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B.TECH.
(SEM VII) THEORY EXAMINATION 2023-24
SOIL & WATER CONSERVATION ENGINEERING

Time: 3 Hours

Total Marks: 100

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt all questions in brief.

2x10 = 20

- (a) Discuss the effect of soil erosion.
- (b) Define spillways.
- (c) Explain the classification of gullies.
- (d) Explain in short, the various factors responsible for the sheet erosion.
- (e) Write about impact of surface roughness on the wind erosion.
- (f) List two methods of Air Erosion Control.
- (g) Enlist the different method of grass land management.
- (h) Enlist various types of water losses.
- (i) What do you mean by infiltration?
- (j) What do you mean by the “Soil Conservation”?

SECTION B

2. Attempt any three of the following:

10x3 = 30

- (a) Using the USLE, calculate the annual soil loss in tons per hectare from afield with the following details:
 Rainfall erosivity factor = 800
 Soil erodibility factor = 0.20
 Crop management factor = 0.50
 Conservation practice factor = 1.0
 Slope length factor = 0.2
 Also find out by how much % of soil loss is reduced when the cultivation is done on the contour. Assume value of conservation practice P for contouring as 0.5.
- (b) Differentiate between u shape and v shape gullies.
- (c) How can we use biological methods in conserving the soil?
- (d) How does agricultural waste contaminate water sources?
- (e) What is the need for planning of water resources project?

SECTION C

3. Attempt any one part of the following:

10x1 = 10

- (a) Explain why erosion rates are more in clay soils compared to sandy soils.
- (b) Explain wind erosion control measure.

4. Attempt any *one* part of the following: 10 x1 = 10

- (a) Calculate the height and cross-sectional area of contour bund to be constructed on the land of slope 5%. The other details are given below
 - I. Rainfall excess for 24-hr duration is 80cm
 - II. Horizontal interval is 15cm
 - III. Depth of water flow over the weir is 30 cm.
- (b) What are the components of chute spillway?

5. Attempt any *one* part of the following: 10x1 = 10

- (a) Write about the assessment of the surface water resources in India. Also explain in detail; the inter and intra basin development concept.
- (b) What is soil quality management? Write in brief, the various methods to improve the soil quality. Explain; how will you perform the reclamation of salt affected soils.

6. Attempt any *one* part of the following: 10x1 = 10

- (a) What are the four processes involved in water self-purification?
- (b) How to control and reduce evaporation losses?

7. Attempt any *one* part of the following: 10x1 = 10

- (a) Explain various measures to flood control.
- (b) What is the economic importance of water resources?

Model Paper, Amit Singh