

GENERAL CERTIFICATE OF EDUCATION BOARD
Technical and Vocational Education Examination

Survey and Soil Mechanics 1
7220

JUNE 2021

ADVANCED LEVEL

| | |
|----------------------------|---|
| Specialty (Specialty Code) | Civil Engineering – (CE-BC, CE-AD, CE-PW) |
| Centre No. | 2227 |
| Centre Name | BAFOUSSAM 1 EXTERNAL |
| Candidate No. | |
| Candidate Name | |

Mobile phones are NOT allowed in the examination room
7220 Survey and Soil Mechanics 1: MULTIPLE CHOICE QUESTION PAPER

One and a half hours

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed **Advanced Level – 7220 Survey and Soils Mechanics 1**

4. Fill the information required in the spaces above.

5. Fill the information required in the spaces provided on the answer sheet using your HB pencil:

Candidate Name, Exam Session, Subject Code, Centre Number and Candidate Number. Take care that you do not crease or fold the answer sheet or make any marks on it other than those asked for in these instructions.

6. Answer **ALL** questions

7. Each question has **FOUR** suggested answers: **A, B, C** and **D**. Decide on which answer is correct. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.

For example, if **C** is your correct answer, mark **C** as shown below:

[A] [B] [C] [D]

8. Mark only **one** answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
9. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
10. Do all rough work in this booklet, using, where necessary, the blank spaces in the question booklet.
11. Texts, notes and pre-prepared materials of any kind are also **NOT** allowed in the examination room.
12. **At the end of the examination, the invigilator shall collect the answer sheet first and then the question booklet after. DO NOT ATTEMPT TO LEAVE THE EXAMINATION HALL WITH IT.**

Turn Over

1. During chaining, the participants of the survey process are made up of.

- A The leader
- B The follower
- C The leader and the follower
- D The leader and the instrument

2. The most economic method of distance measurement is.

- A Chaining method
- B EDM method
- C Theodolite method
- D GPS method

3. In leveling process were the surveyor used the field note book as shown below to fill his data. Which type of leveling was carried out?

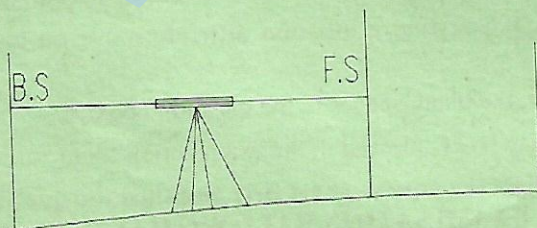
| station | reading | | | Rise | Fall | R.L | Remark |
|---------|---------|-----|-----|------|------|-----|--------|
| | B.S | I.S | F.S | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

- A Dumpy level
- B The plane of collimation (HI method)
- C The rise and fall method
- D Fly leveling

4. In a situation in leveling where the B.M of a staff station is above the line of collimation (line of sight). How is the staff position

- A Up right at the B.M
- B Inverted at the B.M
- C After the B.M
- D Before the B.M

5. From the diagram below, identify the name given to the vertical line.



- A Rang pool
- B Prism
- C Staff
- D Arrows

6. As a surveyor invited for landscaping, identify the type of survey you will first start with.

- A Earthwork calculation
- B Topographic survey
- C Leveling survey
- D Setting out survey

7. Figure out the number of directions in which the telescope of a transit theodolite can rotate

- A One direction
- B Three direction
- C Two direction
- D Four direction

8. Diagnose the pair of equipment the surveyor uses during traversing.

- A Theodolite and a staff
- B Theodolite and a prism
- C Total station and a staff
- D Total station and a rang pool

9. An equipment used to find the true north (magnetic meridian) is.

- A The theodolite
- B Total station
- C The staff
- D The compass

10. You were asked to carry out a field work in geodetic survey. Which of the equipment can do fast work.

- A A theodolite
- B Total station
- C A chaing
- D Clisimeter

11. An equipment that measure the distance between two points without the use of a meter is known as

- A Clisimeter
- B Theodolite
- C A level
- D An EDM theodolite

12. Which of the equipment reflect the light rail emitted from an EDM equipment.

- A A staff
- B A rang pool
- C A prism
- D A peg

13. In the process of ranging, how can the stations points be identified at a far distance.

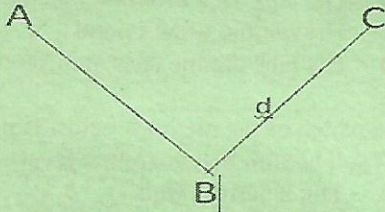
- A By using paint
- B By putting a ranging pole
- C By putting staffs at the points

