

SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF AGRICULTURAL ENGINEERING

QUESTION BANK



VI SEMESTER

AG3663 SOIL AND WATER CONSERVATION ENGINEERING

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Prepared by

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SUBJECT: SOIL AND WATER CONSERVATION ENGINEERING
SEM / YEAR: 06 /III

UNIT-I: SOIL EROSION PRINCIPLES			9
Approaches to soil conservation – Soil conservation in India - Erosion – Agents -Causes - Mechanics of water erosion – Soil erosion problems - Types of water erosion: Raindrop erosion, Sheet erosion, Rill erosion, Gully erosion, Stream bank erosion –Classification of Gully – Gully Control Structures: Drop Spillway, Drop Inlet, Chute Spillways - Prerequisites for soil and water conservation measures.			
PART - A			
Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	List at least four causative factors of land degradation.	BT-1	Remember
2	What causes accelerated soil erosion all over the world?	BT-3	Apply
3	How will you classify soil erosion?	BT-2	Understand
4	What do you understand by accelerated erosion.	BT-1	Remember
5	Classify soil erosion according to erosion agents.	BT-2	Understand
6	List out the factors influencing soil erosion.	BT-1	Remember
7	Write the biological factors that affects soil erosion.	BT-3	Apply
8	Describe about mechanics of water erosion.	BT-1	Remember
9	List out the types of water erosion.	BT-1	Remember
10	Write short notes on splash erosion.	BT-3	Apply
11	Describe about sheet erosion.	BT-1	Remember
12	Write the difference between rill erosion and gully erosion.	BT-2	Understand
13	What do you understand about stream bank erosion?	BT-3	Apply
14	Define gully erosion.	BT-1	Remember
15	Why gullies are developed?	BT-1	Remember
16	Describe the four stages of gully development.	BT-1	Remember
17	How gullies are classified based on size?	BT-2	Understand
18	Define chute spillway.	BT-1	Remember
19	List out the types of gully control measures.	BT-1	Remember
20	What are the engineering gully control measures?	BT-3	Apply
21	What is drop spillway?	BT-3	Apply
22	Give the merits of chute spillway.	BT-2	Understand
23	List any four uses of drop spillway.	BT-1	Remember
24	Draw drop inlet spillway and its components.	BT-1	Remember
PART - B			
Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	What are the problems arising due to soil erosion.	BT-2	Understand

2	State the importance of soil conservation practices.	BT-1	Remember
3	Explain in detail about the various types of soil erosion.	BT-3	Apply
4	Elaborate the agents causing soil erosion with neat sketch.	BT-2	Understand
5	Demonstrate different forms of water erosion.	BT-3	Apply
6	Write the different types of water erosion.	BT-2	Understand
7	What are the different types of gullies.	BT-2	Understand
8	How the runoff can be controlled in gully.	BT-2	Understand
9	State different types of Temporary Gully Control Structures (TGCS).	BT-1	Remember
10	Design the notch dimensions of a wooden slab dam to carry a peak flow of 0.6 m ³ /sec. The notch has rectangular opening. Width of gully channel is 2.5 m.	BT-5	Evaluate
11	Explain in detail about the salient features and planning of Permanent Gully Control Structures.	BT-4	Analysing
12	Elaborate design procedure of Permanent Gully Control Structures (PGCS).	BT-2	Understand
13	Explain drop spillway components and functions.	BT-4	Analysing
14	Determine the size of concrete pipe needed in a drop-inlet spillway for a peak flow of 2 m ³ /s and a total head of 3 m. Determine the slope to be given to the pipe for the pipe to flow full. Length of pipe = 12 m, entrance loss coefficient $K_e = 0.5$ and friction loss coefficient $K_f = 0.03$.	BT-5	Evaluate
15	Write the design procedure for a drop spillway.	BT-2	Understand
16	Explain the components of drop inlet spillway.	BT-1	Remember
17	Differentiate between drop spillway and chute spillway.	BT-2	Understand
18	Explain the design features of chute spillway.	BT-3	Apply

UNIT-II: ESTIMATION OF SOIL EROSION

9

Runoff computation for soil conservation: SCS-CN method – Evolution of Universal Soil Loss Equation: Applications and Limitations – Modified Universal Soil Loss Equation – Revised Universal Soil Loss Equation- Permissible erosion – Land use capability classification - Classification of eroded soils.

