Test Paper on Objective Questions

Q. 1. In a hot arid district of Rajasthan State, like Jodhpur, the preferred mode of irrigation, would be :
    (*a*) flood irrigation   (*b*) furrow irrigation
    (*c*) drip irrigation   (*d*) sprinkler irrigation,

Q. 2. The conjunctive use of water in a basin is defined as :
    (*a*) the Evapotranspiration needs of the basin
    (*b*) combined exploitation of surface and ground waters in the basin
    (*c*) combined utilisation of surface waters for kharif as well as Rabi crops in the basin
    (*d*) none of the above.

Q. 3. The ratio of the average value of the shear stress produced on the bed, and that on the banks of an alluvial canal, due to the action of the flowing water, is :
    (*a*) 0.75   (*b*) 1.0
    (*c*) 1.33   (*d*) 0.

Q. 4. Lacey's silt theory is not applicable when :
    (*a*) silt grade consists of pure sand
    (*b*) silt amount is of the order of 500 ppm
    (*c*) the canal is lined
    (*d*) none of the above.

Q. 5.* An alluvial irrigation canal has been excavated with 1 : 1 side slopes in cutting and $1\frac{1}{2}$: 1 (H : V) in filling. At a given cross-section of this canal, the cutting depth is found to be D, and water depth up to FSL as 1.2 D. The berm width left originally is D/2, which, when channel attains regime, will become :
    (*a*) $\dfrac{D}{2}$ (*b*) D
    (*c*) $1.2\,D$ (*d*) $1.3\,D.$

Q. 6.* The maximum area that can be irrigated by a stream discharge of 0.05 cumecs, if the average rate of infiltration is 5 cm/h, is :
    (*a*) 0.36 hectares   (*b*) 100 hectares
    (*c*) 0.84 hectares   (*d*) 10.26 hectares.   (*Calcutta University*)

Q. 7. The ratio of the quantity of water stored in the root zone of the crops to the quantity of water actually delivered into the field, is called :
    (*a*) efficiency of water distribution
    (*b*) efficiency of water storage
    (*c*) efficiency of water use
    (*d*) efficiency of water application.

Q. 8. The hydraulic radius of a standard trapezoidal lined canal with 1.25 H : IV side slopes, 12 m bed width and 2 m FSD, is :
    (a) 1.11 m   (b) 1.41 m
    (c) 1.61 m   (d) none of them.

Q. 9. Safety ladders are provided to enable :
    (a) the fish to move in water from downstream to upstream to their ancesstoral spawning grounds
    (b) the fish to move in water from upstream to downstream in search of food
    (c) both (a) and (b) above
    (d) none of the above.

Q. 10. Which one of the following statements is not true about cement concrete lining ?
    (a) that it develops frequent cracks due to temperature changes
    (b) that it develops frequent cracks due to settlement of subgrade
    (c) that it is likely to be damaged by alkaline water
    (d) that it can be easily punctured by weed growth.

Q. 11.* River yamuna in the city reach of Delhi, has to carry a maximum discharge of about 5000 cumecs. The river has been jacketed on both sides by dikes at 2 km apart. These dikes come under frequent attacks of the meandering river, and need elaborate protective anti-erosion works, because the dikes are closely spaced, curtailing the original meander belt by about :
    (a) 10%   (b) 25%
    (c) 50%   (d) 75%.

Q. 12.* The meander width for an alluvial stream is estimated to be about 3.4 km. The normal width of this stream shall roughly be of the order of :
    (a) 100 m   (b) 200 m
    (c) 30 m   (d) 600 m.

Q. 13. An Indian irrigation project designed to serve a command of more than 2000 hectares and up to 10000 hectares, is known as a :
    (a) major irrigation project
    (b) minor irrigation project
    (c) medium irrigation project
    (d) none of them, since irrigation projects are classified on the basis of their costs.

Q. 14. The property of a zeological formation, which represents its capability to allow transmission of water through it, is called :
    (a) porosity   (b) permeability
    (c) field capacity   (d) yield.

