Register Number: ……..

B.E DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Sixth Semester

CIVIL ENGINEERING

CEE212: Hydrology

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The process of artificial stimulation of precipitation is called as
   a) Cloud Stimulation b) Cloud Seeding
   c) Condensation d) Artificial Rainfall
2. The form of precipitation in which the fusion of ice crystals are taken place is called as
   a) Glaze b) Dew
   c) Sleet d) Snow flakes
3. An Isohyet is a line which joins the places having the same
   a) Average annual temperature b) Average annual rainfall
   c) Average seasonal temperature d) Average monthly rainfall
4. The Pan coefficient value of US weather bureau class A evaporation pan is
   a) 0.98 b) 0.59
   c) 0.70 d) 0.17
5. The term DSR denotes
   a) Distributed Surface Runoff b) Depression Storage Rate
   c) Direct Surface Runoff d) Distributed Storage Rate
6. From the following, which is not a type of hydrograph?
   a) Flood Hydrograph b) Stage Hydrograph
   c) Velocity Hydrograph d) Fixed Hydrograph
7. The maximum flood that any structure can safely pass is called
   a) Design flood b) Standard Projected Flood
   c) Maximum Probable Flood d) Peak Flood
8. The first to suggest that frequency should be considered as a factor in estimating flood was;
   a) Allen Hazen b) Gumbel
   c) Fuller d) Weibull
9. Artesian aquifer is also called as
   a) Unconfined aquifer b) Aquiclude
   c) Aquifuge d) Confined aquifer
10. Darcy's law is valid for
    a) Steady and non-uniform flow b) Turbulent flow
    c) Laminar flow d) Unsteady and Uniform flow

PART B (10 x 2 = 20 Marks)

11. Define Orographic precipitation.
12. Define Probable Maximum Precipitation (PMP).
13. List the meteorological factors that influence the rate of evaporation from a water body.
14. Assuming a growing season of 4 months December- March for wheat, determine the consumptive use of wheat in the month of January if the pan evaporation for the month is 9.5 cm. Take the consumptive use coefficient at 40%, stage growth of the crop as 0.52.
15. Distinguish between Hyetograph and Hydrograph.
16. The recession curve of a hydrograph is sometimes called as the 'depletion curve' why?
17. Define flood.
18. Mention and write any two empirical flood formulae.
19. State Darcy's law.
20. Explain the terms 'storage coefficient' and 'transmissibility'.

PART C (5 x 14 = 70 Marks)

21. a) (i) Explain with the help of a neat sketch about the hydrological cycle with its various components. (10)

    (ii) Compare the merits and demerits of arithmetic mean and thiessen polygon methods of finding out average rainfall in an area. (4)

    (OR)

    b) (i) In certain watersheds (River basin), there are four rain gauge stations. The normal precipitation amounts respectively to 800, 520, 440 and 420 mm. Determine the optimum number of rain gauges in the watershed if it is required to limit the error in average rainfall to 6%. (6)

    (ii) Describe the working principle of a non- recording type rain gauge with neat sketch, mentioning its advantages and disadvantages. (8)

22. a) (i) State the Horton's equation for infiltration capacity curve with the sketch of its salient features and explain the working principle of the Double Ring (10)

Infiltrometer.

(ii) Define the Infiltration indices with their formulae. (4)

(OR)

b) Explain with neat sketch, the various methods of estimation of Evaporation.

23. a) (i) Define Unit Hydrograph. Enumerate the steps adopted to derive a UH from an observed single peaked flood hydrograph. (8)

(ii) List out the limitations and applications of UH (6)

(OR)

b) (i) Describe the Hydrograph and its components with neat sketch. (8)

(ii) The following are the ordinates of a 3-hour unit hydrograph. Derive the ordinates of a 6-hour unit hydrograph. (6)

Time (Hour)	0	3	6	9	12	15	18	21	24
3-hr UH ordinates (cumecs)	0	1.5	4.5	8.6	12.0	9.4	4.6	2.3	0.8

24. a) Explain the methods of Flood control with neat sketches.

(OR)

b) Explain the purpose and procedure of reservoir routing.

25. a) (i) Explain the various types of aquifers with neat sketches. (10)

(ii) Write Dupuit's assumptions (4)

(OR)

b) (i) Explain the well yield tests with their formulae (6)

(ii) A 20 cm well penetrates 30 m below static water level(GWT). After a long period of pumping at a rate of 1800 lpm, the drawdown in the observation wells at 12m and 36 m from the pumped well are 1.2m and 0.5 m, respectively. (8)

Determine: (i) the transmissibility of the aquifer,

(ii) the drawdown in the pumped well assuming R= 300m,

(iii) the specific capacity of the well.

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