



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF SPATIAL PLANNING AND NATURAL RESOURCES MANAGEMENT
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF ARTS IN SPATIAL
PLANNING AND DESIGN
2ND YEAR 1ST SEMESTER 2024/2025 ACADEMIC YEAR
MAIN CAMPUS

COURSE CODE: PNB 1316

COURSE TITLE: WATER SUPPLY II

DATE: 22/4/2025

TIME: 2HOURS

DURATION: 15.00-17.00

VENUE: LR 10

Instructions:

1. Answer ALL questions in Section A and B and ANY other TWO questions in Section C
2. Tick the most correct alternative in Section A
3. Answers to Questions in Section B and C must be written in the spaces provided on the question paper.
4. Candidates must ensure they submit their work by clicking "finish and submit attempt" button at the end.

1. Blue baby syndrome is caused by
- A. Thermal pollution
 - B. Air Pollution
 - C. Water Pollution
 - D. None of the above

ANSWER: C

2. Which of the following is not a water borne disease?
- A. Cholera
 - B. Itching
 - C. Hepatitis
 - D. Typhoid

ANSWER: B

3. Is groundwater a renewable resource?
- A. Yes; the amount of groundwater increases significantly every time it rains
 - B. No; new groundwater is not produced
 - C. Yes and no; groundwater is currently being used more quickly than it is being produced.
 - D. None of the above

ANSWER: C

4. How can you improve the drinking-water in polluted areas?
- A. Fertilize the ground with calcium so it seeps through and purifies the groundwater.
 - B. Plant trees with deep roots.
 - C. Once the groundwater is polluted, it is too late to do anything.
 - D. None of the above

ANSWER: B

5. In which type of water demand, minimum average consumption of water takes place?
- A. Domestic water demand
 - B. Industrial water demand
 - C. Institutional and commercial water demand
 - D. Fire demand

ANSWER: D

6. Water lost in theft and waste contributes to how much % of total consumption?
- A. 5
 - B. 10
 - C. 15
 - D. 20

ANSWER: C

7. Which reservoir is also known as Mitigation reservoir?
- A. Conservation reservoir
 - B. Flood control reservoir
 - C. Multipurpose dam
 - D. Storage reservoir

ANSWER: B

8. A reservoir having gates and valves installation at its spillway and at its sluice outlets
- A. Storage reservoir

- B. Retarding basin
- C. Both storage and retarding reservoir
- D. Distribution reservoir

ANSWER: A

9. Which reservoir is helpful in permitting the pumps or the water treatment plants to work at a uniform rate?

- A. Storage reservoir
- B. Detention reservoir
- C. Multipurpose reservoir
- D. Distribution reservoir

ANSWER: D

10. A well is considered to be good if it is sunk into

- A. Clay
- B. Sand
- C. Coarse gravel
- D. Silt

ANSWER: (C)

11. Abyssinian tube well is a special type of

- A. Slotted type wells
- B. Cavity type wells
- C. Strainer type well
- D. None of these

ANSWER: (C)

12. Acidity in water is caused due to

- A. Mineral acids
- B. Free CO₂
- C. Iron sulphate
- D. All the above

ANSWER: (D)

13. The maximum permissible limit for suspended solids is

- A. 10 mg/l
- B. 20 mg/l
- C. 30 mg/l
- D. 40 mg/l

Answer» C. 30 mg/l

14. Which method is used to measure the color of water?

- A. Gravimetric analysis
- B. Chromatography
- C. Tintometer method
- D. Hydrometer analysis

ANSWER: C Tintometer method

15.1 TCU (True Color Unit) is equivalent to

- A. The color produced by 1 g of platinum cobalt
- B. The color produced by 1 mg of platinum cobalt
- C. The color produced by 1 mg of platinum cobalt in 1l of distilled water
- D. The color produced by 1 mg of platinum cobalt in 1ml of distilled water

ANSWER: C

16. Threshold odour number testing is preferred in hot water.

- A. True

B. False
Answer» B. false

17. A city supply includes
A. Domestic water demand
B. Industrial and commercial water demands
C. Demand for public uses and fire
D. All the above
ANSWER: (D)

18. A high velocity of wash water is required for
A. Rapid gravity filter with strainers
B. Rapid gravity filter without strainers
C. Slow sand filter with strainers
D. Slow sand filter without strainers
ANSWER: (B)

19. A pressure conduit carrying water beneath a stream or a canal, is known as
A. Sag
B. Depressed pipe
C. Inverted syphon
D. All the above
ANSWER: (D)

20. A pressure conduit laid underground, may not be subjected to
A. Internal pressure of water
B. Pressure due to external load
C. Longitudinal temperature stress
D. Longitudinal stresses due to unbalanced pressure to bends
ANSWER: (C)

21. A slow sand filter is cleaned if its filter head is higher than
A. 10 cm to 20 cm
B. 20 cm to 40 cm
C. 40 cm to 70 cm
D. 70 cm to 120 cm
ANSWER: (D)

22. What are the factors affecting per capita demand?
A. Size of city
B. Size of city, habit of people
C. Cost of water, quality of water, size of city
D. Cost of water, quality of water, size of city, habit of people
ANSWER: D

23. Which of the following statement is correct?
A. Rich class consumes less water
B. Intermittent water supplies leads to less water consumption
C. Loss of water is more if the pressure in the distribution system is less
D. Water consumption is less in flush system
ANSWER: B

24. What is the design period for the water treatment unit?
A. 10 years
B. 15 years

- C. 20 years
 - D. 30 years
- ANSWER: B

25. What is the design discharge for intake structures?

- A. Maximum daily demand
- B. Maximum hourly demand
- C. Maximum weekly demand
- D. Average daily demand

ANSWER: A

24. In which of the following units, design period is maximized?

- A. Distribution system
- B. Demand reservoir
- C. Water treatment unit
- D. Pipe mains

ANSWER: B

26. Suspended solids are measured by which of the following?

- A. Turbidity rod
- B. Gravimetric test
- C. Chromatography
- D. Jackson's turbidity meter

ANSWER: B.

27. Identify the correct relation between the following?

- A. Dissolved solid = total solid + suspended solid
- B. Dissolved solid = total solid – suspended solid
- C. Total solid = dissolved solid / suspended solid
- D. Dissolved solid = suspended solid – total solid

ANSWER: B.

28. The presence of high coliform counts in water indicate:

- A. Contamination by human wastes
- B. Phosphorous contamination
- C. Decreased biological oxygen demand
- D. Hydrocarbon contamination

ANSWER: A

29. A centrifugal pump is required to be primed before starting if it is located.

- A. At higher level than water level of reservoir
- B. At lower level than water level of reservoir
- C. Both (a) and (b)
- D. Neither (a) nor (b)

ANSWER: (A)

30. How does the biological oxygen demand gets affected with the increased presence of organic matter in water?

- A. The oxygen demand decreases
- B. The oxygen demand increases
- C. The oxygen demand remains unchanged
- D. The oxygen demand decreases then increase after 5 days

ANSWER: B

SECTION B: 20 Marks

Attempt ALL questions

- a. Examine sources of wastewater (10 Marks)
- b. Explain factors to be considered while locating an intake for water supply (10 marks)

SECTION C: 20 Marks

Attempt ANY TWO questions

- a. Describe the recommended five methods for final sludge disposal and /or re-use (10 Marks)
- b. In all biological waste treatment processes some surplus sludge is produced. Explain how the sludge is disposed of without affecting the environment. (10 Marks)

Discuss constructed wetland and Trickling filters wastewater treatment methods