



Code No. : 5039/M

FACULTY OF ENGINEERING
B.E. 3/4 (Civil) II Semester (Main) Examination, May/June 2012
WATER RESOURCES ENGINEERING AND MANAGEMENT – I

Time: 3 Hours]

[Max. Marks : 75

Note : Answer *all* questions from Part – A, answer *any five* questions from Part – B.

PART – A

25 Marks

1. Write two disadvantages of recording rain gauges. 2
2. Find the radius of circle of influence if hydraulic conductivity is 40 m/day. 3
3. Water is released at the rate of 12 cumecs at the head of a canal. If duty at the field is 1250 Ha/cumec and loss of water in transit is 20%, find the area of land that can be irrigated. 3
4. Draw the section of canal in full filling. 2
5. Write limitations of Bligh's theory. 2
6. Draw the section of weir and barrage. 3
7. Explain the differences between aqueduct and super passage. 3
8. Show that for pipe outlet will be proportional when setting is equal to 0.3. 2
9. Write functional requirements of a multipurpose project. 2
10. Define Warabandhi system and explain its applications and limitations. 3

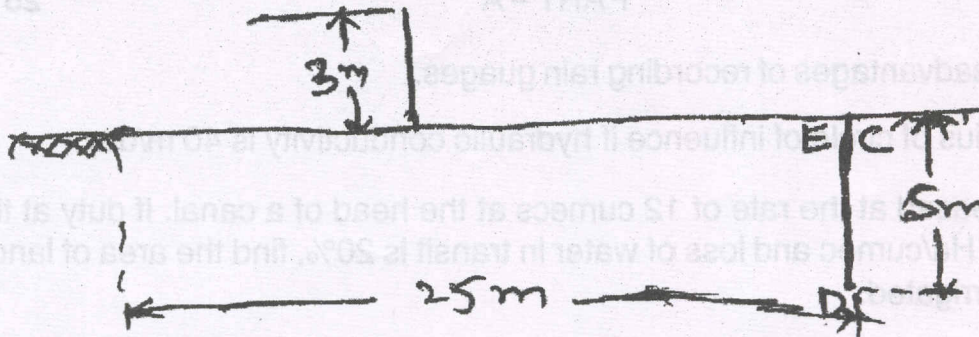
PART – B

50 Marks

11. a) Draw a neat sketch of hydrologic cycle in qualitative representation and explain it. 5
- b) From the historical data of annual flood peaks the mean and standard deviations are given as 20,000 and 10,000 m³/s. A structure on this catchment has been designed for 40,000 m³/s. Find its return period. Assume $\sigma_n = 1.06$ and $\bar{y}_n = 0.52$. 5



12. a) From basics of Lacey's equation derive the relation between silt factor, discharge and bed slope of channel. 5
- b) The discharge of an outlet is $0.2 \text{ m}^3/\text{s}$ and average losses from outlet to field are 10% of water flowing through outlet, if kor period and kor depth for wheat and rice are 3 weeks, 120 mm and 2 weeks, 250 mm. Calculate how much area can be irrigated for each crop. 5
13. a) Briefly explain causes of failure of weirs on permeable foundations with neat sketches. 5
- b) Determine analytically the uplift pressure at points E, D and C and exit gradient for the figure given below. 5



14. a) Draw the sketches of cross regulator and head regulator and write their functions. 5
- b) Explain Hind's method of design transition. 5
15. a) Briefly explain the following. 5
- i) Project formulation.
- ii) Project evaluation.
- b) Write short notes on : 5
- i) Integrated water management.
- ii) Systematic canal operation.
16. a) Derive the equation of yield of an open well by recuperation test. 5
- b) A 500 km^2 watershed received a 8 hr-storm which produced hourly intensities of 6, 9, 20, 16, 4, 14, 12 and 2 mm/hr. If the initial abstractions are estimated as 15 mm and ϕ index as 5 mm/hr, what would be the runoff volume produced by storm? 5
17. a) Compare Kennedy's and Lacey's theory in detail. 5
- b) Find the field capacity of soil with the data, depth of root zone = 2 m, existing water content = 6 % dry, density of soil = 1400 kg/m^3 , water applied to soil = 500 m^3 , water lost due to evaporation = 10 %. Area of land irrigated = 1000 m^2 . 5