



KINGS

COLLEGE OF ENGINEERING



DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK

Sub.Code / Name : CE 1353 Irrigation Engineering

Year/Sem : III/VI

UNIT I

INTRODUCTION

PART A

1) Define irrigation ?

Irrigation is defined as the science of artificial application of water to the land in accordance with the crop requirements.

2) What are the necessity of irrigation ?

- 1.Inadequate rainfall
- 2.Increasing yield of crops
- 3.Growing perennial crops
- 4.Uneven distribution of rainfall.

3) What are the advantages of irrigation?

- 1.Increase in food production
- 2.Optimum benefits
- 3.General prosperity
- 4.Afforestation.

4) What are the disadvantages of irrigation?

- 1.Over irrigation may lead to water logging
- 2.It may reduce crop yield
- 3.It is expensive and complex.

5) What are the types of irrigation?

- 1.Surface irrigation
- 2.Sub-surface irrigation.

6) What are the techniques of water distribution in the farms?

- 1.Free flooding
- 2.Border flooding
- 3.Check flooding
- 4.Basin flooding, furrow irrigation method, drip irrigation method.

7) What are the types of sprinkler system?

- 1.Permanent system
- 2.Semi-permanent system
- 3.Portable system

8)What are the advantages of sprinkler irrigation?

- 1.Land levelling is not required
- 2.Fertilisers can be uniformly applied
- 3.It is less labour oriented

9) What are the limitations of sprinkler irrigation?

- 1.Initial cost of the system is very high
- 2.It requires larger electrical power
- 3.High wind may distort sprinkler pattern

10) What is arid region?

The area where irrigation is must for agriculture is called arid region

11) What is semi-arid region?

The area in which inferior crops can be grown without irrigation

12) What is crop period?

The time period that elapses from the instant of its sowing to the instant of its harvesting is called crop period.

13) What is base period?

The time between the first watering of a crop at the time of its sowing to its last watering before harvesting is called the base period

14) What is rotation period?

The time interval between two such consecutive watering is called frequency irrigation.

15) Define duty of water?

It is the relationship between the volume of water and the area of crops it matures is called duty of water.

16) Define delta of a crop?

Each crop requires a certain amount of water after a certain fixed interval of time, through its period of growth is called delta of a crop

17) What are the factors on which duty depends?

- 1.Type of crop
- 2.Climate and seasons
- 3.Useful rainfall
- 4.Type of soil
- 5.Efficiency of cultivation method

18) What are kharif crops?

The kharif crops are rice,bajra,jawar,maize,cotton,tobacco, groundnut,etc.

19) What are rabi crops?

Rabi crops are wheat,barley,gram,linseed,mustard,potatoes,etc

20) Define irrigation efficiency?

It is the efficiency of water output to the water input,and is usually expressed as percentage.

21) What is called effective rainfall?

Precipitation falling during the growing period of a crop that is available to meet the evapo-transpiration needs of the crop, is called effective rainfall.

PART B

- 1) What are the merits and demerits of irrigation?
- 2) What are the factors affecting duty?
- 3) Briefly explain about irrigation efficiencies?
- 4) What are the consumptive uses of water?
- 5) Briefly explain about planning and development of irrigation project?

UNIT II

IRRIGATION METHODS

PART A

1) List some types of irrigation ?

Canal irrigation, lift irrigation, tank irrigation, etc

2) What are the necessity of irrigation ?

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2. Increasing yield of crops
3. Growing perennial crops
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- 3.High wind may distort sprinkler pattern

10) What are the types of canals?

- 1.Alluvial canal
- 2.Non-alluvial canal

11)What are alignment of canals?

- 1.Watershed canal or ridge canal
- 2.Contour canal
- 3.Side slope canal

12)What are distribution system of canal irrigation?

- 1.Main canal
- 2.Branch canal
- 3.Major canal
- 4.Watercourses
- 5.Minor canal

13)Define tank irrigation?

It is defined as the storage irrigation scheme,which utilizes the water stored on the upstream side of a smaller earth dam

14)Define tank banks?

The earthen bunds,spanning across the steams are called tank bunds or tank banks

15)What is called alluvial soil?

The process of silt deposition may continue over long periods of

time,resulting in the formation is called alluvial soil

16)What is called non-alluvial soil?

Mountainous regions may go on disintegrating over a period of time,resulting in the formation of a rocky plain area called non-alluvial soil

17)What is called watershed canal?

The dividing ridge line between the catchment areas of two streams is called watershed canal

18)What is the other name for drip irrigation?

