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**Question Paper Code : 20502**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Fifth Semester

Civil Engineering

CE 3053 – RAINWATER HARVESTING

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is Rainwater Harvesting?
2. State the necessity for water conservation.
3. Define Runoff.
4. State Darcy's law.
5. What is Rooftop Rainwater Harvesting?
6. In a Rainwater Harvesting system, the rainwater from a roof of 22m × 20 m drains into a cylindrical tank having diameter of 2m and height 3.5m. If the tank is full, determine the Precipitation.
7. How does Contour Bunds work?
8. Where are Gully Plugs used?
9. What are the difficulties in Rain Water Harvesting at catchment level?
10. What is the significance of Modernisation of Rain Water Harvesting system?

PART B — (5 × 13 = 65 marks)

11. (a) (i) What are the various sources of Water? Explain (6)  
(ii) What are the salient features of National Water Policy? Explain. (7)

Or

- (b) (i) How does Water conservation help in ensuring agriculture sustainability? (6)  
(ii) Explain briefly about Legislations on Rainwater Harvesting in India. (7)
12. (a) (i) Explain Hydrologic Cycle with neat sketch. (6)  
(ii) Explain in detail about Tipping type Raingauge with a sketch. Also discuss about their advantages and disadvantages. (7)

Or

- (b) (i) Derive an expression for flow into a well in unconfined aquifer. (6)  
(ii) A tube well penetrates into an unconfined aquifer having a saturated depth of 80 m. When the drawdown was 12m, discharge from the well was 180 l. p.m. Determine the discharge from the well at a drawdown of 18 m. Assume steady state condition and radius of influence as constant. (7)
13. (a) (i) What are the basic components of Rooftop Rainwater Harvesting system? Explain. (6)  
(ii) What is the function of filtration unit in Rooftop Rainwater Harvesting system? Explain about the filtration unit with a sketch. (7)

Or

- (b) (i) What are the different Traditional Rainwater Harvesting practices? Explain. (6)  
(ii) What are the methods of Artificial recharge? Explain. (7)

14. (a) (i) What are the components of Rain Water Harvesting system? Explain. (6)  
(ii) Write short notes on Check Dam and Percolation Pond. (7)

Or

- (b) (i) Explain briefly about recharging groundwater through Tube well. (6)  
(ii) What are the differences between Recharge Pit and Recharge Shaft? Explain with neat diagram. (7)
15. (a) (i) Explain briefly about maintenance of Rain Water Harvesting structures. (6)  
(ii) How do you evaluate Rain Water Harvesting structures? Explain. (7)

Or

- (b) (i) Explain about the maintenance of Rain Water Harvesting structures and its importance. (6)  
(ii) Discuss about the Contemporary practices of Rain Water Harvesting in India. (7)

PART C — (1 × 15 = 15 marks)

16. (a) What are the various types of Aquifers? Explain with sketch. (15)

Or

- (b) Explain in detail about the best practices of Rain water Harvesting in Urban areas. (15)