Q. 15. The water consumed in irrigation, when compared with the total water used for all purposes in our country, is about :
    (a) 30%   (b) 50%
    (c) 70%   (d) 90%.

Q. 16. 1 Tonne of wheat produced, may consume water, as much as, say :
    (a) 100 tonnes   (b) 500 tonnes
    (c) 2000 tonnes   (d) 4000 tonnes.

Q. 17. The velocity of flow of water (v) through a soil stratum of permeability K and porosity n, as per Darcy's equation, is given by :
(a) $v = Ki$
(b) $v = Ki\,A$
(c) $v = K\,i \cdot n$
(d) $v = Ki \cdot \dfrac{1}{n}$.

Q. 18. Water required in producing 1 tonne of Rice is of the order of :
(a) 100 tonnes
(b) 500 tonnes
(c) 1000 tonnes
(d) 4000 tonnes.

Q. 19. The zeological formation, which does not contain any amount of ground water, is an :
(a) aquitard
(b) aquifer
(c) aquiclude
(d) aquifuse.

Q. 20. An example of aquitard stratum in the ground profile, is a layer of :
(a) granite rock
(b) clay
(c) sandy clay
(d) sand stone.

Q. 21. The appropriate percentage that represents the world's water resources existing in the form of ground water, is :
(a) 2%
(b) 12%
(c) 22%
(d) 47%.

Q. 22. In a meandering river reach, the shallowest portions of the river can be searched out, at :
(a) the crossings
(b) the convex banks
(c) the concave banks
(d) none of them.

Q. 23. The 'sinuosity' of a meandering river is defined as :
(a) $\dfrac{\text{meander length}}{\text{meander width}}$
(b) $\dfrac{\text{meander width}}{\text{meander length}}$
(c) $\dfrac{\text{length of the river}}{\text{axial length of the river}}$
(b) $\dfrac{\text{axial length of the river}}{\text{length of the river}}$.

Q. 24. 'Crossings' in a meandering river, are :
(a) straight channel reaches, between two consecutive clockwise and anticlockwise loops
(b) apex points of clockwise loops
(c) apex points of anticlockwise loops
(d) both (b) and (c).

Q. 25. A river reach downstream of a newly built dam, may behave as :
(a) aggrading
(b) degrading
(c) virgin
(d) all of them.

Q. 26. An unconfined aquifer in ground water profile is also known, as :
(a) an artesian aquifer
(b) a perched aquifer
(c) a water table aquifer
(d) none of the above.

Q. 27.* The upper limit of Reynold's number, for the Darcy's law to remain valid for ground water flow, is :
(a) 0
(b) 1
(c) 100
(d) ∞.

Q. 28. The safe depression head for open wells is generally taken to be x times the critical depression head, when x is :
(a) $\frac{1}{6}$
(b) $\frac{1}{3}$
(c) $\frac{1}{2}$
(d) $\frac{3}{4}$.

Q. 29. When groundwater flows into a stream to augment its discharge, then the stream is called :
    (*a*) an influent stream   (*b*) an effluent stream
    (*c*) a perennial stream   (*d*) an ephemeral stream.

Q. 30. A bridge is proposed to be constructed across the Ganga river at a site, where the design discharge is about 20,650 cumecs. The river width is proposed to be reduced at the bridge site to 800 m by constructing guide banks and marginal bunds, on either side. The length of each guide bank in this case will be about :
    (*a*) 0.8 km   (*b*) 1.2 km
    (*c*) 1.4 km   (*d*) 2.8 km.

Q. 31.* A guide bank is to be constructed for an alluvial river, having maximum design discharge of 6400 cumecs. The thickness of the stone pitching required on the river side of this guide bank, will be about :
    (*a*) 0.6 m   (*b*) 0.9 m
    (*c*) 1.2 m   (*d*) 1.5 m.

Q. 32. A fully developed pilot cut, excavated in a river, is called :
    (*a*) a cut off   (*b*) a short cut
    (*c*) a meander   (*d*) a river channel.

