Irrigation Engineering

Question No. 01

The consumptive use of water for a crop

(A) Is measured as the volume of water per unit area
(B) Is measured as depth of water on irrigated area
(C) May be supplied partly by precipitation and partly by irrigation
(D) All the above

Question No. 02

Canals taken off from ice-fed perennial rivers, are known

(A) Permanent canals
(B) Ridge canals
(C) Perennial canals
(D) Inundation canals

Question No. 03

In gravity canals, F.S.L. is

(A) Always at the ground level
(B) Always below the ground level
(C) Generally 4 to 5 metres above the ground level
(D) Only a few cm above the ground level

Question No. 04

The field capacity of a soil is 25%, its permanent wilting point is 15% and specific dry unity weight is 1.5. If the depth of root zone of a crop, is 80 cm, the storage capacity of the soil, is

(A) 8 cm
(B) 10 cm
(C) 12 cm
(D) 14 cm

Question No. 05

If water table is comparatively high, the irrigation canal becomes useless, due to

(A) Large amount of seepage
(B) Water logging of the cultivated areas
(C) Uncertain water demand
(D) All the above

Question No. 06

If *A* is the area of the surface, $\bar{x}$ is the depth of its C.G. from the surface of the water and ω is the density of water, then

(A) Total pressure on the surface is equal to $\omega\bar{x}$
(B) Depth of the point at which total pressure acts is equal to its moment of inertia divided by $A\bar{x}$
(C) Depth of the centre of pressure is 2/3*H* vertically below the surface
(D) All the above

Question No. 07

In a syphon aqueduct

(A) Drainage passes over the canal and F.S.L. of the canal is below the bottom of the drainage trough
(B) Drainage passes over the canal and F.S.L. of the canal is above the bottom of the drainage trough
(C) Canal passes over the drainage and H.F.L. of the drainage is above the bottom of the canal trough
(D) Canal passes over the drainage and H.F.L. of the drainage is below the bottom of the canal trough

Question No. 08

If the height of the hydraulic gradient line above the floor of thickness *t* is *h* and the specific gravity of the material of the floor is *G*, the minimum thickness *t* of the floor downstream of the crest-wall, is given by the equation

(A) $t = (h + 1)/(G + t)$

(B) $t = (h - 1)/(G + t)$

(C) $t = (h - 1)/(G - t)$

(D) $t = (h + 1)/G$

Question No. 09

To hold hydraulic jumps, baffle walls are provided in

(A) Sarda type falls

(B) English type falls

(C) Montague type falls

(D) Vertical type falls

Question No. 10

Pick up the correct sequence of the part of a canal system from the following

(A) Head work-distributary-branch canal-minor

(B) Head works-main canal-branch canal-distributary-minor

(C) Head works-main canal-branch canal-minor-distributary

(D) Heads works-branch canal-main canal distributary, minor

Question No. 11

The field capacity of a soil depends upon

(A) Capillary tension in soil

(B) Porosity of soil

(C) Both (a) and (b)

(D) Neither (a) nor (b)

Question No. 12

The water face of the guide banks, is protected by

(A) One men stone pitching
(B) Two man stone pitching
(C) Three man stone pitching
(D) Four man stone pitching

Question No. 13

Pick up the correct statement from the following

(A) Escapes are essential safety valves in a canal system
(B) The escapes must lead the surplus water to natural drainages
(C) The escapes are aligned to take advantage of contours of lower values
(D) All the above

Question No. 14

For a unique design of a channel by Kennedy's theory

(A) Its breadth must only be known
(B) Its depth must only be known
(C) Its breadth and depth ratio must only be known
(D) All the above

Question No. 15

The structure constructed to allow drainage water to flow under pressure through an inverted syphon below a canal, is called

(A) Syphon
(B) Super passage
(C) Super-aqueduct
(D) Syphon aqueduct

Question No. 16

The main cause of silting up a channel,

(A) Non-regime section
(B) Inadequate slope
(C) Defective head regulator
(D) All the above

Question No. 17

Pick up the correct statement from the following:

(A) Gravity water is harmful to crops
(B) Hygroscopic water remains attached to soil molecules by chemical bond
(C) Capillary moisture held in the soil pores against gravity by surface tension, is utilised by plants
(D) All the above

Question No. 18

A river training work is generally required when the river is

(A) Meandering
(B) Aggrading
(C) Degrading
(D) All the above

Question No. 19

When a canal flowing under pressure is carried below a natural drainage such that its F.S.L. does not touch the underside of the supporting structure, the structure so provided, is called

(A) Syphon
(B) Aqueduct
(C) Super passage
(D) Syphon-aqueduct

Question No. 20

Pick up the correct statement from the following

(A) In a level crossing, a crest with its top at the canal F.S.L. is provided across the drainage at its up-stream junction with canal
(B) In a level crossing a regulator is provided across the drainage at its down-stream
(C) In a level crossing, a cross regulator is provided on the canal below the crossing
(D) All the above

Question No. 21

In a Sarda type fall, the rectangular crest, may be used for discharge upto

(A) 6 cumecs
(B) 10 cumecs
(C) 14 cumecs
(D) 20 cumecs

Question No. 22

The measure to remove water logging of land, is

(A) To reduce percolation from canals and water courses
(B) To increase outflow from the ground water reservoir
(C) Both (a) and (b)
(D) Neither (a) nor (b)

Question No. 23

Borrow pits should preferably be located in

(A) Field on the left side of the canal
(B) Field on the right side of the canal
(C) Fields on both sides of the canal
(D) Central half width of the section of the canal

Question No. 24

The sinuosity of a meander is the ratio of

(A) Meander length and the width of meander
(B) Meander length and half width of the river
(C) Curved length and the straight distance
(D) None of these

Question No. 25

Pick up the correct statement from the following:

(A) If the flexibility is more than one, the outlet is hyper-proportional
(B) If the setting of an outlet is higher than that required for proportionality, the outlet is hyper-proportional
(C) If the flexibility is zero, it is a rigid module
(D) All the above

Question No. 26

According to Khosla, the exits gradient of surface flow

(A) Depends upon the b/d ratio
(B) Is independent of the b/d ratio

(C) Is independent of the depths of d/s cut off walls
(D) None of these

Question No. 27

A hydraulic structure is designed to withstand

(A) Seepage forces
(B) Hydraulic jump
(C) Hydraulic pressure
(D) All the above

Question No. 28

If the optimum depth of kor watering for a crop is 15.12 cm, the outlet factor for the crop for four week period in hectares per cumec, is

(A) 1000
(B) 1200
(C) 1400
(D) 1600

Question No. 29

In Montague type fall

(A) A straight glacis is provided
(B) A circular glacis is provided
(C) A parabolic glacis is provided
(D) No glacis is provided

Question No. 30

Cross regulators in main canals are provided

(A) To regulate water supply in the distributaries
(B) To increase water head upstream when a main canal is running with low supplies
(C) To overflow excessive flow water
(D) None of these

Question No. 31

According to Lacey, depth of scour in a river depends upon the straightness of the reach. If *D* is the depth of scour in regime flow in a right angled bend, it is

(A) 1.25 *D*
(B) 1.50 *D*
(C) 1.75 *D*
(D) 2.00 *D*

Question No. 32

According to Lacey, in regime conditions

(A) Silt is kept in suspension by vertical components of eddies
(B) Entire cross-section of the channel is generated at all points by the forces normal to the wetted perimeter
(C) Both (a) and (b)
(D) Neither (a) nor (b)

Question No. 33

The most suitable section of a lined canal, is

(A) Triangular section with circular bottom for small canals
(B) Trapezoidal section with rounded corners for large canals
(C) Both (a) and (b)
(D) None of these

Question No. 34

An outlet is said to be proportional if its flexibility, is

(A) Zero
(B) Less than one
(C) More than one
(D) One

Question No. 35

The level of the floor of a syphon aqueduct can be obtained

(A) By subtracting the depth of the culvert from the canal bed level
(B) By subtracting the thickness of culvert plus the depth of the culvert from the canal bed level
(C) Both (a) and (b)
(D) None of these

