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B.E., (FULL TIME) DEGREE END SEMESTER EXAMINATION APRIL/MAY - 2011

CIVIL ENGINEERING

VII SEMESTER (REGULATION - 2004)

CE 514 – HYDROLOGY

40

Time: 3 hours

Marks: 100

Part – A

10 x 2 = 20

Answer ALL questions

1. Define hydrology.
2. List the different forms of precipitation.
3. State the advantage of using double ring infiltration method in estimation of infiltration rate.
4. Sketch the stage discharge relationship and state its purpose.
5. What factors should be considered in selecting a site for stream gauging station?
6. Draw the synthetic hydrograph and mentioned its components.
7. What is meant by Maximum Probable Flood?
8. Define metrological drought.
9. What are the advantages of rainwater harvesting?
10. List any four methods artificial recharge technique.

Part - B

5 x 16 = 80

11. (a) (i) Explain with the help of a neat sketch about the hydrological cycle with its various components. **(10)**
(ii) The normal annual precipitation of five raingauge stations P, Q, R, S and T are respectively 125, 102, 76, 113, and 137 cm. During a particular storm the precipitation recorded by Stations P, Q, R, R and S are 13.2, 9.2, 6.8 and 10.2 cm respectively. The instrument at station T was inoperative during that storm. Estimate the rainfall at station T during that storm. **(6)**
12. (a) (i) Sketch an double ring infiltrometer and derive the necessary Horton's equation to estimate the rate of infiltration. **(10)**

- b. i. What are the optics used in photogrammetric equipments. **3**
- ii. With a neat sketch describe the main parts of a frame aerial camera. **13**
13. a. i. With a neat sketch derive an equation for relief displacement. **6**
- ii. A vertical aerial photograph was taken with a 152.4-mm-focal-length camera from a flying height of 1358m above datum. Images a and b of two ground points A and B appear on the photograph, and their measured photo coordinates (corrected for shrinkage and distortions) are $x_a = -52.35\text{mm}$, $y_a = -48.27\text{mm}$, $x_b = 40.64$ and $y_b = 43.88\text{mm}$. Determine the horizontal length of line AB if the elevation of points A and B are 185m and 140m, above datum respectively. **10**

(or)

- b. i. Derive an equation for auxiliary image co-ordinate for a tilted photo with neat sketch. **6**
- ii. A particular tilted aerial photograph exposed with a 153-mm-focal-length camera has a tilt angle of $2^{\circ}45'$ and a swing angle of 140° . On this photograph, what are the auxiliary x' and y' photo co-ordinates for points a and b, whose photo coordinates measured with respect to the fiducial axes are $x_a = 67.92\text{mm}$, $y_a = -42.70\text{mm}$, $x_b = -53.27\text{mm}$ and $y_b = 103.68\text{mm}$? **10**
14. a. i. Explain in detail about establishment of horizontal and vertical control points. **16**

(or)

- b. i. Explain the significance of factors to be considered for flight planning? **6**
- ii. A rectangular area 25km in the North-South direction by 16km East West direction is to be covered with aerial photography having a scale at 1:7,000. End lap and side lap are 65% and 25% respectively. A camera having a 23cm square format is to be used. Compute the total number of photographs in the project, assuming that flight line Parallel with east and west project boundaries. **10**
15. a. i. With neat sketches explain various elements of visual interpretation with examples. **16**

(or)

- b. i. What is an interpretation key? Explain different types of interpretation keys. **10**
- ii. Explain the characteristics of photographic images. **6**