GENERAL CERTIFICATE OF EDUCATION BOARD

Technical and Vocational Education Examination

Surveys, Soil Mechanics and Materials 1
5230

JUNE 2023 **INTERMEDIATE LEVEL**

Specialty Name and Acronym	**CIVIL ENGINEERING BUILDING CONSTRUCTION CE-BC**
Centre No	
Centre Name	
Candidate No.	
Candidate Identification sName	

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

5230 SURVEYS, 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 **SURVEYS, 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, 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.

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**

1. Apart from the Slump Test, which other test is used to determine the workability of fresh concrete ?
   A Setting Time Test
   B Proctor Test
   C Compacting Factor Apparatus test
   D Consistency Test

2. The surface that provides good bonding in adhesive and mastic is
   A Rough
   B Smooth
   C Impervious
   D Plain

3. Select an example of a ferrous metal from the list.
   A Copper
   B Iron
   C Lead
   D Steel

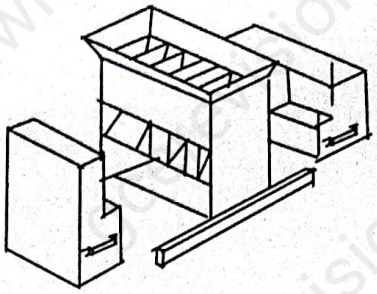
4. The equivalence of 90^0 in radian is
   A $\pi/2$
   B $\pi/4$
   C 2π
   D π

5. A coordinate system that uses horizontal distances and angles to define points is known as
   A Polar Coordinate
   B Grids
   C Bearings
   D GeographicalCoordinate

6. A material which when added to loose particles hardens by physical or chemical means is termed
   A Sand
   B Soil
   C Binder
   D Plaster of Paris

7. Identify the use of the apparatus in fig 1.

Fig. 1



   A To carryouttensile test
   B For sieving of aggregates
   C To carryout compressive test
   D For quartering of aggregates

8. The product obtained from the addition of water toquicklime is
   A Binder.
   B Lime mortar
   C Limestone.
   D Cement.

9. Retarders in a concrete mix
   A Reduces the initial setting time of cement.
   B Increases the initial setting time of cement.
   C Reduces the final setting time of cement.
   D Increases the final setting time of cement.

10. A completely saturated soil is composed of
   A Soil and water
   B Soilonly
   C Soil and air
   D Water only

11. Reading that are taken at turning points during Survey operations are called
   A Back sightsonly
   B Intermediatesightsonly
   C Fore-sight and Back-sight
   D Intermediate-sight and Fore-sight

12. What is the difference between the bearing of a line X-Y and the same line Y-X?
   A $\alpha_{YX} = \alpha_{XY} \pm 180^o$
   B $\alpha_{YX} = \alpha_{XY} + 180^o$
   C $\alpha_{YX} = \alpha_{XY} \pm 360^o$
   D $\alpha_{YX} = \alpha_{XY} - 360^o$

13. The dry density of a soil having a bulk density of $22KN/m^3$ and a water content of 10% is
A $23.2KN/m^3$
B $18.8KN/m^3$
C $22.3KN/m^3$
D $20.0KN/m^3$

14. Select an example of light weight aggregate from the list.
A Natural stone.
B Saw dust and wood fibre.
C Artificial stone.
D Tar and metal

15. Which of these apparatus is used in the determination of the setting time of cement?
A Pipepitte
B Casangrande
C Flask
D Vicat

16. Cracks are usually sealed in building units using
A Mastic.
B Adhesive.
C Bitumen.
D Cement.

17. What causes dry rot in timber?
A Presence of water in the timber.
B Poor weather condition.
C Lack of ventilation.
D Absence of water in the timber.

18. The moisture content of a well-seasoned timber varies from
A 20% to 30%
B 10% to 12%
C 4% to 6%
D 15% to 20%

19. Theodolite is an instrument used for the
A Measurement of both horizontal and vertical angles.
B Measurement of horizontal angles only.
C Measurement of both horizontal and vertical distances.
D Measurement of vertical distances only.

20. How are the graduations in prismatic compass presented?
A Upright and runs clockwise at 0^0 to the North
B Inverted and runs clockwise at 0^0 to the North
C Upright and runs clockwise at 0^0 to the South
D Inverted and runs clockwise at 0^0 to the South

21. Rapid-hardening Cement attain early strength because of
A Rough grinding.
B Finergrinding.
C Tri-calcium silicate.
D Tri-calcium aluminate.

22. Who is the author of the Unified Soil Classification system?
A Casagrande.
B Atterberg.
C Kozeney.
D Rankine.

23. Identify a solution that is used to test impurities of sand in the field.
A Sodium Nitrate.
B Sodium Sulphate.
C Sodium Chloride.
D Sodium Hydroxide.

