

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE
ASKED TO DO SO)

PH.D.-EE-October, 2026 (Civil Engineering (UIET))



100013

Sr. No.

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

Roll No. _____ (in figure) _____ (in words)

Name _____ Father's Name _____

Mother's Name _____ Date of Examination _____

(Signature of the Candidate)

(Signature of the Invigilator)

**CANDIDATES MUST READ THE FOLLOWING INFORMATION/ INSTRUCTIONS
BEFORE STARTING THE QUESTION PAPER.**

1. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Discrepancy, if any, should be immediately reported to the invigilator and should ask for replacement of Question booklet / OMR Answer Sheet. **Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after start of the examination.**
2. All questions are compulsory. There will be no negative marking. Each correct answer will be awarded one full mark.
3. For each question, four suggested answers (1), (2), (3), (4) are given. The candidate is to choose only one answer which he / she considers the correct or best one. If the candidate darkens more than one circle or cutting / over writing / erasing, then such answer(s) shall not be evaluated.
4. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the space provided in the end of question booklet. Answers **MUST NOT** be ticked in the Question book-let.
5. Use only Black or Blue **BALL POINT PEN** of good quality in the OMR Answer-Sheet.
6. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
7. Question Booklet(s) along with answer key(s) of all the A, B, C & D codes will be got uploaded on the university website after the conduct of Entrance Examination. Candidates may raise valid objection / complaint, if any, with regard to discrepancy in the question booklet / answer key within 24 hours of uploading the same on the University website. The complaint be sent by the student to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
8. The candidates must return the Question booklet as well as Original OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehavior will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

(For Rough Work Only)

1. Which learner characteristic is most directly related to the ability to process, analyze and interpret information ?
 - (1) Cognitive characteristic
 - (2) Physical characteristic
 - (3) Institutional characteristic
 - (4) Financial characteristic
2. Which level of teaching promotes critical thinking and problem-solving ?
 - (1) Memory level
 - (2) Understanding level
 - (3) Reflective level
 - (4) Informative level
3. Which type of evaluation is conducted during the teaching-learning process ?
 - (1) Placement evaluation
 - (2) Summative evaluation
 - (3) Terminal evaluation
 - (4) Formative evaluation
4. Exploratory research is particularly useful when :
 - (1) The research problem is already completely understood
 - (2) Little is known about the research problem
 - (3) The findings have already been established conclusively
 - (4) No literature review is required
5. Which statement best represents the post-positivist view ?
 - (1) All scientific conclusions are absolutely certain
 - (2) Knowledge is provisional and subject to revision based on evidence
 - (3) Evidence is irrelevant
 - (4) Reality cannot be investigated systematically

6. Which sequence is most appropriate ?

- (1) Problem identification → Data collection → Data analysis → Literature review → Conclusion
- (2) Research design → Problem identification → Literature review → Data collection → Data analysis
- (3) Problem identification → Literature review → Research design → Data collection → Data analysis
- (4) Literature review → Research design → Problem identification → Data collection → Conclusion

Read the following passage carefully and answer questions 7 to 9 based on this passage :

The rapid development of technology has changed the nature of work and increased the importance of lifelong learning. Knowledge and skills acquired at the beginning of a career may become insufficient as new technologies, processes and organizational practices emerge. Lifelong learning does not necessarily mean returning to formal education every few years. It can include professional training, online courses, workplace learning, reading, mentoring, participation in professional communities and independent study. An important feature of lifelong learning is the ability to identify one's own learning needs and take appropriate action. Organizations also have a role to play by creating opportunities for employees to acquire new skills. Thus, lifelong learning is both an individual responsibility and an institutional concern.

7. Why may knowledge acquired at the beginning of a career become insufficient ?

- (1) People forget everything they learn
- (2) New technologies and work practices emerge
- (3) Formal education is always ineffective
- (4) Organizations stop using technology

8. An important feature of lifelong learning is the ability to :

- (1) Depend entirely on an institution
- (2) Identify one's own learning needs
- (3) Avoid new technology
- (4) Stop learning after graduation

9. What conclusion can be drawn from the passage ?

- (1) Lifelong learning is solely the responsibility of individuals
- (2) Lifelong learning is solely the responsibility of organizations
- (3) Both individuals and organizations have roles in lifelong learning
- (4) Lifelong learning is unnecessary for experienced workers

10. Which of the following is not a characteristic of effective communication ?

- (1) Clarity
- (2) Completeness
- (3) Ambiguity
- (4) Correctness

11. The study of communication through body movement is commonly called :

- | | |
|---------------|---------------|
| (1) Proxemics | (2) Kinesics |
| (3) Semantics | (4) Phonetics |

12. Eye contact during communication can help to :

- (1) Indicate attention and engagement
- (2) Always eliminate communication barriers
- (3) Replace all verbal communication
- (4) Guarantee agreement

13. A barrier in effective communication caused by differences in the meanings of words is called :

- | | |
|------------------------|----------------------------|
| (1) Physical barrier | (2) Organizational barrier |
| (3) Mechanical barrier | (4) Semantic barrier |

14. A researcher observes that several metals expand on heating and concludes that metals generally expand on heating. This is :

- | | |
|-------------------------|-------------------------|
| (1) Deductive reasoning | (2) Inductive reasoning |
| (3) Circular reasoning | (4) Verbal reasoning |

15. Find the next number :

100, 90, 81, 73, 66, ?

- | | |
|--------|--------|
| (1) 58 | (2) 59 |
| (3) 60 | (4) 61 |

16. X is the sister of Y. Y is the father of Z. How is X related to Z ?

- | | |
|------------|-----------------|
| (1) Mother | (2) Grandmother |
| (3) Sister | (4) Aunt |

17. If the price of a commodity is increased by 20% and then decreased by 20%, the net change is :

- | | |
|-----------------|-----------------|
| (1) No change | (2) 2% increase |
| (3) 4% decrease | (4) 4% increase |

18. The average of 6 numbers is 20. If one number, 30, is removed, the average of the remaining numbers is :

- | | |
|--------|--------|
| (1) 16 | (2) 18 |
| (3) 20 | (4) 22 |

19. Misrepresenting an opponent's argument to make it easier to attack is :

- | | |
|--------------------------|--------------------|
| (1) Straw man | (2) Appeal to pity |
| (3) Begging the question | (4) Equivocation |

20. In the inference "The hill has fire because it has smoke," smoke is the :

- | | |
|------------|------------|
| (1) Paksha | (2) Sadhya |
| (3) Hetu | (4) Vyapti |

21. Which of the following is most closely associated with an invalid or defective inferential reason ?

- | | |
|----------------|----------------|
| (1) Hetvabhasa | (2) Pratyaksha |
| (3) Shabda | (4) Upamana |

22. Which of the following represents discrete data ?

- | | |
|------------------------|------------|
| (1) Temperature | (2) Height |
| (3) Number of machines | (4) Weight |

23. A category representing 25% of the total data would occupy what angle in a pie chart ?

- | | |
|---------|----------|
| (1) 45° | (2) 60° |
| (3) 90° | (4) 120° |

24. Which measure is least affected by an extremely large or extremely small observation ?

- | | |
|------------------------|--------------|
| (1) Mean | (2) Median |
| (3) Arithmetic average | (4) Variance |

25. A system that translates domain names into IP addresses is :

- | | |
|----------|-------------------|
| (1) HTML | (2) SMTP |
| (3) FTP | (4) None of these |

26. Questionnaires, interview schedules and raw tables are usually placed in a thesis as :

- | | |
|--------------|----------------|
| (1) Preface | (2) Footnotes |
| (3) Abstract | (4) Appendices |

27. A pre-writing consideration in report writing is to :

- (1) Submit the report to the library
- (2) Print the title page
- (3) Bind the final copy
- (4) Prepare an outline and decide the intended audience

28. The preliminary pages of a thesis (certificate, acknowledgements, contents) are usually numbered in :

- (1) Roman numerals
- (2) Arabic numerals starting from 100
- (3) Capital letters
- (4) Fractions

29. A detailed scholarly work on a single subject, usually by one author, is called a :

- | | |
|----------------|---------------|
| (1) Newsletter | (2) Editorial |
| (3) Abstract | (4) Monograph |

30. A journal paper that critically summarises and evaluates existing research on a topic is a/an :

- | | |
|--------------------------|---------------|
| (1) Review article | (2) Erratum |
| (3) Letter to the editor | (4) Editorial |

31. A bibliography is normally arranged :

- (1) Alphabetically by the author's surname
- (2) By the number of pages
- (3) By the colour of the cover
- (4) By the date of purchase

32. The abbreviation 'Ibid.' in a footnote refers to :

- (1) The same source as the immediately preceding note
- (2) A source cited earlier but not immediately before
- (3) An unpublished source
- (4) The author's own earlier work

33. Footnotes are generally placed :

- (1) At the beginning of the thesis
- (2) On the cover page
- (3) Only in the abstract
- (4) At the bottom of the page on which the reference occurs

34. The citation style that gives the author's surname and year of publication in the text is :

- | | |
|--------------------------|--------------------------|
| (1) ISSN system | (2) APA style |
| (3) Colon Classification | (4) Dewey Decimal System |

35. The abbreviation 'op. cit.' means :

- | | |
|-------------------------------|-----------------------|
| (1) And others | (2) In the same place |
| (3) In the work already cited | (4) Compare with |

36. The arithmetic mean of 5, 7, 9, 11 and 13 is :

- | | |
|-------|--------|
| (1) 7 | (2) 8 |
| (3) 9 | (4) 10 |

37. The median of 3, 8, 5, 10 and 2 is :

- | | |
|-------|--------|
| (1) 3 | (2) 5 |
| (3) 8 | (4) 10 |

38. The mode of 2, 3, 3, 4, 5, 3, 6 is :

- | | |
|-------|-------|
| (1) 3 | (2) 4 |
| (3) 5 | (4) 6 |

39. Which measure of central tendency is most affected by extreme values ?

- | | |
|---------------------|--------------|
| (1) Median | (2) Quartile |
| (3) Arithmetic mean | (4) Mode |

40. For a distribution with open-ended class intervals, the most suitable average is the :

- | | |
|--------------------|---------------------|
| (1) Geometric mean | (2) Median |
| (3) Harmonic mean | (4) Arithmetic mean |

41. If the mean of a moderately skewed distribution is 20 and the median is 18, the mode is approximately :

- | | |
|--------|--------|
| (1) 14 | (2) 16 |
| (3) 18 | (4) 22 |

42. SPSS stands for :

- (1) Statistical Process for Survey Studies
- (2) Scientific Package for Statistical Sampling
- (3) Statistical Package for the Social Sciences
- (4) Standard Programme for Social Surveys

43. In MS Excel, the function used to find the arithmetic mean of a range of cells is :

- | | |
|-------------|-------------|
| (1) TOTAL | (2) MEAN |
| (3) AVERAGE | (4) SUMMARY |

44. A graph that shows the relationship between two numerical variables is a :

- | | |
|---------------|------------------|
| (1) Pictogram | (2) Pie chart |
| (3) Histogram | (4) Scatter plot |

45. In MS Excel, the function CORREL returns :

- (1) The standard deviation of a data set
- (2) The correlation coefficient between two data sets
- (3) The number of cells in a range
- (4) The regression intercept

