

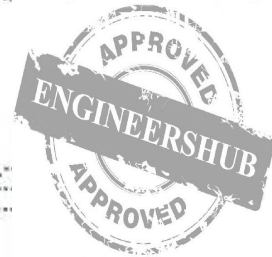
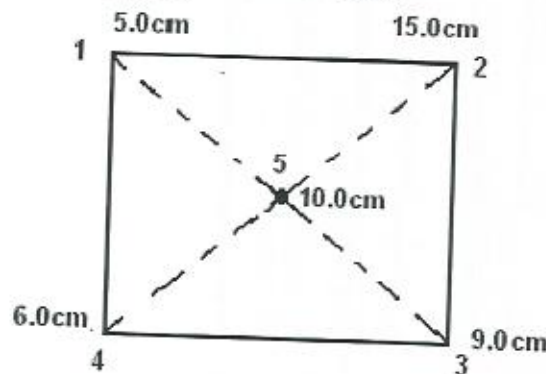
**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**B. Tech III Year I Semester Examinations, November/December - 2012**  
**WATER RESOURCES ENGINEERING-I**  
 (Civil Engineering)

Time: 3 hours

Max. Marks:75

Answer any five questions  
 All questions carry equal marks

1. a) What is hydrologic cycle? Explain with the help of a schematic diagram.  
 b) Find the mean precipitation for the area sketched below by Thiessen method. The area is composed of a square plot of side 6 km. Rainfall readings are given in the figure for the five rain gauge stations in cms. [6+9]



2. a) Define Evapotranspiration. How do you employ Blaney Criddle method to estimate the potential Evapotranspiration? Explain.  
 b) What is an Infiltration capacity curve? Give the Horton's equation for the Infiltration capacity and explain how it helps in estimating the Infiltration rate. [8+7]
3. a) What is a Unit Hydrograph? Explain the principles of Unit Hydrograph theory.  
 b) What is an S-Curve? How do you construct the same? Explain the procedure.  
 c) What is a synthetic UH? When do you develop the same? Explain. [5+5+5]
4. a) Explain the terms "Permeability", "Transmissivity" and "Storage Coefficient".  
 b) In a Water table aquifer of 50 m thickness, a 20 cm diameter well is pumped at a uniform rate of 0.05 m<sup>3</sup>/sec. If the steady state drawdowns measured in the observation wells located at 10m and 100m distances from the pumped well are 6.5m and 0.25m respectively, determine the average hydraulic conductivity of the aquifer. [6+9]
5. a) Explain the Furrow method and the Sprinkler method of irrigation. What are their advantages as compared to the Free flooding methods.  
 b) Give a detailed classification of Indian Agricultural soils and indicate what type of crops can be grown in such soils. [8+7]

6. a) Define the following:

- i) Irrigation efficiency
- ii) Duty of water
- iii) Field Capacity
- iv) Soil Moisture tension

b) Work out irrigation efficiency from the following data:

Water conveyance and delivery loss = 40%

Deep percolation and surface Run off = 30%

Water stored in soil lost by evaporation = 20%.

[7+8]

7. a) Explain the following types of canals with the help of sketches.

- i) Canal in full cutting
- ii) Canal in partial cutting & partial filling

b) What is Kennedy's theory?

Design a channel section with the following data as per Kennedy's theory.

Discharge =  $15 \text{ m}^3/\text{sec}$ , Slope = 0.0002,  $n = 0.0225$ ,  $m = 1$

[6+9]

8. a) Distinguish between:

- i) Maximum probable flood and Design flood.
- ii) Return period and probability of occurrence
- iii) Annual series and partial series

b) What is a stage - discharge curve?

How do you extend the same? Explain the different methods of extending this curve.

[9+6]

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