

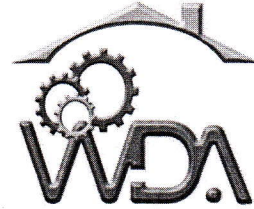
**PWO – Water Supply and
Sanitation**

T017

Thursday, 10/11/2016

08:30 – 11:30

WORKFORCE DEVELOPMENT AUTHORITY



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**ADVANCED LEVEL NATIONAL EXAMINATIONS, 2016,
TECHNICAL AND PROFESSIONAL STUDIES**

EXAM TITLE: Water Supply and Sanitation
OPTION: Public Works (PWO)
DURATION: 3hours

INSTRUCTIONS:

The paper is composed of **three (3) main Sections** as follows:

Section I: Seventeen (17) compulsory questions.	55 marks
Section II: Attempt any three (3) out of five questions.	30 marks
Section III: Attempt any one (1) out of three questions.	15 marks

The use of calculator is admitted

Note:

Every candidate is required to carefully comply with the above instructions. Penalty measures will be applied on their strict consideration.

Section I. Seventeen (17) Compulsory questions**55marks**

- 01.** Give four (4) physical properties of water. **2marks**
- 02.** Distinguish hard water and soft water. **4marks**
- 03.** Enumerate four (4) conditions to consider during the installation of internal stop valve within a building. **4marks**
- 04.** Mention any two (2) most commonly used materials for new underground installations and also used for the replacement of existing mains. **2marks**
- 05.** Name four (4) factors that depends the amount of water which can be expected from any given surface. **4marks**
- 06.** Calculate the discharge in liters per second through a 25 mm diameter pipe when the total length is 30 m and there is a constant head of 8 m. **3marks**
- 07.** Enumerate four (4) necessity of pumping. **4marks**
- 08.** What are the processes of hydrologic cycle? **3marks**
- 09.** Enumerate three (3) types of examination of water. **3marks**
- 10.** List four (4) properties of dangerous waste. **2marks**
- 11.** What is a bidet and what are the types of bidet? **3marks**
- 12.** Name two functions of manhole. **4marks**
- 13.** Name four (4) factors that contribute to pipe corrosion. **4marks**
- 14.** Define the term "intake structure" and give any three (3) considerations for selection of site for intake structure. **5marks**
- 15.** What pipes are connected to the water storage cistern? **3marks**
- 16.** Define the term "water hammer". **2marks**
- 17.** Give three (3) advantages of incinerating the solid wastes. **3marks**

Section II. Choose and answer any three (3) questions.**30marks**

18. What are the most common technologies found in municipal water treatment plant? **10marks**
19. Briefly, what is the distinction between sittings closed and squatting closed? **10marks**
20. In domestic buildings, waste water will be coming from where? (Give the examples to support the answer). **10marks**
21. The quantity of water flowing in plastic pipe is 60 liters /second. If the velocity of water (V) is 2m/sec. Find the diameter of the pipe. **10marks**
22. What are the advantages and disadvantages of irrigation? **10marks**

Section III. Choose and answer any one (1) question.**15marks**

23. In the following table, the catchment area and run-off coefficient are given.

Name of catchment area	Area of catchment in ha	Run-off coefficient (c)
A1	2	0.60
A2	?	0.25
A3	3	0.15

Find the area of catchment A₂.

15marks

24. A, B, C are points on a water pipe line AD on sloping ground. The slope distance between the points is measured by using a tape and the corresponding angle of slopes are given below.

Water pipe line	Slope distance (m)	Angle of slope
AB	75	5°
BC	30	15°

Calculate the horizontal distance of the water pipe line AC.

15marks

(Use a sketch to support your answer)

25. a) What are the three (3) methods of filtration of water?
b) List any four (4) sources of water
c) What the two (2) methods used to distribute water to consumers?
d) An open rectangular channel is 40 cm base and 80 cm height. Find the hydraulic radius (r) of the open channel.

15marks