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B.E. / B.Tech. (Full Time) DEGREE ARREAR EXAMINATIONS, NOV / DEC 2013

CIVIL ENGINEERING BRANCH

Eighth Semester

CE 9038 WATERSHED CONSERVATION AND MANAGEMENT

(Regulation 2008)

Time: 3 hours

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

- 1) Decode the watershed 4A2B3.
- 2) Classify the watersheds based on their area.
- 3) How does erosivity and erodibility differ?
- 4) Calculate the topographic factor if slope length is 100 m, slope angle is 12° . Assume $m=0.2$
- 5) What are the various in-situ soil moisture conservation practices carried out for annual crops?
- 6) List out the benefits of Rain Water Harvesting.
- 7) Expand a) NABARD b) TAWDEVA c) DPAP d) NWDPRA
- 8) Substantiate why an integrated approach for watershed management is necessary.
- 9) With suitable examples, differentiate Range and Pastures.
- 10) What are the methods to control stream temperature?

Part – B (5 x 16 = 80 Marks)

- 11) i) How is erosion classified and enumerate the factors responsible for the same? (6)
ii) Discuss the morphometric characteristics of watershed in detail. (10)
 - 12) a) i) In a 20 ha catchment, the soil erosion is to be evaluated. The following information for the catchment is available. $R = 1000 \text{ t-m/ha mm/h}$; $K = 0.25 \text{ t/ha/R}$; $LS = 0.1$; vegetative cover factor = 0.5, contour farming is practiced in 12 ha ($P=0.6$) and strip cropping in the remaining area ($P=0.3$). Calculate the soil loss using USLE and the annual soil loss when no such conservation measure is taken up. (4)
ii) Discuss the USLE and its limitations. (4)
iii) What is gully erosion? Explain the various stages of gully and their classification. (8)
- (or)
- b) i) With a neat sketch, discuss contour trenching. (8)

ii) Design a trapezoidal water channel with 4:1 side slope along a longitudinal gradient of 4% and carries 1.65 cumecs. The maximum permissible velocity of flow is 1.21 m/s and a free board of 10 cm is recommended. Assume Manning's $n=0.04$. (8)

13) a) Give the layout of a farm pond and explain the steps involved in the design. (16)

(or)

b) State the different water harvesting techniques and explain the types of short term runoff harvesting techniques. (16)

14) a) i) Write short notes on any two watershed programmes implemented in Tamil Nadu. (8)

ii) Explain how Aerial Photography and Remote Sensing techniques are useful in watershed management. (8)

(or)

b) Describe the step by step procedure followed in the preparation of a detailed watershed plan for implementation. (16)

15) a) i) What is grazing and discuss the effects and methods of grazing in detail. (16)

(or)

b) i) What are wastelands and how are they classified? Elaborate the measures to develop the same. (16)