POSTAL Book Package 2023

CIVIL ENGINEERING

Irrigation Engineering

Objective Practice Sets

Contents

MADE EASY Publications

1 CHAPTER
Irrigation Principles, Practices and Project

Q.1 Water application efficiency is highest in
(a) Basin flooding (b) Sprinkler irrigation
(c) Furrow method (d) Drip irrigation

Q.2 With the increase in supplied irrigation water, the yield of crops
(a) increases continuously.
(b) decreases continuously.
(c) increases up to a certain limit, and then becomes constant.
(d) increases up to a certain limit, and then decreases.

Q.3 Match **List-I** with **List-II** and select correct answer from codes below:

List-I
A. Furrow method
B. Subsurface irrigation
C. Sprinkler irrigation
D. Trickle irrigation

List-II
1. Wide range of topography can be irrigated
2. Narrow channels at regular intervals
3. Flow, direct application to root zone
4. Impervious subsoil at 2-3 m depth

Codes:

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

Q.4 In contour border irrigation method
(a) the supply ditch runs along the contour.
(b) the drainage channel runs along the contour.
(c) the border strips are on the approximate contour and have uniform longitudinal gradient.
(d) the border strips are normal to the contour and level across the strip.

Q.5 Select the incorrect statement pertaining to the check-basin method of irrigation.
In the check-basin method of irrigation
(a) the ridges interfere with the movement of tractor drawn implements
(b) considerable land is wasted by ridges and lateral channels
(c) the surface drainage is unhindered and as such, is excellent
(d) is unsuitable for growing crops which are sensitive to wet soil condition around their stem

Q.6 If the available land is steep in nature, the method of irrigation used is
(a) Check method (b) Basin flooding
(c) Border method (d) Free flooding

Q.7 Which of the following statements are correct?
1. Trickle irrigation is adopted where there is acute scarcity of irrigation water.
2. Evaporation losses are eliminated in drip irrigation as water is provided at root level.
(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) Neither 1 nor 2

Q.8 The most suitable method of irrigation for areas having low rainfall and strong winds is
(a) furrow irrigation
(b) sprinkler irrigation
(c) drip irrigation
(d) contour farming

Q.9 What is the moisture depth available for evapotranspiration in root zone of 1 m depth of soil, if dry weight of soil is 1.5 gm/cc, field capacity is 30% and permanent wilting point is 10%?
(a) 450 mm (b) 300 mm
(c) 200 mm (d) 150 mm

Multiple Select Questions (MSQ)

Q.21 Pick up the correct statements with respect to the definition of irrigation.

(a) Process of artificially supplying water to soil for raising crops.

(b) It is the engineering of controlling and harnessing the various natural and man-made sources of waters by the construction of dams, canals etc. for the agricultural field.

(c) It includes a provision of purification of water during the course of supply of water to agricultural field.

(d) It is the science of planning and designing an efficient, low-cost, economic irrigation system.

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Answers Irrigation Principles, Practices and Project

1. (d)	2. (d)	3. (b)	4. (c)	5. (c)	6. (d)	7. (a)	8. (c)	9. (b)	10. (b)
11. (c)	12. (b)	13. (a)	14. (c)	15. (a)	16. (c)	17. (c)	18. (d)	19. 56	20. 0.112
21. (a, b, d)									

Explanations Irrigation Principles, Practices and Project

1. (d)

In Drip irrigation losses of water is least so its water application efficiency in highest.

7. (b)

Evapotranspiration losses are only minimized, not eliminated in drip irrigation.

6. (d)

In stop land free flooding method of irrigation in generally used.

8. (c)

In case of low rainfall and strong wind we require type of irrigation in which losses because of strong wind in lest. Because of strong wind the water coming because of low rainfall will get easily evaporated so in such case drip irrigation will be the most favourable option.

10. (b)

Check flooding is similar to ordinary flooding except that the water is controlled by surrounding the check area with low and flat levels. Levels are generally constructed along the continuous having vertical interval of about 5 to 10 cm.

This method is suitable for more permeable soils as well as for less permeable soils. The water can also be held on the surface for a longer time in case of less permeable soils.

9. (b)

Depth of irrigation water

$$= \frac{\gamma_d \times d}{\gamma_w}(\text{F.C.} - \text{OMC})$$

$$\Rightarrow \quad \frac{1.5}{1} \times 1(0.30 - 0.10)$$

$\Rightarrow$ 0.30 m = 300 mm

11. (c)

Favorable conditions for sprinkler method:

(i) When land topograph is irregular and hence in those surfaces irrigation is unsuitable, so sprinkler method is adopted.

(ii) When soil is erodible and land gradient is steeper.

(iii) When water table is high. So to prevent water logging sprinkler method is adopted.

(iv) When soil is either excessively permeable or highly impermeable.

(v) When water is available with difficulty and is scarce.

in given statements, statement (1) is wrong, as this method does not required preparation of land before irrigation.

Statement (2) is also wrong it prevent water logging and provide optimum irrigation.

Only statement (3) and (4) is correct.

12. (c)

$A = 1000\ m^2$

$f = 7$ cm/hr

$$Q = A \times f = \frac{1000 \times 7 \times 10^{-2}}{3600}$$

$= 1.94 \times 10^{-2}\ m^3/s$

14. (c)

In case of drip irrigation moisture content of the root soil in more or less constant with time.

18. (d)

Modular limits are extreme values of any one or more variables, beyond which an outlet becomes incapable of acting as a module or semi-module. The range between the lowest and highest limiting values of various such factors is known as modular range.

Modular limit is not a ratio.

19. 56 (54 to 58)

$Q = 0.03$ cumec $= 0.03 \times 3600\ m^3/hr$

$= 0.0108$ ha-m/hr

$y = 7.5$ cm $= 0.075$ m

$I = 5$ cm/hr $= 0.05$ m/hr

$A = 0.1$ ha

$$\therefore\ t = 2.303 \frac{y}{I} \log_{10}\left(\frac{Q}{Q - IA}\right)$$

$$= \frac{2.303 \times 0.075}{0.05} \log_{10}$$

$$\left(\frac{0.0108}{0.0108 - 0.1 \times 0.05}\right) \text{hours}$$

$= 0.933$ hours $= 55.98$ min $\simeq 56$ min

20. 0.112 (0.10 to 0.12)

$$t = 2.303 \frac{y}{f} \log_{10}\left(\frac{Q}{Q - fA}\right)$$

$$\frac{70}{60} = 2.303 \times \frac{0.06}{0.08} \log_{10}\left(\frac{Q}{Q - 0.08 \times 4000}\right)$$

$$\frac{Q}{Q - 320} = 4.7364$$

$Q = 4.7364Q - 1515.65$

$= 405.644\ m^3/hr$

$= 0.112\ m^3/s$

21. (a, b, d)

No purification provision is made in irrigation.

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