D By putting workers at the points

14. Who has the responsibility to fix an arrow at the end of a chain during measurement.

- A The leader
- B The follower
- C The client
- D The architect

15. Identify the formula to calculate the distance (d) from the sketch below



- A $d^2 = (X_c - X_B)^2 + (Y_C - Y_B)^2$
- B $d^2 = (X_c - X_B)^2 - (Y_C - Y_B)^2$
- C $d^2 = (X_c + X_B)^2 + (Y_C + Y_B)^2$
- D $d^2 = (X_c + X_B)^2 - (Y_C + Y_B)^2$

16. If the whole circle bearing is between 0° to 90° .

Identify the quadrant that it falls

- A S-E
- B S-W
- C N-W
- D N-E

17. When an angle is measured clockwise from the North point of the reference meridian toward a line, the angle formed is called.

- A Reduced bearing
- B Whole circle bearing
- C Bearing
- D Angle

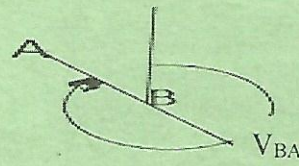
18. During leveling, choose what is calculated

- A Bearing between two or more points
- B Distance between two or more points
- C The height difference between points
- D The reduced bearings between points

19. A survey process in which a closed traverse was formed in a clockwise direction. Identify the type of angle obtained

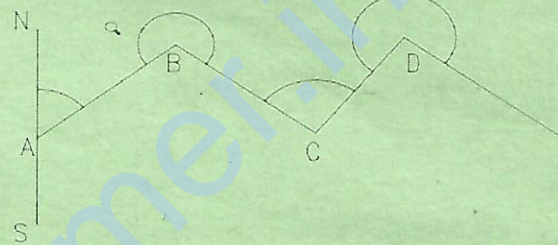
- A External angle
- B Internal angle
- C Vertical angle
- D Open angle

20. Which type of bearing is shown below



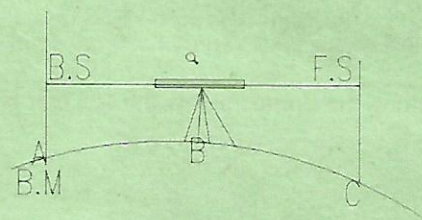
- A Forward bearing
- B Back ward bearing
- C Bearing
- D Zenith angle

21. Which type of traverse is shown below.



- A Closed traverse
- B Deflection angle traverse
- C Vertical traverse
- D Open traverse

22. At the end of a survey process, a sketch was obtained as seen below. What is the reduced level (H_c) at point C.



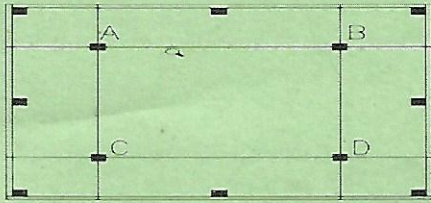
- A $H_c = B.M + BS - FS$
- B $H_c = B.M - BS - FS$
- C $H_c = B.M + BS + FS$
- D $H_c = H_a + BS$

23. Identify the function of a plumb bob to a surveyor during setting out

- A To plum the staff
- B To plum the theodolite
- C To plum the tripod
- D To position the theodolite

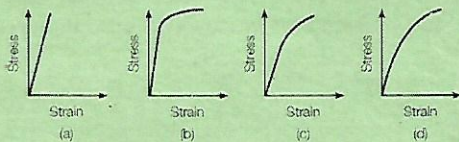
Turn Over

24. At the end of a setting out process the sketch below was obtained. Pegs A to D represent what



- A Where the profile board will be transferred next
 B The stations points
 C The corners of the structure
 D The frame of reference

