe all laws of crystallography in detail.
19. Write in detail about the symmetry elements and forms present in the hemihedral class of tetragonal crystal system with diagram.

PART - C

Answer any *one* question.

20. Write in detail about the symmetry elements and forms present in the *normal class* of the isometric system with diagram.
21. Describe silicate mineral and explain various silicate structures with diagram.

1 x 10 = 10 Marks

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2M7N24004 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Seventh Semester Integrated M.Sc Geology Degree Examination, November 2024

GLO7IB15–ADVANCED STRATIGRAPHY

(2020 Admission onwards)

Time: 2 ½ hours Max. Marks: 80

(Draw neat sketches, wherever necessary)

PART – A

Answer any *ten* questions.

Each question carries Two mark.

1. What is Lametta Formation?
2. Write about sequence stratigraphy?
3. Describe Shaw's Graphic correlation
4. Distinguish Group and Super group with suitable examples.
5. What is Angular Unconformity?
6. How is the Code of Stratigraphic Nomenclature important?
7. What is Chronostratigraphy?
8. Write about the Intrusive Contacts
9. What is Magnetostratigraphy?
10. Define Mandla lobe?
11. Describe the *Two-fold classification* of Gondwana Supergroup.
12. Define Stratotype?

PART – B

Answer any *five* questions.
Each question carries Eight marks.

13. Describe the Geology of Kerala, highlighting its major rock formations, structural features, and geological evolution.
14. Provide an overview of the Mesozoic rock formations in Peninsular India, highlighting their geological features and importance.
15. Write about the Palaeogene sequences of the Sub-Himalaya
16. Discuss the significance and key characteristics of the K-T Boundary extinction and its causes.
17. Give principle of biostratigraphy and explain concepts of biozones.
18. Outline the classification, phases of volcanic activity and the economic significanceof the Deccan Volcanic Province.
19. Provide the stratigraphic succession of Triassic of Spiti, including formations, ages, and lithologies.

5x8=40 Marks

PART - C

Answer any *two* questions.
Each question carries Ten marks.

20. Describe the Mesozoic stratigraphic succession, classification and depositional characteristics of Kutch basin.
21. Discuss in detail about the stratigraphic succession, classification and economic importance of Cuddapah Supergroup.
22. Discuss in detailstratigraphy and depositional environment of Palaeozoic Succession of Kashmir.
23. Describe the key geological processes and tectonic events that led to the formation of the Himalayas.

2 x 10 = 20 Marks

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2M7N24003 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Seventh Semester Integrated M.Sc Geology Degree Examination, November 2024

GLO7IB14–ADVANCED IGNEOUS AND METAMORPHIC PETROLOGY

(2020 Admission onwards)

Time: 2 ½ hours Max. Marks: 80

(Draw neat sketches, wherever necessary)

PART – A

Answer any *ten* questions.

Each question carries Two mark.

1. What is schistosity?
2. Briefly explain assimilation process?
3. Define Deviatoric stress?
4. What is the purpose of an IUGS diagram in geological studies?
5. Write a note on Ophiolites.
6. Define index minerals?
7. What are Buchan zones?
8. Define pyrometamorphism?
9. Define Experimental petrology?
10. What are the factors controlling textures of igneous rocks?
11. List the primary minerals found in basalt and explain their significance in oceanic crust formation?
12. What is mineral paragenesis?

10 x 2 = 20 Marks

PART – B

Answer any *five* questions.
Each question carries Eight marks.

13. Explain the Gibbs Phase Rule, and how is it applied to igneous systems?
14. Discuss various agents of metamorphism?
15. How do the norm classification contribute to the understanding of mineral composition of igneous rocks?
16. Explain Paired metamorphic belts?
17. Enumerate the major, minor and trace elements geochemistry of igneous rocks?
18. What are Barrovian zones? What is the basis for sub-divisions of these zones?
19. What is isograd? How it is useful in distinguishing different metamorphic terrains?

5x8=40 Marks

PART - C

Answer any *two* questions.
Each question carries Ten marks.

20. Give a detailed outline of genetic significance of textures in igneous rocks?
21. What are metamorphic facies and metamorphic facies series? Give suitable examples?
22. Explain the mineral paragenesis of metamorphic rocks with the help of a graphical representation of ACF and AKF diagram?
23. What is the significance of the different types of phase diagrams (unary, binary, ternary, quaternary) in understanding crystallization processes?

2 x 10 = 20 Marks

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5

1M9N24003 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Ninth Semester Integrated M.Sc. Geology Degree Examination, November 2024

GLO9IB21–ADVANCED REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEM

(2020 Admission onwards)

Time: 2 ½ hours Max. Marks: 80

(Draw neat sketches, wherever necessary)

PART – A

Answer any *ten* questions.

Each question carries Two mark.

1. What is GRASS?
2. What do you mean by Kirchhoff's law of radiation?
3. Define buffering.
4. What is raster form, and how does it represent information?
5. How is data reclassification performed using GIS?
6. Explain Intensity Hue Saturation.
7. What is supervised classification in remote sensing?
8. What are lidar and radar?
9. How do scattering and surface roughness affect remote sensing?
10. What is BRDF?
11. What does PCA analysis involve in image transformation?
12. List out the key applications of DEMs.

