Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **18AT2015** | **Duration :** | **3hrs** |
| **Sub. Name :** | **GROUND WATER, WELLS AND PUMPS** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | |
| 1. | What are the types of aquifer? | CO 1 | 1 |
| 2. | Classify the wells. | CO 1 | 1 |
| 3. | Where the spiral auger is used? | CO 1 | 1 |
| 4. | Under what situation cavity wells are adopted? | CO 1 | 1 |
| 5. | What are the assumptions made for Theim’s equation? | CO 1 | 1 |
| 6. | State Darcy’s law. | CO 1 | 1 |
| 7. | Define the term ‘specific yield’. | CO 1 | 1 |
| 8. | What are the methods used to determine the aquifer parameters? | CO 1 | 1 |
| 9. | What is the ‘coefficient of permeability’? | CO 1 | 1 |
| 10. | Name the geological formation that has no interconnected pores. | CO 1 | 1 |
| 11. | What is the ratio of air to liquid used in air foam method? | CO 2 | 1 |
| 12. | What are the common methods adopted for installing well screens? | CO 3 | 1 |
| 13. | Name the chemicals used for well maintenance. | CO 3 | 1 |
| 14. | What are the direct methods of logging? | CO 2 | 1 |
| 15. | What are the suitable conditions on which percussion drilling can be used? | CO 2 | 1 |
| 16. | Name the method of drilling suitable for unconsolidated formation up to 15cm diameter. | CO 2 | 1 |
| 17. | What is the allowable limit of chloride in water as per WHO standard? | CO 2 | 1 |
| 18. | Classify the pumps. | CO 3 | 1 |
| 19. | What is the suitability of a plunger pump? | CO 3 | 1 |
| 20. | How the speed will affect the capacity of a pump? | CO 3 | 1 |

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| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | What are the different methods of ground water exploration? | CO 1 | 5 |
| 22. | Draw the neat sketches of various aquifers. | CO 1 | 5 |
| 23. | What are the factors to be considered for selecting site for a well? | CO 1 | 5 |
| 24. | What are the different methods of drilling? Explain any two in detail. | CO 2 | 5 |
| 25. | A 30cm well fully penetrates a confined aquifer 30m deep. After a long period of pumping at a rate of 1200lpm, the drawdowns in the wells at 20m and 45m from the pumping well are found to be 2.2m and 1.8m respectively. Determine the transmissibility of the aquifer. What is the drawdown in the pumped well? | CO 1 | 5 |
| 26. | Explain the laboratory tests conducted to find the permeability. | CO 1 | 5 |
| 27. | Elaborate different methods of ground water recharge. | CO 2 | 5 |
| 28. | Derive the Theim’s equation for the confined aquifer. | CO 2 | 5 |
| 29. | What are the factors to be considered for selection of a pumping set? | CO 3 | 5 |
| 30. | Differentiate between deep well turbine pump and submersible pump. | CO 3 | 5 |
| 31. | Explain the various water quality plots used for representing water quality. | CO 1 | 5 |
| 32. | Explain the performance curves of centrifugal pump. | CO 3 | 5 |

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| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | Describe the various types of tube wells with neat sketches. | CO 1 | 8 |
| b. | Compare open wells with tube wells. Also mention the factors to be considered in choosing the type of well. | CO 1 | 7 |
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| 34. | a. | During a recuperation test, the water level in an open well was depressed by 2.5m by pumping. It recouped 1.8m in 80minutes. Find: (i) the yield from the well of 4m dia under a depression head of 3m, and (ii) the diameter of the well to yield 480lpm under a depression head of 2m. | CO 2 | 8 |
| b. | What is the well development? Explain the well development methods. | CO 2 | 7 |
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| 35. | a. | Explain working of hydraulic ram with neat sketch. | CO 3 | 7 |
| b. | Draw the neat sketch of Centrifugal pump and mark its components. Also explain the working of centrifugal pump. | CO 3 | 8 |