Question No. 36

If the straight sides of a triangular section of a lined canal with circular bottom of radius *D*, make an angle θ with horizontal, the hydraulic mean depth is

(A) *D*
(B) *D*/2
(C) *D*/3
(D) *D*/5

Question No. 37

According to Bligh's creep theory, percolating water flows along

(A) Straight path under the foundation of the dam

(B) Circular path under the foundation of the dam
(C) The outline of the base of the foundation of the dam
(D) None of these

Question No. 38

For a standing crop, the consumptive use of water is equal to the depth of water

(A) Transpired by the crop
(B) Evaporated by the crop
(C) Transpired and evaporated by the crop
(D) Used by the crop in transpiration, evaporation and also the quantity of water evaporated from adjacent soil

Question No. 39

Bed bars in a canal are provided

(A) To watch the general behaviour of canal
(B) To measure the discharge
(C) To raise the supply level
(D) To control the silting

Question No. 40

The velocity of drainage water in the barrels of a syphon-aqueduct, is normally limited to

(A) 1 to 2 m per second
(B) 2 to 3 m per second
(C) 3 to 4 m per second
(D) 4 to 5 m per second

Question No. 41

For the design of major hydraulic structures on the canals, the method generally preferred to, is based on

(A) Bligh's theory
(B) Electrical analogy method
(C) The relaxation method
(D) Khosla's method of independent variables

Question No. 42

Pick up the incorrect statement from the following:

(A) In free flooding irrigation, water is admitted at one corner of a field and is allowed to spread over the entire area

(B) In check method of irrigation, the field is divided into smaller compartments and water is admitted to each in turn

(C) In furrow irrigation water is admitted between the rows of plants in the field

(D) None of these

Question No. 43

Pick up the incorrect statement from the following

(A) Side walls of a venturi head flume are splayed out from the end of the throat at 1 : 10 for a length of 4.5 m

(B) Length of side walls should be such that the width of the flume is made equal to 2/3rd the bed width of the distributary

(C) Once the width of the flume becomes 2/3rd of the width of the distributary, the splayed walls are increased to 1 in 3 to get full bed width

(D) None of these

Question No. 44

Irrigation canals are generally aligned along

(A) Ridge line

(B) Contour line

(C) Valley line

(D) Straight line

Question No. 45

In a canal syphon, the flow is

(A) Under atmospheric pressure

(B) Pipe flow

(C) With critical velocity

(D) Under negative pressure

Question No. 46

Pick up the correct statement from the following

(A) Approach of the water line in a flumed channel section should not be steeper than 22½°
(B) Departure of the water line from a flumed channel section should not be steeper than 30°
(C) Approach of the water line should not be steeper than 30° and departure line not steeper than 22½° in a flumed channel section
(D) Approach and departure of the water line in a flumed channel section, should not be steeper than 22½°

Question No. 47

The main function of a diversion head works of a canal from a river, is

(A) To remove silt
(B) To control floods
(C) To store water
(D) To raise water level

Question No. 48

Pick up the correct statement from the following:

(A) The full supply level of a canal should be above ground level
(B) According to Lacey, regime conditions require a particular slope for a given discharge and silt factor
(C) In case the ground slope is less than the required bed slope, the silt factor must be reduced by permitting the entry of coarse silt
(D) All the above

Question No. 49

If d_1 is the depth of cutting, d_2 is the height of the bank from bed level r_2 : 1 and r_1 : 1 are the slopes in filling and cutting respectively, the horizontal distance n between the bed and bank, is

(A) $x = r_1 d_1$
(B) $x = r_2 d_2$
(C) $x = d_1 / r_1$
(D) $x = d_2 / r_2$

Question No. 50

If V_0 is the critical velocity of a channel, its silt transporting power, according to Kennedy, is proportional to

(A) $V_0^{1/2}$

(B) $V_0^{3/2}$

(C) $V_0^{5/2}$

(D) $V_0^{7/2}$