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# Assam Lec. Tech.

Previous Year Paper  
(Civil)  
2023



LT-2023

Booklet No. 32370

**WRITTEN TEST**  
For Selection to the Post of  
**Lecturer (Technical) in**  
**Civil Engineering**  
Under Higher Education (Technical) Department,  
Government of Assam

Time : 09:30 AM to 12:00 NOON

Series Code

**C**

**QUESTION BOOKLET**

**INSTRUCTIONS**

1. Answer the Questions in the OMR Answer Sheet Provided.
2. Do not Fold/staple the OMR Answer Sheet.
3. Open the Booklet after the Bell rings at 09:30 A.M.
4. Write and darken your Roll Number carefully in the OMR Sheet Side-1.
5. Darken the Correct Answer/most suitable Answer in the OMR Answer Sheet using BLACK BALL PEN.
6. Please darken the correct option as shown below :  
Correct : ● ○ ○ ○      Incorrect : ⊗ ⊘ ⊙ ⊖
7. Write and darken your Question Booklet Series Code [A/B/C/D] carefully in the OMR Answer Sheet.
8. There are altogether 75 Questions and 24 pages in the Question Booklet.
9. All Questions are Multiple Choice type Questions (MCQ).
10. Please check the total number of Questions and Page Numbers of the Question Booklet. In case of discrepancy in this regard, please inform the Invigilator for replacement of the Question Booklet.
11. One (1) Mark will be awarded for every Correct Answer and for every Wrong Answer, one-fourth (0.25) mark will be deducted.
12. No candidate will be allowed to leave the Examination Hall temporarily during the Examinations.
13. No candidate can leave the designated seat of the Examination Hall till the end of the examination.
14. Candidates need to maintain discipline before, during and after the examination.
15. Use of Calculators, Cell Phones (mobiles) and other Electronic Gadgets, cameras are strictly prohibited inside the Examination Hall.
16. The blank spaces and blank sheets attached at the end of the Question Booklet are to be used for rough calculations only.
17. You will be asked by the Invigilator to put your signature and your Left Hand Thumb Impression on the Attendance Sheet & OMR Answer Sheet. Please sign the Attendance Sheet and OMR Answer Sheet in the same way as you signed and uploaded during Online Application which is appearing in your Admit Card.
18. Please submit the OMR Answer Sheet to the Invigilator before leaving the examination hall.
19. Candidature of any candidate will be cancelled if he/she does not follow the guidelines and instructions and if he/she is found to adopt unfair means, in any form as noted by the invigilator/authority.

**(TURN THIS PAGE WHEN THE BELL RINGS AT 09:30 AM)**

**1/LT – Civil Engineering**



**LECTURER (TECHNICAL)  
CIVIL ENGINEERING**

1. Type of scaffolding provided for a building on the side of a busy street, where the ordinary scaffolding will obstruct the traffic on the road, is

- (A) Gunny bag scaffolding      (B) Steel scaffolding  
(C) Mason's scaffolding      (D) Needle scaffolding

2. Voussoirs are



- (A) Large bricks laid at the bottom of the partition wall  
(B) Inner curved surfaces of an arch  
(C) Wedge shaped units of masonry forming an arch  
(D) Outer curved surfaces of an arch

3. In prestressed concrete, the concept of pressure line is used to understand

- (A) Shear mechanism      (B) Bending mechanism  
(C) Torsion mechanism      (D) Load carrying mechanism

4. A flexible material used for damp proofing course is

- (A) Plastic sheeting      (B) Cement concrete spreading  
(C) Mastic asphalt layer      (D) Bitumen sheeting

5. A nozzle is found to carry a variable discharge. It is a typical case of

- (A) Steady and uniform flow      (B) Unsteady and uniform flow  
(C) Steady and non-uniform flow      (D) Unsteady and non-uniform flow

6. A soil sample has a liquid limit and plastic limit of 45% and 25% respectively. In the liquid limit test on the soil sample, number of blows was increased from 10 to 100. The toughness index of soil is

(A) 0.25 (B) 0.5  
(C) 0.66 (D) 0.75

$$\frac{45}{25} = \frac{I_f}{I_p}$$

$$\frac{20}{100} = \frac{I_f}{10}$$

7. The purpose of drawing a flownet is to obtain

(A) Exit gradient and coefficient of permeability  
(B) Exit gradient, uplift pressure and seepage quantity  
(C) Coefficient of permeability and profile of the hydraulic structure  
(D) Uplift pressure and profile of the hydraulic structure

$$q = k h \frac{N_f}{N_d}$$

$$I_f = \frac{w - w_p}{\log \left( \frac{2.5}{I_p} \right)}$$

$$= \frac{25 - 10}{\log \left( \frac{2.5}{10} \right)}$$

8. A clay deposit of 4.0 m thick undergoes 10.0 cm settlement when subject to a load. If a drainage layer is inserted in the middle of the layer, then settlement will be