Q. 33. Retrogression occurring at the downstream reach of a weir site, is :
    (*a*) a continuous scouring process
    (*b*) a continuous silting process
    (*c*) a reversible process, in which gradual scouring occurs during the initial 4-5 years of weir construction ; which later, changes into gradual silting, and recovery towards original levels, and even more, sometimes.
    (*d*) a reversible process, in which gradual silting occurs during the initial 4-5 years of weir construction ; which then changes into gradual scouring, and recovery towards original levels and even more, sometimes.

Q. 34. A 'breast wall' is usually provided above the sill of a canal head regulator at a barrage site, between :
    (*a*) sill level and pond level
    (*b*) pond level and HFL of river
    (*c*) pond level and FSL of canal
    (*d*) none of the above.

Q. 35. The alkali salt, which is most injurious to plant growth, is :
    (*a*) sodium corbonate   (*b*) sodium chloride
    (*c*) sodium sulphate   (*d*) sodium nitrate.

Q. 36. The joints in the C.C. blocks laid over the inverted filter infront of the downstream end of concrete floor of a barrage, should be filled up with :
    (*a*) C.C. 1 : 2 : 4   (*b*) cement mortar 1 : 4
    (*c*) bajri or coarse sand   (*d*) any of the above.

Q. 37. A deflecting groyne is :
    (*a*) a small repelling groyne, giving only local protection, without repelling the river current
    (*b*) a small attracting groyne
    (*c*) a specially designed curved head groyne
    (*d*) a tree groyne.

Q. 38. The spacing between the groynes constructed to protect a dike, in the absence of model testing, may be of the order of :
(a) 2 to 2.5 times their length
(b) 8 to 10 times their length
(c) 20 to 30 times their length
(d) 50 times their length.

Q. 39. Rigid boundary canals, whose bed and banks are made with non-erodible materials, are in :
(a) initial regime   (b) final regime
(c) true regime   (d) permanent regime.

Q. 40. Lacey's silt theory is not applicable to channels, which are in :
(a) final regime   (b) permanent regime
(c) true regime   (d) none of the above.

Q. 41. A perfectly lined canal is a :
(a) mobile boundary canal   (b) rigid boundary canal
(c) neither (a) nor (b)   (d) either (a) or (b).

Q. 42.* The total water requirement for certain irrigated area is 300 M cum. The reservoir losses and carry over losses are 10% and 5% respectively ; and dead storage is 10% of gross storage. The gross storage capacity of reservoir should be :
(a) 375 M cum   (b) 383 M cum
(c) 395 M cum   (d) 400 M cum.

Q. 43. The stone apron laid infront of a hydraulic structure in the river bed, to ensure its launching into any possible scour that may occur at the site, is called :
(a) launching apron   (b) rip rap
(c) talus   (d) all of these.

Q. 44. A pilot cut in a meandering river should be as deep as possible, and the ratio $\dfrac{R}{L^2}$ for the cut should be :
(a) lesser for the cut than for the main course
(b) greater for the cut than for the main course
(c) equal for the cut and the main course
(d) none of the above.

                              where R is the hydraulic radius
                                       L is the channel length.

Q. 45. Cut off ratio for an alluvial river is always :
(a) < 1 (b) 1
(c) > 1 (d) none of them.

Q. 46. When other conditions are favourable, a natural cut off along an existing side channel may develop across a sharp meandering bend in an alluvial river, at a meander ratio of the order of :
(a) 0.5 to 1.0   (b) 1.0 to 1.5
(c) 1.7 to 3.0   (d) 10 to 20.

Q. 47. The arrangements made along a canal, to help the unfortunate victims being swept away by water current, are called :
(a) canal crossings   (b) cattle crossings
(c) canal ladders   (d) none of them.

Q. 48. **The only irrigation module, which is not an orifice type but is of weir type, is :**
(a) Kennedy's gauge outlet   (b) open flume outlet
(c) pipe outlet   (d) adjustable proportional module.