46. The base of the hexadecimal number system is :

- | | |
|--------|--------|
| (1) 2 | (2) 8 |
| (3) 10 | (4) 16 |

47. The decimal equivalent of the binary number 1011 is :

- | | |
|--------|--------|
| (1) 9 | (2) 10 |
| (3) 11 | (4) 13 |

48. The binary equivalent of the decimal number 25 is :

- | | |
|-----------|-----------|
| (1) 11001 | (2) 11010 |
| (3) 10101 | (4) 10011 |

49. The hexadecimal equivalent of the decimal number 255 is :

- | | |
|--------|---------|
| (1) EF | (2) 100 |
| (3) FF | (4) FE |

50. The octal equivalent of the binary number 110101 is :

- | | |
|--------|--------|
| (1) 35 | (2) 53 |
| (3) 65 | (4) 56 |

51. A beam of rectangular cross-section is 100 mm wide and 200 mm deep. If the section is subjected to a shear force of 20 kN, then the maximum shear stress in the section is :

- | | |
|----------------------------|-----------------------------|
| (1) 1 N/mm ² | (2) 1.125 N/mm ² |
| (3) 1.33 N/mm ² | (4) 1.5 N/mm ² |

52. Two bars of different materials are of the same size and are subjected to same tensile forces. If the bars have unit elongations in the ratio of 4 : 7, then the ratio of moduli of elasticity of the two materials is :

- | | |
|------------|-------------|
| (1) 7 : 4 | (2) 4 : 7 |
| (3) 4 : 17 | (4) 16 : 49 |

53. The hydraulic radius of a circular pipe of diameter D flowing full is :

- | | |
|---------|---------|
| (1) D/2 | (2) D/3 |
| (3) D | (4) D/4 |

54. The discharge over a sharp-crested rectangular weir is proportional to the head H raised to the power :

- | | |
|---------|---------|
| (1) 3/2 | (2) 1/2 |
| (3) 1 | (4) 5/2 |

55. Cavitation in hydraulic machines occurs when the local pressure falls below :

- (1) The stagnation pressure
- (2) Atmospheric pressure
- (3) The critical pressure of the liquid
- (4) The vapour pressure of the liquid

56. In the activated sludge process, the aeration tank volume is 2000 m³ and the MLSS is 3000 mg/L. Sludge is wasted at 100 m³/day with a concentration of 10,000 mg/L (no solids in the effluent). What is the mean cell residence time (SRT) ?

- | | |
|-------------|-------------|
| (1) 3 days | (2) 6 days |
| (3) 10 days | (4) 12 days |

57. A circular sedimentation tank receives 4000 m³/day and has a surface area of 100 m². The surface overflow rate is :

- | | |
|--|---|
| (1) 20 m ³ /m ² /day | (2) 40 m ³ /m ² /day |
| (3) 80 m ³ /m ² /day | (4) 400 m ³ /m ² /day |

58. Two identical noise sources each produce 60 dB at a point. The combined sound level is approximately :

- | | |
|-----------|------------|
| (1) 60 dB | (2) 63 dB |
| (3) 90 dB | (4) 120 dB |

59. A vehicle travels at 72 km/h with a reaction time of 2.5 s and a coefficient of friction of 0.35 (level road). The stopping sight distance is approximately:

- | | |
|-----------|-----------|
| (1) 78 m | (2) 98 m |
| (3) 108 m | (4) 128 m |

60. In the CBR test, the standard load for 2.5 mm penetration is :

- | | |
|-------------|-------------|
| (1) 1020 kg | (2) 1370 kg |
| (3) 2055 kg | (4) 2630 kg |

61. If the fore bearing of a line is 125° , its back bearing is :

- | | |
|-----------------|-----------------|
| (1) 55° | (2) 125° |
| (3) 235° | (4) 305° |

62. The minimum number of GPS satellites required to determine a three-dimensional position fix (including receiver clock error) is :

- | | |
|-------|-------|
| (1) 2 | (2) 3 |
| (3) 4 | (4) 6 |

63. A material has $E = 200$ GPa and $G = 80$ GPa. Its Poisson's ratio is :

- | | |
|----------|----------|
| (1) 0.20 | (2) 0.25 |
| (3) 0.30 | (4) 0.50 |

64. At a point, $\sigma_x = 80$ MPa, $\sigma_y = 0$ and $\tau_{xy} = 30$ MPa. The maximum principal stress is :

- | | |
|-------------|-------------|
| (1) 80 MPa | (2) 90 MPa |
| (3) 100 MPa | (4) 110 MPa |

65. The radius of gyration of a solid circular section of diameter d about a centroidal axis is :

- | | |
|------------------|-----------|
| (1) $d/8$ | (2) $d/2$ |
| (3) $d/\sqrt{2}$ | (4) $d/4$ |

66. The shape factor of a solid circular section is :

- | | |
|----------|----------|
| (1) 1.27 | (2) 1.50 |
| (3) 1.70 | (4) 2.00 |

67. A singly reinforced beam has $b = 250$ mm, $d = 450$ mm, $A_{st} = 1000$ mm², M20 concrete and Fe415 steel. Using IS 456 : 2000, the ultimate moment of resistance is approximately :

- | | |
|----------------|----------------|
| (1) 118.6 kN·m | (2) 132.1 kN·m |
| (3) 139.7 kN·m | (4) 161.0 kN·m |

68. As per IS 800 : 2007, the design shear capacity of a single M20 bolt of grade 8.8 ($f_{ub} = 800$ MPa) in single shear with the threaded portion in the shear plane ($A_{nb} = 0.78 \times$ gross area, $\gamma_{mb} = 1.25$) is approximately :

- | | |
|--------------|--------------|
| (1) 62.8 kN | (2) 90.5 kN |
| (3) 113.2 kN | (4) 144.8 kN |

69. The water table is at 2 m depth in a deposit with $\gamma = 18$ kN/m³ above it and $\gamma_{sat} = 20$ kN/m³ below it. Taking $\gamma_w = 9.81$ kN/m³, the effective vertical stress at 6 m depth is :

- | | |
|--------------|---------------|
| (1) 36.0 kPa | (2) 76.8 kPa |
| (3) 96.0 kPa | (4) 120.0 kPa |

70. Water flows at 2 m/s in a rigid pipe in which the wave speed is 1400 m/s. If the flow is stopped suddenly, the pressure rise is :
- (1) 0.28 MPa (2) 0.56 MPa
(3) 1.4 MPa (4) 2.8 MPa
71. A rectangular channel of width 6 m carries water at a depth of 2 m. Taking Manning's $n = 0.015$ and bed slope 0.0004, the discharge is approximately :
- (1) 9.0 m³/s (2) 12.0 m³/s
(3) 15.1 m³/s (4) 18.1 m³/s
72. A pump delivers 0.05 m³/s against a total head of 30 m with an overall efficiency of 70%. Taking $\gamma_w = 9.81 \text{ kN/m}^3$, the input power required is approximately :
- (1) 10.3 kW (2) 14.7 kW
(3) 21.0 kW (4) 30.0 kW
73. The probability that a 50-year flood is equalled or exceeded at least once in the next 10 years is approximately :
- (1) 0.18 (2) 0.20
(3) 0.40 (4) 0.50
74. Hourly rainfall of 20, 40 and 30 mm/h on a catchment produces a direct runoff depth of 40 mm. The ϕ -index is :
- (1) 16.7 mm/h (2) 20.0 mm/h
(3) 25.0 mm/h (4) 30.0 mm/h

75. A canal commands 1000 ha with a peak consumptive use of 8 mm/day. With field application efficiency of 60% and conveyance efficiency of 80%, the required discharge at the canal head is approximately :
- (1) 0.93 m³/s (2) 1.45 m³/s
(3) 1.93 m³/s (4) 3.86 m³/s
76. A wastewater has a 5-day BOD of 200 mg/L at 20 °C and a BOD rate constant $k = 0.23 \text{ d}^{-1}$ (base e). Its ultimate BOD is approximately :
- (1) 150 mg/L (2) 200 mg/L
(3) 244 mg/L (4) 293 mg/L
77. In an activated sludge process, the settled sludge volume after 30 min is 250 mL/L and the MLSS is 2500 mg/L. The sludge volume index (SVI) is :
- (1) 25 mL/g (2) 40 mL/g
(3) 62.5 mL/g (4) 100 mL/g
78. A spherical particle of diameter 0.05 mm and density 2650 kg/m³ settles in water ($\rho = 1000 \text{ kg/m}^3$, $\mu = 1 \times 10^{-3} \text{ Pa.s}$) under Stokes' law. The settling velocity is approximately :
- (1) 0.225 mm/s (2) 2.25 mm/s
(3) 22.5 mm/s (4) 225 mm/s

79. As per Greenshields' model, free-flow speed is 80 km/h and jam density is 120 veh/km. The maximum flow (capacity) is :
- (1) 600 veh/h (2) 1200 veh/h
(3) 2400 veh/h (4) 4800 veh/h
80. A transition curve is to be provided for a design speed of 80 km/h and a circular curve radius of 300 m. Taking the rate of change of centripetal acceleration as 0.5 m/s^3 , the length of transition is approximately :
- (1) 37 m (2) 55 m
(3) 73 m (4) 146 m
81. In tacheometry with an inclined line of sight, the staff intercept is 1.5 m, the multiplying constant is 100, the additive constant is zero and the vertical angle is 10° . The horizontal distance is approximately :
- (1) 145.5 m (2) 147.7 m
(3) 150.0 m (4) 151.0 m
82. The offsets from a survey line at 10 m intervals are 2.0, 3.2, 4.0, 3.6 and 2.4 m. By Simpson's rule, the area between the line and the boundary is :
- (1) 120 m^2 (2) 126 m^2
(3) 130 m^2 (4) 132 m^2

83. The expected duration of a critical path is 36 days with a variance of 16 days². Assuming normal distribution ($z = 1.00 \Rightarrow 84.1\%$), the probability of completing the project in 40 days is :
- (1) 68.3% (2) 84.1%
(3) 97.7% (4) 99.9%
84. A rectangular channel carries a discharge per unit width of $4 \text{ m}^2/\text{s}$. The critical depth is approximately :
- (1) 0.82 m (2) 1.18 m
(3) 1.50 m (4) 2.00 m
85. A solid circular steel shaft of diameter 100 mm transmits a torque of 10 kN·m. The maximum torsional shear stress is approximately :
- (1) 25.5 MPa (2) 40.0 MPa
(3) 50.9 MPa (4) 101.9 MPa
86. A crop has a duty of 1800 hectares per cumec over a base period of 120 days. Its corresponding delta is approximately :
- (1) 0.48 m (2) 0.576 m
(3) 0.72 m (4) 1.20 m
87. The Mohr-Coulomb shear strength equation for soil is:
- (1) $\tau = c + \sigma \tan \phi$ (2) $\tau = c - \sigma \tan \phi$
(3) $\tau = \sigma/c + \tan \phi$ (4) $\tau = c\sigma \tan \phi$

88. For a soil with $G_s = 2.65$ and $e = 0.65$, the critical hydraulic gradient for quicksand condition is approximately :

- | | |
|----------|----------|
| (1) 0.65 | (2) 0.80 |
| (3) 1.00 | (4) 1.65 |

89. Using Webster's approximate formula :

$$C_0 = \frac{1.5L + 5}{1 - Y}$$

if total lost time $L = 12$ s and critical flow ratio $Y = 0.70$, the optimum cycle is approximately :

- | | |
|------------|------------|
| (1) 50.0 s | (2) 66.7 s |
| (3) 76.7 s | (4) 90.0 s |

90. A town has a population of 100,000 and a water demand of 135 litres per capita per day. The average daily demand is :

