

Unit-1

SHORT ANSWER QUESTIONS

1. Define reservoir? What are its Applications?
2. Explain the classification of reservoirs?
3. Explain the classification of flood control reservoirs?
4. What are the factors to be considered before selecting a site for a reservoir?
5. Explain the different types of storage zones in a reservoir with the help of a neat sketch?
6. Define dam? Explain different types of concrete dams with neat sketches.
7. Write the importance of geological structures in the selection of dam site from civil engineering point of view. ?
8. Explain how safe yield of a reservoir is obtained for a given capacity. ?

LONG ANSWER QUESTIONS

1. Give the classification of reservoirs.
2. What is meant by reservoir sedimentation and life of a reservoir?
3. Write short notes on gravity dam and buttress dam
4. Explain the following terms
 - i) Catchment area
 - ii) Normal pool level
 - iii) Maximum pool level
5. How is the capacity of reservoir fixed based on a specific yield? Also explain how safe yield?
6. Discuss the steps involved in selecting a site for reservoir construction.
7. Explain the procedure to determine reservoir capacity using a mass curve.

OBJECTIVE QUESTIONS

1. Water is useful for
 - A. running hydroelectric turbines
 - B. floating the boats and ships
 - C. providing steam for running locomotives
 - D. warming dwelling units
 - E. all the above.
2. Knowledge of hydrology is necessary for civil engineers for

- A. designing and construction of irrigation structures
 - B. designing and construction of bridges and culverts
 - C. flood control works
 - D. all the above.
3. Pick up the correct statement from the following :
- A. Run off and surface run off are the same
 - B. Run off includes the water flowing over the surface
 - C. Run off is sometimes called discharge of the river
 - D. Surface run off is sometimes called stream flow.
4. Pick up the correct statement from the following :
- A. Yield of a drainage basin is the run off at any time
 - B. Yield of a drainage basin is the run off over long periods
 - C. Yield of a drainage basin is expressed as surface run off per year
 - D. Run off is expressed as total volume per day
 - E. None of these.
5. Run off includes
- A. precipitation over catchment area of the stream and its tributaries
 - B. surface run off
 - C. ground water flow
 - D. all the above.
6. Pick up the correct statement from the following :
- A. Hydrograph is a plot of discharge and time
 - B. In hydrographs, time is plotted on X-axis
 - C. The maximum flow in the river due to rainfall, is called peak flow
 - D. Peak flows are different for rainfalls
 - E. All the above.

7. A soil strata may consist of
- A. soil zone
 - B. intermediate zone
 - C. capillary zone
 - D. ground water zone
 - E. all the above.
8. Pick up the correct statement from the following :
- A. The amount of water retained on the surface of soil grains by molecular attraction, is known as pellicular water
 - B. The degree of resistance to movement of the pellicular water generally expressed by the surface tension
 - C. The pellicular water held in any soil, is called field capacity
 - D. The portion of the pellicular water absorbed by the root action of the vegetation, is called available moisture
 - E. All the above.
9. If the slope of a line for infiltration capacity curve is $\frac{1}{1.737}$, the value of constant k in Horton's equation of infiltration capacity curve, is
- A. 2.0
 - B. 2.5
 - C. 3.0
 - D. 3.5
 - E. 4.0.
10. The equation $P - Q = Te \phi_{index}$ for determining the infiltration capacity, was suggested by
- A. Horton
 - B. Horner
 - C. Llyod

D. Bernard.

Unit-2

SHORT ANSWER QUESTIONS

1. What you meant by gravity dam? What are its compounds?
2. What are the main points to be considered while selecting site for a gravity dam construction?
3. What are the different types of galleries in gravity dam?
4. Explain the following forces acting on a gravity dam.
 - (i) Weight of the dam
 - (ii) Wave pressure
 - (iii) Wind pressure
 - (iv) Uplift pressure
5. Write detailed notes on elementary profile of gravity dam?
6. Write detailed notes on practical profile of gravity dams?

LONG ANSWER QUESTIONS

1. Explain the following methods of stability analysis of gravity dam .?
 - (i) Analogy method-slab
 - (ii) Finite element method
2. Explain the following failure in gravity dam in detail.
 - (i) Sliding failure
 - (ii) Tension failure
 - (iii) Overturning failure.
3. Define the following parameters with respect to the gravity dam
4. Enumerate various methods of stability analysis of gravity dam Explain any two of them.
5. Explain the forces acting on a gravity dam
6. Write the effects of earthquake forces on a gravity dam
7. What are the modifications given to an elementary profile to get practical profile?

