Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3160616 Date:14/06/2022

Subject Name:Foundation Engineering

Time:10:30 AM TO 01:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Enumerate the factors affecting bearing capacity.	**03**
	(b)	Define bearing capacity, gross bearing capacity and net bearing capacity.	**04**
	(c)	Classify the methods of sub-soil exploration and explain in detail Augur boring method.	**07**
Q.2	**(a)**	Differentiate between general shear failure and local shear failure.	**03**
	(b)	Explain about floating foundation with neat sketch..	**04**
	(c)	Determine the safe bearing capacity of a strip footing 2 m wide and 1.5 m depth resting on a dry sand bed. Consider γsand=17.5 kN/m3 and bearing capacity factors Nc= 35.5 Nq= 24.2 , Nγ = 21.0 corresponding to $\phi=37^0$ and FOS=3.	**07**
		OR	
	(c)	Describe plate load test with neat sketches.	**07**
Q.3	**(a)**	Discuss Various correction required in SPT test.	**03**
	(b)	Explain Electrical resistivity method in details.	**04**
	(c)	Determine the area ratio , inside clearance and outside clearance for the following soil samplers and comment on the nature of the samples obtained. (i) Core edge : 77 mm outer & 70 mm inner diameter. (ii) Samping tube: 74 mm outer & 72 mm inner diameter	**07**
		OR	
Q.3	**(a)**	Enlist the various method of pile driving equipment.	**03**
	(b)	Define negative skin friction. What is its effect on the pile?	**04**
	(c)	Explain different function of geo-synthetics in detail with figures.	**07**
Q.4	**(a)**	Explain group action of pile	**03**
	(b)	Write Short note on Under reamed pile.	**04**
	(c)	A square concrete pile 40 cm x 40 cm is driven in to homogeneous sand layer, (ϕ=35, γ=17 kN/m3,) for a depth of 15m. calculate ultimate load . take K= 1.3 and $\delta= 18^0$, Nq=51	**07**
		OR	
Q.4	**(a)**	Explain concept of CNS layer.	**03**
	(b)	Describe Hiley's formula for calculating the ultimate bearing capacity of pile.	**04**
	(c)	Discuss the various types of anchors used for sheet pile wall.	**07**

Q.5	**(a)**	Explain seismic refraction method in details.	**03**
	(b)	Give basic difference between Cantilever and Counter fort retaining wall.	**04**
	(c)	A drop hammer weighing 60 kN and having an effective fall of 0.75m drives an RCC pile weighing 40 kN. The average settlement per blow is 1.6cm. The total temporary elastic compression is 2.0 cm. Determine ultimate bearing capacity and allowable load on pile assuming coefficient of restitution as 0.30 and factor of safety 2.5. Use Hiley's formula.	**07**

OR

Q.5	**(a)**	Discuss the Sheet pile? where it is used?	**03**
	(b)	Write short note on "Guide walls".	**04**
	(c)	What is the "active zone" in black cotton soil? Explain the properties of black cotton soil.	**07**

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