

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), Nov 2017

B. Tech Civil Engineering, Semester V

Roll No.....

Course Code : CE510 Hydrology and Water
Resources Engineering

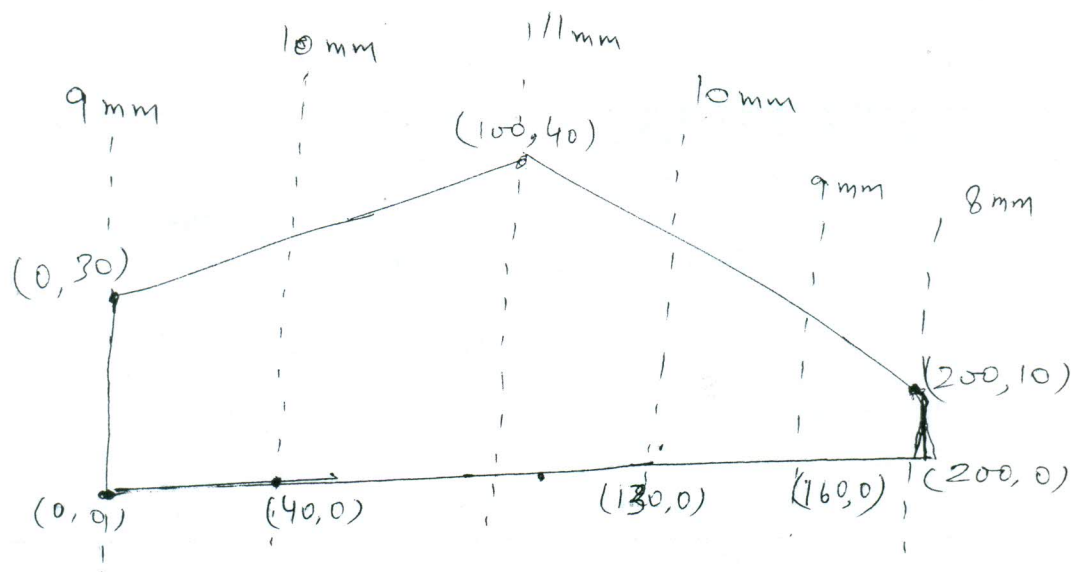
Time: 3 hours

Max. Marks: 100

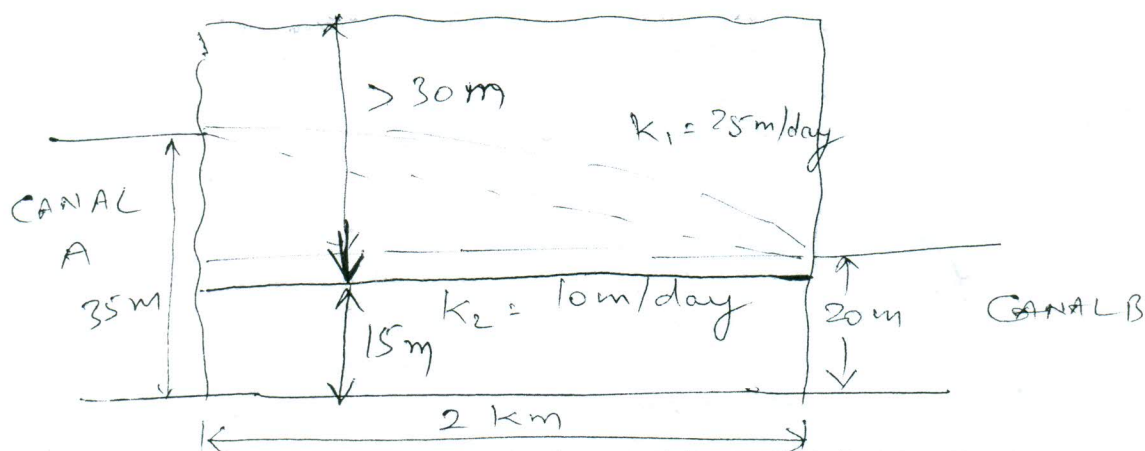
Instructions to students:

1. Do not write anything other than your roll number on question paper.
 2. Assume suitable data wherever required and mention it clearly.
 3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
-