(A) 2.0 cm (B) 5.0 cm  
(C) 12 cm (D) 10.0 cm

$$\square 4 \text{ m}$$

$$\frac{\Delta H}{H} = \frac{\Delta e}{e - e_0}$$

9. The stabilization of a soil by reducing first heave is done with

(A) Calcium chloride (B) Clay  
(C) Sand (D) Fly ash

10. While sinking a well, in order to overcome skin friction and loss in weight of the well due to buoyancy, which of the following is used?

(A) Bed block (B) Kentledge  
(C) Steining (D) Gravel

11. Bituminous material when added to a soil

- ☒ (A) Imparts cohesion and reduced water absorption
- (B) Increases infiltration ✗
- (C) Reduces runoff ✗
- (D) Enhances overtaking distance

12. Double mass curve technique is used

- (A) to prepare rainfall hyetograph from rainfall mass curve
- ☒ (B) to check the consistency of record at a suspected rain gauge station
- (C) to derive the hydrograph ✗
- (D) to derive the S-curve hydrograph ✗

13. Which of the following is the first principle of surveying?

- (A) As a whole
- ☒ (B) Whole to part
- (C) Dividing the field into squares ✗
- (D) Dividing the field into circles ✗

14. Which type of surveying is used for exploring minerals?

- ☒ (A) Hydrographic surveying
- (B) Mine surveying
- (C) Topographic surveying ✗
- (D) Plane tabling ✗

15. In which one of the following surveying methods, surface of the earth is considered as a plane and spheroidal shape is neglected?

- ☒ (A) Plane Surveying
- (B) Geodetic Surveying
- (C) Hydrographic Surveying
- (D) Topographic Surveying

16. A channelization island provides
- (A) equal entry and exit widths
  - (B) funnel shaped entry and wider exit
  - (C) wider entrance and funnel shaped exit
  - (D) high relative speed at entry and low speed at exit
17. Aggregate impact value indicates which of the following properties of aggregates?
- (A) Durability
  - (B) Toughness
  - (C) Hardness
  - (D) Strength
18. Compensating errors in chaining are
- (A) Proportional to the length of the line
  - (B) Proportional to the square root of the length of the line
  - (C) Inversely proportional to the square root of the length of the line
  - (D) Inversely proportional to the length of the line
19. Total Stations only measure
- (A) Horizontal Angle, Vertical Angle and Slope Distance
  - (B) Horizontal Angle, Ordinate Angle, Slope Distance
  - (C) Traverse Angle, Negative Angle, Slope Distance
  - (D) Horizontal Angle, Positive Angle, Slope Distance

20. Type of foundation used for the construction of building on black cotton soil is

- (A) Conventional foundation      (B) Mat foundation  
(C) Floating foundation      (D) Inverted arch foundation

21. The isotropic slab can be

1. Rectangular  
2. Circular  
3. Square

Which of the above statements is correct?

- (A) 1 and 2      (B) 1 and 3  
(C) 2 only      (D) 2 and 3

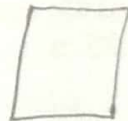
22. Which of the following materials is non-combustible building material with low coefficient of expansion?

- (A) Straw      (B) Asbestos cement  
(C) Brick      (D) Bitumen

23. Maximum shear stress in a reinforced concrete beam, having lever arm of  $z$ , width  $b$  and subjected to a shear force  $F$ , is

- (A)  $Fbz$       (B)  $Fb/z$   
(C)  $F/(bz)$       (D)  $Fz/b$

$$\tau_{max} = \frac{F}{zb}$$



24. Dummy activities are used

- (A) To determine longest path  
(B) To maintain required network  
(C) To maintain lowest man power  
(D) To determine project competition time

25. A soil has a sp.gr of 2.5. Ratio of its submerged unit weight to its dry density is

- (A) 0.33 (B) 0.4  
(C) 0.5 (D) 0.6

$$\frac{\gamma_{sub}}{\gamma_d} = \frac{\frac{W_s}{V} - W_w}{\frac{W_s}{V}} = \frac{G \gamma_w - \gamma_w}{G \gamma_w} = \frac{G - 1}{G}$$