10x2=20 Marks

PART – B

Answer any *five* questions.
Each question carries Eight marks.

13. Write about the applications of passive and active microwave remote sensing
14. Discuss the differences between multispectral, hyperspectral, and thermal image data.
15. Describe airborne and satellite thermal infrared (TIR) scanner systems.
16. Explain the concept of image transformation.
17. Give an explanatory note on radiometric and geometric correction techniques for satellite data.
18. Discuss the Geographic Resources Analysis Support System.
19. Explain the creation of Digital Elevation Models and describe the different types of DEMs.

5x8=40 Marks

PART - C

Answer any *two* questions.
Each question carries Ten marks.

20. Discuss the principles and applications of thermal remote sensing, highlighting its significance in various fields.
21. Evaluate the integration of remote sensing and GIS in planning and analysis for urban and regional resource mapping.
22. Explain spectral signatures and BRDF in the visible, near-infrared, and shortwave infrared regions of the electromagnetic spectrum.
23. Explain the role of GIS in urban hazard mapping. How does it help identify risk-prone areas?

2 x 10 = 20 Marks

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1M9N24004 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Ninth Semester Integrated M.Sc. Geology Degree Examination, November 2024

QUATERNARY GEOLOGY AND PALEOCLIMATE - GLO9IE02(E02c)

(2020 Admission onwards)

Time: 2 hours Max. Marks: 60

(Draw neat sketches, wherever necessary)

PART – A

Answer any *nine* questions.

Each question carries Two mark.

1. How do racemization and epimerization contribute to amino acid dating techniques?
2. What is the role of perlite in obsidian hydration dating?
3. Define overbank facies.
4. What different types of paleosols are there?
5. What is Paleoclimatology?
6. What are the five major components of the climate system?
7. Why is the correlation of continental and marine records important for understanding Quaternary climatic changes?
8. How does obliquity influence the climate?
9. What is phytoliths.
10. How can biostratigraphy contribute to the petroleum exploration?
11. What is meant by Neolithic revolution?

9x 2 =18 Marks

PART – B

Answer any*four* questions.
Each question carries Eight marks.

12. Explain the impact of glacial and interglacial cycles during the Quaternary on plant and animal life.
13. Briefly discuss the geomorphotectonic changes in the Indian Peninsula during the Quaternary period.
14. Discuss the advancements in tools and techniques during the Stone Age, highlighting the differences among the Paleolithic, Mesolithic, and Neolithic periods.
15. Briefly explain the applications of pollen, spores, and phytoliths in Quaternary stratigraphy.
16. Discuss the different types of proxies and their applications in reconstructing paleoclimate.
17. Describe how anthropogenic activities influence global climate change, emphasizing the primary causes and their impacts.

4x8=32 Marks

PART - C

Answer any*one*question.
Each question carries Ten marks.

18. Explain the Quaternary dating methods, emphasizing absolute and relative dating. Discuss the principles, limitations, and applications of each method.
19. Explain the response of geomorphic processes to environmental changes and their application in natural hazard assessment.

1 x 10 = 10 Marks

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1M9N24005 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Ninth Semester Integrated M.Sc. Geology Degree Examination, November 2024

MARINE GEOLOGY AND OCEANOGRAPHY - GLO9IE03(E03a)

(2020 Admission onwards)

Time: 2 hours Max. Marks: 60

(Draw neat sketches, wherever necessary)

PART – A

Answer any *nine* questions.

Each question carries Two mark.

1. Write about hypsometric curve.
2. Give the features of continental shelf.
3. How Geostrophic currents are formed?
4. What is lysocline?
5. Why and where oxygen minimum layer is formed in the ocean.
6. Give some factors affecting the erosion of coastal area.
7. Comment on distribution of thermocline in ocean.
8. What is reason behind the formation of Ekman spiral?
9. Give the concept of Corioliseffect.
10. Why surface ocean salinity varying through latitude?
11. What are the major coastal processes that lead to shaping of coast?

9x 2 =18 Marks

PART – B

Answer any*four* questions.
Each question carries Eight marks.

12. Describe the global climate phenomenon El-Nino southern oscillation.
13. Discuss the formation of cyclone and anticyclone. Describe the origin of temperate cyclone and tropical cyclone.
14. Explain the global atmospheric circulation and how they are affecting the weather condition throughout the world.
15. Explain the chemical properties of seawater elements and their vertical distributionpattern.
16. Comment on coastal erosion and their protection methods.
17. Describe five ocean gyres with the help of a diagram.

4x8=32 Marks

PART - C

Answer any*one*question.
Each question carries Ten marks.

18. What is thermohaline circulation and give a detailed note on the distribution and movement of thermohaline circulation.
19. Comment on various types of marine sediments, its origin and distribution throughout the ocean.

1 x 10 = 10 Marks

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