- | | |
|--------------|--------------|
| (1) 9.5 MLD | (2) 10.0 MLD |
| (3) 13.5 MLD | (4) 18.0 MLD |

91. In railway engineering, cant refers to :

- (1) Longitudinal gradient of the track
- (2) Rail section thickness
- (3) Rail length
- (4) Difference in elevation between the two rails on a curve

92. The void ratio of a soil is defined as :

- (1) Volume of voids / total volume
- (2) Volume of solids / volume of voids
- (3) Volume of voids / volume of solids
- (4) Volume of solids / total volume

93. The purpose of breakpoint chlorination is primarily to :

- (1) Satisfy chlorine demand and establish a useful free residual
- (2) Remove hardness
- (3) Remove suspended solids by sedimentation
- (4) Increase alkalinity

94. A compacted soil has a bulk unit weight of 18 kN/m^3 and water content of 12%. Its dry unit weight is approximately :

- | | |
|---------------------------|---------------------------|
| (1) 16.1 kN/m^3 | (2) 14.4 kN/m^3 |
| (3) 17.0 kN/m^3 | (4) 20.2 kN/m^3 |

95. For a closed traverse, the algebraic sums of latitude and departure are :

$$\sum L = +0.12 \text{ m}, \sum D = -0.16 \text{ m}.$$

The magnitude of the linear closing error is :

- | | |
|------------|------------|
| (1) 0.04 m | (2) 0.12 m |
| (3) 0.16 m | (4) 0.20 m |

96. A treadle bar is used for :
- (1) Interlocking points and signal
 - (2) Setting points and crossings
 - (3) Setting marshalling yard signals
 - (4) Track maintenance
97. For M25 grade concrete with creep coefficient of 1.5, the long term static modulus of elasticity (expressed in MPa) as per provisions of IS : 456 2000 is :
- (1) 5000
 - (2) 7500
 - (3) 10000
 - (4) 25000
98. Activated sludge is the :
- (1) Sludge in the secondary tank after aeration and rich in microbial masses
 - (2) Sludge in the secondary tank after aeration and rich in nutrients
 - (3) Sludge settled in the humus tank
 - (4) Aerated sludge in the aeration unit
99. Sinking fund is :
- (1) the fund for rebuilding a structure when its economic life is over
 - (2) Raised to meet maintenance costs
 - (3) the total sum to be paid to municipal authorities by the tenants
 - (4) A part of the money kept in reserve for providing additional structures and structural modifications
100. Undisturbed soil samples are required for conducting :
- (1) Consolidation test
 - (2) Specific gravity test
 - (3) Shrinkage limit test
 - (4) Hydrometer test

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B

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Sr. No.

Time : 1½ Hours

Max. Marks : 100

Total Questions : 100

Roll No. _____ (in figure) _____ (in words)

Name _____ Father's Name _____

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(Signature of the Invigilator)

**CANDIDATES MUST READ THE FOLLOWING INFORMATION/ INSTRUCTIONS
BEFORE STARTING THE QUESTION PAPER.**

- Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Discrepancy, if any, should be immediately reported to the invigilator and should ask for replacement of Question booklet / OMR Answer Sheet. **Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after start of the examination.**
- All questions are compulsory. There will be no negative marking. Each correct answer will be awarded one full mark.
- For each question, four suggested answers (1), (2), (3), (4) are given. The candidate is to choose only one answer which he / she considers the correct or best one. If the candidate darkens more than one circle or cutting / over writing / erasing, then such answer(s) shall not be evaluated.
- The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the space provided in the end of question booklet. Answers **MUST NOT** be ticked in the Question book-let.
- Use only Black or Blue **BALL POINT PEN** of good quality in the OMR Answer-Sheet.
- Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- Question Booklet(s) along with answer key(s) of all the A, B, C & D codes will be got uploaded on the university website after the conduct of Entrance Examination. Candidates may raise valid objection / complaint, if any, with regard to discrepancy in the question booklet / answer key within 24 hours of uploading the same on the University website. The complaint be sent by the student to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
- The candidates must return the Question booklet as well as Original OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehavior will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

SEAL

1. The study of communication through body movement is commonly called :
 - (1) Proxemics
 - (2) Kinesics
 - (3) Semantics
 - (4) Phonetics
2. Eye contact during communication can help to :
 - (1) Indicate attention and engagement
 - (2) Always eliminate communication barriers
 - (3) Replace all verbal communication
 - (4) Guarantee agreement
3. A barrier in effective communication caused by differences in the meanings of words is called :
 - (1) Physical barrier
 - (2) Organizational barrier
 - (3) Mechanical barrier
 - (4) Semantic barrier
4. A researcher observes that several metals expand on heating and concludes that metals generally expand on heating. This is :
 - (1) Deductive reasoning
 - (2) Inductive reasoning
 - (3) Circular reasoning
 - (4) Verbal reasoning
5. Find the next number :
100, 90, 81, 73, 66, ?
 - (1) 58
 - (2) 59
 - (3) 60
 - (4) 61

6. X is the sister of Y. Y is the father of Z. How is X related to Z ?

- | | |
|------------|-----------------|
| (1) Mother | (2) Grandmother |
| (3) Sister | (4) Aunt |

7. If the price of a commodity is increased by 20% and then decreased by 20%, the net change is :

- | | |
|-----------------|-----------------|
| (1) No change | (2) 2% increase |
| (3) 4% decrease | (4) 4% increase |

8. The average of 6 numbers is 20. If one number, 30, is removed, the average of the remaining numbers is :

- | | |
|--------|--------|
| (1) 16 | (2) 18 |
| (3) 20 | (4) 22 |

9. Misrepresenting an opponent's argument to make it easier to attack is :

- | | |
|--------------------------|--------------------|
| (1) Straw man | (2) Appeal to pity |
| (3) Begging the question | (4) Equivocation |

10. In the inference "The hill has fire because it has smoke," smoke is the :

- | | |
|------------|------------|
| (1) Paksha | (2) Sadhya |
| (3) Hetu | (4) Vyapti |

11. Which of the following is most closely associated with an invalid or defective inferential reason ?

- | | |
|----------------|----------------|
| (1) Hetvabhāsa | (2) Pratyaksha |
| (3) Shabda | (4) Upamana |

12. Which of the following represents discrete data ?

- | | |
|------------------------|------------|
| (1) Temperature | (2) Height |
| (3) Number of machines | (4) Weight |

13. A category representing 25% of the total data would occupy what angle in a pie chart ?

- | | |
|---------|----------|
| (1) 45° | (2) 60° |
| (3) 90° | (4) 120° |

14. Which measure is least affected by an extremely large or extremely small observation ?

- | | |
|------------------------|--------------|
| (1) Mean | (2) Median |
| (3) Arithmetic average | (4) Variance |

15. A system that translates domain names into IP addresses is :

- | | |
|----------|-------------------|
| (1) HTML | (2) SMTP |
| (3) FTP | (4) None of these |

16. Questionnaires, interview schedules and raw tables are usually placed in a thesis as :

- | | |
|--------------|----------------|
| (1) Preface | (2) Footnotes |
| (3) Abstract | (4) Appendices |

17. A pre-writing consideration in report writing is to :

- (1) Submit the report to the library
- (2) Print the title page
- (3) Bind the final copy
- (4) Prepare an outline and decide the intended audience

18. The preliminary pages of a thesis (certificate, acknowledgements, contents) are usually numbered in :

- (1) Roman numerals
- (2) Arabic numerals starting from 100
- (3) Capital letters
- (4) Fractions

19. A detailed scholarly work on a single subject, usually by one author, is called a :

- | | |
|----------------|---------------|
| (1) Newsletter | (2) Editorial |
| (3) Abstract | (4) Monograph |

20. A journal paper that critically summarises and evaluates existing research on a topic is a/an :

- | | |
|--------------------------|---------------|
| (1) Review article | (2) Erratum |
| (3) Letter to the editor | (4) Editorial |

21. A bibliography is normally arranged :

- (1) Alphabetically by the author's surname
- (2) By the number of pages
- (3) By the colour of the cover
- (4) By the date of purchase

22. The abbreviation 'Ibid.' in a footnote refers to :

- (1) The same source as the immediately preceding note
- (2) A source cited earlier but not immediately before
- (3) An unpublished source
- (4) The author's own earlier work

23. Footnotes are generally placed :

- (1) At the beginning of the thesis
- (2) On the cover page
- (3) Only in the abstract
- (4) At the bottom of the page on which the reference occurs

24. The citation style that gives the author's surname and year of publication in the text is :

- | | |
|--------------------------|--------------------------|
| (1) ISSN system | (2) APA style |
| (3) Colon Classification | (4) Dewey Decimal System |

25. The abbreviation 'op. cit.' means :

- | | |
|-------------------------------|-----------------------|
| (1) And others | (2) In the same place |
| (3) In the work already cited | (4) Compare with |

26. The arithmetic mean of 5, 7, 9, 11 and 13 is :

- | | |
|-------|--------|
| (1) 7 | (2) 8 |
| (3) 9 | (4) 10 |

27. The median of 3, 8, 5, 10 and 2 is :

- | | |
|-------|--------|
| (1) 3 | (2) 5 |
| (3) 8 | (4) 10 |

28. The mode of 2, 3, 3, 4, 5, 3, 6 is :

- | | |
|-------|-------|
| (1) 3 | (2) 4 |
| (3) 5 | (4) 6 |

29. Which measure of central tendency is most affected by extreme values ?

- | | |
|---------------------|--------------|
| (1) Median | (2) Quartile |
| (3) Arithmetic mean | (4) Mode |

30. For a distribution with open-ended class intervals, the most suitable average is the :

- | | |
|--------------------|---------------------|
| (1) Geometric mean | (2) Median |
| (3) Harmonic mean | (4) Arithmetic mean |

31. If the mean of a moderately skewed distribution is 20 and the median is 18, the mode is approximately :

- | | |
|--------|--------|
| (1) 14 | (2) 16 |
| (3) 18 | (4) 22 |

32. SPSS stands for :

- (1) Statistical Process for Survey Studies
- (2) Scientific Package for Statistical Sampling
- (3) Statistical Package for the Social Sciences
- (4) Standard Programme for Social Surveys

33. In MS Excel, the function used to find the arithmetic mean of a range of cells is :

- | | |
|-------------|-------------|
| (1) TOTAL | (2) MEAN |
| (3) AVERAGE | (4) SUMMARY |

34. A graph that shows the relationship between two numerical variables is a :

- | | |
|---------------|------------------|
| (1) Pictogram | (2) Pie chart |
| (3) Histogram | (4) Scatter plot |

35. In MS Excel, the function CORREL returns :

- (1) The standard deviation of a data set
- (2) The correlation coefficient between two data sets
- (3) The number of cells in a range
- (4) The regression intercept

36. The base of the hexadecimal number system is :

- (1) 2
- (2) 8
- (3) 10
- (4) 16

37. The decimal equivalent of the binary number 1011 is :

- (1) 9
- (2) 10
- (3) 11
- (4) 13

38. The binary equivalent of the decimal number 25 is :

- (1) 11001
- (2) 11010
- (3) 10101
- (4) 10011

39. The hexadecimal equivalent of the decimal number 255 is :

- (1) EF
- (2) 100
- (3) FF
- (4) FE

40. The octal equivalent of the binary number 110101 is :

- (1) 35
- (2) 53
- (3) 65
- (4) 56

41. Which learner characteristic is most directly related to the ability to process, analyze and interpret information ?

- (1) Cognitive characteristic
- (2) Physical characteristic
- (3) Institutional characteristic
- (4) Financial characteristic

