JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

UNIVERSITY EXAMIMATION FOR THE DEGREE IN SCIENCE IN CONSTRUCTION MANAGEMENT

3RD YEAR 2ND SEMESTER 2023/2024 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TCB 1305

COURSE TITLE: MEASUREMENT OF CONSTRUCTION WORKS II

EXAM VENUE: **STREAM: BSc. CONSTRUCTION MGT**

DATE: /04/2024 **EXAM SESSION:**

DURATION: 2 HOURS

Instructions

1. **Answer question 1 (Compulsory) and ANY other two questions**
2. **Candidates are advised not to write on question paper**
3. **Candidates should have the Civil Engineering Standard Method of Measurement (CESMM)**
4. **No dimension paper will be provided. Please rule your answer book appropriately.**
5. **Bill of quantities item numbers should be based on the CESMM classification codes.**

QUESTION ONE (40 Marks) (Compulsory)

Drawing NO. DW1, DW2 & DW3 attached shows the design of a proposed playing field for Jaramogi Oginga Odinga University of science and technology. Take off and prepare the bill of quantities for classes D&E (Demolitions, site clearance and earthworks only) (40 Marks)

QUESTION TWO (30 Marks)

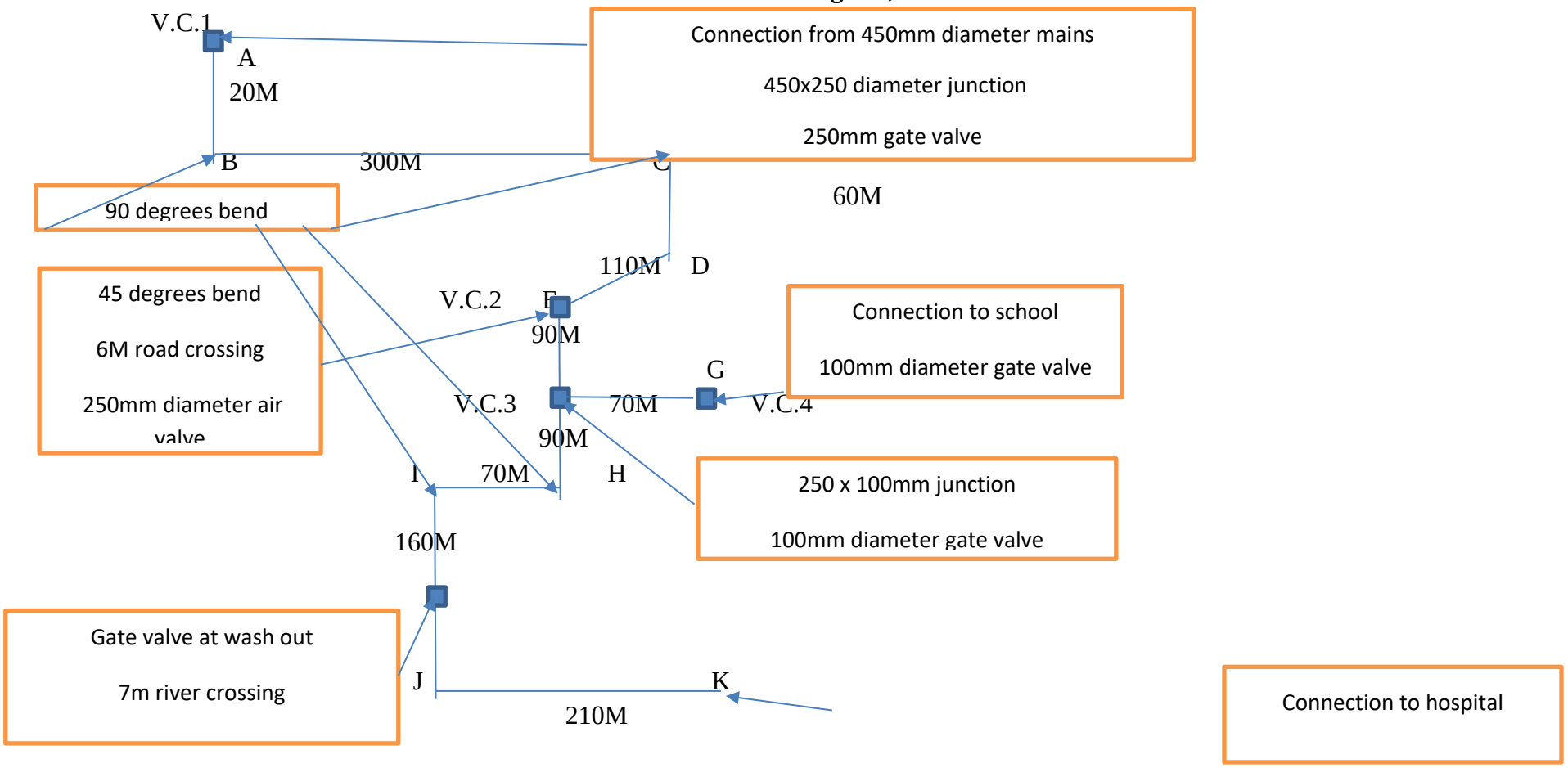
a) Outline the use of the dimension paper and describe all its columns. (8 Marks)
b) Describe the following processes on the dimension paper;
   I. Dotting on (2 Marks)
   II. Nilling (2 Marks)
   III. Squaring (2 Marks)
   IV. Timesing (2 Marks)
c) Explain the differences between the CESMM and the SMM. (10 Marks)
d) Explain how coding and numbering of items is done in the CESMM 4. Use an example to illustrate. (4 Marks)