OBJECTIVE TYPE QUESTIONS

11. Pick up the correct statement from the following :

- A. If ground water enters the channel, the channel is known as effluent channel
- B. If water goes out of channel to meet ground water, the channel is said to be influent stream
- C. If the water table is at higher level than the water level in channel, ground water flows to the stream
- D. If the water level in stream is higher than the water table level, water from the channel enters into ground water
- E. All the above.

12. Pressure exerted by fully saturated air, is known

- A. partial pressure
- B. vapour pressure
- C. saturation vapour pressure
- D. saturation pressure
- E. (c) and (d) of the above.

13. A volume of air at constant barometric pressure may be brought to dew point by

- A. increasing the temperature
- B. decreasing the temperature
- C. neither (a) nor (b)
- D. both (a) and (b).

14. If the dew point is greater than 0°C

- A. dew will be formed
- B. frost will be formed
- C. vapours will be formed
- D. neither of these.

15. Humidity refers to
- A. temperature of the air
 - B. pressure of the air
 - C. moisture content of the air
 - D. volume of the air.
16. Relative humidity is the ratio of actual vapour pressure to the saturation vapour pressure
- A. at the same temperature
 - B. at the same pressure
 - C. in the same volume
 - D. in the atmosphere.
17. Pick up correct statement from the following :
- A. The air from outer portion of cyclones gets lifted for causing precipitation
 - B. The air from central portion of cyclone's gets lifted for causing precipitation
 - C. The air from entire surface of the cyclones gets lifted for causing precipitation
 - D. None of those.
18. Precipitation caused due to upward movement of warmer air as compared to surrounding air, is called
- A. cyclonic precipitation
 - B. convective precipitation
 - C. orographic precipitation
 - D. none of these.
19. Precipitation caused due to striking of air masses with a topographical feature, is called
- A. orographic precipitation
 - B. convective precipitation
 - C. cyclonic precipitation
 - D. none of these.

20. The specifications of most commonly used standard gauges in India, are

- A. 200 sq. cm collector and 4 litres bottle
- B. 100 sq. cm collector and 2 litres bottle
- C. 200 sq. cm collector and 10 litres bottle
- D. 100 sq. cm collector and 4 litres bottle.

UNIT – III

SHORT ANSWER QUESTIONS

1. Explain earth dams with neat sketch.
2. Explain the methods of construction of earths.
3. Explain the various seepage control measures in earth dams.
4. What are the types of spillways?
5. Explain the hydraulic failure of earth dams.
6. Explain seepage failures of earth dams.
7. Write the criteria for safe design of earth dams.
8. Write short notes on zoned type earth dams.

LONG ANSWER QUESTION

1. Explain earth dams with neat sketch.
2. Write short notes on zoned type earth dams.
3. List any qualities of a good siphon.
4. Write short notes on rolled types earth dams
5. Explain ogee- shaped spillway?
6. Give the classification of spillway based on pertinent feature.
7. Write about hydraulic jump.

OBJECTIVE TYPE QUESTIONS

21. Pick up the correct statement from the following :

- A. Higher the gauge, more deficient will be the rain catch
- B. Heavier the rain, lesser will be the rain catch
- C. The trees serving as wind brakes in the vicinity of the gauge, should not subtend angles greater than 45°
- D. Coniferous forest is ideally suited for installing the gauge
- E. All the above.

22. The respective storm totals at three surrounding stations *A*, *B* and *C* are 110, 90 and 70 mm. If the normal annual precipitation amounts at stations *X*, *A*, *B* and *C* are respectively 1000, 1100, 1200 and 1250 mm, the estimated storm precipitation at *X* is

- A. 75 mm
- B. 77 mm
- C. 79 mm
- D. 81 mm.

23. The area enclosed by the adjacent isohyets of a catchment basin are shown under :

Isohyets in cms	40 - 50	50 - 60	60 - 70	70 - 80	80 - 90
Area in sq.km	1500	2500	3000	2000	1000

The average depth of annual precipitation in the catchment basin will be

- A. 60.0 cm
- B. 60.5 cm
- C. 61.5 cm
- D. 62.5 cm
- E. 63.5 cm.

24. The recurrence interval (R.I.) of 20 cm rain storm at a place is 5 years.

- A. The place will definitely have 20 cm rain storm after every five years

- B. The place may have 20 cm rain storm after every five years
- C. The place may have 20 cm rain storm within a set of 5 years twice
- D. None of these.

25. Sharp crested weirs are generally used

- A. for large flows
- B. for small flows
- C. for streams carrying high sediment loads
- D. for rivers carrying floating debris
- E. none of these.

26. For efficient working of a control meter, its throat length is approximately kept

- A. equal to the critical depth
- B. twice the critical depth
- C. three times the critical depth
- D. four times the critical depth.

