



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY::PUTTUR
(AUTONOMOUS)**

Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Soil And Water Conservation Engineering (19AG0711) **Course Branch:** B.Tech –AGE

Year &Sem: III-B.Tech&II-Sem

Regulation: R19

UNIT-I

INTRODUCTION TO SWCE, TYPES OF EROSION, GULLIES CLASSIFICATION, USLE

1.	a.	Define soil erosion.	[L1][CO1]	[2M]
	b.	List soil and water conservation training and research institute in India	[L1][CO1]	[6M]
	c.	Discuss the effect of soil erosion	[L2][CO1]	[4M]
2.	a.	Write a short note on causes of soil erosion	[L1][CO1]	[6M]
	b.	Discuss Briefly about types of erosion.	[L2][CO1]	[6M]
3.		Describe the factors affecting erosion	[L2][CO1]	[12M]
4.	a.	List out the agents causing soil erosion and explain pipe erosion	[L1][CO1]	[6M]
	b.	Compute the annual soil loss from the continuous fallow field tilled up and down the slope using USLE. Values of the other factors of USLE are as follows: Rainfall factor $R = 500$, Soil Erodibility factor $K = 0.15$, LS factor = 0.50 and C and P factor = 1. Also compute the soil loss from the above field when it is cultivated on contour with maize crop and assume value of crop management factor $C = 0.6$ and conservation factor $P = 0.5$.	[L3][CO1]	[6M]
5.	a.	Explain the mechanism of water erosion	[L2][CO1]	[10M]
	b.	Explain why erosion rates are more in clay soils compared to sandy soils	[L2][CO1]	[2M]
6.	a.	Explain the classification of gullies	[L2][CO1]	[6M]
	b.	Differentiate between u shape and v shape gullies	[L2][CO1]	[6M]
7.		Explain the types of water erosion	[L2][CO1]	[12M]
8.	a.	a) Using the USLE, calculate the annual soil loss in tonnes per hectare from a field with the following details: 1) Rainfall erosivity factor = 800 (2) Soil erodibility factor = 0.20 (3) Crop management factor = 0.50 (4) Conservation practice factor = 1.0 (5) 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.	[L3][CO1]	[6M]
	b.	Discuss Applications and Limitations of USLE	[L2][CO2]	[6M]
9.		Briefly explain the each parameters of USLE	[L2][CO2]	[12M]
10.	a.	Write a short note on USLE, MUSLE and RUSLE	[L2][CO2]	[10M]
	b.	Define torrent erosion and anthropogenic erosion	[L1][CO2]	[2M]

UNIT-II**WIND EROSION, RUNOFF, RUNOFF ESTIMATION METHODS AND CONTROL MEASURES**

1.	a.	Define wind erosion	[L1][CO2]	[2M]
	b.	Write the adverse effect of wind erosion	[L2][CO2]	[2M]
	c.	Explain mechanics of wind erosion	[L2][CO2]	[8M]
2.	a.	Explain wind erosion control measure	[L2][CO2]	[10M]
	b.	List the type of mulching material used	[L1][CO2]	[2M]
3.		Explain the Factors affecting runoff	[L2][CO]	[12M]
4.	a.	Describe land use capability classification	[L2][CO2]	[8M]
	b.	Define wind breaks and shelter belts	[L1][CO2]	[4M]
5.	a.	Write briefly about hydrological soil groups	[L2][CO2]	[6M]
	b.	Explain different methods of strip cropping	[L2][CO2]	[6M]
6.	a.	Explain agronomical measure to control erosion	[L2][CO2]	[10M]
	b.	Write a short note on drainage density	[L2][CO2]	[2M]
7.	a.	Classify and explain the different types of mulches used in agriculture	[L3][CO2]	[6M]
	b.	Explain engineering measure to control erosion	[L2][CO2]	[6M]
8.	a.	Explain different methods of estimation of peak rate of runoff in brief	[L2][CO2]	[8M]
	b.	Write a short note on Antecedent Moisture Condition (AMC)	[L2][CO2]	[4M]
9.	a.	Calculate the peak rate of runoff for 10 years return period from an watershed of 75 ha area. The watershed is divided into three parts based on its land use and soil texture in which first part of 25ha with 1% slope is under cultivation($C=0.50$), 30 ha with slope 7% is under pasture($C=0.36$) and rest of the land land with slope 12% is under forest cultivation($C=0.50$). The intensity of rainfall is 7.5cm/ha.	[L3][CO2]	[6M]
	b.	Write the assumption and limitation of Rational method	[L2][CO2]	[6M]
10.	a.	Explain the methods to estimate the Erosivity from Rainfall data	[L2][CO2]	[6M]
	b.	Write a short on time of concentration and Threshold velocity	[L2][CO2]	[4M]
	c.	Explain two types watershed based on shape and how it effects the runoff	[L2][CO2]	[2M]