25. Tell which of the strain/stress curves on the following figure corresponds to a brittle material.

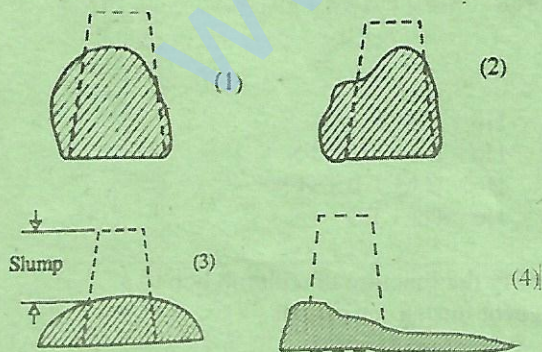


- A (a)
 B (b)
 C (c)
 D (d)

26. Give the value of the water-cement ratio of a mixture in which 200kg of water is used and 5 bags of cement of 50kg.

- A 0.5
 B 1
 C 0.8
 D 0.4

27. Identify among the slumps below the one that is a shear slump.



- A (1)
 B (2)
 C (3)
 D (4)

28. Select the slump range below corresponding to a plastic concrete.

- A 0 mm to 25mm
 B 25 mm to 50 mm
 C 50 mm to 75 mm
 D 75 mm to 100 mm

29. Find the reason for which two different labs carried a test on the same sample of cement and the results were too different.

- A One of the lab didn't follow the right procedure
 B The labs used different machines
 C The sample wasn't good
 D The labs did the tests at different times.

30. Indicate which of the methods below is used to take a sample of soil at 30m below ground level.

- A Dig a narrow well
 B Use Cone Penetrometer Test machine
 C Use remote sensing equipment
 D Use drilling machines

31. Give the technical name of the representation of the different layers of soil found below a site.

- A Soil picture
 B Soil content chart
 C Soil varieties
 D Soil profile

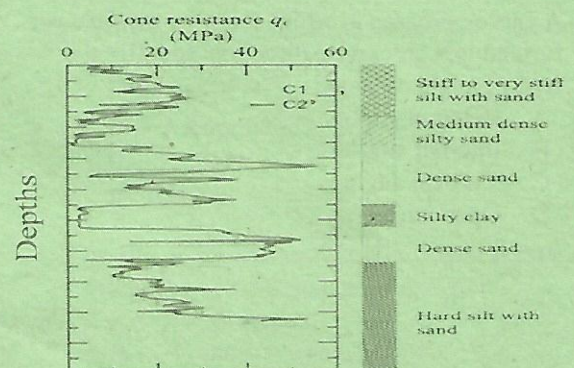
32. For which construction purposes will you recommend the use of sea sand.

- A Concrete works
 B Backfilling works
 C Block laying works
 D Paving works

33. In how many stages is a sample of sand taken between the field and the testing in the lab.

- A 4
 B 2
 C 1
 D 3

34. Name the layer of soil in the figure below that has the greatest bearing capacity at the lower depth.



- A Medium dense silt sand
- B Dense sand
- C Stiff sand
- D Dense sand

35. Give the equivalent cumulated passing percentage on a sieve if the cumulated retained percentage is 35%

- A 35%
- B 55%
- ~~C 65%~~
- D 100%

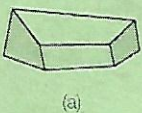
36. Identify from the relative densities below the one of a loose soil.

- A < 20 %
- B 20 to 40%
- C 40 to 60%
- D 60 to 80%

37. Name the kind of test used to quantify the volume of aggregate that can be extracted in a quarry site being considered for a large construction project.

- A Physics test
- B Geological test
- C Geometry test
- D Civil engineering test

38. Name the aggregate size below that is called flaky elongated.



(a)



(b)



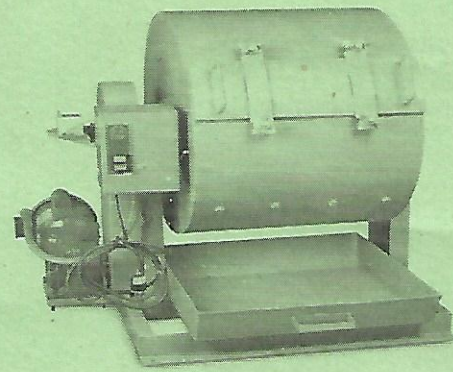
(d)