27. A control meter is preferred to a weir because

- A. it measures the discharge even in silt laden streams
- B. the velocity of approach of the channel increases above the control, and thus removes the silt completely
- C. it is not damaged by floating debris
- D. all the above.

28. A river is said to be of uniform section if in its section

- A. a segment of a circle can be fitted
- B. a parabolic section can be fitted
- C. a rectangular section can be fitted
- D. a trapezoidal section can be fitted
- E. all the above.

29. The run off is affected by
- A. size of the basin
 - B. shape of the basin
 - C. elevation of the water shed
 - D. all the above.
30. The form factor of a drainage basin is obtained by dividing
- A. area of the basin by the axial length
 - B. average width of the basin by the axial basin
 - C. area of the basin by the square of the axial length
 - D. both (a) an (b)
 - E. both (b) and (c).

UNIT-IV

SHORT ANSWER QUESTIONS

1. Give a brief note on diversion headwork.
2. Distinguish between weir and a barrage.
3. Give the classification of weirs
4. mention various components of a diversion headwork.
5. Mention various components of a diversion headwork
6. What are guide banks and marginal banks?
7. Explain bligh's creep theory.
8. Discuss utility and limitation of Khosla's theory

LONG ANSWER QUESTIONS

1. Explain clearly the difference between barrage weir.
2. Explain the functions of various components of a diversion work.

3. Explain sub surface flow?

Discuss the limitations and anomalies of Bligh's creep theory.

4. Discuss Khosla's theory for design of weirs on permeable foundations.

Enumerate the various corrections that are needed in its applications

5. Discuss utility and limitations of Khosla's theory.

OBJECTIVE TYPE QUESTIONS

31. The area of a drainage basin whose axial length is 100 km is 2500 sq. km. Its form factor is

- A. 0.10
- B. 0.20
- C. 0.25
- D. 0.30
- E. 0.35

32. If the axial length of a drainage basin is 35 km and its form factor is 0.2, the total area of the basin is

- A. 205 sq. km.
- B. 215 sq. km.
- C. 225 sq. km.
- D. 235 sq. km.
- E. 245 sq. km.

33. The elevation Z of the watershed is : (where letters carry their usual meanings)

- A. reduced level of the top most point of the basin
- B. reduced level of the lower most point of the basin
- C. average elevation of the highest and lowest point of the drainage basin

obtained by the formula

D.
$$Z = \frac{a_1z_1 + a_2z_2 + a_3z_3 + a_nz_n}{A}$$

34. Run off is measured in

- A. cubic metres
- B. cubic metres per sec.
- C. cubic metres per minute
- D. cubic metres per hour.

35. The rational formula for calculating the discharge, is (where A is the area of basin and P_o is one hour rainfall)

- A. $\left(\frac{1}{12}\right) K \cdot p_o \left(\frac{1}{1 + T_e}\right) \cdot A$
- B. $\left(\frac{1}{24}\right) K \cdot p_o \left(\frac{2}{1 + T_e}\right) \cdot A$
- C. $\left(\frac{1}{36}\right) K \cdot p_o \left(\frac{2}{1 + T_e}\right) \cdot A$
- D. $\left(\frac{1}{48}\right) K \cdot p_o \left(\frac{1}{1 + T_e}\right) \cdot A$

36. The formula for calculating the overland flow time (T_o) in hours for any basin, is (where L_o is the distance of the critical point and H is the difference in elevation)

- A. $T_o = \left(0.225 \frac{L_o^3}{H}\right)^{0.385}$
- B. $T_o = \left(0.665 \frac{L_o^3}{H}\right)^{0.385}$
- C. $T_o = \left(0.435 \frac{L_o^3}{H}\right)^{0.385}$
- D. $T_o = \left(0.885 \frac{L_o^3}{H}\right)^{0.385}$

37. Pick up the correct statement from the following :

- A. The unit hydrograph of a specified unit duration obtained from the past data can be used to obtain the hydrograph of future storms of like duration

- B. To obtain the ordinates of storm hydrograph, the ordinates of unit hydrograph are multiplied by the multiplying factor
- C. The multiplying factor for storm hydrograph may be obtained by dividing the run off in mm by 25 mm
- D. A tolerance of about 25% of specified duration of unit hydrograph may be accepted without any serious error
- E. All the above.

38. Bernard's distribution graph is a plot of time on X-axis and

- A. run off on the y-axis
- B. total run off on the y-axis
- C. percentage of total surface run off on y-axis
- D. percentage of total surface run off during uniform time intervals on y-axis
- E. none of these.

