

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

- Lecture 41 : Sewer Design
- Lecture 42 : Runoff estimation Part 1
- Lecture 43 : Runoff estimation Part 2
- Lecture 44 : Sewerage Network Design Part 1
- Lecture 45 : Sewerage Network Design Part 2
- Week 9 Lecture Material
- Quiz: Week 9 : Assignment 9
- Week 9 Feedback Form

Week 10

Week 11

Week 12

Detail Solution

Live Interactive session

Week 9 : Assignment 9

The due date for submitting this assignment has passed.

Due on 2021-09-29, 23:59 IST.

As per our records you have not submitted this assignment.

1) Select the correct statement/s regarding circular sewer. 1 point

- A. Ideal considering load bearing capacity
- B. Max hydraulic mean depth
- C. Hydraulic properties are better for varying flows
- D. Maximum perimeter for given area.

- a. A, B, C
- b. A, B, D
- c. A, C, D
- d. B, C, D

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

2) Self-cleansing velocity depends on: 1 point

- a. Particle size, Specific gravity of particle, Conduit shape
- b. Particle size, Conduit shape, Depth of flow.
- c. Specific gravity of particle, Conduit shape, Depth of flow.
- d. Particle size, Specific gravity of particle, Conduit shape, Depth of flow

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

Consider the following data of sewer:
The sewer is laid at 1 in 600 slope. The diameter of the sewer is 150 cm. Assume N= 0.015 in Manning's formula and that the sewer is running half full.

Answer question 3 and 4 based on the above given data.

3) What is the velocity of the flow in the sewer?

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 2.24,2.25

4) What is discharge flowing through the sewer?

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 1.98,1.99

Consider the following data:
Circular Sewer diameter = 50 cm
Slope = 1 in 220
N = 0.015 (Manning's coefficient)
Flow is full

Answer question 5,6 and 7 based on the above given data.

5) What would be the velocity and discharge of flow in m/sec and m³/sec respectively? 2 points

- a. 1.124, 0.220
- b. 2.346, 1.454
- c. 0.898, 0.141
- d. 1.454, 2.346

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

6) What would be the velocity and discharge when the same is flowing at 0.30 of its full depth? 1.5 points

- a. 0.043 m/sec, 0.873 m³/sec
- b. 0.873 m/sec, 0.043 m³/sec
- c. 0.058 m/sec, 0.643 m³/sec
- d. 0.643 m/sec, 0.058 m³/sec

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

7) What would be the velocity and discharge when the same is flowing at 0.70 of its full depth? 1.5 points

- a. 0.048 m/sec, 3.052 m³/sec
- b. 3.052 m/sec, 0.048 m³/sec
- c. 1.259 m/sec, 0.160 m³/sec
- d. 0.160 m/sec, 1.259 m³/sec

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

8) The different applications of SWMM include: 1 point

- A. Design and sizing of drainage systems for flood control
- B. Sizing of detention facilities for flood control
- C. Flood plain mapping of natural channel systems
- D. Control strategies for minimizing combined sewer overflows

- a. A, B, C
- b. A, C, D
- c. B, C, D
- d. A, B, C, D

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

9) The _____ of a storm event may be defined as the average recurrence interval between events equal to or exceeding a specified magnitude. 1 point

- a. return period
- b. design period
- c. hyetograph
- d. time area histogram

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

10) Return period selection of a storm depends on: 1 point

- A. Importance of the drainage area
- B. Socio-economic conditions
- C. Constraints (funding and availability of space)
- D. Design period of infrastructure

- a. A, B, C
- b. A, B, D
- c. C, B, D
- d. A, B, C, D

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

11)

Term	Definition
P. Inlet time	I. Time required by storm water in travelling from uppermost inlet up to the point of concentration
Q. Time of travel	II. Maximum flow (peak discharge) while part of the upstream catchment is contributing
R. Time of concentration	III. Time required by runoff from the most remote point of the catchment to flow across the ground surface/drains to inlet of sewer
S. Partial area effect	IV. Time required by runoff from the most remote point of the catchment to reach the point of concentration

The correct match from the set of options given below is:

- a. P-III; Q-I; R-IV; S-II
- b. P-II; Q-I; R-I; S-IV
- c. P-IV; Q-III; R-I; S-II
- d. P-I; Q-IV; R-II; S-III

1 point

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

12) The right order of modelling steps in SWMM is: 1 point

- A. Catchments and sewerage network and components are drawn for the study area.
- B. Simulation is conducted
- C. Default options and object properties are set.
- D. Properties of the objects are set as per existing or proposed design.
- E. Analysis options are chosen.
- F. Results of the simulation are generated.

- a. C-A-D-E-B-F
- b. D-A-C-E-F-B
- c. B-C-A-D-E-F
- d. D-A-C-E-B-F

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

13) Choose the correct statement/s from the following: 1 point

- A. Saturation near point of concentration influences the runoff more than areas further away
- B. Longer periods of light rain corresponds to lower runoff coefficient
- C. Rational formula is the most popular method to determine storm water runoff

- a. A, B
- b. B, C
- c. A, C
- d. A, B, C

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

14) Runoff entering into the sewer depends on: 1 point

- A. Imperviousness of the catchment
- B. Shape of the drainage area
- C. Duration of storm
- D. Specific Yield

- a. A, B, C
- b. A, B, D
- c. C, B, D
- d. A, B, C, D

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

15) Determine the minimum required diameter of a circular sewer making use of the following data: 2 points

Area to be served= 120 hectares
Population of the locality= 30,000
Max. permissible velocity = 3.4 m/sec
Time of entry= 5 minutes
Time of travel= 20 minutes
Rate of water Supply= 230 liters/day/capita
Impermeability factor= 0.45

- a. D = 1.20 m
- b. D = 2.00 m
- c. D = 1.50 m
- d. D = 1.75 m

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

16) Choose the correct statement/s regarding the time-area method from the following options: 1 point

- A. It is an extension of the rational method
- B. This method uses effective rainfall and contributing sub-area
- C. It can account for the temporal variation of rainfall intensity and could be applied to midsize catchments
- D. It is based on the concept of unit hydrograph

- a. A, B, C
- b. A, B, D
- c. C, B, D
- d. A, B, C, D

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

17)

Term	Definition
P. Unit Hydrograph Method	I. Considers individual sub-basins as a single unit (average value of watershed characteristics)
Q. Lumped model	II. Based on direct runoff resulting from a unit depth (1 cm) of rainfall excess occurring uniformly over the catchment and at a uniform rate for a specified duration
R. Distributed model	III. Used for estimating runoff quantity for single event or long-term simulation of runoff mainly for urban sub-catchments
S. Non-Linear reservoir method	IV. Sub-divides each sub-basin further into smaller cells

The correct match from the set of options given below is:

- a. P-III; Q-IV; R-I; S-II
- b. P-II; Q-I; R-IV; S-III
- c. P-I; Q-II; R-III; S-IV
- d. P-IV; Q-III; R-II; S-I

1 point

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.