Q. 49. **The one among the following, which is not a rigid module, is :**
(a) Gibb's module   (b) Foote module
(c) Khanna's module   (d) Kennedy's module.

Q. 50. **Flood waters of rivers are sometimes diverted through canals, called :**
(a) feeder canals   (b) inundation canals
(c) perennial canals   (d) carrier canals.

Q. 51. **A cut off across a meander loop in an alluvial river leads to :**
(a) silting of sediment upstream and scouring downstream
(b) scouring upstream and silting downstream
(c) scouring in the upstream reach only
(d) silting in the downstream reach only.

Q. 52. **The sill level of a canal head regulator is kept higher by about 1.2 to 1.5 m, above the :**
(a) crest level of under-sluice ways
(b) crest level of barrage bays
(c) canal bed level
(d) none of these.

Q. 53. **The tunnel openings provided parallel to the axis of the main canal head regulator and in front of that, are called :**
(a) head sluices   (b) under sluices
(c) silt ejector   (d) silt excluder.

Q. 54. **Out of the following, the measures which help in improving the duty of irrigation water, are :**
(a) lining of canals to reduce conveyance losses of irrigation water
(b) minimising water losses in irrigation fields, by improving the efficiency of cultivation methods
(c) lining of water courses to avoid seepage of water
(d) educating the farmers with the harmful effects of using excess water in irrigation
(e) rotation of crops in farms
(f) all of the above   (g) none of the above.

Q. 55. **An irrigation canal, flowing under pressure below a drainage channel, is specifically called a :**
(a) canal aqueduct   (b) siphon aqueduct
(c) super passage   (d) canal siphon.

Q. 56. **A venturiflume, which is helpful in measuring canal discharge, is also called a :**
(a) standing wave flume   (b) parshall flume
(c) non-metering flume   (d) none of the above.

Q. 57. **The drainage water intercepting the canal can be disploded of by passing the canal above the drainage, in :**
(a) an aqueduct or a siphon aqueduct
(b) a super passage or a canal siphon

(c) a level crossing

(d) none of the above.

Q. 58. A level crossing constructed at the junction of an irrigation canal and a natural drainage channel consists of :

(a) one regulator only

(b) two weirs only

(c) one weir and two regulators

(d) two weirs and two regulators.

Q. 59. Which of the following is not true about a standing wave flume, used for metering purposes in a canal ?

(a) it involves low head loss

(b) its discharge depends only upon the upstream water level

(c) for the same discharging head, its discharge is more than that of a venturi flume

(d) it involves the formation of a hydraulic jump downstream of the throat

(e) it is seldom constructed as independent structure solely for metering purposes

(f) it involves low energy loss.

Q. 60. Cut offs are promoted along a river course in plains, to shorten and straighten its course. This exercise helps us to :

(a) dissipitate excess valley slope of upper mountainous river reach

(b) remedy the deficit surface slope of the river reach in plain

(c) both (a) and (b)

(b) neither (a) nor (b).

Q. 61. Out of the following, which measure helps in reducing scouring and silting along an alluvial river course :

(a) to dissipate excess land slope of upper reach, by constructing weirs and barrages across the river in this reach

(b) to overcome the deficit slope in lower plain reaches, by promoting and affecting cut offs

(c) by promoting soil conservation measures in the upper catchment

(d) by creating storage on the upper reaches, to release somewhat constant outflow in the downstream river.

(e) all of the above.

Q. 62. The floor of a siphon aqueduct needs to be designed for conditions, when :

(a) the canal and drainage are flowing full

(b) the canal is full and there is no drainage discharge

(c) the canal is empty and drainage discharge is full

(d) (a) and (b) both

(e) (b) and (c) both

(f) (c) and (a) both.