42. Which level of teaching promotes critical thinking and problem-solving ?

- (1) Memory level
- (2) Understanding level
- (3) Reflective level
- (4) Informative level

43. Which type of evaluation is conducted during the teaching-learning process ?

- (1) Placement evaluation
- (2) Summative evaluation
- (3) Terminal evaluation
- (4) Formative evaluation

44. Exploratory research is particularly useful when :

- (1) The research problem is already completely understood
- (2) Little is known about the research problem
- (3) The findings have already been established conclusively
- (4) No literature review is required

45. Which statement best represents the post-positivist view ?

- (1) All scientific conclusions are absolutely certain
- (2) Knowledge is provisional and subject to revision based on evidence
- (3) Evidence is irrelevant
- (4) Reality cannot be investigated systematically

46. Which sequence is most appropriate ?

- (1) Problem identification → Data collection → Data analysis → Literature review → Conclusion
- (2) Research design → Problem identification → Literature review → Data collection → Data analysis
- (3) Problem identification → Literature review → Research design → Data collection → Data analysis
- (4) Literature review → Research design → Problem identification → Data collection → Conclusion

Read the following passage carefully and answer questions 47 to 49 based on this passage :

The rapid development of technology has changed the nature of work and increased the importance of lifelong learning. Knowledge and skills acquired at the beginning of a career may become insufficient as new technologies, processes and organizational practices emerge. Lifelong learning does not necessarily mean returning to formal education every few years. It can include professional training, online courses, workplace learning, reading, mentoring, participation in professional communities and independent study. An important feature of lifelong learning is the ability to identify one's own learning needs and take appropriate action. Organizations also have a role to play by creating opportunities for employees to acquire new skills. Thus, lifelong learning is both an individual responsibility and an institutional concern.

47. Why may knowledge acquired at the beginning of a career become insufficient ?

- (1) People forget everything they learn
- (2) New technologies and work practices emerge
- (3) Formal education is always ineffective
- (4) Organizations stop using technology

48. An important feature of lifelong learning is the ability to :

- (1) Depend entirely on an institution
- (2) Identify one's own learning needs
- (3) Avoid new technology
- (4) Stop learning after graduation

49. What conclusion can be drawn from the passage ?

- (1) Lifelong learning is solely the responsibility of individuals
- (2) Lifelong learning is solely the responsibility of organizations
- (3) Both individuals and organizations have roles in lifelong learning
- (4) Lifelong learning is unnecessary for experienced workers

50. Which of the following is not a characteristic of effective communication ?

- (1) Clarity
- (2) Completeness
- (3) Ambiguity
- (4) Correctness

51. If the fore bearing of a line is 125° , its back bearing is :

- | | |
|-----------------|-----------------|
| (1) 55° | (2) 125° |
| (3) 235° | (4) 305° |

52. The minimum number of GPS satellites required to determine a three-dimensional position fix (including receiver clock error) is :

- | | |
|-------|-------|
| (1) 2 | (2) 3 |
| (3) 4 | (4) 6 |

53. A material has $E = 200$ GPa and $G = 80$ GPa. Its Poisson's ratio is :

- | | |
|----------|----------|
| (1) 0.20 | (2) 0.25 |
| (3) 0.30 | (4) 0.50 |

54. At a point, $\sigma_x = 80$ MPa, $\sigma_y = 0$ and $\tau_{xy} = 30$ MPa. The maximum principal stress is :

- | | |
|-------------|-------------|
| (1) 80 MPa | (2) 90 MPa |
| (3) 100 MPa | (4) 110 MPa |

55. The radius of gyration of a solid circular section of diameter d about a centroidal axis is :

- | | |
|------------------|-----------|
| (1) $d/8$ | (2) $d/2$ |
| (3) $d/\sqrt{2}$ | (4) $d/4$ |

56. The shape factor of a solid circular section is :

- | | |
|----------|----------|
| (1) 1.27 | (2) 1.50 |
| (3) 1.70 | (4) 2.00 |

57. A singly reinforced beam has $b = 250$ mm, $d = 450$ mm, $A_{st} = 1000$ mm², M20 concrete and Fe415 steel. Using IS 456 : 2000, the ultimate moment of resistance is approximately :

- | | |
|----------------|----------------|
| (1) 118.6 kN·m | (2) 132.1 kN·m |
| (3) 139.7 kN·m | (4) 161.0 kN·m |

58. As per IS 800 : 2007, the design shear capacity of a single M20 bolt of grade 8.8 ($f_{ub} = 800$ MPa) in single shear with the threaded portion in the shear plane ($A_{nb} = 0.78 \times$ gross area, $\gamma_{mb} = 1.25$) is approximately :

- | | |
|--------------|--------------|
| (1) 62.8 kN | (2) 90.5 kN |
| (3) 113.2 kN | (4) 144.8 kN |

59. The water table is at 2 m depth in a deposit with $\gamma = 18$ kN/m³ above it and $\gamma_{sat} = 20$ kN/m³ below it. Taking $\gamma_w = 9.81$ kN/m³, the effective vertical stress at 6 m depth is :

- | | |
|--------------|---------------|
| (1) 36.0 kPa | (2) 76.8 kPa |
| (3) 96.0 kPa | (4) 120.0 kPa |

60. Water flows at 2 m/s in a rigid pipe in which the wave speed is 1400 m/s. If the flow is stopped suddenly, the pressure rise is :
- (1) 0.28 MPa (2) 0.56 MPa
(3) 1.4 MPa (4) 2.8 MPa
61. A rectangular channel of width 6 m carries water at a depth of 2 m. Taking Manning's $n = 0.015$ and bed slope 0.0004, the discharge is approximately :
- (1) 9.0 m³/s (2) 12.0 m³/s
(3) 15.1 m³/s (4) 18.1 m³/s
62. A pump delivers 0.05 m³/s against a total head of 30 m with an overall efficiency of 70%. Taking $\gamma_w = 9.81$ kN/m³, the input power required is approximately :
- (1) 10.3 kW (2) 14.7 kW
(3) 21.0 kW (4) 30.0 kW
63. The probability that a 50-year flood is equalled or exceeded at least once in the next 10 years is approximately :
- (1) 0.18 (2) 0.20
(3) 0.40 (4) 0.50
64. Hourly rainfall of 20, 40 and 30 mm/h on a catchment produces a direct runoff depth of 40 mm. The ϕ -index is :
- (1) 16.7 mm/h (2) 20.0 mm/h
(3) 25.0 mm/h (4) 30.0 mm/h

65. A canal commands 1000 ha with a peak consumptive use of 8 mm/day. With field application efficiency of 60% and conveyance efficiency of 80%, the required discharge at the canal head is approximately :
- (1) 0.93 m³/s (2) 1.45 m³/s
(3) 1.93 m³/s (4) 3.86 m³/s
66. A wastewater has a 5-day BOD of 200 mg/L at 20 °C and a BOD rate constant $k = 0.23$ d⁻¹ (base e). Its ultimate BOD is approximately :
- (1) 150 mg/L (2) 200 mg/L
(3) 244 mg/L (4) 293 mg/L
67. In an activated sludge process, the settled sludge volume after 30 min is 250 mL/L and the MLSS is 2500 mg/L. The sludge volume index (SVI) is :
- (1) 25 mL/g (2) 40 mL/g
(3) 62.5 mL/g (4) 100 mL/g
68. A spherical particle of diameter 0.05 mm and density 2650 kg/m³ settles in water ($\rho = 1000$ kg/m³, $\mu = 1 \times 10^{-3}$ Pa.s) under Stokes' law. The settling velocity is approximately :
- (1) 0.225 mm/s (2) 2.25 mm/s
(3) 22.5 mm/s (4) 225 mm/s

69. As per Greenshields' model, free-flow speed is 80 km/h and jam density is 120 veh/km. The maximum flow (capacity) is :
- (1) 600 veh/h (2) 1200 veh/h
(3) 2400 veh/h (4) 4800 veh/h
70. A transition curve is to be provided for a design speed of 80 km/h and a circular curve radius of 300 m. Taking the rate of change of centripetal acceleration as 0.5 m/s^3 , the length of transition is approximately :
- (1) 37 m (2) 55 m
(3) 73 m (4) 146 m
71. In tacheometry with an inclined line of sight, the staff intercept is 1.5 m, the multiplying constant is 100, the additive constant is zero and the vertical angle is 10° . The horizontal distance is approximately :
- (1) 145.5 m (2) 147.7 m
(3) 150.0 m (4) 151.0 m
72. The offsets from a survey line at 10 m intervals are 2.0, 3.2, 4.0, 3.6 and 2.4 m. By Simpson's rule, the area between the line and the boundary is :
- (1) 120 m^2 (2) 126 m^2
(3) 130 m^2 (4) 132 m^2

73. The expected duration of a critical path is 36 days with a variance of 16 days². Assuming normal distribution ($z = 1.00 \Rightarrow 84.1\%$), the probability of completing the project in 40 days is :
- (1) 68.3% (2) 84.1%
(3) 97.7% (4) 99.9%
74. A rectangular channel carries a discharge per unit width of $4 \text{ m}^2/\text{s}$. The critical depth is approximately :
- (1) 0.82 m (2) 1.18 m
(3) 1.50 m (4) 2.00 m
75. A solid circular steel shaft of diameter 100 mm transmits a torque of 10 kN·m. The maximum torsional shear stress is approximately :
- (1) 25.5 MPa (2) 40.0 MPa
(3) 50.9 MPa (4) 101.9 MPa
76. A crop has a duty of 1800 hectares per cumec over a base period of 120 days. Its corresponding delta is approximately :
- (1) 0.48 m (2) 0.576 m
(3) 0.72 m (4) 1.20 m
77. The Mohr-Coulomb shear strength equation for soil is:
- (1) $\tau = c + \sigma \tan \phi$ (2) $\tau = c - \sigma \tan \phi$
(3) $\tau = \sigma/c + \tan \phi$ (4) $\tau = c\sigma \tan \phi$

78. For a soil with $G_s = 2.65$ and $e = 0.65$, the critical hydraulic gradient for quicksand condition is approximately :

- (1) 0.65
- (2) 0.80
- (3) 1.00
- (4) 1.65

79. Using Webster's approximate formula :

$$C_0 = \frac{1.5L + 5}{1 - Y}$$

if total lost time $L = 12$ s and critical flow ratio $Y = 0.70$, the optimum cycle is approximately :

- (1) 50.0 s
- (2) 66.7 s
- (3) 76.7 s
- (4) 90.0 s

80. A town has a population of 100,000 and a water demand of 135 litres per capita per day. The average daily demand is :

- (1) 9.5 MLD
- (2) 10.0 MLD
- (3) 13.5 MLD
- (4) 18.0 MLD

81. In railway engineering, cant refers to :

- (1) Longitudinal gradient of the track
- (2) Rail section thickness
- (3) Rail length
- (4) Difference in elevation between the two rails on a curve

82. The void ratio of a soil is defined as :

- (1) Volume of voids / total volume
- (2) Volume of solids / volume of voids
- (3) Volume of voids / volume of solids
- (4) Volume of solids / total volume

83. The purpose of breakpoint chlorination is primarily to :

- (1) Satisfy chlorine demand and establish a useful free residual
- (2) Remove hardness
- (3) Remove suspended solids by sedimentation
- (4) Increase alkalinity

