FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester Integrated M.Sc Geology Degree Examination, November 2021

IGL3C05 – GEOMORPHOLOGY

(2020 Admission onwards)

Time: 2 hours   Max. Marks: 60

(Draw neat sketches, wherever necessary)

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

1. What do you mean by suspension, traction and saltation?

2. Differentiate between *pediments* and *bajada*

3. Define water cycle

4. What is meant by Porosity and permeability?

5. Define *hamada*.

6. Describe the formation of *Oases*.

7. Role of plants and animals in the physical breaking down of rock.

8. What do you mean by Frost Action weathering?

9. Distinguish the topographic map and road map.

10. What are *Einkanters*, *Zweikanter* and *Dreikanters*

11. ExplainHydraulic action, abrasion, attrition and cavitation.

12. Describe the different types of moraines.

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

13. List out the salient features of '*fluvial cycle of erosion*'

14. Describe the soil profile and its different layers in detail.

15. Give an account of lakes and its classification

16. Write brief explanatory note on various drainage patterns.

17. Describe the different types of coral reefs.

18. Discuss the various landforms produced in a karst region

19. Define Brunton Compass. Describe the various parts of a Brunton Compass.

PART - C

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

20. Write a detailed essay on Mass-movement. Statethe conditions favouring mass-wasting and its classification.

21. Explain the processes involved in glacial erosion. List and briefly describe the important erosional and depositional features of a glacier

(1 x 10 = 10 Marks)

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester Integrated M.Sc Geology Degree Examination, November 2021

IGL3C06 – OPTICAL AND DESCRIPTIVE MINERALOGY

(2020 Admission onwards)

Time: 2 ½ hours

Max. Marks: 80

(Draw neat sketches, wherever necessary)

PART – A

Answer *all* questions.

Each question carries **Two** mark.

Ceiling -25 Marks

1. Define Refractive index.

2. What is brittle mica?

3. Define polymorphism

4. What is 2V?

5. Ordinary light and Polarized light.

6. List out the monoclinic amphibole minerals.

7. What do you mean by Optic axis?

8. How to prepare a thin section?

9. Difference between *low relief* and *high relief* in minerals.

10. What do you mean by position of extinction?

11. Explain *Zircon, Zirconium, Zirconia* and *Cubic Zirconia*?

12. Distinguish dichroism and pleochroism?

13. Define the extinction of uniaxial minerals.

14. What is Lechatelierite?

15. Differentiate between Normal zoning and Reverse zoning.

Answer *all* questions.
Each question carries **Five** marks.
Ceiling -35 Marks

16. Write a note on chemistry and properties of Beryl mineral

17. Describe methods of producing Plane polarized light

18. Explain Isotropic and anisotropic minerals.

19. Write brief explanatory note on Total reflection and Critical angle

20. Discuss the theoretical details of Biaxial Indicatrix

21. Briefly explain Scapolite mineral.

22. Discuss briefly on the construction of Nicol prism.

23. Write a short note on different accessory plates used in polarizing microscope.

PART - C
Answer any *two* questions.
Each question carries **Ten** marks.

24. With a schematic sketch, describe the various parts of Petrological microscope.

25. Discuss the structure, classifications, chemical composition and occurrence of *Feldspar group* Minerals

26. Give an account of the structure, properties, polymorphs and varieties of *Quartz* minerals.

27. Discuss the physical and optical properties of *Olivin group* Minerals. Give their chemical composition and mode of occurrence.

2 x 10 = 20 Marks

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester Integrated M.Sc Geology Degree Examination, November 2021

IGL3C07 – REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEM

(2020 Admission onwards)

Time: 2 hours   Max. Marks: 60

(Draw neat sketches, wherever necessary)

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

1. What is GIS?
2. List out the various resolution concepts in RS
3. Define scale of a map.
4. What is meant by Choropleth Map?
5. Role of platforms in Remote sensing
6. Describe *latitude* and *longitude*.
7. Distinguish *surface phenomena* and *volume phenomena*
8. Define the *in-situ sensing* with an example
9. Difference between *low resolution* and *high resolution* images.
10. Define Electromagnetic Radiation
11. ExplainSwath.
12. What do you mean by picture elements?