Q. 63.* The discharge from a spillway on a horizontal floor is 8 cumecs per metre width. If the depth before the jump is 50 cm, the depth after the jump will be ... metres. (GATE - 92)

Q. 64.* 'Eddy viscosity', means that it is

(a) a physical property of the fluid

(b) same as kinematic viscosity   (c) always associated with laminar flow

(d) an apparent viscosity due to turbulent nature of flow.   (GATE-90)

Q. 65. In a siphon aqueduct provided with a depressed floor, the worst uplift acting on the floor is caused when there is no drainage flow, by the
(a) static head due to watertable rising up to the drain bed
(b) seepage head due to canal running full
(c) both (a) and (b)
(b) none of the above.

Q. 66.* The following hydraulic data is available at the proposed site of a canal crossing :

Item	Drain	Canal
B.L. (m)	207.4	209.4
HFL/FSL (m)	209.3	215.6
Discharge (m²/s)	390	350

The appropriate economical cross-drainage work at the above site will be :
(a) an aqueduct   (b) a super passage
(c) an aqueduct syphon   (d) a canal syphon.

Q. 67. Multiple arch dam is an example of :
(a) arch dams   (b) buttress dams
(c) shell-arch dams   (d) all of the above.

Q. 68. An aquifer, which is confined at its bottom but not at the top, is called a :
(a) semiconfined aquifer   (b) confined aquifer
(c) unconfined aquifer   (d) none of the above.

Q. 69.* The permeability of a soil sample at standard temperature of 20°C was 0.01 cm/s. The permeability at 40°C temperature, when kinematic viscosity of water at 20°C and 40°C are given to be 1.009μm²/s and 0.654μm²/s, will be:
(a) 0.01 cm/s   (b) 0.015 cm/s
(c) 0.0065 cm/s   (d) none of these.

Q. 70. The volume of water (cum) that can be extracted from a unit volume of aquifer material (1 cum) under the force of gravity, is called :
(a) storage coefficient   (b) specific coefficient
(c) specific yield   (d) specific capacity.

Q. 71.* Specific capacity of a confined well under equilibrium conditions and within the working limites of drawdown :
(a) is constant at all drawdowns
(b) decreases as the drawdown is increased
(c) increases as the drawdown is increased
(d) none of the above.

Q. 72. A soil sample, having exchangeable sodium percentage = 13%, pH = 7.5, and electrical conductivity = 6000 μΩ/cm, can be classified as :
(a) white alkali   (b) alkaline soil
(c) saline-alkali soil   (d) none of the above.

Q. 73. The dead storage in a reservoir is created for :
(a) sedimentation   (b) firm hydropower
(c) emergent water supply   (d) none of these.

Q. 74. The silt suspended in water, settles down, approximately following the :
(a) Blaney criddle formula   (b) Darcy's law
(c) Lacey's theory   (d) Stoke's law.

Q. 75. Sedimentation over long periods of time, is responsible for reducing the reservoir capacity, earmarked as :
(a) dead storage   (b) live storage
(c) both (a) and (b)   (d) none of these.

Q. 76. The most appropriate value of the 'average estimated life' of a concrete gravity or an earthen dam, is :
(a) 50 years   (b) 100 years
(c) 150 years   (d) none of these.

Q. 77. The axis of a gravity dam is the : .
(a) line of the crown of the dam on the downstream side
(b) line of the crown of the dam on the upstream side
(c) centre line of the top width of the dam
(d) line joining mid points of the base.

Q. 78. Tension cracks in gravity dams may sometimes lead to the failure of the structure, by :
(a) sliding of the dam at the cracked section
(b) overturning about the toe
(c) crushing of concrete, starting from the toe
(d) none of the above.

Q. 79. Presence of tail water in a gravity dam :
(a) increases the principal stress and decreases the shear stress
(b) increases the principal stress and increases the shear stress
(c) decreases the principal stress and increases the shear stress
(d) decreases the principal stress and decreases the shear stress.