PART - A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	State the importance of SCS-CN method.	BT-1	Remember
2	List out the Factors influencing SCS curve number.	BT-1	Remember
3	What are the various hydrological soil groups?	BT-1	Remember
4	Define antecedent moisture condition.	BT-1	Remember
5	Write fundamental hypotheses of SCS-CN method.	BT-1	Remember
6	List out antecedent moisture condition (AMC) classes.	BT-1	Remember
7	Brief about land use cover.	BT-2	Understand
8	How rainfall intensity influences Curve Number?	BT-2	Understand
9	Give the advantages of SCS - CN method.	BT-3	Apply
10	What is the scope of SCS method?	BT-1	Remember
11	Write short notes on sediment yield.	BT-3	Apply
12	State the importance of Universal Soil Loss Equation (USLE).	BT-2	Understand

13	Write Modified Universal Soil Loss Equation (MUSLE) with explained terms.	BT-3	Apply
14	How will you calculate rainfall erosive factor?	BT-2	Understand
15	What is soil erodibility factor?	BT-3	Apply
16	Define topographic factor.	BT-1	Remember
17	Give the stages of crop management factor.	BT-2	Understand
18	State support practice factor.	BT-1	Remember
19	List out the uses of Universal Soil Loss Equation.	BT-1	Remember
20	Illustrate limitations of Universal Soil Loss Equation.	BT-3	Apply
21	Differentiate Universal Soil Loss Equation and Revised Universal Soil Loss Equation.	BT-2	Understand
22	Write Modified Universal Soil Loss Equation expression.	BT-3	Apply
23	Define Runoff factor.	BT-1	Remember
24	Give the factors influencing land capability classification.	BT-2	Understand

PART - B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	How will you determine curve number based on SCS method?	BT-2	Understand
2	State the advantage, scope and limitation of SCS-CN method.	BT-1	Remember
3	Explain in detail about the possible prediction errors related to the use of single composite CN values.	BT-3	Apply
4	How will you estimate soil loss?	BT-2	Understand
5	Explain briefly about Universal Soil Loss equation.	BT-1	Remember
6	Compare and contrast rainfall erosivity and soil erodibility factors.	BT-2	Understand
7	How will you identify different land use classes in field.	BT-2	Understand
8	Explain in detail about the soil classification with respect to various parameters.	BT-3	Apply
9	Write short notes on climatic and wetness limitations.	BT-1	Remember
10	Describe coupled SCS CN method with Universal Soil Loss Equation.	BT-3	Apply
11	Compare and contrast Universal Soil Loss Equation and Revised Universal Soil Loss Equation.	BT-2	Understand
12	Explain briefly about Revised Universal Soil Loss Equation.	BT-2	Understand
13	Demonstrate about Modified Universal Soil Loss Equation.	BT-1	Remember
14	Write the difference between Revised Universal Soil Loss Equation and Modified Universal Soil Loss Equation.	BT-2	Understand
15	Explain in detail about crop management factor.	BT-1	Remember
16	Explain the importance of topographic factor in Universal Soil Loss Equation (USLE).	BT-3	Apply
17	Write the roles of crop management factor in Universal Soil Loss Equation (USLE).	BT-3	Apply
18	Explain briefly about the terms slope, soil depth and available moisture- holding capacity (AMC).	BT-2	Understand

UNIT-III: EROSION CONTROL MEASURES

9

Agronomic practices: contour cultivation - strip cropping – tillage practices – Soil management practices – Bunding: Types and design specifications - Mechanical measures for hill slopes –

Terracing: Classification and design specification of bench terrace – Grassed waterways: Location, construction and maintenance – Types of temporary and permanent gully control structures.

