

GENERAL CERTIFICATE OF EDUCATION BOARD

Technical and Vocational Education Examination

JUNE 2022

INTERMEDIATE LEVEL

Specialty Name and Acronym	CIVIL ENGINEERING BUILDING CONSTRUCTION - CE-BC (F4 BA)
Centre No.	
Centre Name	
Candidate Identification No.	
Candidate Name	

Mobile phones are **NOT** allowed in the examination room.

5230 SURVEY, SOIL MECHANICS AND MATERIALS 1: MULTIPLE CHOICE QUESTION PAPER

1 hour 30 minutes

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 "**Intermediate Level – 5230 SURVEY, SOIL MECHANICS AND MATERIALS 1.**"
4. Fill in the information required in the spaces above.
5. Fill in the information required in the spaces provided on the answer sheet using your HB pencil:

Candidate Name, Exam Session, Subject Code, and Candidate Identification Number.

Take care that you do not erase or fold the answer sheet or make any marks on it other than those asked for in these instructions.

How to answer the questions in this examination:

6. Answer **ALL** the **50** questions in this Examination. All questions carry equal marks.
7. Each question has **FOUR** suggested answers: **A, B, C** and **D**. Decide 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. DO NOT ATTEMPT TO LEAVE THE EXAMINATION HALL WITH IT**

Turn Over

1. Select the type of material that hardens when mixed with water.

- A Aerial binder.
- B Bituminous binder.
- C Hydraulic binder
- D Chemical binder.

2. Write in full the abbreviation G.P.S

- A Global positioning system
- B Geographical positioning station
- C Global positioning station.
- D Geographical positioning system

3. What is the use of Chain in surveying ?

- A Measuring inclined distances between two points
- B Measuring angles between two points
- C Measuring horizontal distances between two points
- D Measuring the difference in height between two points

4. Sand equivalent test is said to have a higher value when

- A There is less clay-like materials in the sample.
- B There is more fine grain in the sample.
- C There is average coarse grains in the sample.
- D There is more clay-like materials in the sample

5. A line along which all points are of the same altitude is called

- A Straight line.
- B Vertical line.
- C Horizontal line.
- D Level line

6. What is another name for plaster of paris ?

- A Crystalline
- B Gypsum.
- C Calcium chloride.
- D Sodium chloride.

7. Loam soil is also referred to as

- A Black soil.
- B Loose soil.
- C Peat soil.
- D Vegetable soil.

8. A product obtained after distilling crude oil is known as

- A Bitumen.
- B Asphalt.
- C Tar.
- D Binder.

9. The name given to the half of a brick cut across its width is

- A Quoin.
- B Bat.
- C Squint.
- D Plinth.

10. Which of these steel is most suitable for reinforced concrete works ?

- A Wrought iron.
- B Stainless.
- C Mild.
- D Cast iron.

11. The product obtained after burning limestone or chalk at high temperature is

- A Hydrated lime.
- B Fat lime
- C Slaked lime.
- D Quick lime.

12. What are star shakes in trees ?

- A Cracks that extends from the bark towards the sap wood across section
- B Part of a branch which becomes enclosed in a growing tree.
- C Cracks that are concentrated at the centre of a sap wood.
- D Part of a branch from which several other branches of a tree are formed.

13. A common material for drain pipes fabrication is

- A Vitrified concrete.
- B Sandlime clay.
- C Aluminium alloy.
- D Vitrified clay.

14. The process of mixing clay, water and other ingredients to fabricate bricks is known as

- A Pugging.
- B Moulding.
- C Kneading.
- D Drying.

15. What advantage is plywood having over other wood ?

- A Greater tensile strength in longer direction.
- B Greater tensile strength in shorter direction.
- C Same tensile strength in all directions
- D More resistant.

16. The defect 'dry rot' in timber is caused by

- A Lack of ventilation.
- B Alternate wet and dry conditions
- C Complete submergence in water.
- D Too much seasoning.

