

May 2017

**WATER RESOURCE MANAGEMENT**

Time Allowed: 3 Hours

Full Marks: 70

**Answer to Question No.1 is compulsory and to be answered first.**

**This answer is to be made in separate loose script(s) provided for the purpose.**

**Maximum time allowed is 45 minutes, after which the loose answer scripts will be collected and fresh answer scripts for answering the remaining part of the question will be provided.**

**On early submission of answer scripts of Question No.1,**

**a student will get the remaining script earlier.**

**Answer any five questions from the rest.**

1. A. Fill in the blanks (any ten): 10x1
- i) \_\_\_\_\_ is the science of studying the different forms of water available on the earth.
  - ii) The graphical representation of discharge of a river against time is known as \_\_\_\_\_.
  - iii) The ground water contribution to the stream is known as \_\_\_\_\_.
  - iv) The permeable formation of the soil of the earth's crust is known as \_\_\_\_\_.
  - v) The impermeable formation which contain water but is not capable of transmitting water is known as \_\_\_\_\_.
  - vi) Recuperation test is adopted to determine the \_\_\_\_\_ of open well.
  - vii) The river in which the water flows to its full capacity in rainy season only is known as \_\_\_\_\_.
  - viii) The canal which is aligned along the water shed line is known as \_\_\_\_\_.
  - ix) Lining of canal is done to control the \_\_\_\_\_ of water.
  - x) When a dam is constructed across a river valley to form storage reservoir it is known as \_\_\_\_\_.
  - xi) \_\_\_\_\_ is provided to eliminate the deposited silt in front of the head regulator.
- B. State whether the following statements are True or False: 10x1
- i) The average annual runoff in cm depth for India is about 110cm.
  - ii) When air is saturated with vapour then- the air temperature and dew point are the same.
  - iii) The standard raingauge widely used in India is a non recordingraingauge.
  - iv) Automatic raingauges used in India are of floating type.
  - v) The line joining the places of equal rainfall is known as isohyets.
  - vi) The unit of specific capacity of a well is m<sup>3</sup>/sec.
  - vii) The performance of a well is measured by its specific yield.
  - viii) Isohyetal method is employed for determination of seepage loss.
  - ix) Fern leaf catchments usually give greater runoff compared with fan shaped catchments.
  - x) Check dams are used to control floods.
2. a) What is water resources management?  
 b) What are the necessities for conservation & development of water resources?  
 c) What are the assumptions made in the theory of unit hydrograph? 3+4+3
3. a) Discuss about the importance of water resources.  
 b) Explain the use of Radar and Satellite in rainfall measurements.  
 c) The base period of paddy is 120days.If the duty for this crop is 950 ha/cumec, find the value of 'delta'. 3+3+4
4. a) Define the following terms: Runoff, permeability, specific yield, specific capacity, porosity.  
 b) Explain the tests for measurement of yield of well with neat sketch. 5+5

5. a) Describe the methods of river training?  
b) What are the different methods of artificial recharge of ground water? Describe briefly.  
c) What are the methods of waste water recharge for reuse? 3+4+3
6. a) What are the causes of failure of Earthen dam?  
b) What are the types of cross drainage works? Explain briefly with a neat sketch.  
c) Describe the Recuperation test conducted for the estimation of well yield. 2+4+4
7. a) Describe various irrigation efficiencies in brief.  
b) Explain the methods adopted for the remedial measure against soil erosion.  
c) What are spillways and what is their necessities? 3+4+3
8. a) Define Field capacity & Permanent wilting point.  
b) Explain the causes of failure of an earthen dam.  
c) Write short note on 'canal lining'. 4+3+3
9. a) What is water logging? What are its remedial measures?  
b) Write short notes on – (i) Soil reclamation, (ii) Soil erosion. 6+4
10. Write short notes on the followings (any four): 2½x4  
a) Contour bunding  
b) Pellicular water  
c) Ø-index and W-index  
d) Artificial recharge
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