6 CHAPTER

Canal Regulation Work

Q.1 Gibb's module is a type of outlet which ensures
(a) constant discharge even if the water levels in the supply channel and water course fluctuate
(b) variable discharge as per the need
(c) constant discharge into the water course when the water levels in the supply channel vary
(d) constant discharge for varying water levels in the water course for a given water level in the supply channel.

Q.2 Match List-I (Type of canal fall) with List-II (Energy dissipating device) and select the correct answer using the codes given below the lists:

List-I
A. Trapezoidal notch
B. Straight glacis fall
C. Sarda type fall
D. Well fall

List-II
1. Lined cistern fall
2. Water cushion
3. Turbulence of impacting jet
4. Forced hydraulic jump

Codes:

	A	B	C	D
(a)	2	3	4	1
(b)	2	4	3	1
(c)	4	2	1	3
(d)	2	4	1	3

Q.3 The functions of a head regulator are:
1. To regulate supplies entering the off-take channel.
2. To control silt entry to off-take channel.
3. To serve as a meter to measure discharge.
4. To shut of supply in off-take channel when not required.

The correct answer is
(a) 1, 2 and 3 (b) 1, 3 and 4
(c) 2, 3 and 4 (d) All of these

Q.4 A cross regulator helps in
(a) increasing supply in the parent channel downstream.
(b) increasing supply in the offtaking channel.
(c) increasing water depth in the parent canal, upstream.
(d) Both (b) and (c)

Q.5 Match List-I (Control structures) with List-II (Functions of the control structures) and select the correct answer using the codes given below the lists:

List-I
A. Canal drop
B. Canal escape
C. Canal cross-regulator
D. Canal outlets

List-II
1. Control of flow depth
2. Control of bed grade
3. Control of full supply level
4. Control of discharge

The correct match is

Codes:

	A	B	C	D
(a)	2	3	4	1
(b)	3	2	1	4
(c)	2	3	1	4
(d)	3	2	4	1

Q.6 In vertical type fall, the energy fall is achieved by
(a) a free hydraulic jump.
(b) a hydraulic jump assisted by baffles.
(c) friction blocks only.
(d) a water cushion.

Q.7 The following structure serves the purpose of a 'safety valve' for a canal:
(a) head regulator (b) cross regulator
(c) canal escape (d) canal fall

Q.8 The Adjustable Proportional Module (APM) is a
(a) modular outlet
(b) semi-modular outlet
(c) non-modular outlet
(d) is an open flume outlet

Q.9 Which is of the following are valid for a standing wave flume used for metering purposes?
1. Low modular limit
2. Low energy loss
3. Hydraulic jump at down stream of throat
(a) Only 1 (b) 2 and 3
(c) 1 and 3 (d) All of the above

Q.10 Match List-I (Outlet) with List-II (Flexibility) and select the correct answer using the codes given below the lists:

List-I	List-II
A. Modular outlet	1. <1
B. Proportional outlet	2. >1
C. Hyper proportional outlet	3. Zero
D. Sub-proportional outlet	4. Unity

Codes:

	A	B	C	D
(a)	3	4	2	1
(b)	3	4	1	2
(c)	3	2	4	1
(d)	4	3	2	1

Q.11 Match List-I (Term) with List-II (Definition) and select the correct answer using the codes given below the lists:

List-I
A. Flexibility
B. Setting
C. Sensitivity
D. Channel index

List-II
1. Depth of the crest level of outlet below FSL to full supply depth of the distributary channel.
2. Rate of change of discharge of an outlet to the rate of change of discharge in the distributary channel.
3. Rate of change of discharge in the channel to the rate of change of depth of the channel.
4. Rate of change of discharge of an outlet to the rate of change of water surface level of the distributary channel.

Codes:

	A	B	C	D
(a)	2	4	1	3
(b)	1	2	4	3
(c)	2	1	3	4
(d)	2	1	4	3

Q.12 A good irrigation module is the one, which
(a) draws heavy silt from the canal.
(b) draws clear water from the canal.
(c) draws fair share of silt from the canal.
(d) None of the above.

