(3 Hours) **Total Marks :80**

N.B. (1) Question No. 1 is compulsory.
(2) Attempt any three questions form remaining five questions.
(3) Draw neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Answer each and every question combined manner in order.

1.	(a)	Write identifying properties of the following minerals-	05
	(i)	Talc	
	(ii)	Calcite	
	(iii)	Corrundum	
	(iv)	Amethyst	
	(v)	Galena	
	(b)	Write name of the rock with the help of given information-	05
	(i)	Extrusive rock,vesicular structure and black colour	
	(ii)	Sedimentary rock shows Lamination, sometimes fossils	
	(iii)	Plutonic rock,coarse grained texture ,major minerals quartz and feldspar	
	(iv)	Metamorphic rock, found in beautiful shades ,mineral composition calcite	
	(v)	Clastic rock , cementing material iron oxide ,major mineral quartz and feldspar.	
	(c)	Draw labeled diagram of the following-	10
	(i)	Angular unconformity	
	(ii)	Volcano	
	(iii)	Gravity dam	
	(iv)	Mural joints	
	(v)	Perched water table	
2.	(a)	Explain any two landforms created by the geological agent wind and river respectively.	10
	(b)	What are the major shells of the earth ? Explain with diagram.	05
	(c)	Discuss the various types of weathering with examples.	05
3.	(a)	Explain any four structures of Primary rock with diagram.	10
	(b)	Describe the Texture of Sedimentary rock.	05
	(c)	Explain the use of Metamorphic rocks with examples.	05
4.	(a)	What is Fold ? Classify the folds based on position of axial plane.	10
	(b)	What is Normal fault and Reverse fault ?	05
	(c)	A westerly dipping limestone bed has thickness of 130 m and the width of the outcrop is 255m.Determine its true thickness and amount of dip.(Scale : 1cm = 50m)	05

5 (a) Classify the rocks according to Geomechanics classification for a Rock having UCS of 190 Mpa and RQD of 80 % with average spacing of discontinuity of 1000 mm which is slightly rough in nature and slightly weathered. The strike is perpendicular to the tunnel axis and drive with dips at an angle of 20^0 . Also 8 lit/min groundwater inflows the tunnel length per 10 m. State the condition of rocks for tunnel construction. (RMR Table should be provided during exam) 10

(b) Write short notes on (any two)- 10

(i) Cone of depression

(ii) Describe suitable geological condition for Dam construction.

(iii) What is Wenners configuration?

(iv) Physiographic divisions of India

(v) Factors controlling water bearing properties of rock

(vi) Cross bedding and Graded bedding

6. (a) What is Elastic Rebound Theory ? 5

(b) What is plate tectonics ? 5

(c) What is Run and Core logging ? Calculate the value of Core Recovery and RQD from the following data. Mention your opinion about the suitability of rock for foundation purpose from obtained result.. 10

Total Run =2 m.

Sr.No.	Length of core sample (in cm)	Nature of joints at lower end of core sample
1	20	N
2	11	N
3	9	N
4	6	M
5	3	M
6	8	N
7	25	N
8	7	M
9	8	N
10	24	M
11	20	N
12	15	N
13	2	N
14	6	M
15	11	N

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