| Seat No.: | Enrolment No |
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|           |              |

## **GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-V • EXAMINATION - SUMMER • 2014** 

| 1.<br>2.<br>3. | Mal                    |   | assum  | ption  |  |   |   | y.   |  | 100  | ai Mi   | агк  | s: 70  |
|----------------|------------------------|---|--|--|--|---|---|--|--|--|---|--|--|
| (a)            | _                      |   |  |  |  |   | _   |  | -  |  | ver a   | catch  | nment  |
| <b>(b)</b>     | Defi                   | ne unit hy  | drogra   | ph. D  | <b>D</b> escril  |   |   |  |  |  | unit h  | ydro   | graph  |
| (a)            | (1) P                  | recipitatio<br>(5) Hydrog   | n (2) l<br>graph (   | nfiltr<br>6) Flo   | ation<br>oods (  | 7) Dro  | ught  |  | -transp  | oiration   | n (4)   | Infilt   | ration   |
| (D)            | Desc                   | ribe in det   | an the   | Tacic  | ors am   | ecting  | шшка  | uon.   |  |  |   |  |  |
| <b>a</b> >     |                        | • •   |  |  |  |   |   |  |  |  | 00  | 0 -  | _  |
| <b>(b)</b>     |                        |   |  | -  | -  | -   |   |  |  |  |   | of 6.2   | 2 cm.  |
|                |                        |   | 1  | 2  |  |   | 4   | 5  |  |  | 7   | 8  |  |
|                | star                   | t in hour   |  |  |  | •   |   |  |  |  |   |  |  |
|                |                        |   | 0.5  | 1.0  | ) [  | 1.8   | 2.6   | 2.0  | 1  | .5   | 1.2   | 0.   | .4   |
|                |                        |   |  |  |  |   |   |  |  |  |   |  |  |
|                |                        | n nour in   | . 80   |  | C  | <b>7</b> 0.   |   |  |  |  |   |  |  |
|                |                        | nute the 🍑  | inde   | ex of  | the st   | orm.  |   |  |  |  |   |  |  |
|                |                        | 109   |  |  |  |   |   |  |  |  |   |  |  |
| (a)            | Defi                   | ne dunoff.  | sub-   | surfa  | ce ru  | noff a  | nd dir  | ect r  | unoff.   | Expl   | ain t   | he fa  | actors   |
| ()             |                        |   |  |  |  |   |   |  |  |  |   |  |  |
| <b>(b)</b>     |                        | A   |  |  | _  | -   |   |  |  |  | _   |  | •  |
|                |                        |   |  |  |  |   |   |  |  |  |   |  |  |
|                |                        |   | 0  | 4  | 8  | 12  | 16  | 20   | 24   | 28   | 32  | 36   | 40   |
|                | _                      |   | 30   | 68   | 205  | 410   | 330   | 254  | 195  | 133  | 95  | 58   | 30   |
|                |                        | _   |  |  | 200  | .10   | 550   | 20.  | 170  | 133  |   |  |  |
|                | <u> </u>               |   |  | •  |  | (   | )R  |  |  | •  | •   | •  |  |
| (a)            |                        |   | _  |  |  | -   |   |  |  |  |   |  |  |
|                | . ,                    |   | -  | , ,  |  |   | -   |  | -  | ude (4   | 4) Aq   | uifug  | ge (5)   |
| (b)            |                        |   |  | _  |  |   |   |  | •  | anifer   | of ne   | rmea   | hility   |
| (D)            |                        |   |  |  |  |   |   |  |  |  |   |  |  |
|                |                        |   |  |  |  |   |   |  |  |  |   |  |  |
|                | Calc                   | ulate the d   | ischar   | ge.  |  |   |   |  |  |  |   |  |  |
|                | Write                  | e a note on   | l  |  |  |   |   |  |  |  |   |  |  |
| (a)            | * * 1 1 1 1 1          |   |  |  |  |   |   |  |  |  |   |  |  |
| (a)            |                        | Lational for  | mula   | for flo  | ood es   | stimatio  | on (2) I  | Flood  | foreca   | sting a  | and wa  | arnin  | g  |
| (a)<br>(b)     | (1) R                  |   |  |  |  |   |   |  |  |  | ind wa  | arnin  | g  |