Drip irrigation is also called as trickle irrigation.

19)What is called sprinkler irrigation system?

Water is applied to the soil in the form of a spray through a network of pipes and pumps is called sprinkler irrigation system

20)What is called called borders?

Land is divided into a number of strips separated by low levees called borders.

PART B

1. Briefly explain about canal irrigation?
2. Briefly explain about lift irrigation?
3. Briefly explain about tank irrigation?
4. Briefly explain about flooding methods?
5. Briefly explain about sprinkler irrigation methods?

UNIT III

DIVERSION AND IMPOUNDING STRUCTURES

PART A

1) What is meant by canal escape?

Canal escapes are the safety valves of canals & must be provided at regular intervals depending upon the importance of channel & availability of suitable drainage for the disposal of the exposed water.

2) Define base period?

The time period that elapses from the instant of sowing to instant of harvesting is called crop or base period.

3) State diff types of sprinkler system.

1. Permanent system
2. Semi-permanent system
3. Portable system

4) State various kinds of dams.

1. Earth dams
2. Rock fill dams
3. Solid masonry gravity dams
4. Hollow " " " "
5. Timber dams
6. Steel dams
7. Arch dams

5) State diff types of spillways.

1. Straight drop spillway
2. Ogee spillway
3. Trough spillway
4. Side channel spillway
5. Shaft spillway
6. Syphon spillway

6) Define gross commanded area?

It is the total area bounded within the irrigation boundary of a project. It includes the cultivable as well as uncultivable areas.

7) What are the various types of dams?

1. Earth dams
2. Rockfill dams
3. Solid masonry gravity
4. Hollow “ “
5. Timber dams
6. Steel dams
7. Arch dams

8) What is weir?

The major part of the water is achieved by a raised crest or a small part is achieved by raising shutters then this barrier is known as weir.

9) What is tank sluices?

It is an opening in the form of culvert under the tank bund and supplying water to the distributory channel.

10) Forces acting on arch dams.

1. Water pressure
2. Uplift “ “
3. Earthquake forces
4. Silt pressure
5. Wave pressure
6. Ice “ “

11) Define sluiceway?

Pipe or tunnel provided for the withdrawal of water from the dams is known as sluiceway.

12) What is spillway?

Spillway is a structure constructed at a dam site for disposing the surplus water from upstream to downstream.

13) Types of earthen dams.

1. Homogeneous embankment type
2. Zoned “ “ “
3. Diaphragm type.

14) Define barrage.

The most of the ponding is done by gates and a smaller of it is done by raised crest then the barrier is known as barrage.

15) What are the modes of failure in gravity dams?

1. By over turning about the toe
2. By crushing
3. By development of tension
4. By sliding

16) Define diversion headwork?

Any hydraulic structure, which offers water to the offtaking canal, is called diversion headwork.

17) What is gravity dam?

A structure which is designed in such a way that its own weight resist external forces and it is more durable .

18) Define stream line?

It represent the path along which the water flows through the subsoil. at a given point in upstream of hydraulic structure will travel its own path & will be represented the stream line.

19) Types of aeration tanks.

1. Air diffusion
2. Mechanical aeration
3. Combined “ “

20) Limitations of blighs creep theory?

1. No difference b/w hzl & vtl creep
2. No hzl & vtl distance b/w pipe line is greater than 2 times the depth
3. No idea about exit gradient

PART B

1. What are the factors affecting location and types of dams?
2. Briefly explain about tanks, sluices, and weirs?
3. What are types of dams and dam arches?
4. What are forces acting on a dam?
5. Explain the design features of cross drainage works?

UNIT IV

CANAL IRRIGATION

PART A

1) What are the classification of canals based on nature of source of supply?

1. Permanent canal
2. Inundation canal

2) What are the classification of canals based on financial aspect?

1. Productive canal
2. Protective canal

3) What are the classification of canals based on function served by the canal?

1. Link canal
2. Feeder canal
3. Power canal

4) Why the canals are aligned?

Water should reach the land by gravity. To accomplish this requirement irrigation canal always aligned in such a way that the water gets proper command over the whole irrigable area.

5) What are the methods of alignment?

1. Alignment of contour channels
2. Alignment of ridge or watershed channels
3. Alignment of side slope channels

6) Write any two factors to be considered while aligning the canal.

1. The canal should be aligned on the ridge.
2. Canal alignment should be kept in the centre of the commanded area.

7) What is cross drainage work?

A cross drainage work is a structure carrying the discharge of a natural stream across a canal intercepting the stream.

