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BE DEGREE (Full Time) END SEMESTER EXAMINATIONS, APRIL/MAY 2011

AGRICULTURAL AND IRRIGATION ENGINEERING

SIXTH SEMESTER

CE 9036 INTEGRATED WATER RESOURCES MANAGEMENT

(REGULATION 2008)

Time: 3 hours

Max. Marks: 100

Answer ALL questions

Part – A

10 x 2 = 20

1. Why the “hydraulic infrastructure plat form” was termed as spectacular both nationally and regionally?
2. Which three parameters are used to measure “the livelihood security index”?
3. How does the basin shape influence the runoff?
4. What does stream frequency and drainage density measure?
5. List the characteristics of a braided channel.
6. Differentiate the effects on runoff between a treated and untreated watershed.
7. State the conditions that have to be satisfied to considered water as an economic good.
8. From the social good context, why is the water considered as a most scarce resource than land?
9. In agenda 21, (Chapter 18) on fresh water, what were the programmes listed for sustainability.
10. Can NGOs effect a change in social instruments?

Part - B

5 x 16 = 80

11. (i) Describe the cause and effects that have transformed a spectacular hydraulic infrastructure to become a bleak hydraulic mission, due to the neglect of the social and economic dimensions resulting in an environment crisis? (8)
(ii) How will the concepts of integrated water resources management help in mitigating this crisis? (8)
12. (a) Explain in details the drainage basin morphometric analysis that have been evolved to determine the characteristics of several drainage networks of a basin. (16)
(OR)
(b) (i) Sketch the storage zones of the reservoir and indicate the density current and the sedimentation processes. (8)

(ii) A reservoir with dead storage capacity of $1.0 \times 10^9 \text{ m}^3$ and with an average annual suspended load in dead storage of $0.02 \times 10^9 \text{ m}^3$ has a soil composition of coarse silt 1 %, medium silt 15 % and fine silt 84 %. If the entire coarse silt, 80% of medium silt and 20 % of fine silt (45% silt and 55% water) is deposited in the reservoir, determine the volume of suspended sediment load deposition in the river. Also estimate the life of the reservoir, if the bed load deposition is 10 % of the annual average suspended load in dead storage. (8)

13. (a) Evaluate the braided channel characteristics of the Brahmaputra river by using topological analysis, deduce the results interpretation and conclusions. (16)

(OR)

(b) (i) To bring out the relationship between rainfall and resulting runoff production on the hill slope under different land uses, list the hydrological parameters that were used as key words. Mention the accepted methods of quantifications and control of soil erosion. (8)

(ii) For a comprehensive soil erosion control programme, highlight the influence of soil conservation factor of a watershed based mixed land use pattern as a soil conservation measures on runoff yield in hilly micro-watershed. (8)

14. (a) (i) Discuss the factors that were considered to classify water as a social and economic good. (8)

(ii) Enumerate the recommendations made to satisfy the National Water Policy (1987) with respect to water rate as means to convey its scarcity to its users and to foster motivation for efficient use and at the same time generate funds for annual operation and maintenance cost and to recover a part of the fixed cost. (8)

(OR)

(b) Prepare a water balance schematic diagram for India and compare it with the water requirement and suggest measures for sustainability. (16)

15. (a) Bring out the sustainability issues using people, land, water, biomass and product as a base for discussion. Deduce the measures for integrated and sustainable economic-ecology restoration techniques. (16)

(OR)

(b) Discuss the concepts, needs, benefits, constrains and limitations in adopting Public Private Partnership for overall benefits and prosperity of the country. (16)