|                | 3. (a) (b) (b) (b) (a) | <ul> <li>(a) Explorer due to due</li></ul> | <ul> <li>(a) Explain the various due to storm. Define unit hydrom a given flow (a) Explain the folious (1) Precipitation rate (5) Hydrog (b) Describe in det</li> <li>(b) A storm with The time distribution of the folious of the foli</li></ul> | <ul> <li>(a) Explain the various of due to storm. Discusses</li> <li>(b) Define unit hydrograms from a given flood hydrogram from a given flood hydrogram from a given flood hydrogram (1) Precipitation (2) If the following (1) Precipitation (2) If the following (1) Precipitation (2) If the following from a given flood from the following flood flood from the following flood flo</li></ul> | <ul> <li>(a) Explain the various methodue to storm. Discuss related to the following term (1) Precipitation (2) Infiltrate (5) Hydrograph (6) Floor the time distribution of the start in hour in cm</li> <li>(b) A storm with 11cm precipitation (1) Precipitation (2) Infiltrate (3) Hydrograph (3) Floor the time distribution of the start in hour in cm</li> <li>(c) Infiltrate (b) A storm with 11cm precipitation (b) Infiltrate (c) Infiltrate (d) Infiltrate (d</li></ul> | <ul> <li>3. Figures to the right indicate full</li> <li>(a) Explain the various methods of due to storm. Discuss relative method before unit hydrograph. Descrif from a given flood hydrograph.</li> <li>(a) Explain the following terms <ul> <li>(1) Precipitation (2) Infiltration rate (5) Hydrograph (6) Floods (b)</li> <li>(b) Describe in detail the factors affecting the time distribution of the storm of the</li></ul></li></ul> | <ul> <li>3. Figures to the right indicate full marks.</li> <li>(a) Explain the various methods of detern due to storm. Discuss relative merits and the proof of the storm a given flood hydrograph. Describe the from a given flood hydrograph.</li> <li>(a) Explain the following terms <ul> <li>(1) Precipitation (2) Infiltration capacity rate (5) Hydrograph (6) Floods (7) Drograph (6) Floods (7) Drograph (6) Floods (7) Drograph (7) Describe in detail the factors affecting in the storm is given by the storm in the storm is given by the storm in the storm.</li> <li>(a) Define stanoff, sub-surface runoff and affecting runoff.</li> <li>(b) The ordinates of flood hydrograph from the ordinates of 4 hour unit hydrograph from the ordinates of 5 hour</li></ul></li></ul> | 3. Figures to the right indicate full marks.  (a) Explain the various methods of determining due to storm. Discuss relative merits and demote to storm a given flood hydrograph. Describe the proced from a given flood hydrograph.  (a) Explain the following terms (1) Precipitation (2) Infiltration capacity (3) Frate (5) Hydrograph (6) Floods (7) Drought (b) Describe in detail the factors affecting infiltration of the storm is given in the distribution of the storm is given in the start in hour start in hour start in hour start in hour in cm  Compute the distribution of the storm.  (a) Define the following in relation to adulfer (1) Confined aquifer (2) Unconfined aquifer (1) Confined aquifer (2) Unconfined aquifer Transmissibility (6) Storage coefficient (7) Sp. (b) A 30 cm diameter well completely penetrates 45 m/day. The length of strainers is 20 m. Udrawdown at the well was found to be 3.0 m. 2. | <ul> <li>3. Figures to the right indicate full marks.</li> <li>(a) Explain the various methods of determining average due to storm. Discuss relative merits and demerits of the procedure of from a given flood hydrograph. Describe the procedure of from a given flood hydrograph.</li> <li>(a) Explain the following terms <ul> <li>(1) Precipitation (2) Infiltration capacity (3) Evaporate (5) Hydrograph (6) Floods (7) Drought</li> <li>(b) Describe in detail the factors affecting infiltration.</li> </ul> </li> <li>OR <ul> <li>(b) A storm with 11cm precipitation produces a direct that the distribution of the storm is given in the following from 1 2 3 4 5 5 start in hour</li> <li>Incremental 0.5 1.0 1.8 2.6 2.0 rainfall in each hour in cm</li> <li>Compute the windex of the storm.</li> </ul> </li> <li>(a) Define tanoff, sub-surface runoff and direct runoff affecting runoff.