Q. 80. Neglecting tail water effect, the major principal stress at the toe of a gravity dam under full reservoir condition, is given by :
(a) p_v (b) $p_v \sec^2 \theta$
(c) $p_v \tan^2 \theta$ (d) $p_v \sin^2 \theta$.
where p_v = direct vertical stress at the toe
        θ = angle of the downstream face with the vertical.

Q. 81. The provision of a drainage gallery in a gravity dam helps in reducing :
(a) hydrostatic pressure   (b) silt pressure
(c) seepage pressure   (d) none of these.

Q. 82. The uplift pressure at the face of a drainage gallery in a gravity dam, is taken as equal to :
(a) hydrostatic pressure at the toe
(b) average of hydrostatic pressure at the toe and heel
(c) two third of the hydrostatic pressure at the toe plus one third of the hydrostatic pressure at the heel
(d) none of the above.

Q. 83. The pore pressure distribution under steady condition in an earthen dam, is:
(a) determined by considering linear variation from upstream to downstream water levels
(b) determined from the flownet
(c) the same as the upstream water level
(d) none of the above.

Q. 84. A rock toe and a horizontal filter is provided on the downstream base of an earthen dam in order to :

(a) prevent piping action in the dam body

(b) prevent piping action in the dam foundation

(c) to reduce the seepage quantity by blocking its flow

(d) to collect and drain out the seepage flow.

Q. 85. The one among the following, which helps to meet the downstream river water requirements in a dam reservoir project, is :

(a) dam spillway   (b) dam galleries

(c) dam sluices   (d) none of these.

Q. 86. The crest of a dam spillway is provided at R.L. equal to that of its :

(a) maximum reservoir level

(b) dead storage level

(c) maximum conservation level

(d) none of the above.

Q. 87. The seepage discharge in an earthen dam, as collected by a horizontal blanket or a rock toe, can be computed by :

(a) plotting the flow net below the dam body

(b) plotting the flow net through the dam body

(c) either (a) or (b)

(d) none of the above.

Q. 88. The hydraulic jump for energy dissipation is used in :

(a) shaft spillway

(b) syphon spillway

(c) side channel spillway

(d) none of them.

Q. 89. The formation of a hydraulic jump at the foot of a spillway is one of the common methods of energy dissipation services, because :

(a) it destroys more than 90% of the total energy by the turbulence produced in the jump

(b) it reduces kinetic energy by increasing the depth of flow

(c) its action is not understood.   (U.P.S.C. Engg. Services, 1977)

Q. 90. The process by virtue of which water moves from regions of higher concentration to lower concentration, the two regions being separated by a selectively permeable membrane, is called :

(a) diffusion   (b) osmosis

(c) transpiration   (d) reverse osmosis.

Q. 91. The productivity of a soil will be maximum, when its pH value is of the order of :

(a) below 6   (b) 6.5—7.5

(c) 7.5—8.0   (d) 8.5— 11.0.

Q. 92.* The efficiency of sprinklar irrigation is the highest in :

(a) arid regions   (b) semi arid regions

(c) humid regions   (d) none of them.

Q. 93. The uniformity coefficient will be higher in case of :

(a) drip irrigation   (b) sprinkler irrigation

(c) equal in both cases

(d) sometimes (a) and sometimes (b), depending on soil type.

Q. 94. The structure among the following, which is not used in a shaft spillway, is:
(a) a tunnel   (b) a bridge
(c) radial gates   (d) radial piers.

Q. 95. 'Morning glory' is the :
(a) special flared inlet of the shaft spillway of a dam of very small height
(b) special flared inlet of the shaft spillway of a large dam project
(c) horizontal tunnel constructed in a shaft spillway across the body of a gravity dam, to carry the surplus reservoir water to the downstream river
(d) horizontal tunnel constructed in the shaft spillway of an earthen dam through its foundation, to carry the surplus reservoir water to the downstream river.

Q. 96. A ski-jump bucket is also known as :
(a) flip bucket   (b) solid roller bucket
(c) slotted roller bucket   (d) none of these.

