

**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2021**

Geology

GEO 4C 07—APPLICATIONS OF REMOTE SENSING AND GIS

Time : Two Hours

Maximum : 60 Marks

Draw neat sketches wherever necessary.

Section A

*Answer at least **eight** questions.*

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 24.

1. NDVI.
2. DEM.
3. Radiometric correction.
4. Image enhancement.
5. Containment.
6. Topology.
7. Spatial Filtering.
8. Surface analysis.
9. Adjacency.
10. Network analysis.
11. Cost-benefit analysis of GIS.
12. GIS Project manager.

(8 × 3 = 24 marks)

Turn over

Section B

*Answer at least **five** questions.
Each question carries 5 marks.
All questions can be attended.
Overall Ceiling 25.*

13. Land use and Land cover mapping using remote sensing.
14. Application of remote sensing in Hydrology.
15. Classification methods in GIS.
16. Topological Data Structure.
17. Layering concept in GIS.
18. Sources of errors in GIS.
19. Outputs in GIS.

(5 × 5 = 25 marks)

Section C

*Answer any **one** question.
Each question carries 11 marks.*

20. Give an account of the application of remote sensing in Geology.
21. Describe the installation of GIS. Add points on the keys for a successful GIS and reasons for unsuccessful GIS.

(1 × 11 = 11 marks)

**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2021**

Geology

GEO 4B 07—OPTICAL AND DESCRIPTIVE MINERALOGY

Time : Two Hours

Maximum : 60 Marks

Answer all questions.

Draw neat sketches wherever necessary.

Section A

Answer at least eight questions.

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 24.

1. Refractive index.
2. Indicatrix.
3. Parallel extinction.
4. Talc.
5. Orthopyroxenes.
6. Mica plate.
7. Critical angle.
8. Epidote.
9. Optic axis.
10. Spinel.
11. Zircon.
12. Optic sign.

(8 × 3 = 24 marks)

Turn over

Section B

*Answer at least **five** questions.
Each question carries 5 marks.
All questions can be attended.
Overall Ceiling 25.*

13. Double refraction.
14. Anisotropic minerals.
15. Physical properties of olivine.
16. Optical properties of hornblende.
17. Varieties of quartz.
18. Plagioclase feldspars.
19. Sign of elongation.

(5 × 5 = 25 marks)

Section C

*Answer any **one** question.
The question carries 11 marks.*

20. Petrological microscope and its parts.
21. Structure, chemistry, optical and physical properties of aluminium silicate group of minerals.

(1 × 11 = 11 marks)

C 2197

(Pages : 2)

Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2021

Geology

GLY 4C 15—REMOTE SENSING AND GIS IV

Time : Three Hours

Maximum : 64 Marks

Draw neat sketches wherever necessary.

Part A (Objective Type Questions)

Answer all ten questions.

Each question carries 1 mark.

1. What is the expansion of NDVI ?
2. What property of snow cover makes the identification of aerial distribution of snow from satellite remote sensing very easy ?
3. Automated DEM generation or topographic mapping is carried out by :
 - a) Contour mapping.
 - b) Stereo matching.
 - c) Image rectifying.
 - d) Analytical plotting.
4. Map-to-image registration in digital image processing is also called _____.
5. Which topological concept allows the vector data model to determine adjacency ?
6. The simplest vector data structure.
7. The picture elements comprising a digital remotely sensed image are called _____.
8. What is the system used to organize, access, maintain and manipulate object or entity data in GIS called ?
9. The most difficult errors to be detected by GIS users.
10. Which of the following phases is not included in GIS installation planning ?
 - a) Planning.
 - b) Analysis.
 - c) Implementation.
 - d) Meeting.

(10 × 1 = 10 marks)

Part B (Short Answer Type Questions)

Answer any seven questions.

Each question carries 2 marks.

11. Explain sea surface temperature measurements using Thermal Infra-red remote sensing.
12. Distinguish between DEM and DTM.

Turn over

13. How is Remote Sensing integrated with GIS ?
14. What is Radiometric correction ?
15. Explain two primary disadvantages of the vector data model.
16. What is the Layering Concept in GIS ?
17. Explain the errors in GIS arising through processing.
18. Write a short note on Topology and its significance.
19. Write a note on GIS outputs.
20. Required human resources for GIS.