(e)

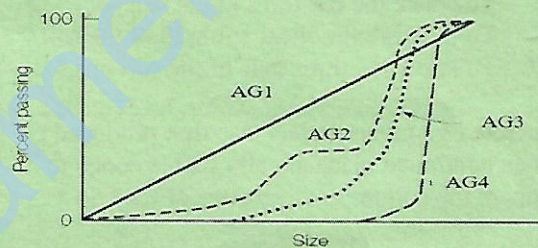
- A (a)
- ~~B (b)~~
- C (d)
- D (e)

39. Identify the purpose of the machine on the picture below



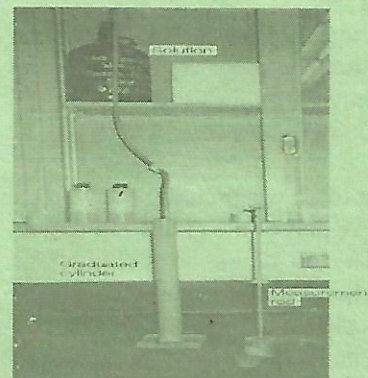
- A Concrete mixing
- B Compaction of soils
- C Aggregates strength testing
- D Water storage on site

40. Indicate the aggregate curve on the graph below that means the aggregate is dense.



- A AG1
- ~~B AG2~~
- C AG3
- D AG4

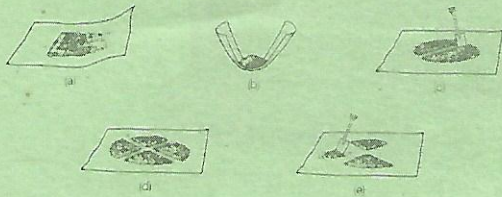
41. Name the test being conducted on the picture below



- A Permeability test
- B Sand equivalent test
- C Setting time test

D - Flow test

42. Identify the lab operation described by the picture below.



- A Concrete batching
- B Sand arrangement
- C Quartering
- D Sand testing

43. State the purpose of the triaxial test on a sample of soil.

- A To measure the water content
- B To check the fractures in the soil
- C To measure the shear strength of the soil
- D To know the three axis of the soil mass

44. The concrete of a given project was first produced manually then continued mechanically with a concrete mixer. Compare the compressive stresses of the two concrete.

- A The resistance of the hand mixed will be greater
- B The resistance of both methods will be equal
- C The resistance of the mechanically mixed concrete will be greater
- D The resistance of the mechanically mixed concrete will be smaller.

45. Tell in which of the tests below the Cassagrand machine is used

- A Proctor test
- B Slump test
- C Atterberg limits test
- D Compressive test

46. Advise what to do when during the weighing of the retained in a sieve part of the grains fall down.

- A The test should be continued
- B The fallen part should be gathered and replaced in the right sieve
- C The fallen part should not be taken
- D The test should be redone

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47. State the number of soil phases found in a completely dried soil

- A 3
- B 1
- C 2
- D 4

48. The number of methods used to prescribe a concrete mix ratio are :

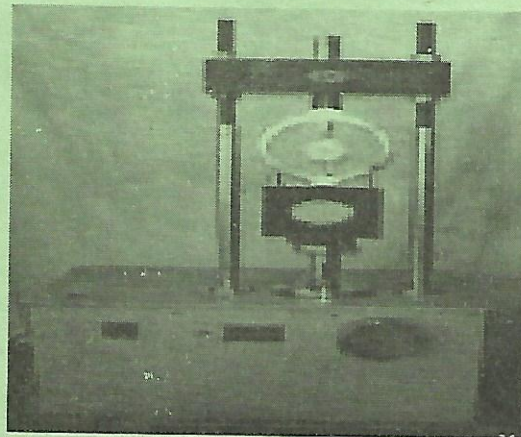
- A 2
- B 4
- C 5
- D 3

49. During operation, how does the pan on the equipment below operate or function.



- A It rotates
- B It translates
- C It maintain static position
- D It reciprocate

50. Identify the function of the apparatus shown below



- A For concrete press
- B For proctor test
- C For triaxial test
- D For tensile test

NOW GO BACK AND CHECK YOUR WORK