17. How is the strength of cement with time after storage ?

- A Increases
- B Normal.
- C Decreases
- D Does not change.

18. Where are Bull nose bricks not suitable for use in construction ?

- A Rounding off sharp corners.
- B Pillars.
- C Arches.
- D Decoration.

19. Mastic asphalt is mostly used for

- A Sound insulation.
- B Water proofing.
- C Fire resistance
- D Thermal insulation.

20. The inner part of a log of timber surrounding the pith, is called

- A Sapwood.
- B Cambium layer.
- C Heart wood.
- D Inner pith.

21. What is the consequence of a poorly mixed concrete?

- A Segregation
- B Bleeding.
- C Cracking.
- D Creeping.

22. If the volume of voids of a soil sample is equal to the volume of solid grains, its porosity will be

- A 1
- B 0
- C 1.5.
- D 0.5

23. What will be the voids ratio if the volume of voids of a soil sample is equal to the volume of its solid grains?

- A 0
- B 1
- C 1.5
- D 0.5

24. In case the voids of a mass of soil is filled with air only, the soil is said to be

- A Air entrained
- B Partially saturated
- C Dehydrated
- D Dry.

25. Water content of a given soil can

- A Never be greater than 100%.
- B Take values only from 0 to 100%.
- C Never be less than 0%
- D Be greater than 100%

26. Identify a sedimentary rock that changes into quartzite by metamorphic action.

- A Limestone.
- B Sandstone
- C Gypsum.
- D Shale.

27. If in a liquid limit test the moisture content at 10 blows is 70% and at 100 blows is 20%, what will be the liquid limit of the said soil ?

- A 35%
- B 50%
- C 65%
- D 55%

28. The survey that enables the determination of spot heights with reference to a given datum is

- A Levelling.
- B Chaining.
- C Topography.
- D Traversing.

29. Surveys that ignore the curvature of the earth for horizontal dimensions are called.

- A Geodetic surveys.
- B Plane surveys.
- C Geometric surveys.
- D Cadastral surveys.

30. The difference in level between two points A and B can best be obtained when the instrument is stationed

- A At equidistance between A and B
- B Closer to the higher station.
- C Closer to the lower station.
- D As far as possible from the line AB

31. The reduced level of a point A which is on the floor is 100m and back sight reading on A is 2.455m. if the foresight reading on the point B which is on the ceiling is 2.745m, what will be the reduced level of point B ?

- A 94.80m
- B 99.71m
- C 100.29m
- D 105.20m

32. Le chatelier flask bottle is used to determine the
- Strength of cement.
 - Density of cement.
 - Setting time of cement.
 - Finest of cement.

33. Give an example of a hydraulic binder.
- Cement.
 - Tar.
 - Bitumen.
 - Plaster of Paris .

34. Finest test of cement is done in the laboratory using
- Abraham cone
 - Sieves.
 - Vicat.
 - Cassagrande apparatus.

35. State chemical formula for quick lime.
- Cao
 - Caco₂
 - Mgco₂
 - Cao₂

36. Quick lime mixed with water gives
- Carbon dioxide.
 - Fat lime
 - Cement
 - Hydrated lime.

37. Select a volcanic rock from the list given.
- Slate.
 - Pumice.
 - Clinker.
 - Foamed blast furnace.

38. What is the volume of water required in a concrete mix having water /cement ratio of 0.5 and the weight of cement of 100kg ?
- 0.25litres.
 - 0.500 litres
 - 0.501litres
 - 501 litres

39. Which of these properties of concrete is being influenced by the Water –cement ratio?
- Durability of concrete.
 - Strength of concrete.
 - Mixing time of concrete.
 - Hardening of concrete.

40. Identify a light weight aggregate from the list below.
- Black stone.
 - White stone.
 - Volcanic stone.
 - Natural stone.

41. The ease with which concrete flows to fill a form is known as
- Compaction
 - Workability
 - Consistency.
 - Mobility.