84. A compacted soil has a bulk unit weight of 18 kN/m^3 and water content of 12%. Its dry unit weight is approximately :

- (1) 16.1 kN/m^3
- (2) 14.4 kN/m^3
- (3) 17.0 kN/m^3
- (4) 20.2 kN/m^3

85. For a closed traverse, the algebraic sums of latitude and departure are :

$$\sum L = +0.12 \text{ m}, \sum D = -0.16 \text{ m}.$$

The magnitude of the linear closing error is :

- (1) 0.04 m
- (2) 0.12 m
- (3) 0.16 m
- (4) 0.20 m

86. A treadle bar is used for :
- (1) Interlocking points and signal
 - (2) Setting points and crossings
 - (3) Setting marshalling yard signals
 - (4) Track maintenance
87. For M25 grade concrete with creep coefficient of 1.5, the long term static modulus of elasticity (expressed in MPa) as per provisions of IS : 456 2000 is :
- (1) 5000
 - (2) 7500
 - (3) 10000
 - (4) 25000
88. Activated sludge is the :
- (1) Sludge in the secondary tank after aeration and rich in microbial masses
 - (2) Sludge in the secondary tank after aeration and rich in nutrients
 - (3) Sludge settled in the humus tank
 - (4) Aerated sludge in the aeration unit
89. Sinking fund is :
- (1) the fund for rebuilding a structure when its economic life is over
 - (2) Raised to meet maintenance costs
 - (3) the total sum to be paid to municipal authorities by the tenants
 - (4) A part of the money kept in reserve for providing additional structures and structural modifications
90. Undisturbed soil samples are required for conducting :
- (1) Consolidation test
 - (2) Specific gravity test
 - (3) Shrinkage limit test
 - (4) Hydrometer test

91. A beam of rectangular cross-section is 100 mm wide and 200 mm deep. If the section is subjected to a shear force of 20 kN, then the maximum shear stress in the section is :
- (1) 1 N/mm²
 - (2) 1.125 N/mm²
 - (3) 1.33 N/mm²
 - (4) 1.5 N/mm²
92. Two bars of different materials are of the same size and are subjected to same tensile forces. If the bars have unit elongations in the ratio of 4 : 7, then the ratio of moduli of elasticity of the two materials is :
- (1) 7 : 4
 - (2) 4 : 7
 - (3) 4 : 17
 - (4) 16 : 49
93. The hydraulic radius of a circular pipe of diameter D flowing full is :
- (1) D/2
 - (2) D/3
 - (3) D
 - (4) D/4
94. The discharge over a sharp-crested rectangular weir is proportional to the head H raised to the power :
- (1) 3/2
 - (2) 1/2
 - (3) 1
 - (4) 5/2
95. Cavitation in hydraulic machines occurs when the local pressure falls below :
- (1) The stagnation pressure
 - (2) Atmospheric pressure
 - (3) The critical pressure of the liquid
 - (4) The vapour pressure of the liquid

(For Rough Work Only)

96. In the activated sludge process, the aeration tank volume is 2000 m^3 and the MLSS is 3000 mg/L . Sludge is wasted at $100 \text{ m}^3/\text{day}$ with a concentration of $10,000 \text{ mg/L}$ (no solids in the effluent). What is the mean cell residence time (SRT) ?
- (1) 3 days (2) 6 days
(3) 10 days (4) 12 days
97. A circular sedimentation tank receives $4000 \text{ m}^3/\text{day}$ and has a surface area of 100 m^2 . The surface overflow rate is :
- (1) $20 \text{ m}^3/\text{m}^2/\text{day}$ (2) $40 \text{ m}^3/\text{m}^2/\text{day}$
(3) $80 \text{ m}^3/\text{m}^2/\text{day}$ (4) $400 \text{ m}^3/\text{m}^2/\text{day}$
98. Two identical noise sources each produce 60 dB at a point. The combined sound level is approximately :
- (1) 60 dB (2) 63 dB
(3) 90 dB (4) 120 dB
99. A vehicle travels at 72 km/h with a reaction time of 2.5 s and a coefficient of friction of 0.35 (level road). The stopping sight distance is approximately:
- (1) 78 m (2) 98 m
(3) 108 m (4) 128 m
100. In the CBR test, the standard load for 2.5 mm penetration is :
- (1) 1020 kg (2) 1370 kg
(3) 2055 kg (4) 2630 kg

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE
ASKED TO DO SO)

PH.D.-EE-October, 2026 (Civil Engineering (UIET))



100011

Sr. No.

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

Roll No. _____ (in figure) _____ (in words)

Name _____ Father's Name _____

Mother's Name _____ Date of Examination _____

(Signature of the Candidate)

(Signature of the Invigilator)

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7. Question Booklet(s) along with answer key(s) of all the A, B, C & D codes will be got uploaded on the university website after the conduct of Entrance Examination. Candidates may raise valid objection / complaint, if any, with regard to discrepancy in the question booklet / answer key within 24 hours of uploading the same on the University website. The complaint be sent by the student to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
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(For Rough Work Only)

110001

1. Questionnaires, interview schedules and raw tables are usually placed in a thesis as :
 - (1) Preface
 - (2) Footnotes
 - (3) Abstract
 - (4) Appendices
2. A pre-writing consideration in report writing is to :
 - (1) Submit the report to the library
 - (2) Print the title page
 - (3) Bind the final copy
 - (4) Prepare an outline and decide the intended audience
3. The preliminary pages of a thesis (certificate, acknowledgements, contents) are usually numbered in :
 - (1) Roman numerals
 - (2) Arabic numerals starting from 100
 - (3) Capital letters
 - (4) Fractions
4. A detailed scholarly work on a single subject, usually by one author, is called a :
 - (1) Newsletter
 - (2) Editorial
 - (3) Abstract
 - (4) Monograph

5. A journal paper that critically summarises and evaluates existing research on a topic is a/an :
- (1) Review article (2) Erratum
(3) Letter to the editor (4) Editorial
6. A bibliography is normally arranged :
- (1) Alphabetically by the author's surname
(2) By the number of pages
(3) By the colour of the cover
(4) By the date of purchase
7. The abbreviation 'Ibid.' in a footnote refers to :
- (1) The same source as the immediately preceding note
(2) A source cited earlier but not immediately before
(3) An unpublished source
(4) The author's own earlier work
8. Footnotes are generally placed :
- (1) At the beginning of the thesis
(2) On the cover page
(3) Only in the abstract
(4) At the bottom of the page on which the reference occurs

9. The citation style that gives the author's surname and year of publication in the text is :
- (1) ISSN system (2) APA style
(3) Colon Classification (4) Dewey Decimal System
10. The abbreviation 'op. cit.' means :
- (1) And others (2) In the same place
(3) In the work already cited (4) Compare with
11. The arithmetic mean of 5, 7, 9, 11 and 13 is :
- (1) 7 (2) 8
(3) 9 (4) 10
12. The median of 3, 8, 5, 10 and 2 is :
- (1) 3 (2) 5
(3) 8 (4) 10
13. The mode of 2, 3, 3, 4, 5, 3, 6 is :
- (1) 3 (2) 4
(3) 5 (4) 6
14. Which measure of central tendency is most affected by extreme values ?
- (1) Median (2) Quartile
(3) Arithmetic mean (4) Mode

15. For a distribution with open-ended class intervals, the most suitable average is the :
- | | |
|--------------------|---------------------|
| (1) Geometric mean | (2) Median |
| (3) Harmonic mean | (4) Arithmetic mean |
16. If the mean of a moderately skewed distribution is 20 and the median is 18, the mode is approximately :
- | | |
|--------|--------|
| (1) 14 | (2) 16 |
| (3) 18 | (4) 22 |
17. SPSS stands for :
- | |
|---|
| (1) Statistical Process for Survey Studies |
| (2) Scientific Package for Statistical Sampling |
| (3) Statistical Package for the Social Sciences |
| (4) Standard Programme for Social Surveys |
18. In MS Excel, the function used to find the arithmetic mean of a range of cells is :
- | | |
|-------------|-------------|
| (1) TOTAL | (2) MEAN |
| (3) AVERAGE | (4) SUMMARY |
19. A graph that shows the relationship between two numerical variables is a :
- | | |
|---------------|------------------|
| (1) Pictogram | (2) Pie chart |
| (3) Histogram | (4) Scatter plot |
20. In MS Excel, the function CORREL returns :
- | |
|---|
| (1) The standard deviation of a data set |
| (2) The correlation coefficient between two data sets |
| (3) The number of cells in a range |
| (4) The regression intercept |
21. The base of the hexadecimal number system is :
- | | |
|--------|--------|
| (1) 2 | (2) 8 |
| (3) 10 | (4) 16 |
22. The decimal equivalent of the binary number 1011 is :
- | | |
|--------|--------|
| (1) 9 | (2) 10 |
| (3) 11 | (4) 13 |
23. The binary equivalent of the decimal number 25 is :
- | | |
|-----------|-----------|
| (1) 11001 | (2) 11010 |
| (3) 10101 | (4) 10011 |
24. The hexadecimal equivalent of the decimal number 255 is :
- | | |
|--------|---------|
| (1) EF | (2) 100 |
| (3) FF | (4) FE |
25. The octal equivalent of the binary number 110101 is :
- | | |
|--------|--------|
| (1) 35 | (2) 53 |
| (3) 65 | (4) 56 |

26. Which learner characteristic is most directly related to the ability to process, analyze and interpret information ?
- (1) Cognitive characteristic
 - (2) Physical characteristic
 - (3) Institutional characteristic
 - (4) Financial characteristic
27. Which level of teaching promotes critical thinking and problem-solving ?
- (1) Memory level
 - (2) Understanding level
 - (3) Reflective level
 - (4) Informative level
28. Which type of evaluation is conducted during the teaching-learning process ?
- (1) Placement evaluation
 - (2) Summative evaluation
 - (3) Terminal evaluation
 - (4) Formative evaluation
29. Exploratory research is particularly useful when :
- (1) The research problem is already completely understood
 - (2) Little is known about the research problem
 - (3) The findings have already been established conclusively
 - (4) No literature review is required
30. Which statement best represents the post-positivist view ?
- (1) All scientific conclusions are absolutely certain
 - (2) Knowledge is provisional and subject to revision based on evidence
 - (3) Evidence is irrelevant
 - (4) Reality cannot be investigated systematically

31. Which sequence is most appropriate ?

- (1) Problem identification → Data collection → Data analysis → Literature review → Conclusion
- (2) Research design → Problem identification → Literature review → Data collection → Data analysis
- (3) Problem identification → Literature review → Research design → Data collection → Data analysis
- (4) Literature review → Research design → Problem identification → Data collection → Conclusion

Read the following passage carefully and answer questions 32 to 34 based on this passage :

The rapid development of technology has changed the nature of work and increased the importance of lifelong learning. Knowledge and skills acquired at the beginning of a career may become insufficient as new technologies, processes and organizational practices emerge. Lifelong learning does not necessarily mean returning to formal education every few years. It can include professional training, online courses, workplace learning, reading, mentoring, participation in professional communities and independent study. An important feature of lifelong learning is the ability to identify one's own learning needs and take appropriate action. Organizations also have a role to play by creating opportunities for employees to acquire new skills. Thus, lifelong learning is both an individual responsibility and an institutional concern.