UNIT-III**CONTOUR BUNDS AND ITS DESIGN, GRADED BUNDS, TERRACES**

1.	a.	Define bund and write its feasibility for construction	[L1][CO3]	[3M]
	b.	Explain the classification of bunding system with their limitations	[L2][CO3]	[6M]
	c.	Differentiate narrow base bund and broad base contour bund	[L2][CO3]	[3M]
2.	a.	Classify types of bunds and explain them	[L2][CO3]	[7M]
	b.	Explain the design criteria of bund construction	[L2][CO3]	[5M]
3.		Explain the steps involved in design of contour bunds	[L2][CO3]	[12M]
4.	a.	Differentiate between Contour bund and Graded bund	[L2][CO3]	[6M]
	b.	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.	[L3][CO3]	[6M]
5.		Design a contour bund for the following specific conditions given below: The area of the field is 1200 m x 50 m having uniform slope of 3% in length wise direction. The soil type is sandy loam having medium to high infiltration rates. The soil cover is moderate during rainy season. The average annual rainfall of the region is 850 mm and one day maximum excess rainfall for 10 years recurrence interval is 900 mm. Take $X=0.6$ and $Y = 1.5$, As per soil conditions (sandy loamy soil), consider 2:1 and 5:1 as upstream and downstream slopes respectively.	[L3][CO3]	[12M]
6.	a.	List the surplusing arrangement made in bunding system and describe the surplus weir	[L1][CO3]	[6M]
	b.	In a hilly region, bench terracing is proposed for cultivation purpose. The general land slope is 30%. Average soil depth is about 1.0m, limiting the depth of cut to 0.7m. Raiser is to be laid on 1:1 gradient. Compute the width of terrace, Earth work per ha and its cost @INR 2.5 per m^3 and Area lost in bench terracing.	[L3][CO3]	[6M]
7.	a.	Discuss the types of trenches with neat sketch	[L2][CO3]	[8M]
	b.	Define terrace and write its importance	[L1][CO3]	[4M]
8.	a.	Explain the adaptability conditions of different types of bench terraces	[L2][CO3]	[4M]
	b.	Write the classification of terrace and explain broad base terrace	[L2][CO3]	[8M]
9.		Briefly describe the design and layout of bench terraces	[L2][CO3]	[12M]
10.	a.	Discuss types of bench terraces with neat diagram	[L2][CO3]	[8M]
	b.	Write the objectives and limitations of bench terraces.	[L2][CO3]	[4M]

UNIT-IV**VEGETATIVE WATERWAYS, SEDIMENTATION, CONTOUR MAPS**

1.	a.	Define grassed waterways and explain its importance in soil conservation	[L1][CO4]	[4M]
	b.	Write the advantages and disadvantages of grassed waterways	[L2][CO4]	[3M]
	c.	Describe important points to be considered for site selection of grassed waterways construction	[L2][CO4]	[5M]
2.	a.	Explain the construction procedure for grassed waterways	[L2][CO4]	[6M]
	b.	Write a short note on maintenance of grassed waterways	[L2][CO4]	[6M]
3.		Explain the design steps of grassed waterways	[L2][CO4]	[12M]
4.	a.	Write a short note on selection of suitable grasses	[L2][CO4]	[5M]
	b.	Design a grassed waterway of parabolic shape to carry a flow of $2.6 \text{ m}^3/\text{s}$ down a slope of 3 percent. The waterway has a good stand of grass and a velocity of 1.8 m/s can be allowed. Assume the value of n in Manning's formula as 0.04.	[L3][CO4]	[7M]
5.	a.	Explain the type of waterways based on shape and explain why parabolic shape of grassed waterways is most suitable shape.	[L2][CO4]	[7M]
	b.	Write down the uses of contour maps in SWCE	[L2][CO4]	[5M]
6.		Explain pre and post sedimentation control methods	[L2][CO4]	[12M]
7.		Describe the methods of in Stream Sediment Measurements	[L2][CO4]	[12M]
8.	a.	Define sedimentation and various sources of sediment in brief	[L1][CO4]	[5M]
	b.	Define contour and briefly write its procedure for preparation of contour map	[L1][CO4]	[7M]
9.	a.	List out various factors affecting reservoirs sedimentation	[L1][CO4]	[10M]
	b.	Write a short note on toposheet	[L2][CO4]	[2M]
10.	a.	Briefly explain the characteristics of contour	[L2][CO4]	[8M]
	b.	Write a short note on sediment delivery ratio and trap efficiency	[L2][CO4]	[4M]

UNIT-V

WATER HARVESTING TECHNIQUES, GULLY CONTROL MEASURES

1.	a.	Define water harvesting and describe its importance	[L1][CO5]	[5M]																
	b.	Write short note on gabion structure, Froud number and piping and freeboard	[L2][CO6]	[7M]																
2.		Explain various water harvesting techniques	[L2][CO5]	[12M]																
3.	a.	Define farm pond, and write its importance	[L1][CO5]	[6M]																
	b.	Describe in detail about the roof water harvesting	[L2][CO5]	[6M]																
4.	a.	List the types of farm pond and describe embankment type farm pond	[L1][CO5]	[10M]																
	b.	Write down the uses of farm pond	[L2][CO5]	[2M]																
5.	a.	Calculate the capacity of farm pond using trapezoidal and Simpsons formula. The area enclosed by different contours of pond site are as below.	[L3][CO5]	[8M]																
		<table border="1"> <tbody> <tr> <td>Contour value</td> <td>300</td> <td>301</td> <td>302</td> <td>303</td> <td>304</td> <td>305</td> <td>306</td> </tr> <tr> <td>Area enclosed (sq.m)</td> <td>220</td> <td>250</td> <td>320</td> <td>370</td> <td>450</td> <td>530</td> <td>600</td> </tr> </tbody> </table>			Contour value	300	301	302	303	304	305	306	Area enclosed (sq.m)	220	250	320	370	450	530	600
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Area enclosed (sq.m)	220	250	320	370	450	530	600													
b.	Write a short note on hydraulic jump	[L2][CO5]	[4M]																	
6.		Enlist permanent gully control structures and explain them	[L1][CO6]	[12M]																
7.		Describe the design steps involved in farm pond	[L2][CO5]	[12M]																
8	a.	Explain the design steps of gully control structures in brief	[L2][CO6]	[10M]																
	b.	Write down the Uses of Drop Structures	[L2][CO6]	[2M]																
9.		Classify the gully control structures and explain temporary structures	[L2][CO6]	[12M]																
10.		Explain components of drop structures with neat sketch	[L2][CO6]	[12M]																