PART - A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	State the term contour.	BT-2	Understand
2	What do you understand about agronomic practices?	BT-1	Remember
3	Where will you implement contour cultivation?	BT-3	Apply
4	List out the merits of contour farming.	BT-2	Understand
5	Define strip cropping.	BT-1	Remember
6	List out the importance of strip cropping	BT-1	Remember
7	What are the types of strip cropping?	BT-1	Remember
8	What do you understand about buffer strips?	BT-1	Remember
9	What are the conditions for strip cropping?	BT-1	Remember
10	How does conservation tillage reduce erosion?	BT-2	Understand
11	What is conservation tillage?	BT-1	Remember
12	How do conservation tillage practices lead to agricultural sustainability?	BT-2	Understand
13	State the term zero till.	BT-1	Remember
14	How will you classify bunds?	BT-3	Apply
15	State the limitation of contour bund.	BT-1	Remember
16	What are the mechanical measures we can provide in hill slopes?	BT-1	Remember
17	Classify terraces.	BT-2	Understand
18	Write the suitability of a broad base terrace.	BT-2	Understand
19	How will you maintain the bench terrace?	BT-2	Understand
20	Write the purpose of a grassed waterway.	BT-1	Remember
21	What do you understand about ballasting?	BT-3	Apply
22	Define gully.	BT-1	Remember
23	Draw a neat sketch illustrating waterfall erosion at gully head.	BT-2	Understand
24	What are the principles of gully control?	BT-1	Remember

PART - B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
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1	Explain in detail the strip cropping practice in erosion control.	BT-1	Remember
2	Describe contour cultivation causes and benefits.	BT-3	Apply
3	Explain the benefits and limitations of tillage practices.	BT-2	Understand
4	Illustrate types of tillage and its suitability.	BT-2	Understand
5	Explain briefly about contour bunds.	BT-1	Remember
6	Explain briefly about graded bund.	BT-3	Apply
7	Differentiate different types of bunds.	BT-2	Understand
8	Explain briefly about earth work and area lost due to bunding.	BT-2	Understand
9	Write short notes on terraces.	BT-2	Understand
10	Explain in detail about bench terrace and its types.	BT-1	Remember
11	How will you assess the area lost due to terracing?	BT-2	Understand
12	Explain the design specification of bunds.	BT-3	Apply
13	On a 20% hill slope, it is proposed to construct bench terraces. If the vertical interval of Terrace is 2 m, calculate (i) length of terrace per hectare, (ii) earth work required per hectare, and (iii) area lost per hectare both for vertical cut and batter slope of 1:1. The cut should be equal to fill.	BT-5	Evaluate
14	Explain the components involved in maintenance of bench terraces.	BT-1	Remember
15	Detail the construction procedure for grassed waterway.	BT-3	Apply
16	List out the steps involved in maintenance of grassed waterway.	BT-2	Understand
17	Give the design criteria of TGCS.	BT-1	Remember
18	Brief about planning of design and salient features of PGCS.	BT-3	Apply

UNIT-IV: WATER CONSERVATION MEASURES**9**

In-situ soil moisture conservation – Water harvesting principles and techniques: Micro catchments, catchment yield using morphometric analysis - Farm ponds: Components, Design, Construction and Protection – Check dams - Earthen dam – Retaining wall.

PART - A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	Define the term in situ moisture conservation.	BT-1	Remember
2	List out the in-situ moisture conservation techniques.	BT-1	Remember
3	Draw micro catchment.	BT-1	Remember
4	List out the functions of micro catchment.	BT-1	Remember
5	What is water harvesting?	BT-3	Apply
6	State runoff.	BT-1	Remember
7	Brief about macro catchment water harvesting.	BT-3	Apply
8	Explain the term Spate Irrigation.	BT-2	Understand
9	How runoff can be differentiated from flood water harvesting.	BT-2	Understand
10	State the term farm pond.	BT-1	Remember
11	Write the types of farm ponds.	BT-2	Understand
12	What are the various components of farm pond?	BT-3	Apply
13	How can the volume of a farm pond be assessed?	BT-2	Understand
14	Write the formula for Catchment and cultivable area ratio.	BT-1	Remember
15	What is morphometric analysis of watershed?	BT-3	Apply
16	Explain bifurcation ratio.	BT-1	Remember
17	Give a short note on the relief ratio.	BT-2	Understand
18	How can the form factor be calculated?	BT-2	Understand
19	Differentiate dam and retaining wall.	BT-2	Understand
20	Write the factors to be considered while designing a check dam.	BT-1	Remember
21	Under what circumstances will the retaining wall be constructed?	BT-3	Apply
22	Write any five components of earthen dam.	BT-2	Understand
23	List out the type of drains.	BT-1	Remember
24	Write the purpose of Hawksley's expression.	BT-3	Apply