39. An intense rain is falling at a uniform rate of 7.5 cm/hour for a period of 60 minutes on a basin whose area is 500 hectares. If the average infiltration capacity during the entire rain period is assumed to be 1.5 cm/hr, the maximum run-off rate based on 10 minute peak percentage of 16% from distributing graph of the basin, is

- A. 40 cumecs
- B. 60 cumecs
- C. 80 cumecs
- D. 100 cumecs.

40. Pick up the correct statement from the following :

- A. The ratio of total volume of voids in soil aggregates to the total volume of aggregate, is called Porosity
- B. Water retained by the interstices due to molecular attraction, is called pellicular water
- C. The ratio of volume of water obtained by gravity drainage to the total volume of the materials drained, is called 'yield'
- D. Sum of the percentage of specific yield and specific retention is 100
- E. All the above.

UNIT- V

SHORT ANSWER QUESTIONS

1. Explain the procedure for the design of trapezoidal notch fall?
2. What are the functions of distributor head regulator and cross regulator.
3. What are the different types of cross drainage works necessary on canal alignment?
4. Explain various type of cross drainage works.
5. What is a cross drainage work?
6. How would you select suitable type of cross drainage work?
7. What is meant by canal regulation?
8. What are modules? What are the requirements of good module?

LONG ANSWER QUESTIONS

1. What are the different types of cross drainage works necessary on canal alignment?
2. What are the functions of head regulator?
3. What are the functions of crowd regulator?

List out various functions of distributary head regulators

4. State how you will determine
 - a) Contraction of canal waterway
 - b) Waterway for the drain, and
 - c) Thickness of floor for the drain in the transition reaches in case of a siphon aqueduct
5. Distinguish between a modular , a non-modular and a semi modular outlet?
6. Explain the procedure for the design of trapezoidal notch fall?

OBJECTIVE TYPE QUESTIONS

41. Isopiastic lines are the contours
- A. drawn to represent water table
 - B. drawn to represent piezometric heads
 - C. drawn to piezometric surface
 - D. none of these.
42. The coefficients of permeability of soils of an unconfined aquifer and another confined aquifer were determined by pumping water from the wells and observing the effect of water table in two test wells at equal distances was found to be equal. The total height of confined aquifer H is given by
- A. $H = h_2 - h_1$
 - B. $H = h_1 - h_2$
 - C. $H = h_2 + h_1$
 - D. $\frac{1}{2} (h_1 + h_2)$
43. The radius of influence is
- A. radius of the main well
 - B. distance from the wall of main well to the point of zero draw down
 - C. distance from the centre of main well to the point of zero draw down
 - D. none of these.
44. When a constant discharge 2.91 litres/sec. was obtained in a pumping test, the draw downs in the test wells at 3 m and 6.184 m were 2.6 m and 0.3 m respectively. If over-all depth of the pumping well was 16 m, the permeability of the soil, is
- A. 0.0005 cm/sec
 - B. 0.001 cm/sec
 - C. 0.002 cm/sec
 - D. 0.01 cm/sec.

45. If ω is unit weight of water, Q the discharge in cumecs, H the total head lift and η , the efficiency of the pump, the H.P. of the motor is

A.
$$\text{H.P.} = \frac{\omega QH}{75 \eta}$$

B.
$$\text{H.P.} = \frac{\omega QH}{4500 \eta}$$

C.
$$\text{H.P.} = \frac{\omega Q \eta}{75 H}$$

D.
$$\text{H.P.} = \frac{\omega Q \eta}{4500 H}$$

46. If h is the loss due to friction in a pipe. Total losses in strainer and bends may be taken as

A. $0.01 h$

B. $0.45 h$

C. $0.20 h$

D. $0.25 h$

E. $0.3 h$.

47. If the loss due to friction in pipes is 4 m, the total losses in strainer and bends may be taken as

A. 0.10 m

B. 0.20 m

C. 0.5 m

D. 1.0 m.

48. The rate of evaporation from reservoirs may be determined by

A. pan-measurement method

B. empirical formulae

C. storage equation method

D. energy budget method

E. all the above.

49. In estimating the rate of evaporation from the reservoir surface, a pan 1.5 metres in diameter,

was filled upto 8.0 cm. During a specified period of time, the rainfall recorded was 5 cm. 3 cm of water was removed from the pan to keep the depth of water. At the end of the time, the depth was 9 cm. If the pan coefficient is 0.6, the evaporation loss is

- A. 2 mm
- B. 4 mm
- C. 6 mm
- D. 6 mm.

50. Dicken's formula for high flood estimate, is useful only for the catchments in

- A. Southern India
- B. Northern India
- C. Eastern India
- D. Western India.