32. Why may knowledge acquired at the beginning of a career become insufficient ?

- (1) People forget everything they learn
- (2) New technologies and work practices emerge
- (3) Formal education is always ineffective
- (4) Organizations stop using technology

33. An important feature of lifelong learning is the ability to :

- (1) Depend entirely on an institution
- (2) Identify one's own learning needs
- (3) Avoid new technology
- (4) Stop learning after graduation

34. What conclusion can be drawn from the passage ?

- (1) Lifelong learning is solely the responsibility of individuals
- (2) Lifelong learning is solely the responsibility of organizations
- (3) Both individuals and organizations have roles in lifelong learning
- (4) Lifelong learning is unnecessary for experienced workers

35. Which of the following is not a characteristic of effective communication ?

- (1) Clarity
- (2) Completeness
- (3) Ambiguity
- (4) Correctness

36. The study of communication through body movement is commonly called :

- (1) Proxemics
- (2) Kinesics
- (3) Semantics
- (4) Phonetics

37. Eye contact during communication can help to :

- (1) Indicate attention and engagement
- (2) Always eliminate communication barriers
- (3) Replace all verbal communication
- (4) Guarantee agreement

38. A barrier in effective communication caused by differences in the meanings of words is called :

- (1) Physical barrier
- (2) Organizational barrier
- (3) Mechanical barrier
- (4) Semantic barrier

39. A researcher observes that several metals expand on heating and concludes that metals generally expand on heating. This is :

- (1) Deductive reasoning
- (2) Inductive reasoning
- (3) Circular reasoning
- (4) Verbal reasoning

40. Find the next number :

100, 90, 81, 73, 66, ?

- (1) 58
- (2) 59
- (3) 60
- (4) 61

41. X is the sister of Y. Y is the father of Z. How is X related to Z ?

- | | |
|------------|-----------------|
| (1) Mother | (2) Grandmother |
| (3) Sister | (4) Aunt |

42. If the price of a commodity is increased by 20% and then decreased by 20%, the net change is :

- | | |
|-----------------|-----------------|
| (1) No change | (2) 2% increase |
| (3) 4% decrease | (4) 4% increase |

43. The average of 6 numbers is 20. If one number, 30, is removed, the average of the remaining numbers is :

- | | |
|--------|--------|
| (1) 16 | (2) 18 |
| (3) 20 | (4) 22 |

44. Misrepresenting an opponent's argument to make it easier to attack is :

- | | |
|--------------------------|--------------------|
| (1) Straw man | (2) Appeal to pity |
| (3) Begging the question | (4) Equivocation |

45. In the inference "The hill has fire because it has smoke," smoke is the :

- | | |
|------------|------------|
| (1) Paksha | (2) Sadhya |
| (3) Hetu | (4) Vyapti |

46. Which of the following is most closely associated with an invalid or defective inferential reason ?

- | | |
|----------------|----------------|
| (1) Hetvabhāsa | (2) Pratyaksha |
| (3) Shabda | (4) Upamana |

47. Which of the following represents discrete data ?

- | | |
|------------------------|------------|
| (1) Temperature | (2) Height |
| (3) Number of machines | (4) Weight |

48. A category representing 25% of the total data would occupy what angle in a pie chart ?

- | | |
|---------|----------|
| (1) 45° | (2) 60° |
| (3) 90° | (4) 120° |

49. Which measure is least affected by an extremely large or extremely small observation ?

- | | |
|------------------------|--------------|
| (1) Mean | (2) Median |
| (3) Arithmetic average | (4) Variance |

50. A system that translates domain names into IP addresses is :

- | | |
|----------|-------------------|
| (1) HTML | (2) SMTP |
| (3) FTP | (4) None of these |

51. A canal commands 1000 ha with a peak consumptive use of 8 mm/day. With field application efficiency of 60% and conveyance efficiency of 80%, the required discharge at the canal head is approximately :
- (1) 0.93 m³/s (2) 1.45 m³/s
(3) 1.93 m³/s (4) 3.86 m³/s
52. A wastewater has a 5-day BOD of 200 mg/L at 20 °C and a BOD rate constant $k = 0.23 \text{ d}^{-1}$ (base e). Its ultimate BOD is approximately :
- (1) 150 mg/L (2) 200 mg/L
(3) 244 mg/L (4) 293 mg/L
53. In an activated sludge process, the settled sludge volume after 30 min is 250 mL/L and the MLSS is 2500 mg/L. The sludge volume index (SVI) is :
- (1) 25 mL/g (2) 40 mL/g
(3) 62.5 mL/g (4) 100 mL/g
54. A spherical particle of diameter 0.05 mm and density 2650 kg/m³ settles in water ($\rho = 1000 \text{ kg/m}^3$, $\mu = 1 \times 10^{-3} \text{ Pa.s}$) under Stokes' law. The settling velocity is approximately :
- (1) 0.225 mm/s (2) 2.25 mm/s
(3) 22.5 mm/s (4) 225 mm/s
55. As per Greenshields' model, free-flow speed is 80 km/h and jam density is 120 veh/km. The maximum flow (capacity) is :
- (1) 600 veh/h (2) 1200 veh/h
(3) 2400 veh/h (4) 4800 veh/h
56. A transition curve is to be provided for a design speed of 80 km/h and a circular curve radius of 300 m. Taking the rate of change of centripetal acceleration as 0.5 m/s³, the length of transition is approximately :
- (1) 37 m (2) 55 m
(3) 73 m (4) 146 m
57. In tachemetry with an inclined line of sight, the staff intercept is 1.5 m, the multiplying constant is 100, the additive constant is zero and the vertical angle is 10°. The horizontal distance is approximately :
- (1) 145.5 m (2) 147.7 m
(3) 150.0 m (4) 151.0 m
58. The offsets from a survey line at 10 m intervals are 2.0, 3.2, 4.0, 3.6 and 2.4 m. By Simpson's rule, the area between the line and the boundary is :
- (1) 120 m² (2) 126 m²
(3) 130 m² (4) 132 m²

59. The expected duration of a critical path is 36 days with a variance of 16 days². Assuming normal distribution ($z = 1.00 \Rightarrow 84.1\%$), the probability of completing the project in 40 days is :
- (1) 68.3% (2) 84.1%
(3) 97.7% (4) 99.9%
60. A rectangular channel carries a discharge per unit width of 4 m²/s. The critical depth is approximately :
- (1) 0.82 m (2) 1.18 m
(3) 1.50 m (4) 2.00 m
61. A solid circular steel shaft of diameter 100 mm transmits a torque of 10 kN·m. The maximum torsional shear stress is approximately :
- (1) 25.5 MPa (2) 40.0 MPa
(3) 50.9 MPa (4) 101.9 MPa
62. A crop has a duty of 1800 hectares per cumec over a base period of 120 days. Its corresponding delta is approximately :
- (1) 0.48 m (2) 0.576 m
(3) 0.72 m (4) 1.20 m
63. The Mohr-Coulomb shear strength equation for soil is:
- (1) $\tau = c + \sigma \tan \phi$ (2) $\tau = c - \sigma \tan \phi$
(3) $\tau = \sigma/c + \tan \phi$ (4) $\tau = c\sigma \tan \phi$

64. For a soil with $G_s = 2.65$ and $e = 0.65$, the critical hydraulic gradient for quicksand condition is approximately :

- (1) 0.65 (2) 0.80
(3) 1.00 (4) 1.65

65. Using Webster's approximate formula :

$$C_0 = \frac{1.5L + 5}{1 - Y}$$

if total lost time $L = 12$ s and critical flow ratio $Y = 0.70$, the optimum cycle is approximately :

- (1) 50.0 s (2) 66.7 s
(3) 76.7 s (4) 90.0 s

66. A town has a population of 100,000 and a water demand of 135 litres per capita per day. The average daily demand is :

- (1) 9.5 MLD (2) 10.0 MLD
(3) 13.5 MLD (4) 18.0 MLD

67. In railway engineering, cant refers to :

- (1) Longitudinal gradient of the track
(2) Rail section thickness
(3) Rail length
(4) Difference in elevation between the two rails on a curve

68. The void ratio of a soil is defined as :

- (1) Volume of voids / total volume
- (2) Volume of solids / volume of voids
- (3) Volume of voids / volume of solids
- (4) Volume of solids / total volume

69. The purpose of breakpoint chlorination is primarily to :

- (1) Satisfy chlorine demand and establish a useful free residual
- (2) Remove hardness
- (3) Remove suspended solids by sedimentation
- (4) Increase alkalinity

70. A compacted soil has a bulk unit weight of 18 kN/m^3 and water content of 12%. Its dry unit weight is approximately :

- (1) 16.1 kN/m^3
- (2) 14.4 kN/m^3
- (3) 17.0 kN/m^3
- (4) 20.2 kN/m^3

71. For a closed traverse, the algebraic sums of latitude and departure are :

$$\sum L = +0.12 \text{ m}, \sum D = -0.16 \text{ m}.$$

The magnitude of the linear closing error is :

- (1) 0.04 m
- (2) 0.12 m
- (3) 0.16 m
- (4) 0.20 m

72. A treadle bar is used for :

- (1) Interlocking points and signal
- (2) Setting points and crossings
- (3) Setting marshalling yard signals
- (4) Track maintenance

73. For M25 grade concrete with creep coefficient of 1.5, the long term static modulus of elasticity (expressed in MPa) as per provisions of IS : 456 2000 is :

- (1) 5000
- (2) 7500
- (3) 10000
- (4) 25000

74. Activated sludge is the :

- (1) Sludge in the secondary tank after aeration and rich in microbial masses
- (2) Sludge in the secondary tank after aeration and rich in nutrients
- (3) Sludge settled in the humus tank
- (4) Aerated sludge in the aeration unit

75. Sinking fund is :

- (1) the fund for rebuilding a structure when its economic life is over
- (2) Raised to meet maintenance costs
- (3) the total sum to be paid to municipal authorities by the tenants
- (4) A part of the money kept in reserve for providing additional structures and structural modifications

76. Undisturbed soil samples are required for conducting :

- (1) Consolidation test
- (2) Specific gravity test
- (3) Shrinkage limit test
- (4) Hydrometer test

77. A beam of rectangular cross-section is 100 mm wide and 200 mm deep. If the section is subjected to a shear force of 20 kN, then the maximum shear stress in the section is :
- (1) 1 N/mm² (2) 1.125 N/mm²
 (3) 1.33 N/mm² (4) 1.5 N/mm²
78. Two bars of different materials are of the same size and are subjected to same tensile forces. If the bars have unit elongations in the ratio of 4 : 7, then the ratio of moduli of elasticity of the two materials is :
- (1) 7 : 4 (2) 4 : 7
 (3) 4 : 17 (4) 16 : 49
79. The hydraulic radius of a circular pipe of diameter D flowing full is :
- (1) D/2 (2) D/3
 (3) D (4) D/4
80. The discharge over a sharp-crested rectangular weir is proportional to the head H raised to the power :
- (1) 3/2 (2) 1/2
 (3) 1 (4) 5/2
81. Cavitation in hydraulic machines occurs when the local pressure falls below :
- (1) The stagnation pressure
 (2) Atmospheric pressure
 (3) The critical pressure of the liquid
 (4) The vapour pressure of the liquid

