

Ex/SC/GEOL/UG/CORE/TH/13/2022

B. SC. (GEOLOGICAL SCIENCES) EXAMINATION, 2022

(3rd Year, 2nd Semester)

GEOMORPHOLOGY, REMOTE SENSING AND GIS-THEORY

PAPER – CORE/TH/13

Time : Two hours

Full Marks : 40

(Use a separate Answer script for each Part)

PART I (20 Marks)

Geomorphology

Answer the Question No. 1 and any two (02) from the rest

1. **Answer any five :** **2×5=10**
- i) What are the mineral groups or minerals that most likely form under conditions of intense leaching in a humid tropical environment? What elements are abundant in pedalfer and pedocal soils?
 - ii) Name the channel form generated by a steep river, with a high discharge and a large supply of readily mobile bed-load. How does liquefaction regulate mass-wasting?
 - iii) What is loess? How can it be distinguished from varve deposit?
 - iv) What is the geological implication of variations in stream gradient index without lithological modification?

[Turn over

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- v) What are the factors that control beach morphology?
- vi) What is “intersection point” on an alluvial fan? State the location of expected dominance of mass-flow products with reference to this “intersection point”.
- vii) What are the major landform assemblages in the mid-latitude zone?
- viii) How would you explain continental glaciation in lower latitudes?
2. How would you identify a tide dominated delta? Cite an example. What can be the nature of estuary in such environment? How do you explain reversal direction along two banks of a tidal inlet? 5
3. a) How is the soil profile modified in different climatic conditions?
b) Name the land forms developed by the depositional action of wind in hot deserts? 5
4. What are the different types of river terraces? Discuss their geological significances. 5

PART II (20 Marks)
(Remote Sensing and GIS)

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5. What is spectral reflectance? Discuss the spectral reflectance curve for water and vegetation. What is CAB? $(1.5+3+1.5)=6$
6. Fill in the blanks : $(4 \times 0.5)=2$
- a) If a sensor records 7 bits data then the values of digital numbers will range from 0 to _____.
- b) The _____ the spectral resolution, the wider the wavelength ranges for a particular channel or band.
- c) All geographical data can be reduced to _____ basic geographical phenomenon.
- d) GPS has _____ segments.
7. Justify the statements (*any two*) : $(2 \times 3)=6$
- a) Remote sensing is not possible beyond atmospheric window.
- b) Vegetation appears red in standard FCC satellite image.
- c) Satellite image gets tilted after registration.
8. Distinguish between the followings (*any two*): $(2 \times 3)=6$
- a) Vector and raster data structure
- b) Polar orbiting and geostationary satellite
- c) Across track and along track scanning