QUESTION THREE (30 Marks)

a) Drawing No.A/001/A attached shows the design of the proposed Juja-B water supply project. You are given the following additional details:
   1) Allow pre-cast concrete marker posts size 300x50x1200mm, 600mm deep below ground and 600mm high above ground at a spacing of 30m and at all corners.
   2) Allow mass concrete mix 1:3:6 thrust blocks size 600x600x600mm wherever there is a 90-degree bend.
   3) Allow masonry valve chambers (V.C) size 600x600 Internally by depth to pipe invert at position of air valve, washouts and gate valves. The V. Cs to have M.D.C.I covers but H.D covers at road crossings.

   Notes
   1. Pipe material is galvanized mild steel class B jointed in V-J couplings
   2. Pipe fittings – ditto
   3. Pipe sizes (nominal bore)
      A. Point A-F: 250mm diameter
      B. Point F-G: 100mm diameter
      C. Point F-K: 150mm diameter
   4. Depths to invert
      A. Point A-F:1m
      B. Point F-G: 1.6m
      C. Point F-K: 2m

PROPOSED JUJA-B WATER SUPPLY PROJECT. Drawing No., A/001/A



QUESTION FOUR (30 Marks)

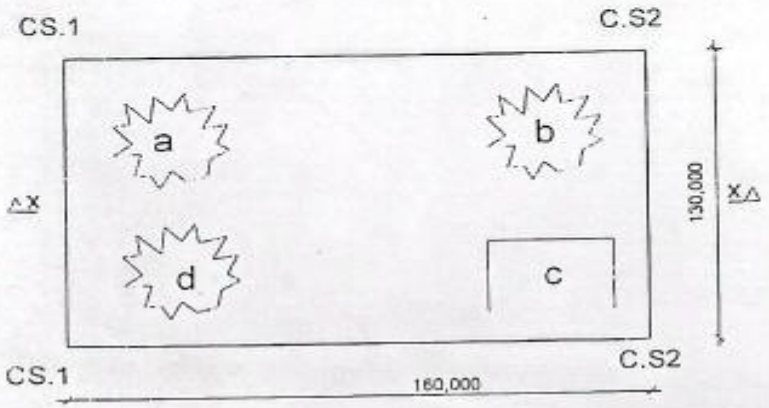
a) Drawing No.A/02/85 attached shows the design of the proposed sewer line for Gachororo. Take off and prepare the bill of quantities for the sewer line works. (30 Marks).

MEASUREMENT OF SITE CLEARANCE AND EARTHWORKS

PROPOSED PLAYING FIELD

Measure site clearance and earthworks only for the following proposed playing field