42. One advantage of laminated timber over simple timber is
- Less expensive.
 - High resistance to loads
 - Cheaper
 - Readily available.

43. The process of coating a material is known as
- Painting.
 - Plastering.
 - Cladding.
 - Surfacing.

44. In figure 1 below 20 represents

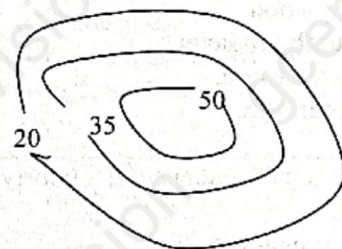


Fig 1

- Name of the contour.
- Distance between the two contours
- Height of the contour.
- Reference of the contour.

45. In figure 2, if the water/ cement ratio is 0.4, what will be the strength of concrete after 7 days ?

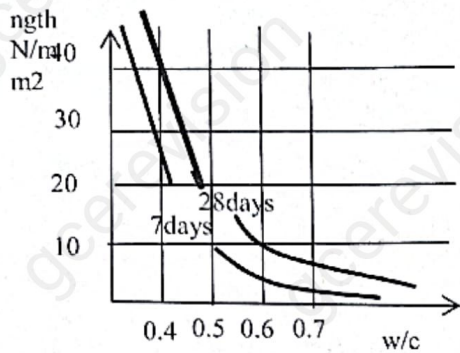


Fig 2

- A 40N/mm²
 B 30N/mm²
 C 20N/mm²
 D 10N/mm²

46. In figure 2, above, if the required strength needed after 28 days is 30N/mm², the water /cement ratio will be

- A 0.45
 B 0.54
 C 0.65
 D 0.75

47. An instrument used in measuring angles in a slope is called

- A Sextant..
 B Compass.
 C Level.
 D Optical square.

48. The angle B in fig 3 represents

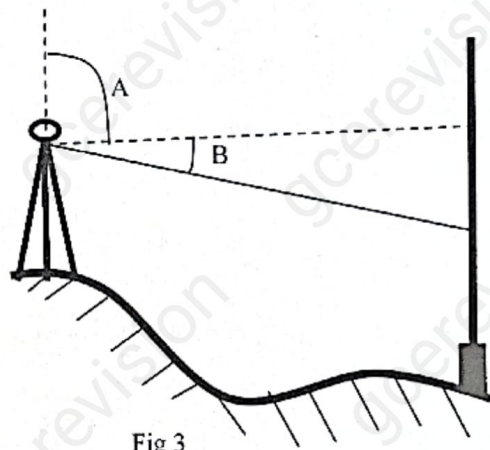


Fig 3

- A Zenith angle
 B Vertical angle
 C Inclined angle
 D Plane angle

49. The reading made in fig 4 is called

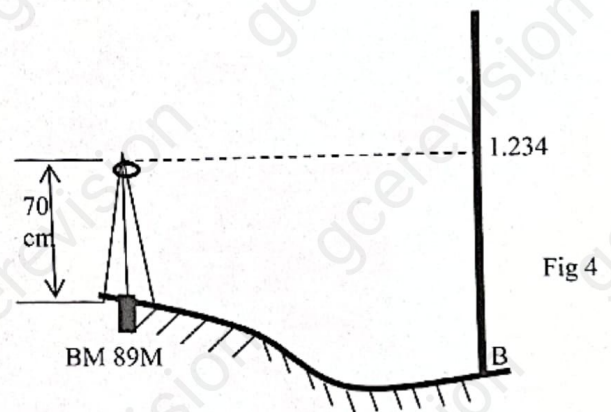


Fig 4

- A First reading
 B Intermediate reading
 C Fore sight reading
 D Back sight reading

50. From fig 4 above, The reduced level at B is

- A 88.766m
 B 90.234m
 C 88.466m
 D 99.466m

STOP

NOW GO BACK AND CHECK YOUR WORK