24. The strength of cement depends mainly on
A Aggregate-Cement ratio.
B Quality of aggregates.
C Water-Cement ratio.
D Quality of water.

25. State the approximate carbon content of cast iron.
A 0.45%
B 1.5% to 5.5%
C 0.25%
D 0.05% to 1.75%

26. Tensilestrength of Plywoodis
A Same in all directions.
B Greateralong the length.
C Greateralong the width.
D Varies between the length and the width.

27. The reduced level at point B as seen in figure 2 is

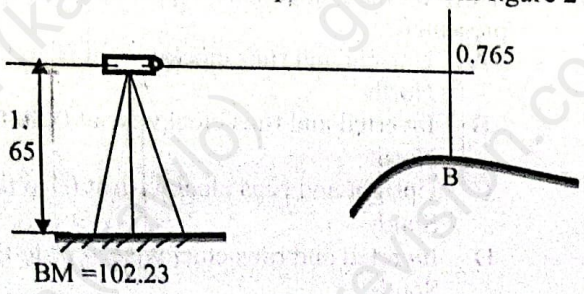


Figure 2

A 102.995
B 102.23
C 103.88
D 103.115

28. Glazing are used in order to make earthware
A Hard.
B Porous.
C Impervious.
D Soft.

29. Identify the element on which roofing sheets are generally nailed.
A King post.
B Purlins.
C Rafters.
D Struts.

30. Choose the strongest mortar in civil engineering from the list.
A Lime mortar.
B Cementmortar.
C Harden mortar.
D Gaugedmortar

31. In a building site, all levels are referred to a fixed point, identify this point
A Groundlevel.
B Datumlevel
C Floorlevel.
D Sealevel.

32. Bricks that are most suitable for lining furnace are
A Burnt bricks.
B Unburnt bricks.
C Clay bricks
D Refactory bricks.

33. If the plasticity index of a soilis 45%, the soil is said to be
A Verylow plastic.
B Averagely plastic
C Non-plastic.
D Veryhighly plastic.

34. State the relation for the calculation of the plasticity index of a soil.
A IP = WP - WL
B IP = WL - WP
C IP = IL - IS
D IP = IS - IL

35. The life span of timber in average is
A More than 10 years.
B Lessthan 1 year.
C Between 1 to 5 years.
D Between 5 to 10 years.

36. For permanent adjustment of theodolites, the "Spire" test is used for
A Adjustment of line of sight.
B Adjustment of vertical axis.
C Adjustment of plate levels.
D Adjustment of horizontal axis.

37. Which type of leveling is recommended where the first and last points are far apart?
A Profile.
B Defferential.
C Fly.
D Reciprocal.

38. Define Contour Interval
A Horizontal distance between two consecutive contours.
B Horizontal distance between two points on the same contour.
C Vertical distance between two points on the same contour.
D Vertical distance between two consecutive contours.

39. A tool use in surveying for the measurement of very long distance is
A Prismaticlevel.
B Wheel.
C Automaticlevel.
D Theodolite.

40. The ease with which freshly mixed concrete can be handled is known as
A Maniability.
B Workability.
C Consistency.
D Compactibility..

41. A black viscous liquid that is obtained by the destructive distillation of coal or wood is
A Charcoal.
B Tar.
C Cement.
D Wood-ash

42. The separation of larger particles from finer particles in a mix during transportation or pouring is
Segregation.
B Creeping.
C Bleeding.
D Shrinkage.

43. Which of these elements canenable us to measure the range of particle size?
A Coefficient of curvature.
B Gad-graded.
C Uniformity coefficient.
D Well-graded.

44. The type of surveying that needs less office work is
A Tacheometricsurveying.
B Plane table surveying.
C Trigonometricsurveying.
D Theodolitesurveying.

45. Hydrographic surveys deals with the mapping of
A Large water bodies.
B MountaneousRegions.
C Canal system
D Very flat areas.

46. A well-graded soil sample is said to have
A Lack of many sizes in the sample.
B Only fine grains.
C Onlycoarse grains.
D Good representation of particles of all sizes.

47. The coefficient of uniformity is given by the expression
A D30 : D10
B D60 : D10
C D10 : D60
D D10 : D30

48. The process of mixing clay, water and other ingredients to make bricks is called
A Batching.
B Kneading.
C Moulding.
D Pugging.

49. What is the most important property of ferrous metal?
A Durability.
B Strength.
C Ductility.
D Brightness.

50. Choose the most suitable tool for the lifting and spreading of mortar in brick laying.
A Spade.
B Trowel.
C Bucket.
D Headpan.

STOP

GO BACK AND CHECK YOUR WORK