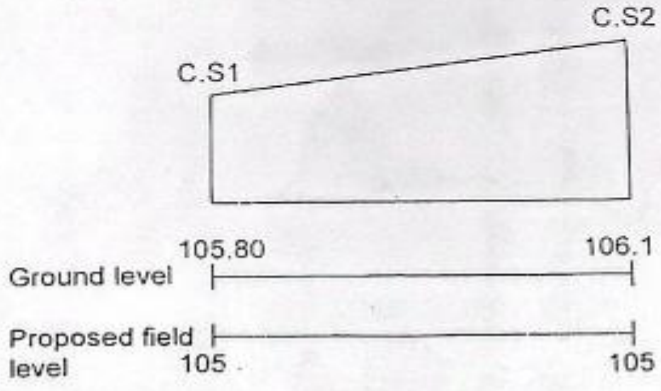
DW1: Plan of existing site



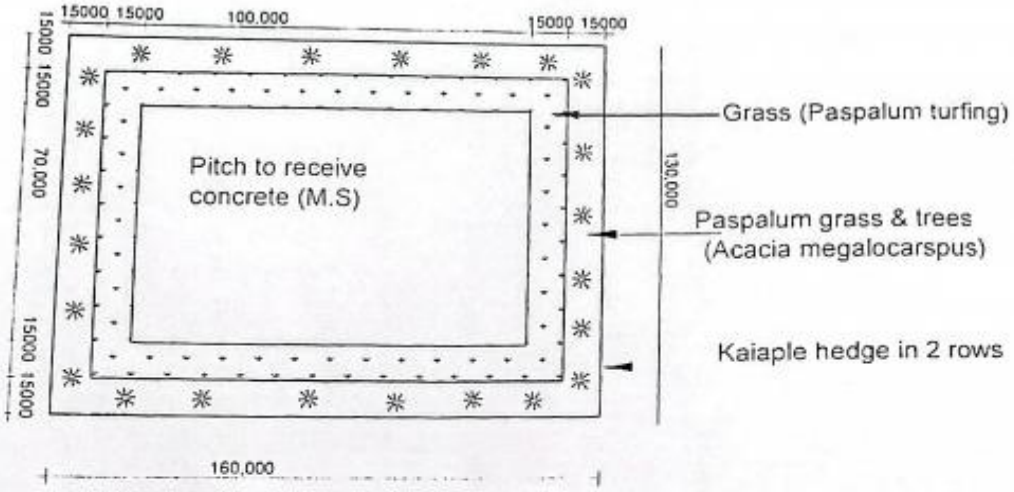
Demolitions legend

a. Tree size 1950mm girth; To be removed
b. Ditto 3200mm; Ditto
c. Masonry building with concrete roof slab overall size 4000x8000x3000mm high; To be demolished
d. Tree size 1500mm girth; To be removed

DW2: Section X -X



DW3: Plan of proposed playing field

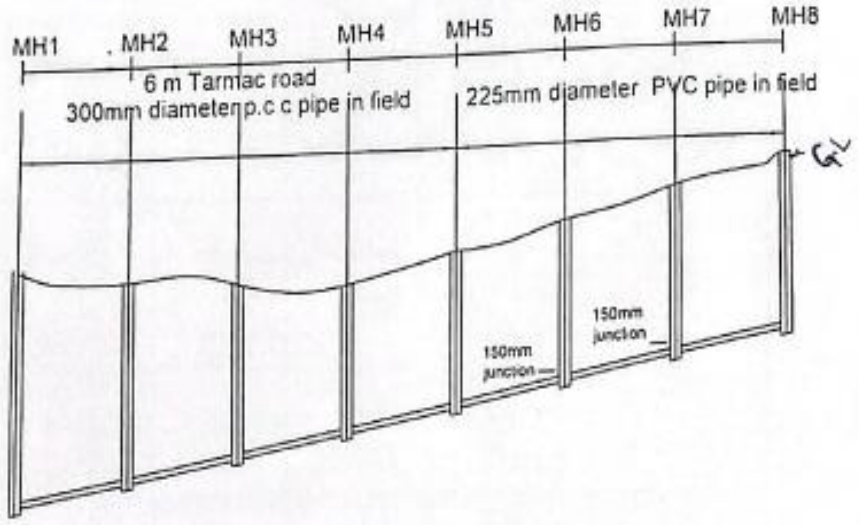


Notes:

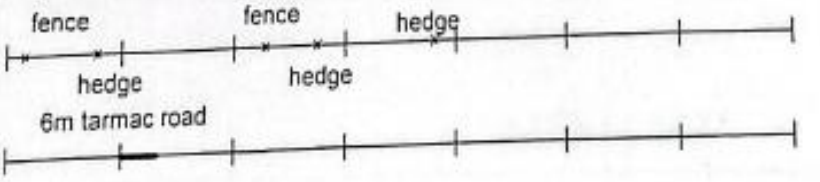
a. 150mm deep topsoil will be excavated first to be used later for landscaping in same thickness
b. Filling to landscaped areas shall include light compaction to approval
c. Filling to landscaped areas and soil in holes to receive trees shall be fertilized at a ratio of 1:10 (Natural manure to red soil)
d. Items for landscaping shall include watering and weeding the plants until the area established.

MEASUREMENT OF SEWER
PROPOSED GACHORORO SEWER
DRAWING NO. A\02\85

LONGITUDINAL PROFILE



Sewer invert level		98.99	99.21	99.41	99.64	99.86	100.02	100.23	100.50
Ground level		102.49	102.21	101.61	101.44	101.71	101.82	101.90	102.10
Distance in (m)	0	65	125	195	260	295	340	400	



NB

1. Manhole size = 1.2 x 1.2 internally x depth to invert all in masonry
2. Manhole cover = 450 x 600 mm C.I medium duty but heavy duty at roads
3. Allow concrete mix 1:2:4 bed and surround to pipe passing under road
4. Allow 1m deep rock excavation between manholes 1-2.