82. In the activated sludge process, the aeration tank volume is 2000 m³ and the MLSS is 3000 mg/L. Sludge is wasted at 100 m³/day with a concentration of 10,000 mg/L (no solids in the effluent). What is the mean cell residence time (SRT) ?
- (1) 3 days (2) 6 days
 (3) 10 days (4) 12 days
83. A circular sedimentation tank receives 4000 m³/day and has a surface area of 100 m². The surface overflow rate is :
- (1) 20 m³/m²/day (2) 40 m³/m²/day
 (3) 80 m³/m²/day (4) 400 m³/m²/day
84. Two identical noise sources each produce 60 dB at a point. The combined sound level is approximately :
- (1) 60 dB (2) 63 dB
 (3) 90 dB (4) 120 dB
85. A vehicle travels at 72 km/h with a reaction time of 2.5 s and a coefficient of friction of 0.35 (level road). The stopping sight distance is approximately:
- (1) 78 m (2) 98 m
 (3) 108 m (4) 128 m
86. In the CBR test, the standard load for 2.5 mm penetration is :
- (1) 1020 kg (2) 1370 kg
 (3) 2055 kg (4) 2630 kg

87. If the fore bearing of a line is 125° , its back bearing is :

- | | |
|-----------------|-----------------|
| (1) 55° | (2) 125° |
| (3) 235° | (4) 305° |

88. The minimum number of GPS satellites required to determine a three-dimensional position fix (including receiver clock error) is :

- | | |
|-------|-------|
| (1) 2 | (2) 3 |
| (3) 4 | (4) 6 |

89. A material has $E = 200$ GPa and $G = 80$ GPa. Its Poisson's ratio is :

- | | |
|----------|----------|
| (1) 0.20 | (2) 0.25 |
| (3) 0.30 | (4) 0.50 |

90. At a point, $\sigma_x = 80$ MPa, $\sigma_y = 0$ and $\tau_{xy} = 30$ MPa. The maximum principal stress is :

- | | |
|-------------|-------------|
| (1) 80 MPa | (2) 90 MPa |
| (3) 100 MPa | (4) 110 MPa |

91. The radius of gyration of a solid circular section of diameter d about a centroidal axis is :

- | | |
|------------------|-----------|
| (1) $d/8$ | (2) $d/2$ |
| (3) $d/\sqrt{2}$ | (4) $d/4$ |

92. The shape factor of a solid circular section is :

- | | |
|----------|----------|
| (1) 1.27 | (2) 1.50 |
| (3) 1.70 | (4) 2.00 |

93. A singly reinforced beam has $b = 250$ mm, $d = 450$ mm, $A_{st} = 1000$ mm², M20 concrete and Fe415 steel. Using IS 456 : 2000, the ultimate moment of resistance is approximately :

- | | |
|----------------|----------------|
| (1) 118.6 kN·m | (2) 132.1 kN·m |
| (3) 139.7 kN·m | (4) 161.0 kN·m |

94. As per IS 800 : 2007, the design shear capacity of a single M20 bolt of grade 8.8 ($f_{ub} = 800$ MPa) in single shear with the threaded portion in the shear plane ($A_{nb} = 0.78 \times$ gross area, $\gamma_{mb} = 1.25$) is approximately :

- | | |
|--------------|--------------|
| (1) 62.8 kN | (2) 90.5 kN |
| (3) 113.2 kN | (4) 144.8 kN |

95. The water table is at 2 m depth in a deposit with $\gamma = 18$ kN/m³ above it and $\gamma_{sat} = 20$ kN/m³ below it. Taking $\gamma_w = 9.81$ kN/m³, the effective vertical stress at 6 m depth is :

- | | |
|--------------|---------------|
| (1) 36.0 kPa | (2) 76.8 kPa |
| (3) 96.0 kPa | (4) 120.0 kPa |

(For Rough Work Only)

96. Water flows at 2 m/s in a rigid pipe in which the wave speed is 1400 m/s. If the flow is stopped suddenly, the pressure rise is :
- (1) 0.28 MPa (2) 0.56 MPa
(3) 1.4 MPa (4) 2.8 MPa
97. A rectangular channel of width 6 m carries water at a depth of 2 m. Taking Manning's $n = 0.015$ and bed slope 0.0004, the discharge is approximately :
- (1) 9.0 m³/s (2) 12.0 m³/s
(3) 15.1 m³/s (4) 18.1 m³/s
98. A pump delivers 0.05 m³/s against a total head of 30 m with an overall efficiency of 70%. Taking $\gamma_w = 9.81$ kN/m³, the input power required is approximately :
- (1) 10.3 kW (2) 14.7 kW
(3) 21.0 kW (4) 30.0 kW
99. The probability that a 50-year flood is equalled or exceeded at least once in the next 10 years is approximately :
- (1) 0.18 (2) 0.20
(3) 0.40 (4) 0.50
100. Hourly rainfall of 20, 40 and 30 mm/h on a catchment produces a direct runoff depth of 40 mm. The ϕ -index is :
- (1) 16.7 mm/h (2) 20.0 mm/h
(3) 25.0 mm/h (4) 30.0 mm/h

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE
ASKED TO DO SO)

PH.D.-EE-October, 2026 (Civil Engineering (UIET))



100012

Sr. No.

Time : 1½ Hours

Max. Marks : 100

Total Questions : 100

Roll No. _____ (in figure) _____ (in words)

Name _____ Father's Name _____

Mother's Name _____ Date of Examination _____

(Signature of the Candidate)

(Signature of the Invigilator)

**CANDIDATES MUST READ THE FOLLOWING INFORMATION/ INSTRUCTIONS
BEFORE STARTING THE QUESTION PAPER.**

1. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Discrepancy, if any, should be immediately reported to the invigilator and should ask for replacement of Question booklet / OMR Answer Sheet. **Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after start of the examination.**
2. All questions are compulsory. There will be no negative marking. Each correct answer will be awarded one full mark.
3. For each question, four suggested answers (1), (2), (3), (4) are given. The candidate is to choose only one answer which he / she considers the correct or best one. If the candidate darkens more than one circle or cutting / over writing / erasing, then such answer(s) shall not be evaluated.
4. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the space provided in the end of question booklet. Answers **MUST NOT** be ticked in the Question book-let.
5. Use only Black or Blue **BALL POINT PEN** of good quality in the OMR Answer-Sheet.
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(For Rough Work Only)

1. For a distribution with open-ended class intervals, the most suitable average is the :

- | | |
|--------------------|---------------------|
| (1) Geometric mean | (2) Median |
| (3) Harmonic mean | (4) Arithmetic mean |

2. If the mean of a moderately skewed distribution is 20 and the median is 18, the mode is approximately :

- | | |
|--------|--------|
| (1) 14 | (2) 16 |
| (3) 18 | (4) 22 |

3. SPSS stands for :

- (1) Statistical Process for Survey Studies
- (2) Scientific Package for Statistical Sampling
- (3) Statistical Package for the Social Sciences
- (4) Standard Programme for Social Surveys

4. In MS Excel, the function used to find the arithmetic mean of a range of cells is :

- | | |
|-------------|-------------|
| (1) TOTAL | (2) MEAN |
| (3) AVERAGE | (4) SUMMARY |

5. A graph that shows the relationship between two numerical variables is a :

- | | |
|---------------|------------------|
| (1) Pictogram | (2) Pie chart |
| (3) Histogram | (4) Scatter plot |

6. In MS Excel, the function CORREL returns :
- (1) The standard deviation of a data set
 - (2) The correlation coefficient between two data sets
 - (3) The number of cells in a range
 - (4) The regression intercept
7. The base of the hexadecimal number system is :
- (1) 2
 - (2) 8
 - (3) 10
 - (4) 16
8. The decimal equivalent of the binary number 1011 is :
- (1) 9
 - (2) 10
 - (3) 11
 - (4) 13
9. The binary equivalent of the decimal number 25 is :
- (1) 11001
 - (2) 11010
 - (3) 10101
 - (4) 10011
10. The hexadecimal equivalent of the decimal number 255 is :
- (1) EF
 - (2) 100
 - (3) FF
 - (4) FE
11. The octal equivalent of the binary number 110101 is :
- (1) 35
 - (2) 53
 - (3) 65
 - (4) 56

12. Which learner characteristic is most directly related to the ability to process, analyze and interpret information ?
- (1) Cognitive characteristic
 - (2) Physical characteristic
 - (3) Institutional characteristic
 - (4) Financial characteristic
13. Which level of teaching promotes critical thinking and problem-solving ?
- (1) Memory level
 - (2) Understanding level
 - (3) Reflective level
 - (4) Informative level
14. Which type of evaluation is conducted during the teaching-learning process ?
- (1) Placement evaluation
 - (2) Summative evaluation
 - (3) Terminal evaluation
 - (4) Formative evaluation
15. Exploratory research is particularly useful when :
- (1) The research problem is already completely understood
 - (2) Little is known about the research problem
 - (3) The findings have already been established conclusively
 - (4) No literature review is required
16. Which statement best represents the post-positivist view ?
- (1) All scientific conclusions are absolutely certain
 - (2) Knowledge is provisional and subject to revision based on evidence
 - (3) Evidence is irrelevant
 - (4) Reality cannot be investigated systematically

17. Which sequence is most appropriate ?

- (1) Problem identification → Data collection → Data analysis → Literature review → Conclusion
- (2) Research design → Problem identification → Literature review → Data collection → Data analysis
- (3) Problem identification → Literature review → Research design → Data collection → Data analysis
- (4) Literature review → Research design → Problem identification → Data collection → Conclusion

Read the following passage carefully and answer questions 18 to 20 based on this passage :

The rapid development of technology has changed the nature of work and increased the importance of lifelong learning. Knowledge and skills acquired at the beginning of a career may become insufficient as new technologies, processes and organizational practices emerge. Lifelong learning does not necessarily mean returning to formal education every few years. It can include professional training, online courses, workplace learning, reading, mentoring, participation in professional communities and independent study. An important feature of lifelong learning is the ability to identify one's own learning needs and take appropriate action. Organizations also have a role to play by creating opportunities for employees to acquire new skills. Thus, lifelong learning is both an individual responsibility and an institutional concern.

18. Why may knowledge acquired at the beginning of a career become insufficient ?

- (1) People forget everything they learn
- (2) New technologies and work practices emerge
- (3) Formal education is always ineffective
- (4) Organizations stop using technology

19. An important feature of lifelong learning is the ability to :

- (1) Depend entirely on an institution
- (2) Identify one's own learning needs
- (3) Avoid new technology
- (4) Stop learning after graduation

20. What conclusion can be drawn from the passage ?

- (1) Lifelong learning is solely the responsibility of individuals
- (2) Lifelong learning is solely the responsibility of organizations
- (3) Both individuals and organizations have roles in lifelong learning
- (4) Lifelong learning is unnecessary for experienced workers

21. Which of the following is not a characteristic of effective communication ?

- (1) Clarity
- (2) Completeness
- (3) Ambiguity
- (4) Correctness

22. The study of communication through body movement is commonly called :

- | | |
|---------------|---------------|
| (1) Proxemics | (2) Kinesics |
| (3) Semantics | (4) Phonetics |

23. Eye contact during communication can help to :

- (1) Indicate attention and engagement
- (2) Always eliminate communication barriers
- (3) Replace all verbal communication
- (4) Guarantee agreement

24. A barrier in effective communication caused by differences in the meanings of words is called :

- | | |
|------------------------|----------------------------|
| (1) Physical barrier | (2) Organizational barrier |
| (3) Mechanical barrier | (4) Semantic barrier |

25. A researcher observes that several metals expand on heating and concludes that metals generally expand on heating. This is :

- | | |
|-------------------------|-------------------------|
| (1) Deductive reasoning | (2) Inductive reasoning |
| (3) Circular reasoning | (4) Verbal reasoning |

26. Find the next number :

100, 90, 81, 73, 66, ?

