PAPER ID-311262

Subject Code: BCE055R

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM V) THEORY EXAMINATION 2024-25
ENGINEERING HYDROLOGY

TIME: 3 HRS

M.MARKS: 70

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 07 = 14

Q no.	Question	CO	Level
a.	What are the main components of the hydrologic cycle?	1	K2
b.	Define the term "world water balance" and its significance.	1	K1
c.	What are the methods for estimating evapotranspiration?	2	K2
d.	Define depression storage and interception in hydrology.	3	K2
e.	Differentiate between a mass curve and a hydrograph.	3	K3
f.	Explain the difference between confined and unconfined aquifers.	4	K2
g.	What is the significance of well losses in well hydraulics?	5	K2

SECTION B

2. Attempt any *three* of the following: 07 x 3 = 07

a.	Explain the process of infiltration and discuss the factors affecting infiltration capacity.	1	K2
b.	Discuss the factors influencing flood hydrographs and their significance in flood analysis.	2	K2
c.	Describe the hydrologic storage routing method and its application in flood control.	3	K2
d.	Explain the role of aquifers in groundwater movement and storage.	4	K2
e.	Discuss the methods for controlling groundwater contamination and improving groundwater quality.	5	K2

SECTION C

3. Attempt any *one* part of the following: 07 x 1 = 07

a.	A rainfall event resulted in a total precipitation of 75 mm over an area of 10 km². If 20 mm is lost to initial losses and infiltration, calculate the net runoff volume.	1	K5
b.	Discuss the various methods for measuring precipitation, highlighting their advantages and limitations.	1	K3

4. Attempt any *one* part of the following: 07 x 1 = 07

a.	A hydrograph has a peak flow of 200 m³/s and a duration of 8-hours. Discuss the process of converting this hydrograph into an S-curve hydrograph.	2	K5
b.	Explain the concept of a unit hydrograph and its application in flood estimation.	2	K3

5. Attempt any *one* part of the following: 07 x 1 = 07

a.	Discuss the design and construction of water wells, including well development and maintenance practices.	3	K5
b.	Explain the process of artificial recharge of groundwater and its benefits for water conservation.	3	K3

6. Attempt any *one* part of the following: 07 x 1 = 07

a.	Derive the equation for steady flow through a confined aquifer and discuss the assumptions made in the derivation.	4	K3
b.	A well penetrates a confined aquifer and has a drawdown of 3 m at a distance of 100 m from the well. Calculate the hydraulic conductivity if the discharge is 150 m³/day. Assume necessary data.	4	K5

7. Attempt any *one* part of the following: 07 x 1 = 07

a.	Discuss the significance of flood frequency analysis in the design of hydraulic structures.	5	K3
b.	Explain the basic principles of groundwater modeling techniques and their applications in hydrology.	5	K3

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