17351

14115

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) **Attempt any SIX of the following:** **12**

(i) Define Hydrology.

(ii) Define Run off.

(iii) State the forms of precipitation.

(iv) State the different methods of stream guaging.

(v) Define water table.

(vi) State the factors affecting runoff.

(vii) State the methods of flood routing.

(viii) Define raingauge.

Marks

b) **Attempt any <u>TWO</u> of the following:** **8**

(i) Explain the hydrological cycle with a neat sketch.

(ii) State the factors affecting the site selection for rain guage station.

(iii) How is the Geohydrological and hydrological balance maintained? Explain

2. Attempt any <u>FOUR</u> of the following: **16**

a) State and explain factors affecting rainfall.

b) Explain river guaging.

c) Define a hydrograph and state its components.

d) Explain and state the different methods of measurement of rainfall and explain any one method.

e) Define a unit hydrograph and explain it in detail.

f) State and explain the various grand water resources.

3. Attempt any <u>FOUR</u> of the following: **16**

a) Explain the factors affecting flood hydrograph.

b) Explain the uses and limitation of a hydrograph.

c) Explain any one method of estimation of runoff volume from a catchment.

d) A small watershed is 250 ha in size has group C soil. The land cover can be classified as 30% open forest and 70% poor quality pasture. Assuming AMC at average condition and the soil to be black soil, estimate the direct runoff volume due to a rainfall of 75m. in one day.

e) Explain the factors affecting the site selection for steam guaging.

Marks

4. Attempt any FOUR of the following: **16**

a) Differentiate between confined and unconfined equators.

b) State the different methods of drilling and explain any one in detail.

c) Define the following

(i) Isobathes

(ii) Isobars

(iii) Recharge of ground water

(iv) Draw down

d) Explain Cooli's method of estimation of peak runoff.

e) During a reamperation test the water in an openwell as depressed by pumping by 2.5m, it recuperated 1.8m in 80minutes. Calculate the yield from a well of 4.0m. diameter under a depression heat of 3m.

f) Explain perched water table.

5. Attempt any FOUR of the following: **16**

a) State the methods of routing and explain any one in detail.

b) State the factors affecting sedimentation.

c) Explain reservoir sedimentation control.

d) Explain the Geological formations as aquifers.

e) Explain ground water recharge.

f) Name the procedures for sediment yield from water sheds and explain any one in detail.

Marks

6. Attempt any <u>FOUR</u> of the following: **16**

a) Explain Thession's polygon method with neat sketch to calculate average rainfall.

b) Establish a relationship between rainfall and runoff.

c) State the assumptions of unit hydrograph theory.

d) State the different methods of stream guaging and explain any one in detail.

e) Describe briefly the SCS method of estimation of yield of a catchment through use of daily rainfall record.

f) Compute the runoff volume due to a rainfall of 15cm in a day on a 550 hectare watershed. The hydrological soil groups are 50% of group C and 50% of group D randomly distributed in the watershed. The land use is 55% cultivated with good quality bunding and 45% wasted land. Assume antecedent moisture condition of type III and use standard SCS - CN method.