(b) Distinguish between unit hydrograph and distribution graph. What are the uses of distribution graph ? 10

Section–D

8. (a) Differentiate between :

(i) Water table and piezometric surface

(ii) Influent and effluent streams

(iii) Aquiclude and aquitard

(iv) Hydraulic conductivity and intrinsic permeability. 10

(b) An unconfined aquifer has an areal extent of 15 km^2. When 9.5 million m^3 of water was pumped out, the water table was observed to go down by 2.4 m. What is the specific yield of the aquifer ? If the water table of the same aquifer rises by 12.5 m during a monsoon season, what is the volume of recharge ? 10

9. (a) List out the assumptions made in the analysis of steady radial flow into well. 10

(b) Determine the yield from a 30cm diameter well under a drawdown of 10m in the well, if the radius of influence and hydraulic conductivity are 150 m and 5 m/day ressp. The aquifer is unconfined with a thickness of 60 m. 10

B.Tech. 5th Semester (Civil Engg.) Examination,

Decen ıber–2015

HYDR OLOGY

Paper–C E–311–F

Time allowed : 3 hours] *[Maximum marks : 100*

Note : *(i)* ***Q. No. 1 is compuls*** *ory.*

*(ii) Attempt **one** questio, n from each section.*

(iii) All questions carry e qual marks.

*(iv) Attempt **five** questions in all.*

(v) Assume missing data, if any, suitably.

1. Briefly describe the following :

(a) Sources of hydrological data i ı India.

(b) Hypsometric curves.

(c) Salient characteristics of precipi tation in India.

(d) Methods to control reservoir evap oration

(e) Infiltration capacity

(f) Methods to measure velocity of run off

(g) Stage hydrograph and stage recorder

(h) Forms of sub-surface zone

(i) Compressibility of aquifer

(j) Perched water table 10 ×2=20

Section–A

2. (a) Describe the hydrologic cycle with a neat sketch. 10

   (b) What is meant by Probable Maximum Precipitation ? Describe the methods of estimating PMP. What are its design applications ? 10

3. (a) Describe the step by step procedure involved in the analysis for developing intensity-frequency-duration relationships. Sketch a typical set of these curves. 10

   (b) The co-ordinate distances in km of 5 rain gauge station X, A, B, C and D are (0, 0), (4, 5), (–6, 8), (–9, –6) and (5, –7) respectively. During July 2005 station X was inoperative and the other four stations A, B, C and D recorded rainfalls of 8.3, 10.1, 7.7 and 12.4 cm respectively. Calculate the missing July rainfall at X. 10

Section–B

4. (a) During a daily routine observation, 10.8 litres of water was added to bring the water surface in the evaporation pan to the stipulated level and the nearby rain gauge measured 3.6 mm of rainfall. What was the evaporation recorded for the day if the diameter of the pan is 122 cm ? 10

   (b) Bring out the difference between evaporation, transpiration, evapo-transpiration and consumptive use. 10

5. (a) Define Φ-index and W-index and bring out the difference between them. How is Φ-index determined from the rainfall hyetograph ? 10

   (b) Define infiltration. What are the factors affecting infiltration ? Describe in detail. 10

Section–C

6. (a) Explain the principle involved in the measurement of streamflow by the dilution method. What are the fundamentals of a good tracer used in the dilution method ? 10

   (b) Define the stage in the river. Describe with neat sketches how the stage can be measured with the help of a vertical staff gauge. 10

7. (a) From the topographical map of a drainage basin the following quantities are measured : $A = 3480\ km^2$, $L = 148\ km$ and $L_c = 74\ km$ the 12h unit hydrograph derived for the basin has a peak ordinate of $155 m^3/s$ occurring at 40 h. Determine the coefficients C_t and C_p for the synthetic unit hydrograph of the basin. 10