Q. 97. The most commonly used vertical lift gates in modern days is :
(a) sliding gates   (b) free-roller gates
(c) stoney gates   (d) fixed wheel gates.

Q. 98. The percentage of energy dissipation in a hydraulic jump :
(a) increases with the increase in the Froude number (of the incoming flow)
(b) decreases with the increase in the Froude number
(c) remains unaffected with the increase in the Froude number
(d) increases with the increase in Froude number up to a limit, and then decreases with further increase in Froude number.

Q. 99. In case of dam spillways, the approaching Froude number F_1, usually lies in the range of :
(a) < 2.5   (b) 2.5—4.5
(c) 4.5—0.9, or sometimes even more
(b) none of them.

Q. 100. In case of weirs and barrages, the approaching Froude number F_1, usually lies in the range of :
(a) < 2.5   (b) 2.5—4.5
(c) 4.5—9.0   (d) more than 9.0.

ANSWERS FOR THE TEST PAPER

1. (c)	2. (b)	3. (c)	4. (c)	5. (c)
6. (a)	7. (d)	8. (c)	9. (d)	10. (d)
11. (d)	12. (b)	13. (c)	14. (b)	15. (d)
16. (c)	17. (d)	18. (d)	19. (d)	20. (c)
21. (c)	22. (b)	23. (c)	24. (a)	25. (b)
26. (c)	27. (b)	28. (b)	29. (b)	30. (c)
31. (c)	32. (a)	33. (c)	34. (b)	35. (a)
36. (c)	37. (a)	38. (a)	39. (d)	40. (b)
41. (b)	42. (c)	43. (d)	44. (b)	45. (c)
46. (c)	47. (c)	48. (b)	49. (d)	50. (b)
51. (b)	52. (a)	53. (d)	54. (f)	55. (d)
56. (b)	57. (a)	58. (c)	59. (a)	60 (b)

61. (e)	62. (e)	63. 4.86 m	64. (d)	65. (c)
66. (c)	67. (b)	68. (c)	69. (b)	70. (c)
71. (b)	72. (a)	73. (a)	74. (d)	75. (c)
76. (c)	77. (b)	78. (c)	79. (d)	80. (b)
81. (c)	82. (c)	83. (b)	84. (d)	85. (c)
86. (c)	87. (b)	88. (c)	89. (b)	90. (b)
91. (b)	92. (c)	93. (a)	94. (c)	95. (b)
96. (a)	97. (d)	98. (a)	99. (c)	100. (b).

HINTS FOR SOLVING STARRED QUESTIONS OF THE TEST PAPER

Q. 5. From Fig. 30.1, it can be seen that the original berm AB attains $A'B'$, when channel attains $\frac{1}{2}H : 1V$ regime side slopes. From geometry of this Fig., $A'B'$ is found to be $1.2D$.
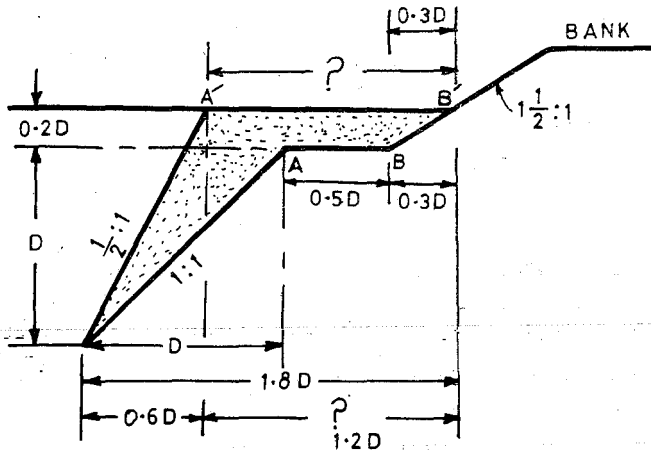

Fig. 30.1.