8) What are the types of cross drainage works?

1.C.D works carrying canal over the drainage 2. C.D works carrying canal over the canal 3. C.D works admitting the drainage water into the canal

9) What is canal head works?

When a permanent canal system is taken off from the river some works are to be provided at the off take to care of irregularities in river flow condition. Since these works are constructed at the point of take off, that is at the head of the canal system they are termed as canal headworks.

10) What is diversion headworks?

The main object of the canal headworks is to divert the water from the river into the canal. So it is sometimes termed as diversion headworks.

11) Where the canal headworks are located?

The canal headworks are located in the sub-mountainous stage.

12) What are all the considerations needed before selecting the canal headworks?

1. Economical considerations
2. Functional considerations
3. Structural considerations

13) What are all the components of canal headworks?

1. Weir or an anicut
2. Divide wall
3. Under sluices or scouring sluices
4. Fish ladder
5. Head regulator for a canal
6. Silt exclusion device
7. River training works

14) Differentiate between a weir and the barrage.

Barrage : It is a low obstructive barrier constructed across the river. Gates are provided on the crest of the barrier.

Weir : All small obstructions are simply termed as weirs. The obstructions may be falling shettres or trained gates or drum gates.

15) Why training works are provided?

When a river is very wide some training is to be done before constructing the headworks. The aim of training works is to induce the flow of water along the desired bank or

channel without causing abrupt changes. Generally guide banks, marginal bunds and sometimes spurs are provided for the purpose.

PART B

1. What is the necessity of river training works?
2. Describe in brief different types of river training works?
3. What is meant by guide banks? what are their functions and effects?
4. State the necessity and location of canal falls?
5. Briefly explain about classification of canals?

UNIT V

IRRIGATION WATER MANAGEMENT

PART A

1) What are the causes of water loss?

1. Seepage from the canal
2. Over irrigation of field
3. Heavy surface runoff

2) What are ways of water loss in the canal?

1. Seepage loss
2. Evaporation loss

3) What are factors on which seepage loss depends?

1. Position of water table
2. Porosity of sub-soil
3. Porosity of soil
4. Extend of absorbing medium

4) What are two different condition of seepage?

1. Percolation
2. Absorption

5. What are the remedial measures for losses?

1. Efficient surface drainage
2. Restriction of irrigation
3. Change in crop pattern

6) What are the advantages of irrigation water managements?

1. Achievement of optimum irrigation efficiency
2. Economical and efficient operation and maintenance of irrigation system
3. Equitable distribution of supplies to irrigators especially at the end

7) Discuss some components of water management?

1. Water shed management
2. Land management

- 3.Rain water management
- 4.Reservoir management

8.What are the impact of water user association?

- 1.Conveyance efficiency
- 2.Operation efficiency
- 3.Equity
- 4.Area water unit ratio

9.) What are the advantages of water user association?

- 1.Better maintenance of the distributry
- 2.Possibility of high value of crop programme
- 3.Availability of water and irrigation process

10) What are optimization of water user association?

- 1.To reduce the seepage loss and conveyance
- 2.Control over the usage of water
- 3.Planning
- 4.To avoid excess supply of water

11)What are the factors which influence evaporation loss?

- 1.Temperature
- 2.Wind velocity
- 3.Relative humidity

12. What is land management?

The intensity of raising productivity per unit area per unit time needs to be increased which amounts to increasing cropped area.

13. What are the irrigation methods for cultivation?

- 1.Border strip-wheat
- 2.Furrow method –cotton
- 3.Basin method –orchard

14. What is meant by CAD?

Command area developments. the concept of this developments is to ensure efficient water utilization.

15. What are the uses of irrigation waters?

- 1.Wastages due to over irrigation

2. Wastages due to surface runoff
3. Wastages due to escape of water

16. What are the work of on farm development?

1. Irrigation practice
2. Crop planning
3. Irrigation method
4. Right amount of irrigation

17. What are the components of on farm developments?

1. Field drain
2. Crossing in field channel
3. Crossing of field channel
4. Formation of field channel

18. What is called optimum water depth?

The quantity of water at which the yield is maximum, is called the Optimum water depth.

19. What is called optimum utilization of irrigation?

It generally means, getting maximum yield with any amount of water.

20. What is the relation between efficiency and losses?

Efficiency is inversely proportional to the losses.

PART B

1. Briefly explain about on-farm-development works?
2. What is the need for water user's association?
3. What is the need for optimisation of water use?
4. Briefly explain about percolation pond?
5. Discuss the role of farmers in water management?