Q.13 The rate of change of discharge through an irrigation outlet becomes equal to the rate of change of water depth in the channel, when its
(a) flexibility is 1.
(b) sensitivity is 1.
(c) setting is 1.
(d) sensitivity is zero.

Q.14 A fully modular canal outlet has its
(a) sensitivity = 1, and flexibility = 1
(b) sensitivity = 1, and flexibility = 0
(c) sensitivity = 0, and flexibility = 1
(d) sensitivity = 0, and flexibility = 0

Q.15 A cylinder or well fall is suitable and economical for
(a) High discharges and high drops
(b) High discharges and low drops
(c) Low discharges and high drops
(d) Low discharges and low drops

Q.16 In a Sarda type fall, the width B of the trapezoidal crest is given by
(a) $B = 0.44\sqrt{H+d}$
(b) $B = 0.44\sqrt{H-d}$
(c) $B = 0.55\sqrt{H+d}$
(d) $B = 0.55\sqrt{H-d}$
where H = depth of water
d = drop in bed level

Q.17 The type of irrigation module, which is usually considered as the best in our country, is
(a) Adjustable orifice semi module
(b) Punjab open flume outlet
(c) Khanna's rigid module
(d) Kennedy's gauge module

Q.18 An irrigation outlet is said to be proportional, when its
(a) $\text{Setting} = \dfrac{\text{Outlet index}}{\text{Channel index}}$
(b) Setting = Channel index × Outlet index
(c) $\text{Setting} = \dfrac{\text{Channel index}}{\text{Outlet index}}$
(d) None of the above

Q.19 A trapezoidal notch fall can maintain normal water depth in the upstream channel
(a) at any one given value of design discharge.
(b) at all the discharge.
(c) at any two values of design discharge.
(d) at no discharge at all.

Q.20 The best energy dissipation on the down stream of a canal drop is caused in
(a) Glacis fall (b) Montague fall
(c) Ogee fall (d) Sarda type fall

Q.21 The hydraulic jump that develops on a sloping glacis, as compared to that on a horizontal floor is always
(a) more definite, more efficient.
(b) less definite, less efficient.
(c) less definite, more efficient.
(d) less definite, less efficiency.

Q.22 If the sensitivity of an irrigation module is $\frac{1}{2}$, then 50% variation in canal water depth will cause variation in outlet discharge of
(a) 100% (b) 50%
(c) 25% (d) 75%

Q.23 A meter fall of 1.8 m height is to be constructed on a canal carrying a discharge of 50 cumecs. The type of fall that you may recommend will be
(a) Glacis fall (b) Montage fall
(c) Inglis fall (d) None of the above

Q.24 The only irrigation semi module, through which the discharge is not proportional to $\sqrt{H}$, where H is the head causing flow through the module is
(a) Kennedy's gauge outlet.
(b) Open flume outlet.
(c) Free pipe outlet.
(d) Adjustable orifice semi module.

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Answers Canal Regulation Work

1. (a)	2. (b)	3. (d)	4. (d)	5. (c)	6. (d)	7. (c)	8. (b)	9. (b)	10. (d)
11. (d)	12. (c)	13. (b)	14. (d)	15. (c)	16. (c)	17. (a)	18. (a)	19. (c)	20. (b)
21. (b)	22. (c)	23. (c)	24. (b)						

Explanations Canal Regulation Work

7. (c)
Canal escapes are the safety valves of canal and must be provided at regular intervals depending upon the importance of the canal and availability of suitable drainage. Minimum capacity of escape is generally kept as half of the channel capacity at the point of escape.

12. (c)
A good irrigation module should fit well to the decided principles of water distribution. It should be simple and cheap. It should draw its fair share of silt.

13. (b)
Sensitivity is defined as the ratio of the rate of change of discharge through the outlet to the rate of change of water level of the distributary, referred to the normal depth of the channel.

14. (d)
Rigid modules or modular outlets are those through which the discharge is constant and fixed within limits irrespective of the fluctuations of the water levels of either the distributary or of the water course or of both.
$\therefore$ Sensitivity = 0, and Flexibility = ∞.

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