(7 × 2 = 14 marks)

Part C (Paragraph type questions)

Answer any four questions.

Each question carries 5 marks.

21. Explain the application of Remote Sensing in monitoring of atmospheric constituents.
22. Describe Spectral, Spatial and radiometric resolutions as applicable to remote sensing data for digital image processing.
23. Give an account of Maximum Likelihood Classifier.
24. Sources of errors in GIS due to natural variation or from original measurement.
25. Describe the types of outputs in GIS.
26. Explain the reasons for unsuccessful GIS.

(4 × 5 = 20 marks)

Part D (Essay Type Questions)

Answer any two questions.

Each question carries 10 marks.

27. Give an account of the application of Remote Sensing in Land cover classification and Land cover change detection. Add a note on Global vegetation map.
28. Describe Digital Image Processing highlighting on the processes of Image Enhancement, Spatial Filtering and Feature Extraction.
29. Explain the Topological Data Structure in GIS. Add a note on its advantages.
30. Describe GIS Installation highlighting on its plan and consideration. Add a note on the keys for a successful GIS.

(2 × 10 = 20 marks)

C 2196

(Pages : 3)

Name.....

Reg. No.....

**FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2021**

Geology

GLY 4B 07—MINERALOGY

Time : Three Hours

Maximum : 80 Marks

Draw neat sketches wherever necessary.

Part A (Objective Type Questions)

Answer all ten questions.

Each question carries 1 mark.

1. The best example of a mineral with van der Waals bonds.
2. Silicates with typical framework structure are called :
 - a) Phyllosilicates.
 - b) Inosilicates.
 - c) Tektosilicates.
 - d) Nesosilicates.
3. Define polymorphism of minerals.
4. The Becke line method is used to determine the _____ of minerals.
5. A mineral is said to be optically _____ if the optical direction "X" in the mineral is the acute bisectrix.
6. What is meant by parallel extinction of a mineral ?
7. The mineral having the highest birefringence :
 - a) Calcite.
 - b) Diamond.
 - c) Quartz.
 - d) Biotite.
8. In which crystal system do all the garnet minerals crystallize ?
9. Which of the following is the orthorhombic amphibole ?
 - a) Glaucofanane.
 - b) Anthophyllite.
 - c) Hornblende.
 - d) Aenigmatite.
10. Give the chemical compositions of Rutile and Corundum.

(10 × 1 = 10 marks)

Turn over

Part B (Short Answer Type Questions)

*Answer any ten questions.
Each question carries 2 marks.*

11. Mineral vs Mineraloid.
12. Solid solution and exsolution in minerals.
13. Cyclosilicates.
14. Ordinary light and polarized light.
15. Total internal reflection.
16. Nicol prism.
17. Straight extinction and Oblique extinction of minerals.
18. Optical anomalies.
19. Monoclinic pyroxenes.
20. Physical properties of feldspars.
21. Physical and optical properties of corundum.
22. Tourmaline in thin sections.

(10 × 2 = 20 marks)

Part C (Paragraph Type Questions)

*Answer any five questions.
Each question carries 6 marks.*

23. Types of chemical bonding in minerals.
24. Methods of determination of specific gravity of minerals.
25. Construction and uses of Gypsum plate and Mica plate.
26. Optical properties of anisotropic minerals under parallel and crossed Nicols.
27. Uniaxial and Biaxial Indicatrix.
28. Structure, mineralogy, physical and optical properties of Garnet.
29. Physical and optical properties of Zeolite group of minerals.
30. Polymorphs and varieties of Quartz.

(5 × 6 = 30 marks)

Part D (Essay Type Questions)

*Answer any two questions.
Each question carries 10 marks.*

31. Describe the important physical properties of minerals with suitable examples.
32. Describe the parts of a petrological microscope with the help of a neat sketch.
33. Discuss the mineralogical composition, structure, physical and optical properties, mode of occurrence and uses of Olivine group of minerals.
34. Give an account of the mineralogy, structure, chemistry, physical and optical properties, modes of occurrence and industrial uses of Calcite and Fluorite.

(2 × 10 = 20 marks)

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