$G = 2.5$

26. Details of a compacted soil sample are: void ratio = 0.75, Sp.gr = 2.7 and water content = 25 %. Then it has a degree of saturation of

- (A) 75% (B) 90%  
(C) 100% (D) 27%

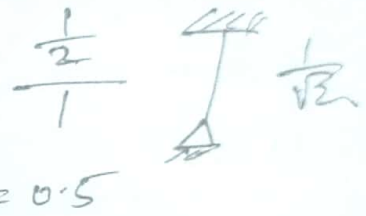
$$eS = wG$$

$$0.75S = 0.25 \times 2.7$$

$$S = \frac{0.675}{0.75} = 0.9$$

27. The ratio of the theoretical critical buckling load for a column with fixed ends to that of another column with the same dimensions and material but with pinned ends, is equal to

- (A) 0.5 (B) 1.0  
(C) 2.0 (D) 4.0



28. A uniform sandy soil of 2.5 m thick is found to have a sp.gr of 2.62 and a void ratio of 0.62. The hydraulic head required to cause quick sand condition in it is

- (A) 2.5 m (B) 3.5 m  
(C) 4.25 m (D) 1.25 m

$$i = \frac{h}{L}$$

$$h = i \times L = 1 \times 2.5 \text{ m}$$

$$h = \frac{G - 1}{1 - e} \times L$$

$$= \frac{2.62 - 1}{1 - 0.62} \times 2.5$$

$$= 1.25 \text{ m}$$

29. For a dam, the soil at the toe is found to have a void ratio of 0.67 and sp.gr of 2.67. The soil at the toe reaches critical state at a gradient of

- (A) 2.67 (B) 0.98  
(C) 1.00 (D) 0.67

$$i = \frac{G - 1}{1 - e}$$

$$= \frac{2.67 - 1}{1 - 0.67}$$

$$= 1.0$$

30. In sewage treatment process, the settleable faecal and other organic matter are removed in

- ☒ (A) Secondary sedimentation tank      (B) Primary sedimentation tank  
(C) Trickling filter      (D) Grit chamber ✗

31. In general, mean cell residence time for activated sludge process is

- ☒ (A) Less than one day      (B) Less than an hour ✗  
(C) 4 to 15 days      (D) More than a month

32. The unevenness index for a good pavement has to be

- (A) Less than 150 cm/km      (B) 1500 cm/km  
(C) 7500 mm/km      (D) More than 250 cm/km

33. In the case of areas with heavy rainfall, as per IRC, the minimum camber required for bituminous roads is

- (A) Less than 1% ✗      ☒ (B) 2.5%  
(C) 6.2%      (D) 12% ✗

$$\frac{1}{100} \times \frac{25}{100 \times 10} = \frac{25}{10000} = \frac{1}{400}$$

$$SSD = \sqrt{V^2 + \dots}$$

34. Pick out the incorrect statement from the following

- ☒ (A) The stopping sight distance depends upon length of vehicle  
(B) The stopping sight distance depends upon reaction time ✗  
(C) The stopping sight distance depends upon length friction  
(D) The stopping sight distance depends upon speed of the vehicle ✗

35. The action of negative skin friction on the pile is to

(A) increase the ultimate load on the pile

(B) reduce the allowable load on the pile

(C) maintain the working load on the pile

(D) reduce the settlement of the pile

36. The disinfection efficiency of chlorine in water treatment

(A) is not dependent of pH value

(B) is increase by increased pH value

(C) remains constant at all pH values

(D) is reduced by increased pH values

37. The volume of water that can be released by gravitational effects from a unit volume of an aquifer is its

(A) specific storage

(B) specific yield

(C) specific capacity

(D) specific porosity

38. Identify which of the following items is not considered while designing rigid pavements

(A) Centre of the panel

(B) Edge of the panel

(C) Corner of the panel

(D) Dowel bar between edges

39. Load factor accounts for

(A) Lapse in predicting magnitudes of dead or live load

✓ (B) Lapse in designing

(C) Overloading ✗

(D) Lapse in funding ✗

40. Condition of minimizing potential energy in a linear elastic structural system yields

✓ (A) Compatibility conditions

(B) Equilibrium equations

(C) No-displacement condition

(D) No-bending conditions

41. Pick out the correct statement

(A) In slope deflection method, the forces are taken as unknowns ✗

(B) Slope deflection equations give the relationship between slope and deflection only ✗

✓ (C) Slope deflection method is also known as Force method

(D) In slope deflection method, the joint rotations are taken as unknowns

42. Which of the following is correct?

Linear arch means....

