ZLX-U-GLY

GEOLOGY Paper - I

Time Allowed: Three Hours

Maximum Marks: 200

Question Paper Specific Instructions

Please read each of the following instructions carefully before attempting questions:

There are ELEVEN questions divided under SIX sections.

Candidate has to attempt SIX questions in all. The ONLY question in Section A is compulsory. Out of the remaining TEN questions, the candidate has to attempt FIVE, choosing ONE from each of the other Sections B, C, D, E and F.

The number of marks carried by a question/part is indicated against it.

Symbols, abbreviations and notations have their usual standard meanings.

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly.

Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

Answers must be written in ENGLISH only.

Neat sketches are to be drawn to illustrate answers, wherever required.

Wherever required, graphs/tables are to be drawn on the Question-cum-Answer Booklet itself.

SECTION A

(Compulsory Section)

Q1.	Answer	and/or	describe	the	following	in	brief	with	diagrams
	wherever necessary:								5×10=50

(a) Differentiate between raster and vector data. Discuss their utility in Geology.

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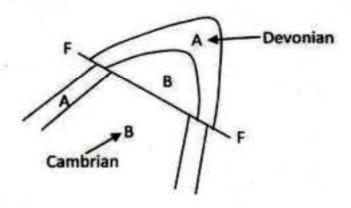
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- (b) Discuss the formation of four different types of sand dunes with relation to sand supply, vegetation and wind.
- (c) Differentiate between glacial deposits and fluvial deposits. Discuss three examples each of glacial depositional landforms and fluvial depositional landforms.
- (d) In a toposheet 45 D-11 (1:50,000 scale) the distance between two places is 10 cm. What is the actual distance on ground? What are the other toposheets that occur to N, S, E, W of the above number toposheet? Show in a diagram.
- (e) In a horizontal topography, two beds A and B are involved in deformation. Describe the details about the structure and sequence of their development.



- (f) Discuss the seismic character of convergent plate boundaries with suitable example.
- (g) Karewa Group
- (h) Geological Time Scale
- (i) Biocoenose and thanatocoenose fossil assemblages
- (j) Ecology of diatoms

SECTION B

Qz.	(a)	remote sensing. Can we have all the resolutions very high/fine in a particular satellite data? What is resolution trade-off? Discuss the spatial and temporal resolutions suitable/optimum for geological study, climatic study and geological hazard study.	15		
	(b)	Write short notes on the following:	15		
		(i) Shutter Ridges			
		(ii) Fault-line Scarp			
		(iii) Horst and Graben			
		(iv) Triangular Facet			
		(v) Pull-apart Basin			
Q 3.	(a)	Discuss the image elements and geotechnical elements for visual classification of satellite images.			
	(b)	Discuss the difference among multispectral, hyperspectral and thermal images and their advantages. Give one example each of these three types of satellite images.	10		
	(c)	What is a glacier and where does it form? Discuss how glaciers move. Describe four pre-glacial landforms and four post-glacial landforms.	10		

SECTION C

Q4.	(a)	Write about the buckling mechanism of folding. How does it explain the association of folds of different wavelength and amplitude?	15
	(b)	Draw 3D diagrams for normal, thrust and strike slip faults and show the orientation of σ_1 , σ_2 and σ_3 responsible for generation of faults.	15
Q5.	(a)	In a progressive deformation, write the significance of slaty cleavage, crenulation cleavage, boudinaged fold and folded boudin.	10
	(b)	Write about the different forms of salt diapirs and the structures associated with these.	10
	(c)	In a stereoplot, the poles of axial plane schistosity of F_1 folds lie on a girdle. When the F_1 fold axes are plotted in the same diagram, they lie very close to the pole of the girdle. Show the plot and interpret the	
		structure.	10

SECTION D

Q6.	(a)	Write short notes on the following:	15		
		i) Accretionary Prism			
		ii) Back-arc Basin			
		iii) Blueschist Facies Rocks			
	(b)	Define a rift zone. Distinguish between active and passive rifts. Describ the structure and typical rock associations of a continental rift zone.			
Q7.	(a)	What is a collisional orogeny ? Discuss the structural and lithological characters of a collisional orogenic belt.	10		
	(b)	Discuss the structure of a 'divergent plate boundary'. What are the main geochemical signatures of basalts associated with mid-oceanic ridges?			
	(c)	Compare and contrast the following:	10		
		i) Lithosphere and Asthenosphere			
		ii) Subduction and Obduction			

SECTION E

Q8.	(a)	Outline the palaeogeography of India near the Precambrian/Cambrian boundary.	15			
	(b)	Discuss the salient events of the fragmentation of the Gondwanaland during the Permian-Cretaceous interval.	15			
Q9.	Write brief notes on the following:					
	(a)	India-Asia collision and the rise of the Himalayas	10			
	(b)	Maximum Flooding Surface (MFS) in sequence stratigraphy	10			
	(c)	Radiometric dating of rocks	10			

SECTION F

Q10.	(a)	Describe the bathymetric distribution of organisms.	15
	(b)	Throw light in brief on the evolution of vertebrate life through the ages.	15
Q11.	(a)	Describe oculo-genital rings of echinoids.	10
	(b)	Differentiate between the Pelecypoda and Brachiopoda.	10
	(c)	Explain macroevolution with examples.	10

