

June 2019

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) For the safety of the vehicle running, over the service road on a canal bank _____ is provided.
 - ii) _____ is provided to eliminate the deposited silt in front of the head regulator.
 - iii) Lining of canal is done to control the _____ of water.
 - iv) The lining is known as _____ lining when the cement mortar is applied on sub-grade by cement gun.
 - v) The guide bank is also known as _____ bund.
 - vi) For the movement of fishes the _____ is provided by the side of divide wall.
 - vii) When a drainage passes over the irrigation canal, then the _____ is constructed at the crossing point.
 - viii) The process of reclamation of saline soil is known as _____.
 - ix) The only good effect of flood is that the agricultural land is enriched with _____.
 - x) The permeable temporary structure constructed on the river bank to protect it from erosion is known as _____.
 - xi) The groyne which is constructed obliquely to the bank at an angle 60° towards the downstream is known as _____ groyne.
 - xii) _____ is the science of studying the different forms of water available on the earth.
- B. State whether the following statements are True or False: 10x1
- i) Check dams are used to control floods.
 - ii) The unit of specific capacity of a well is m^3/sec .
 - iii) Automatic rain gauges used in India are of floating type
 - iv) The average annual runoff in cm depth for India is about 110cm.
 - v) When air is saturated with vapour then— the air temperature and dew point are the same.
 - vi) The standard rain gauge widely used in India is a non recording rain gauge.
 - 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) The line joining the places of equal rainfall is known as isohyets.
2. a) Define hydrology and enumerate the importance of it.
 b) What is meant by hydrologic cycle? Explain with neat sketch. 5+5
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 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
5. 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
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 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
8. 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
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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