(A) Upper surface of the arch

(B) Tangent at the centre of the arch

(C) Variation of shear force

✓ (D) Thrust line

43. The conveyance of a channel is dimensionally expressed as
- ☒ (A) dimensionless      (B)  $L^{\frac{1}{2}}$
- (C)  $L^{\frac{3}{2}}$       (D)  $L$
44. Pick up among the following slopes, that is not sustainable
- ☒ (A) Adverse slope      (B) Mild slope
- (C) Critical slope      (D) Steep slope
45. Consistency of rainfall data of a rain gauge station is ascertained using
- ☒ (A) Double mass curve      (B) Lysimeter
- (C) Mass curve      (D) Flow duration curve
46. Probability of a flood that is equal or greater than 1000 yr flood, occurring next year is
- (A) 0.001      (B) 0.075
- (C) 0.0001      (D) 0.75
47. As per Indian standards for bricks, minimum acceptable compressive strength of any class of burnt clay bricks in dry state is
- (A) 10.0 MPa      (B) 0.75 MPa
- (C) 5.0 MPa      ☒ (D) 3.5 MPa



48. The process of coagulation-flocculation with alum is carried out

- ☒ (A) Before rapid sand filtration      (B) After rapid sand filtration  
(C) Immediately before chlorination      (D) Immediately after chlorination

49. Which of the following is not a coagulant?

- (A) Copper sulphate      (B) Ferric chloride  
☒ (C) Ferric sulphate      (D) Aluminium sulphate

50. Which of the following is used to clean slow sand filter?

- (A) Back washing      (B) Vacuum cleaning  
☒ (C) Scraping and cleaning of sand      (D) Jet of high pressure air

51. For the design of a rapid sand filter, the uniformity coefficient of sand used is

- (A) 2.5      (B) More than 5  
(C) Less than 1      ☒ (D) 1.2 to 1.8

52. Purpose of the stand pipe in a water supply system is to

- ☒ (A) to boost pressure in pipes      (B) to act as fire extinguisher  
(C) to take care of losses      (D) to balance the pipe net work

53. In sewage analysis, Imhoff cone is used to measure

- ☒ (A) Settleable solids      (B) Total solids  
(C) Organic solids      (D) Inorganic solids

C

(13)

1/LT-Civil Engineering

[Turn over



54. As per Indian standard code of practice for prestressed concrete (IS 1343 : 1980) the minimum grades of concrete to be used for post-tensioned and pre-tensioned structural elements are respectively

- (A) M20 for both ☒ (B) M40 and M30  
(C) M15 and M20 ☒ (D) M30 and M40

55. The centre of pressure of a liquid on a plane surface immersed vertically in a static body of liquid, always lies below the centroid of the surface area, because

(A) in liquids the pressure acting is same in all directions

(B) there is no shear stress in liquids at rest

(C) the liquid pressure is constant over depth ☒

☒ (D) the liquid pressure increases linearly with depth

$$I_C = \bar{I} + \frac{A\bar{x}^2}{A}$$

56. Francis turbine is

(A) an impulse turbine

(B) a radial flow impulse turbine

(C) an axial flow turbine

(D) a reaction radial flow turbine

57. Calculate the evaporation (mm) from a pond, if the pan evaporation is 45 mm, the pan coefficient is 0.70

(A) 13.5

(B) 19.28

☒ (C) 31.5

(D) 64.28

$$\frac{45}{0.70} = \frac{31.5}{1}$$

58. The discharge capacity required at the outlet to irrigate 2600 ha of sugarcane having a kor depth of 17 cm and a kor period of 30 days is

(A) 2.3 m<sup>3</sup>/s

(B) 1.71 m<sup>3</sup>/s

☒ (C) 14.7 m<sup>3</sup>/s

(D) 0.18 m<sup>3</sup>/s

$$D = \frac{ha}{m^3/sec}$$

$$D = \frac{8.64 \times 10^6 \times \frac{17}{100} \times 30}{2600 \times 10^4} = 14.7$$

1/1LT-Civil Engineering

$$D = \frac{8.64 \times 10^6 \times \frac{17}{100} \times 30}{2600 \times 10^4} = 14.7$$

59. A suspension cable is mainly designed for

(A) Rotational thrust

(B) Axial tension

(C) Axial thrust

(D) Bending tension

60. Pick up the false statement pertaining to deflection of a point nearby a fixed support

(A) Displacement as well as slope is non-zero

(B) Displacement and slope are zero

(C) Nil displacement

(D) Slope is zero



$$\begin{array}{r} 1296 \overline{) 221000} \\ \underline{2592} \phantom{00} \\ 9140 \phantom{0} \\ \underline{9072} \phantom{0} \\ 68 \phantom{0} \end{array}$$