Q. 6. From eqn. (1.2)

$$A_{max} = \frac{Q}{f}$$

where $Q = 0.05$ cumec
$= 0.05 \times 60 \times 60 \text{ m}^3/\text{h}$
$= 180 \text{ m}^3/\text{h}$
$f = 5 \text{ cm/h} = 0.05 \text{ m/hr}$

$= \dfrac{180}{0.05} \text{ m}^2 = 3600 \text{ m}^2$

$= 0.36$ hectare. **Ans.**

Q. 8. $\tan \theta = \dfrac{1}{1.25}$

$\theta = 0.675$

From eqn. (5.8)
$$A = (B + y\theta + y\cot\theta)$$
$$= 2\,(12 + 2 \times 0.675 + 2 \times 1.25) = 31.7\,\text{m}^2$$
From eqn. (5.9)
$$P = B + 2y\theta + 2y\cot\theta$$
$$= 12 + 2 \times 2 \times 0.675 + 2 \times 2 \times 1.25 = 19.7\,\text{m}$$
$$R = \frac{A}{P} = \frac{31.2}{19.7} = \textbf{1.61 m.}\quad \textbf{Ans.}$$

Q. 11. $M \approx 150\,\sqrt{Q_{dom}}$

$$= 150 \times \sqrt{5000 \times \frac{9}{16}}\;\text{m} \approx 8\,\text{km}$$

Spacing provided = 2 km
Meander belt cut off
$$= 8 - 2 = 6\,\text{km}$$
$$= \frac{6}{8} \times 100\% = 75\%\quad \textbf{Ans.}$$

Q. 12. $M_B = 3400\,\text{m} \approx 17\,W$
$\therefore$ $W = 200\,\text{m.}\quad \textbf{Ans.}$

Q. 27. $\because$ The flow becomes turbulent when R_e exceeds 1, and Darcy's law is valid only in laminar range.

Q. 31.   From Eqn. (8.4) : $t = 0.06\,(6400)^{1/2}$
$$= 1.11 \approx 1.2\,\text{m.}\quad \textbf{Ans.}$$

Q. 42.   Carryover (conveyance) loss is 5% (of head discharge)

$\because$ Water drawn from reservoir
$$= \frac{300}{0.95}\,\text{M cum.}$$

Reservoir loss and dead storage
$$= 20\%$$

$\because$ Gross reservoir capacity
$$= \frac{\text{water drawn}}{0.8}$$
$$= \frac{300}{0.95} \times \frac{1}{0.8} = 394.7\,\text{M cum}$$
$$\approx 395\,\text{M cum}\quad \textbf{Ans.}$$

Q. 63.   From eqn. (10.6) :

$$y_2 = -\frac{y_1}{2} + \sqrt{\frac{y_1^2}{4} + \frac{2q^2}{gy_1}}$$

where $q = 8\,\text{cumecs/m}$
$y_1 = 0.5\,\text{m}$

$\therefore$ $$y_2 = -\frac{0.5}{2} + \sqrt{\frac{0.25}{4} + \frac{2 \times 64}{9.81 \times 0.5}}$$
$$= 4.86\,\text{m.}\quad \textbf{Ans.}$$

Q. 64.   See article 4.8.

Q. 66.   Refer Example 14.5 (*b*).

Q. 69.
$$K \propto \frac{1}{v}$$

$$\therefore \qquad \frac{K_{40^\circ}}{K_{20^\circ}} = \frac{v_{20^\circ}}{v_{40^\circ}} = \frac{1.009}{0.654}$$

$$\therefore \qquad K_{40^\circ} = \frac{1.009}{0.654} \times 0.01 \text{ cm/s} = 0.015 \text{ cm/s.} \quad \textbf{Ans.}$$

Q. 71.   From eqn. (16.28) :
Specific capacity

$$= \frac{1}{C_1 + C_2 Q}.$$

This eqn. shows that specific capacity decreases as Q increases, and Q increases only when drawdown is increased by heavier pumping, and hence, specific capacity decreases as drawdown is increased. **Ans.**

Q. 92.   Efficiency of sprinkler irrigation is the highest in humid or cool climates.