GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fifth Semester Regular) Examinations, December – 2023

21BAGES25005 – Soil and Water Conservation Engineering

(AGE)

Time: 3 hrs Maximum: 70 Marks

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. How can human activities such as deforestation and agriculture contribute to soil erosion?	CO1	K2
b. What is soil erosion and why is it a concern for the environment?	CO1	K1
c. How does vegetation cover affect the formation and growth of gullies?	CO2	K2
d. What is water erosion, and how does it differ from other forms of erosion?	CO3	K1
e. What do you mean by wind erosion?	CO4	K1

PART – B **(15 x 4 = 60 Marks)**

Answer ***ALL*** questions	Marks	CO #	Blooms Level
2. a. How has human-induced soil erosion intensified over the past century, and what are the socio-economic implications of this trend on agricultural communities and global food security?	10	CO1	K2
b. Determine the terminal velocity and kinetic energy of 2 mm diameter raindrop, if drag coefficient is 0.517, density of water is 1000 kg/m3 and density of air is 1.2 kg/m3.	5	CO1	K3
(OR)			
c. Define water erosion and explain the mechanics of Splash Erosion in details	10	CO1	K2
d. Determine the terminal velocity and kinetic energy of 2 mm diameter raindrops if (i) Drag Coefficient (Cd) = 0.517 for 2 mm drop, density of water is 1000 kg/m3 and density of air is 1.2 kg/m3.	5	CO1	K3
3.a. How do conservation practices, such as afforestation, contour bundling, and check dams, help mitigate gully erosion?	10	CO2	K2
b. Can you discuss the importance of community involvement and participatory approaches in gully erosion control projects? How do local knowledge and traditional practices contribute to effective erosion management?	5	CO2	K2
(OR)			

c.	What are gullies, and how do they form? Could you elaborate on the geological and environmental factors that contribute to their development?	10	CO2	K2
d.	Explain about Gully Classification and control measures?	5	CO2	K2
4.a.	How does rainfall intensity and duration influence the initiation and severity of water erosion? Can you explain the relationship between precipitation patterns and erosion rates?	10	CO3	K2
b.	What are the different types of water erosion? Explain each in details.	5	CO3	K1
	(OR)			
c.	Can you explain the mechanisms behind rill erosion and gully erosion? What are the key differences between these two forms of water erosion, and how do they impact landscapes differently?	10	CO3	K2
d.	What are the different types of water erosion? Explain each in Details	5	CO3	K1
5.a.	Define the Followings (i) Wind-break (ii) Shelterbelt	8	CO4	K1
b.	Find out the length of protection from a wind break of 18 m height. The angle of deviation of prevailing wind perpendicular to the barrier is 25^{o}. The actual wind velocity is 13.5 kmph at 15 m height and minimum wind velocity that is capable of moving the soil fraction is 15 kmph at 15 m height.	7	CO4	K3
	(OR)			
c.	What are the major factors that contribute to the process of wind erosion, and how do they interact with each other?	8	CO4	K1
d.	Calculate the area of protection from a wind break of 250 m in length and 15 m height. The angle of deviation of prevailing wind perpendicular to the barrier is 25^{o}. The actual wind velocity is 13.5 kmph at 15 m height and minimum wind velocity that is capable of moving the soil fraction is 15 kmph at 15 m height.	7	CO4	K3

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