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GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Seventh Semester – Regular) Examinations, November – 2022 BPCAG7010 – Water Harvesting and Soil Conservation Structures (AGE)

Time: 3 hrs

Maximum: 70 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)

(1 x 10 = 10 Marks)

Q.1. Answer ALL questions

	[CO#]	[PO#]
a. Importance of storage water is greater	CO4	PO5
(i) in arid and semi-arid regions		
(ii) in humid regions		
(iii) at the place where construction of water structure is very costly		
(iv) both (i) & (ii)		
b. To harvest water for irrigating crops, the ratio of catchment area and cultivated area should be equal to	CO3	PO2
(i) 1:5 to 1:40		
(ii) 1:2		
(iii) 4:5		
(iv) 3:5		
c. The runoff harvesting relatively for shorter duration can be performed by the surface as	CO2	PO3
(i) Semi-circular hoop		
(ii) trapezoidal or graded bund		
(iii) rock catchment and ground catchment		
(iv) all above		
d. The height of settlement allowance in earthen embankment of farm pond, depends on	CO4	PO3
(i) Construction method		
(ii) foundation material		
(iii) Depth of water stored		
(iv) both i & ii		
e. Spring or creek fed dugout farm ponds are associated to	CO3	PO4
(i) Plain land areas		
(ii) hilly areas where springs or creeks are available with sufficient discharge		
(iii) flood affected areas		
(iv) Coastal areas		
f. In dam/embankment the core walls are provided at	CO2	PO6
(i) Centre		
(ii) Either side		
(iii) 1/3 rd distance of bottom width of foundation		
(iv) 2/3 rd distance of dam height		
g. Two possible flow depth having same specific energy are known as	CO3	PO4
(i) alternate depths		
(ii) Sequent depths		
(iii) Upstream and downstream flow depth		
(iv) all above		
h. Froude number at critical flow condition is	CO5	PO3
(i) equal to 1.5		
(ii) 1 to 1.5		
(iii) equal to 1.0		
(iv) zero		
i. Drop inlet and chute spillways consist of	CO4	PO6
(i) inlet and outlet		
(ii) Inlet, conduit and outlet		
(iii) weir and outlet		
(iv) earth dam and outlet		
j. A straight drop structure does not consist of	CO6	PO5
(i) Inlet		
(ii) Outlet		
(iii) Conduit		
(iv) Apron		

PART – B: (Short Answer Questions)**(2 x 10 = 20 Marks)**Q.2. Answer ALL questions

	[CO#]	[PO#]
a. What is rainwater harvesting?	CO2	PO3
b. What is water harvesting potential?	CO1	PO2
c. Enlist short-term water harvesting methods.	CO3	PO4
d. What is Dugout Ponds?	CO4	PO3
e. What is Off-stream storage ponds?	CO5	PO6
f. What is specific energy?	CO4	PO5
g. What is Critical Depth?	CO3	PO3
h. Enlist temporary gully control Structures.	CO4	PO5
i. What do you mean by Structural Design?	CO3	PO6
j. Write down uses of Drop Structures.	CO4	PO4

PART – C: (Long Answer Questions)**(10 x 4 = 40 Marks)**Answer ALL questions

	Marks	[CO#]	[PO#]
3. a. Calculate the size of micro-catchment for water harvesting to feed the trees, if (i) Area is semi-arid (ii) Fruit trees to be grown in Negarim micro-catchment. (iii) Annual water requirement is 1000 mm. (iv) Annual design rainfall is 350 mm. (v) Canopy area of mature tree is 10 m ² . (vi) Runoff coefficient is 0.5. Efficiency factor is 0.5.	5	CO1	PO1
b. Enlist various flood water harvesting structures and explain any one with neat sketch. (OR)	5	CO2	PO3
c. Explain Quanat System with neat sketch.	5	CO2	PO2
d. Explain Negarim micro-catchment.	5	CO1	PO4
4. a. Explain components of farm Pond with neat sketch.	5	CO3	PO2
b. Explain classification of Surplus weirs with neat sketch. (OR)	5	CO2	PO4
c. Explain design aspect of waste Weir.	5	CO2	PO2
d. Explain Site Characteristic and Design considerations of Nala bunds.	5	CO2	PO6
5. a. Write down application of Hydraulic Jump.	5	CO4	PO2
b. Write short notes on “Hydraulic Jump as Energy Dissipators”. (OR)	5	CO3	PO5
c. Explain types of Hydraulic Jump with neat sketch.	5	CO3	PO3
d. Given: Rectangular Channel; Velocity, $v = 10$ m/s; Depth, $y_1 = 0.5$ m. Find Length of hydraulic jump.	5	CO2	PO6
6. a. Explain Bligh's Creep Theory for Seepage Flow with neat sketch.	5	CO4	PO4
b. Explain functional use, advantages, disadvantages, applicability of straight drop structure. (OR)	5	CO3	PO5
c. Explain Lane's Weighted Creep Theory for Seepage Flow with neat sketch.	5	CO3	PO3
d. Explain Box Inlet Drop Spillway with neat sketch.	5	CO3	PO4

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