Tertiary and Vocational Education Commission

NVQ Level 05 – Semester II

Construction Technology

Irrigation Technology - I	F45C001M13	Three Hours

Answer any five (05) questions

(Q1)

The data of a village reservoir tank in a Dry zone are mentioning below.

1. Bed contour survey details

Contours level (m)	100	101	102	103	104	105	106	107
Water spread area (ha)	0	8	23	42	73	94	125	152

2. Spill level -106.5 m
3. Sluice sill level - 101m
4. Free board - 1.2 m
5. Water duty in Maha season – 0.9 ham/ha

Answer the following questions with the help of above details.

a. Calculate the volume and capacity of the tank bed at each contour levels. (5 marks)
b. Take a suitable scale and draw "area – capacity" against "contour level" graph. (5 marks)
c. What is the dead storage? (2 marks)
d. What is the area submerged at FSL? (2 marks)
e. Calculate the irrigable area that can be irrigated in Maha, when the tank is at full capacity. (2 marks)
f. What is the bund top level? (2 marks)
g. Find out the new capacity of the reservoir, if the spill and bund level are raised by 0.5m. (2 marks)

(Q2)

a. Define the term of irrigation "Duty" (4 marks)
b. State four factors affecting duty? (4 marks)
c. What is the gravity dam? (4 marks)
d. What are the forces acting on a gravity dam? (4 marks)
e. What do you mean by the base period? (4 marks)

(Q3)

a. What do you mean by the effective rain fall? (4 marks)
b. Express the necessities of irrigation. (4 marks)
c. Express your ideas to describe advantages of irrigation. (5 marks)
d. Express your ideas to describe disadvantages of irrigation. (4 marks)
e. State that the types of irrigation. (3 marks)

(Q4)

a. Name and describe four types of irrigation channels based on distribution. (3 marks)
b. Name and describe three types of irrigation channels based on alignment. (3 marks)
c. Define farm losses and conveyance losses. (4 marks)
d. What do you mean by channel falls? (3 marks)
e. Calculate the theoretical maximum discharge of the channel by using manning's formula with help of data given below, (7 marks)
    1. Channel bed width = 2.0 m
    2. Side slope = 1: 1
    3. Full supply depth = 1.2 m
    4. Manning's coefficient = 0.035
    5. Bed slope = 0.0004

(Q5)

a. State the various water source used for irrigation. (4 marks)
b. Define the term of spill. (4 marks)
c. Mention the most common type of spills. (2 marks)
d. Calculate the length of clear over fall spill required to a tank which catchment area is 2000 acres and assume afflux of 2 feet, uniform rain fall intensity is 2.5 inch/hours, catchment coefficient is 0.5. (4 marks)
e. Name the two major cultivation active period of paddy in Sri Lanka? (2 marks)
f. Define the term "precipitation" and name five common methods of precipitations. (4 marks)

(Q 6)

a. What is mean by water logging? (4 marks)
b. State the effects of water loggings. (4 marks)
c. State four methods used for controlling water logging. (4 marks)
d. Draw a neat cross section for a tank bund and mark the following parameters; (5 marks)

    1. Bund top level (RL 37.5 m)
    2. Full supply level (RL 36.0)
    3. High flood level (RL 36.5)
    4. Afflux
    5. Sluice sill level (RL 32.0)
    6. Full supply depth (4 m)
    7. Bund top width (3m)

e. Do and state a comparison for tank irrigation and Anicut irrigation. (3 marks)