PART – B

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

13. Write an explanatory note on Geostationary satellites and Near-polar satellites

14. Explain the different types of Remote sensing

15. Write a note on types of spatial data in GIS.

16. Explain the concepts and principles of Remote sensing

17. Give an account of components of GIS.

18. Briefly explain the various methods for photogrammetric measurements and processing data. Describe in short several applications of photogrammetry.

19. Define Database Management System (DBMS) in GIS. Explain different DBMS models used in GIS.

PART - C

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

20. Give an account on Global positioning system. Briefly explainfollowing with respect to GPS.

    (i)   Parts of GPS

    (ii)   GPS constellation

    (iii)   How does it work in determining the geographic position and

    (iv)   Its accuracy, various applications and uses.

21. Explain the following in detail.

    (i)   History and development of Remote sensing.

    (ii)   Historical overviews and various applications of Geographic Information System.

                                                                        1 x 10 = 10 Marks

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Name: ....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester Integrated M.Sc Geology Degree Examination, November 2021

PHY31C02 - Optics & Spectroscopy, Modern Physics, Electronics and Numerical Methods

(2020 Admission onwards)

Time: 2 ½ hours   Max. Marks: 80

PART – A
Answer *all* questions.
Each question carries Two marks.

1. Write a short note on the principle of superposition.

2. What is the difference between uniaxial and biaxial crystals?

3. Two independent sources cannot produce interference. Why?

4. What is meant by UV catastrophe?

5. Give the operators for energy and momentum.

6. What is meant by radiometric dating?

7. What are the major components of a laser system?

8. What is Population Inversion?

9. Give the principle operation of a semiconductor laser.

10. Draw the circuit of a full wave rectifier.

11. Draw the circuit diagram of a Zener diode voltage regulator.

12. Draw the circuit and logical symbol of a NOT gate.

13. Discuss the difference between analytical and numerical method of studying a physical problem.

14. Using forward difference operator, find an expression for $\Delta^2 y_0$.

15. By Newton-Raphson method, Find the solution of $x^2 - 2x - 1 = 0$

Ceiling - 25 Marks

PART – B
Answer *all* questions.
Each question carries Five marks.

16. Discuss Fraunhofer diffraction due to single slit and derive an expression for its intensity distribution in the diffraction pattern.

17. Discuss on binding energy and stability of nucleus.

18. Determine the amount of $^{210}_{84}Po$ having activity equal to 5 millicurie. The half life of Po is 138 days.

19. What are induced absorption, spontaneous emission and stimulated emission?

20. A 50 V Zener diode is used to obtain a regulated output voltage across a load $10k\Omega$. The series resistor is $5k\Omega$. If the input changes from 80 to 120V, find the maximum zener current.

21. State De Morgan's theorem. Using it show that $(A+E)(Á +É)=AÉ+ÉA$

22. Explain Runge-Kutta method for the solution of 1st order differential equations.

23. Using Simpson's 1/3 rule with a step size 0.1, find $\int_1^2 \frac{x^3+2x}{x^2+2x}dx$.

Ceiling - 35 Marks

PART - C
Answer any *two* questions.
Each question carries Ten marks.

24. What are Newton's rings? How would you obtain Newton's rings with bright center? Describe an experiment to determine the wavelength of sodium light using Newton's rings.

25. Discuss the principle, construction and working of a He-Ne laser.

26. Explain the construction and working of a CE amplifier. Draw the frequency response. What are the merits of negative feedback?

27. What is curve fitting? Discuss the principle of least squares and straight-line fitting. Find the equation of the best fit straight line for the following data points.

X :	1	2	4	5	6	8	9
Y :	2	5	7	10	12	15	19

2 x 10 = 20 Marks