</li> <li>(b) The ordinates of flood hydrograph from a 4 hour Derive the ordinates of 4 hour unit hydrograph for a Time 0 4 8 12 16 20 (hours)  Discharge 30 68 205 410 330 254 m3/s  OR </li> <li>(a) Define the following in relation to aquifer (1) Confined aquifer (2) Unconfined aquifer (3) A 30 cm diameter well completely penetrates a confidence of the storm of t</li></ul> | <ul> <li>3. Figures to the right indicate full marks.</li> <li>(a) Explain the various methods of determining average rair due to storm. Discuss relative merits and demerits of each (b) Define unit hydrograph. Describe the procedure of deriv from a given flood hydrograph.</li> <li>(a) Explain the following terms (1) Precipitation (2) Infiltration capacity (3) Evapo-transfrate (5) Hydrograph (6) Floods (7) Drought (b) Describe in detail the factors affecting infiltration.</li> <li>OR (b) A storm with 11cm precipitation produces a direct surf. The time distribution of the storm is given in the following. Time from 1 2 3 4 5 6 start in hour. Incremental 0.5 1.0 1.8 2.6 2.0 1 rainfall in each hour in cm.</li> <li>Compute the windex of the storm.</li> <li>(a) Define sanoff, sub-surface runoff and direct runoff. affecting runoff.</li> <li>(b) The ordinates of flood hydrograph from a 4 hour rain Derive the ordinates of 4 hour unit hydrograph for a catch. Time 0 4 8 12 16 20 24 (hours) Discharge 30 68 205 410 330 254 195 m3/s</li> <li>OR (a) Define the following in relation to aquifer (1) Confined aquifer (2) Unconfined aquifer (3) Aquict Transmissibility (6) Storage coefficient (7) Specific yield 45 m/day. The length of strainers is 20 m. Under steady drawdown at the well was found to be 3.0 m and radius of the strainers and the steady drawdown at the well was found to be 3.0 m and radius of the strainers and the stra</li></ul> | <ul> <li>(a) Explain the various methods of determining average rainfall of due to storm. Discuss relative merits and demerits of each.</li> <li>(b) Define unit hydrograph. Describe the procedure of deriving a from a given flood hydrograph.</li> <li>(a) Explain the following terms <ul> <li>(1) Precipitation (2) Infiltration capacity (3) Evapo-transpiration rate (5) Hydrograph (6) Floods (7) Drought</li> <li>(b) Describe in detail the factors affecting infiltration.</li> </ul> </li> <li>(b) A storm with 11cm precipitation produces a direct surface runted distribution of the storm is given in the following table.  Time from 1 2 3 4 5 6 start in hour lincremental 0.5 1.0 1.8 2.6 2.0 1.5 rainfall in each hour in cm</li> <li>(c) Compute the condex of the storm.</li> </ul> <li>(a) Define the off, sub-surface runoff and direct runoff. Explaiffecting runoff.  (b) The ordinates of flood hydrograph from a 4 hour rainfall at Derive the ordinates of 4 hour unit hydrograph for a catchment at Time 10 4 8 12 16 20 24 28 (hours)  Discharge 30 68 205 410 330 254 195 133 m3/s  OR  (a) Define the following in relation to aquifer (1) Confined aquifer (2) Unconfined aquifer (3) Aquiclude (4) Transmissibility (6) Storage coefficient (7) Specific yield  (b) A 30 cm diameter well completely penetrates a confined aquifer 45 m/day. The length of strainers is 20 m. Under steady state drawdown at the well was found to be 3.0 m and radius of influence of the storm.</li> | <ul> <li>(a) Explain the various methods of determining average rainfall over a due to storm. Discuss relative merits and demerits of each.</li> <li>(b) Define unit hydrograph. Describe the procedure of deriving a unit from a given flood hydrograph.</li> <li>(a) Explain the following terms (1) Precipitation (2) Infiltration capacity (3) Evapo-transpiration (4) rate (5) Hydrograph (6) Floods (7) Drought</li> <li>(b) Describe in detail the factors affecting infiltration.</li> <li>OR</li> <li>(b) A storm with 11cm precipitation produces a direct surface runoff The time distribution of the storm is given in the following table.