Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC– SEMESTER VII– • EXAMINATION – SUMMER - 2016

Subject Code: X70601 **Date: 23/11/2016**

Subject Name: Design Of Hydraulic Structure

Time:10:30 AM to 1:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Describe modes of failure of earthen dam.	**07**
	(b)	Explain (i) Uplift pressure (ii) Earthquake pressure (iii) Water pressure in gravity dam .	**07**
Q.2	**(a)**	Describe ogee spillway and its design .	**07**
	(b)	Describe phreatic line in earthen dam and discuss how to plot it when the filter is provided in earthen dam .	**07**
		OR	
	(b)	Design a practical profile of of gravity dam for the given data : (i) RL of base of dam =70 m (ii) RL of HFL of dam = 120m (iii) Safe compressive stress in concrete =3000 kN/m^2 (iv) Specific gravity of concrete=2.4 (v) Height of wave = 1.5 m.	
Q.3	**(a)**	Explain IS types of stilling basin	**07**
	(b)	In order to find factor of safety of d/s slope during steady seepage condition of section of dam drawn to a scale of 1cm = 5m and following results were obtained in critical slip circle (i) Area of N rectangle =15 sq cm (ii) Area of T rectangle=8.5 sq cm (iii) Area of U rectangle =3.0 sq cm (iv) length of arc =14.9 cm (v) φ= 27 ^{0} (vi) c=0.18 kg/cm^2 (vii)Unit weight of soil =1.8 g/cm^3. Calculate Factor of Safety .	**07**
		OR	
Q.3	**(a)**	Explain Types of earthen dam .	**07**
	(b)	Explain design of sarda type of fall .	**07**
Q.4	**(a)**	Explain chute spillway .	**07**
	(b)	Explain joints in Gravity dam.	**07**
		OR	
Q.4	**(a)**	Explain galleries in gravity dam.	**07**
	(b)	Explain ski jump bucket.	**07**
Q.5	**(a)**	Explain Energy dissipation below spillway .	**07**
	(b)	Describe analytical method of stability analysis of gravity dam .	**07**
		OR	
Q.5	**(a)**	Enlist different types of fall and explain Inglis type of fall.	
	(b)	Describe Swedish slip circle method .	

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