PART - B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	Write soil condition and bunding options for in situ moisture conservation.	BT-3	Apply
2	Write the importance of water harvesting technique.	BT-1	Remember
3	Describe different types of water harvesting.	BT-3	Apply
4	Explain in detail about the long term runoff harvesting structures.	BT-2	Understand
5	Explain briefly about flood water harvesting methods.	BT-2	Understand
6	Elaborate groundwater harvesting and its types.	BT-1	Remember
7	Elaborate different types of farm pond.	BT-2	Understand
8	Explain with a neat sketch about the dugout pond.	BT-1	Remember
9	Write optimization procedure for different farm pond dimensions.	BT-3	Apply
10	Elaborate about the check dam and its classification with durability check.	BT-2	Understand
11	Explain about brushwood dams and its types.	BT-3	Apply
12	Demonstrate various types of retaining wall.	BT-2	Understand
13	Explain the components of earthen dam.	BT-1	Remember
14	Write short notes on various types of earthen dam.	BT-1	Remember
15	Give the design criteria for earthen dam.	BT-3	Apply
16	Illustrate merits and demerits of earthen dam.	BT-3	Apply
17	Compare earthen and check dams with a neat sketch.	BT-2	Understand
18	Demonstrate the factors that differentiate retaining walls from dams.	BT-3	Apply

UNIT-V: SEDIMENTATION

9

Sediment: Sources – Types of sediment load – Mechanics of sediment transport – Estimation of bed load – Sediment Graph - Reservoir sedimentation: Basics - Factors affecting sediment distribution pattern, Rates of reservoir sedimentation - Silt Detention Tanks – sediment control methods.

PART - A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	Define the term sedimentology.	BT-1	Remember
2	Describe the sedimentation process.	BT-1	Remember
3	Write the different sources of sedimentation.	BT-2	Understand
4	Draw a sediment diagram.	BT-1	Remember
5	Give any five factors that are influencing sedimentation.	BT-2	Understand

6	Draw a relationship between sediment yield and watershed area.	BT-2	Understand
7	What are the four modes of particle transport?	BT-3	Apply
8	Define boundary layer.	BT-1	Remember
9	Write the various types of sediment transport.	BT-2	Understand
10	Illustrate the Hjulstrom curve.	BT-3	Apply
11	List out the factors that govern suspended load.	BT-1	Remember
12	How are the sediment particles categorized during transport?	BT-2	Understand
13	Write the importance of sediment graphs.	BT-3	Apply
14	Draw a neat sketch of a sediment graph.	BT-1	Remember
15	Why do we need to consider reservoir sedimentation?	BT-2	Understand
16	List out the influencing factors of reservoir sedimentation.	BT-1	Remember
17	Define trap efficiency.	BT-1	Remember
18	Explain sediment delivery ratio.	BT-2	Understand
19	What is the post constructive measures of reservoir sedimentation?	BT-3	Apply
20	Write the importance of design capacity.	BT-2	Understand
21	Brief about silt detention tanks.	BT-3	Apply
22	Define the term reservoir constriction.	BT-1	Remember
23	Give the merits of the detention tank.	BT-3	Apply
24	List out the steps involved in detention tank design.	BT-1	Remember

PART - B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	Explain in detail about the sources of sedimentation.	BT-1	Remember
2	Explain the factors affecting sedimentation.	BT-2	Understand
3	Explain briefly about bed load.	BT-3	Apply
4	Write short notes on suspended load.	BT-2	Understand
5	Demonstrate about dissolved load.	BT-1	Remember
6	How can the bed load be measured?	BT-2	Understand
7	Demonstrate about the suspended load can be estimated?	BT-3	Apply
8	Compare wash load and bed load.	BT-2	Understand
9	Differentiate suspended and dissolved load.	BT-2	Understand

10	Write short notes on any five losses due to sedimentation.	BT-2	Understand
11	Illustrate equal discharge increment method with formula.	BT-3	Apply
12	How will you estimate the rate of sedimentation in a reservoir?	BT-2	Understand
13	Explain in detail about pre constructive measure of reservoir sedimentation.	BT-1	Remember
14	Explain briefly any five factors affecting sedimentation of reservoir.	BT-2	Understand
15	Explain equal width increment method.	BT-1	Remember
16	Elaborate sediment graph and its importance with a neat sketch.	BT-3	Apply
17	Describe the basics of reservoir sedimentation.	BT-1	Remember
18	Explain in detail about the analytical method of bed load estimation.	BT-3	Apply