</li> <li>Time from 1 2 3 4 5 6 7</li> <li>Start in hour Incremental 0.5 1.0 1.8 2.6 2.0 1.5 1.2 rainfall in each hour in cm</li> <li>Compute the Coindex of the storm.</li> <li>(a) Define anoff, sub-surface runoff and direct runoff. Explain the affecting runoff.</li> <li>(b) The ordinates of flood hydrograph from a 4 hour rainfall are given the ordinates of 4 hour unit hydrograph for a catchment area on the ordinates of the storm.</li> <li>(a) Define anoff, sub-surface runoff and direct runoff. Explain the affecting runoff.</li> <li>(b) The ordinates of flood hydrograph from a 4 hour rainfall are given being the ordinates of 4 hour unit hydrograph for a catchment area on the ordinates of the storm.</li> <li>OR</li> <li>(a) Define the following in relation to aquifer (3) Aquiclude (4) Aquiclude (4) Aquiclude (4) Aquiclude (4) Aquiclude (5) Storage coefficient (7) Specific yield</li> <li>(b) A 30 cm diameter well completely penetrates a confined aquifer of penetrates a confined aquifer of penetrates and confined aqui</li></ul> | <ul> <li>(a) Explain the various methods of determining average rainfall over a catch due to storm. Discuss relative merits and demerits of each.</li> <li>(b) Define unit hydrograph. Describe the procedure of deriving a unit hydrograph a given flood hydrograph.</li> <li>(a) Explain the following terms  (1) Precipitation (2) Infiltration capacity (3) Evapo-transpiration (4) Infiltrate (5) Hydrograph (6) Floods (7) Drought  (b) Describe in detail the factors affecting infiltration.  OR  (b) A storm with 11cm precipitation produces a direct surface runoff of 6.7. The time distribution of the storm is given in the following table.  Time from 1 2 3 4 5 6 7 8 8 start in hour  Incremental 0.5 1.0 1.8 2.6 2.0 1.5 1.2 0. rainfall in each hour in cm  Compute the defindex of the storm.  (a) Define tanoff, sub-surface runoff and direct runoff. Explain the faraffecting runoff.  (b) The ordinates of flood hydrograph from a 4 hour rainfall are given be Derive the ordinates of 4 hour unit hydrograph for a catchment area of 640.  Time 0 4 8 12 16 20 24 28 32 36 (hours)  Discharge 30 68 205 410 330 254 195 133 95 58 m3/s  OR  (a) Define the following in relation to aquifer (1) Confined aquifer (2) Unconfined aquifer (3) Aquiclude (4) Aquifug Transmissibility (6) Storage coefficient (7) Specific yield</li> <li>(b) A 30 cm diameter well completely penetrates a confined aquifer of permea 45 m/day. The length of strainers is 20 m. Under steady state of pumping drawdown at the well was found to be 3.0 m and radius of influence was 30 permea and radius of influence was 30 penetrates a confined aquifer of permea 45 m/day. The length of strainers is 20 m. Under steady state of pumping drawdown at the well was found to be 3.0 m and radius of influence was 30 penetrates a confined aquifer of permea 45 m/day. The length of strainers is 20 m. Under steady state of pumping drawdown at the well was found to be 3.0 m and radius of influence was 30 penetrates a confined aquifer of permea 45 m/day. The length of strainers is 20 m. Under steady s</li></ul> |

| (a)<br>(b) | Explain the procedure to determine the reservoir capacity using mass curve.  Describe in brief  (1) Reservoir sedimentation (2) Components of power house | 07<br>07   |
|------------|---|--|
| (a)        | Write a note on (1) Causes of drought (2) Water conservation  | 07   |
| <b>(b)</b> | Explain various methods of water harvesting.  | 07   |
| (a)        | <del></del>   | 07   |
| (a)<br>(b) | Explain functional requirements of water resources projects.  | 07   |
|            | <ul><li>(b)</li><li>(a)</li><li>(b)</li><li>(a)</li></ul>   | <ul> <li>(b) Describe in brief <ul> <li>(1) Reservoir sedimentation (2) Components of power house</li> </ul> </li> <li>(a) Write a note on <ul> <li>(1) Causes of drought (2) Water conservation</li> </ul> </li> <li>(b) Explain various methods of water harvesting. <ul> <li>OR</li> </ul> </li> <li>(a) Explain flood frequency analysis.</li> </ul> |

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