61. Which of the following structure performs better during an earthquake occurrence?

(A) Statically determinate and indeterminate

(B) Depends upon magnitude of earthquake

(C) Statically determinate

(D) Statically indeterminate

$$\begin{array}{r} 108 \times 3 \\ \hline 25 \times 5 \times 17 \end{array} \quad \begin{array}{r} 1300 \\ \times 17 \\ \hline 9100 \\ 13000 \\ \hline 22100 \end{array}$$

$$D = \frac{259.20}{17} \frac{ha}{m^3/sec.}$$

$$C \quad \begin{array}{r} 259.20 \\ \hline 17 \times 2600 \end{array}$$

$$\begin{array}{r} 25920 \\ \times 2 \\ \hline 51840 \end{array} \quad \begin{array}{r} 108 \times 17 \times 2600 \\ \hline 25920 \times 17 \\ \hline 440640 \end{array}$$

1/1T-Civil Engineering  
[Turn over]

62. In a pipe flow, the Reynolds number is 200. The Darcy-Weisbach friction factor for this flow is

(A) 0.64

(B) 0.064

(C) 0.32

(D) 0.032

63. For a flow, the existence of stream function indicates that

(A) The flow satisfies continuity equation

(B) Flow is steady

(C) Flow is rotational

(D) Flow satisfies momentum equation

64. A turbine in which the total energy at the inlet is only kinetic energy, then the turbine is

(A) Reaction turbine

(B) Impulse turbine

(C) Axial flow turbine

(D) Mixed flow turbine

65. While defining the Froude Number in an open channel of any shape, the characteristic length used is

(A) Square root of wetted

(B) Wetted perimeter

(C) Ratio of area to top width

(D) Top width

66. The difference between total energy line and piezometric line is

(A) Pressure head

(B) Suction head

(C) Delivery head

(D) Velocity head

67. Steep portion of grain size distribution curve represents

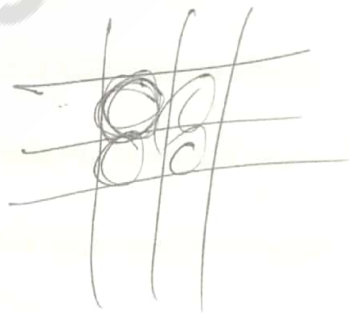
- ☐ (A) Non-uniform grain sizes      ☒ (B) More uniform grain sizes  
☐ (C) Spherical soil particles ✗      ☐ (D) Coarse soil particles ✗

68. Piping failure of a structure spreads

- ☐ (A) from u/s edge to half of the base of the structure  
☒ (B) from u/s edge to toe of the structure  
☐ (C) from toe of the structure to further d/s of the structure  
☐ (D) from toe of the structure to u/s side ✗

69. Quantity of seepage in each flow channel of a flownet is

- ☒ (A) Same  
☐ (B) Decreases from u/s to d/s side  
☐ (C) Increases from u/s to d/s side  
☐ (D) Depends upon the size of the structure



70. The pipe mains conveying water from the source are designed for

- ☐ (A) Maximum weekly demand      ☐ (B) Average annual demand  
☒ (C) Maximum daily demand      ☐ (D) Average daily demand

71. A well constructed in the top aquifer without penetrating any impervious bottom strata is known as

- ☐ (A) Infiltration well      ☒ (B) Shallow well  
☐ (C) Strainer well      ☐ (D) Spring well

72. Given that the scope of the construction work is well-defined with all its drawings, specifications, quantities and estimates, which one of the following types of contract would be most preferred?

☒ (A) EPC contract

(B) Percentage rate contract

(C) Item rate contract

(D) Lump sum contract

73. In the sieve analysis of fineness test, the residue on No.9 sieve after 15 minutes of sieving should not be more than

☒ (A) 5%

(B) 7.5%

(C) 10%

(D) 15%

74. The span to depth ratio limit is specified in IS 456:2000 for the reinforced concrete beams, in order to ensure that the

(A) tensile crack width is below a limit

(B) shear failure is avoided

(C) stress in the tension reinforcement is less than the allowable value

☒ (D) deflection of the beam is below a limiting value

75. The loss of prestress due to elastic shortening of concrete is least in

(A) one wire pre-tensioned beam

☒ (B) one wire post-tensioned beam

(C) multiple wire pre-tensioned beam with sequential cutting of wires

(D) multiple wire post-tensioned beam subjected to sequential prestressing