- Q.1A Objective type multiple choice questions (10 questions @ 1 mark) 10
- i. The percentage of total quantity of fresh water trap in the form of glaciers in the world is about (a) 60 % (b) 33 % (c) 69 % (d) 97 %
 - ii. When the cyclones reach to the earth their energy will in comparison to sea. (a) Reduce (b) Increase (c) Both (d) None
 - iii. As the area of catchment increases average rainfall in the catchment (a) Increases (b) decreases (c) constant (d) None
 - iv. Water stored below the dead storage can be (a) used by pumping (b) never used (c) there is no water below dead storage (d) always used by gate operations
 - v. A reservoir will the flood peak in the downstream. (a) Increase (b) decrease (c) not affected (d) both
 - vi. In case of water logging water table rises up to (a) 30 cm below ground level (b) root zone of plant (c) upto ground level (d) above ground level
 - vii. The actual volume of water that can be extracted by the force of gravity is (a) porosity (b) specific retention (c) permeability (d) specific yield
 - viii. Alluvial soil aquifers are generally of following type. (a) Confined (b) Unconfined (c) Perched (d) None
 - ix. Darcy's law is valid in porous media if Reynolds number is (a) >1 (b) <1 (c) $= 0$ (d) None
 - x. The discharge per unit drawdown at a well is known as (a) specific yield (b) specific storage (c) safe yield (d) specific capacity
- Q.2 Short answer type questions (4 questions @ 2.5 marks) 10
- i. Define flood routing in simple words with some example.
 - ii. Name the various type of Geological formation contains the water.
 - iii. Draw a neat sketch to show the confined and unconfined aquifer with recharge zones.
 - iv. Find the average rainfall by Isohyetals method.

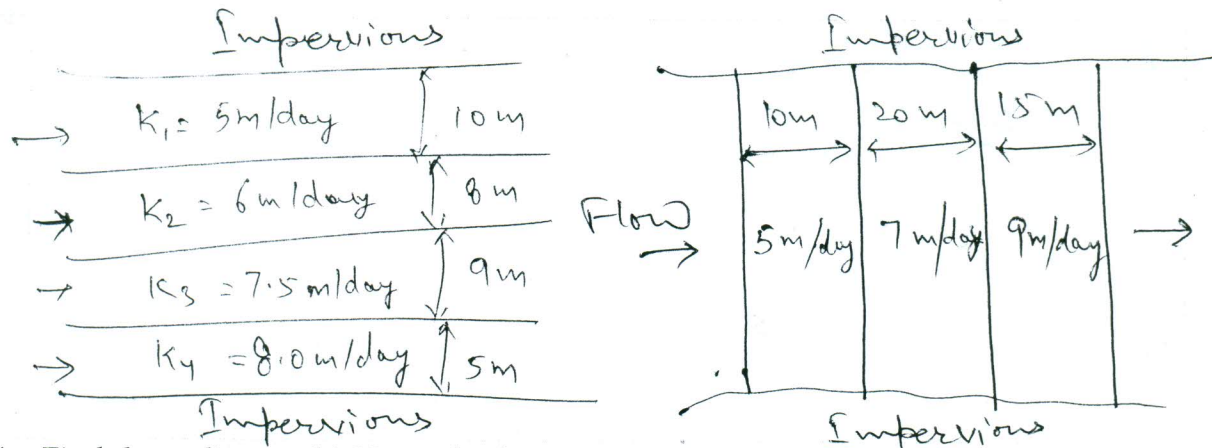


- Q.3A What are the different types of precipitation? 05
- Q.3B Describe the various parameters on which infiltration depends. 05
- Q.4A Name the various factors affecting storm Hydrograph in detail. 05
- Q.4B Write the various investigations required for a reservoir and dam construction. 05
- Q.5A What is flood forecasting? What is the importance of flood forecasting? 05
- Q.5B Draw a neat sketch to represent the attenuation and time displacement of flood peak in the upstream and downstream section of a river. 05
- Q.6A Define the following i. Guide Banks ii. Marginal Bunds iii. Spur Dikes iv. Flood plains of river 05
- Q.6B Define the following terms i. Permeability ii. Transmissibility iii. Surface drains 05
- Q.7A Draw a neat sketch to show the effect of pumping on the water table near to the well. 05
- Q.7B Two parallel canals A and B are separated by a land mass as given in fig. estimate the seepage discharge from canal A to B per unit length of the canal. 05



OR

- Q.7B Find the equivalent permeability for following case 05



- Q.8A Find the ordinate of 3 H unit hydrograph. The ordinates of runoff hydrograph are as given below for 2 continuous rainfalls of 2 cm and 4 cm. The base flow is 5 m³/sec.

15

0	3	6	9	12	15	18	21	24	27	30	33	36
5	45	245	585	825	865	705	469	267	143	75	25	5

- Q.9 A 30 cm well completely penetrates an unconfined aquifer of saturated depth 40 m. After a long period of pumping at a steady rate of 1500 lpm, the drawdown in two observation wells 25 and 75 m from the pumping well were found to be 3.7 m and 2.2 m respectively. Determine the transmissibility of the aquifer. What is the drawdown at the pumping well?

15

OR

- Q.9 Derive the expression for discharge in steady flow in well for i. confined and Unconfined aquifer.

15