- | | |
|--------|--------|
| (1) 58 | (2) 59 |
| (3) 60 | (4) 61 |

27. X is the sister of Y. Y is the father of Z. How is X related to Z ?

- | | |
|------------|-----------------|
| (1) Mother | (2) Grandmother |
| (3) Sister | (4) Aunt |

28. If the price of a commodity is increased by 20% and then decreased by 20%, the net change is :

- | | |
|-----------------|-----------------|
| (1) No change | (2) 2% increase |
| (3) 4% decrease | (4) 4% increase |

29. The average of 6 numbers is 20. If one number, 30, is removed, the average of the remaining numbers is :

- | | |
|--------|--------|
| (1) 16 | (2) 18 |
| (3) 20 | (4) 22 |

30. Misrepresenting an opponent's argument to make it easier to attack is :

- | | |
|--------------------------|--------------------|
| (1) Straw man | (2) Appeal to pity |
| (3) Begging the question | (4) Equivocation |

31. In the inference "The hill has fire because it has smoke," smoke is the :

- | | |
|------------|------------|
| (1) Paksha | (2) Sadhya |
| (3) Hetu | (4) Vyapti |

32. Which of the following is most closely associated with an invalid or defective inferential reason ?

- | | |
|----------------|----------------|
| (1) Hetvabhasa | (2) Pratyaksha |
| (3) Shabda | (4) Upamana |

33. Which of the following represents discrete data ?

- | | |
|------------------------|------------|
| (1) Temperature | (2) Height |
| (3) Number of machines | (4) Weight |

34. A category representing 25% of the total data would occupy what angle in a pie chart ?

- | | |
|---------|----------|
| (1) 45° | (2) 60° |
| (3) 90° | (4) 120° |

35. Which measure is least affected by an extremely large or extremely small observation ?

- | | |
|------------------------|--------------|
| (1) Mean | (2) Median |
| (3) Arithmetic average | (4) Variance |

36. A system that translates domain names into IP addresses is :

- | | |
|----------|-------------------|
| (1) HTML | (2) SMTP |
| (3) FTP | (4) None of these |

37. Questionnaires, interview schedules and raw tables are usually placed in a thesis as :

- | | |
|--------------|----------------|
| (1) Preface | (2) Footnotes |
| (3) Abstract | (4) Appendices |

38. A pre-writing consideration in report writing is to :

- (1) Submit the report to the library
- (2) Print the title page
- (3) Bind the final copy
- (4) Prepare an outline and decide the intended audience

39. The preliminary pages of a thesis (certificate, acknowledgements, contents) are usually numbered in :

- (1) Roman numerals
- (2) Arabic numerals starting from 100
- (3) Capital letters
- (4) Fractions

40. A detailed scholarly work on a single subject, usually by one author, is called a :

- | | |
|----------------|---------------|
| (1) Newsletter | (2) Editorial |
| (3) Abstract | (4) Monograph |

41. A journal paper that critically summarises and evaluates existing research on a topic is a/an :

- | | |
|--------------------------|---------------|
| (1) Review article | (2) Erratum |
| (3) Letter to the editor | (4) Editorial |

42. A bibliography is normally arranged :

- (1) Alphabetically by the author's surname
- (2) By the number of pages
- (3) By the colour of the cover
- (4) By the date of purchase

43. The abbreviation 'Ibid.' in a footnote refers to :

- (1) The same source as the immediately preceding note
- (2) A source cited earlier but not immediately before
- (3) An unpublished source
- (4) The author's own earlier work

44. Footnotes are generally placed :

- (1) At the beginning of the thesis
- (2) On the cover page
- (3) Only in the abstract
- (4) At the bottom of the page on which the reference occurs

45. The citation style that gives the author's surname and year of publication in the text is :

- | | |
|--------------------------|--------------------------|
| (1) ISSN system | (2) APA style |
| (3) Colon Classification | (4) Dewey Decimal System |

46. The abbreviation 'op. cit.' means :

- | | |
|-------------------------------|-----------------------|
| (1) And others | (2) In the same place |
| (3) In the work already cited | (4) Compare with |

47. The arithmetic mean of 5, 7, 9, 11 and 13 is :

- | | |
|-------|--------|
| (1) 7 | (2) 8 |
| (3) 9 | (4) 10 |

48. The median of 3, 8, 5, 10 and 2 is :

- | | |
|-------|--------|
| (1) 3 | (2) 5 |
| (3) 8 | (4) 10 |

49. The mode of 2, 3, 3, 4, 5, 3, 6 is :

- | | |
|-------|-------|
| (1) 3 | (2) 4 |
| (3) 5 | (4) 6 |

50. Which measure of central tendency is most affected by extreme values ?

- | | |
|---------------------|--------------|
| (1) Median | (2) Quartile |
| (3) Arithmetic mean | (4) Mode |

51. For a soil with $G_s = 2.65$ and $e = 0.65$, the critical hydraulic gradient for quicksand condition is approximately :

- (1) 0.65 (2) 0.80
(3) 1.00 (4) 1.65

52. Using Webster's approximate formula :

$$C_0 = \frac{1.5L + 5}{1 - Y}$$

if total lost time $L = 12$ s and critical flow ratio $Y = 0.70$, the optimum cycle is approximately :

- (1) 50.0 s (2) 66.7 s
(3) 76.7 s (4) 90.0 s

53. A town has a population of 100,000 and a water demand of 135 litres per capita per day. The average daily demand is :

- (1) 9.5 MLD (2) 10.0 MLD
(3) 13.5 MLD (4) 18.0 MLD

54. In railway engineering, cant refers to :

- (1) Longitudinal gradient of the track
(2) Rail section thickness
(3) Rail length
(4) Difference in elevation between the two rails on a curve

55. The void ratio of a soil is defined as :

- (1) Volume of voids / total volume
(2) Volume of solids / volume of voids
(3) Volume of voids / volume of solids
(4) Volume of solids / total volume

56. The purpose of breakpoint chlorination is primarily to :

- (1) Satisfy chlorine demand and establish a useful free residual
(2) Remove hardness
(3) Remove suspended solids by sedimentation
(4) Increase alkalinity

57. A compacted soil has a bulk unit weight of 18 kN/m^3 and water content of 12%. Its dry unit weight is approximately :

- (1) 16.1 kN/m^3 (2) 14.4 kN/m^3
(3) 17.0 kN/m^3 (4) 20.2 kN/m^3

58. For a closed traverse, the algebraic sums of latitude and departure are :

$$\sum L = +0.12 \text{ m}, \sum D = -0.16 \text{ m}.$$

The magnitude of the linear closing error is :

- (1) 0.04 m (2) 0.12 m
(3) 0.16 m (4) 0.20 m

59. A treadle bar is used for :

- (1) Interlocking points and signal
- (2) Setting points and crossings
- (3) Setting marshalling yard signals
- (4) Track maintenance

60. For M25 grade concrete with creep coefficient of 1.5, the long term static modulus of elasticity (expressed in MPa) as per provisions of IS : 456 2000 is :

- (1) 5000
- (2) 7500
- (3) 10000
- (4) 25000

61. Activated sludge is the :

- (1) Sludge in the secondary tank after aeration and rich in microbial masses
- (2) Sludge in the secondary tank after aeration and rich in nutrients
- (3) Sludge settled in the humus tank
- (4) Aerated sludge in the aeration unit

62. Sinking fund is :

- (1) the fund for rebuilding a structure when its economic life is over
- (2) Raised to meet maintenance costs
- (3) the total sum to be paid to municipal authorities by the tenants
- (4) A part of the money kept in reserve for providing additional structures and structural modifications

63. Undisturbed soil samples are required for conducting :

- (1) Consolidation test
- (2) Specific gravity test
- (3) Shrinkage limit test
- (4) Hydrometer test

64. A beam of rectangular cross-section is 100 mm wide and 200 mm deep. If the section is subjected to a shear force of 20 kN, then the maximum shear stress in the section is :

- (1) 1 N/mm²
- (2) 1.125 N/mm²
- (3) 1.33 N/mm²
- (4) 1.5 N/mm²

65. Two bars of different materials are of the same size and are subjected to same tensile forces. If the bars have unit elongations in the ratio of 4 : 7, then the ratio of moduli of elasticity of the two materials is :

- (1) 7 : 4
- (2) 4 : 7
- (3) 4 : 17
- (4) 16 : 49

66. The hydraulic radius of a circular pipe of diameter D flowing full is :

- (1) D/2
- (2) D/3
- (3) D
- (4) D/4

67. The discharge over a sharp-crested rectangular weir is proportional to the head H raised to the power :

- (1) 3/2
- (2) 1/2
- (3) 1
- (4) 5/2

68. Cavitation in hydraulic machines occurs when the local pressure falls below :

- (1) The stagnation pressure
- (2) Atmospheric pressure
- (3) The critical pressure of the liquid
- (4) The vapour pressure of the liquid

69. In the activated sludge process, the aeration tank volume is 2000 m^3 and the MLSS is 3000 mg/L . Sludge is wasted at $100 \text{ m}^3/\text{day}$ with a concentration of $10,000 \text{ mg/L}$ (no solids in the effluent). What is the mean cell residence time (SRT) ?

- (1) 3 days (2) 6 days
(3) 10 days (4) 12 days

70. A circular sedimentation tank receives $4000 \text{ m}^3/\text{day}$ and has a surface area of 100 m^2 . The surface overflow rate is :

- (1) $20 \text{ m}^3/\text{m}^2/\text{day}$ (2) $40 \text{ m}^3/\text{m}^2/\text{day}$
(3) $80 \text{ m}^3/\text{m}^2/\text{day}$ (4) $400 \text{ m}^3/\text{m}^2/\text{day}$

71. Two identical noise sources each produce 60 dB at a point. The combined sound level is approximately :

- (1) 60 dB (2) 63 dB
(3) 90 dB (4) 120 dB

72. A vehicle travels at 72 km/h with a reaction time of 2.5 s and a coefficient of friction of 0.35 (level road). The stopping sight distance is approximately:

- (1) 78 m (2) 98 m
(3) 108 m (4) 128 m

73. In the CBR test, the standard load for 2.5 mm penetration is :

- (1) 1020 kg (2) 1370 kg
(3) 2055 kg (4) 2630 kg

74. If the fore bearing of a line is 125° , its back bearing is :

- (1) 55° (2) 125°
(3) 235° (4) 305°

75. The minimum number of GPS satellites required to determine a three-dimensional position fix (including receiver clock error) is :

- (1) 2 (2) 3
(3) 4 (4) 6

76. A material has $E = 200 \text{ GPa}$ and $G = 80 \text{ GPa}$. Its Poisson's ratio is :

- (1) 0.20 (2) 0.25
(3) 0.30 (4) 0.50

77. At a point, $\sigma_x = 80 \text{ MPa}$, $\sigma_y = 0$ and $\tau_{xy} = 30 \text{ MPa}$. The maximum principal stress is :

- (1) 80 MPa (2) 90 MPa
(3) 100 MPa (4) 110 MPa

78. The radius of gyration of a solid circular section of diameter d about a centroidal axis is :

- (1) $d/8$ (2) $d/2$
(3) $d/\sqrt{2}$ (4) $d/4$

79. The shape factor of a solid circular section is :

- | | |
|----------|----------|
| (1) 1.27 | (2) 1.50 |
| (3) 1.70 | (4) 2.00 |

80. A singly reinforced beam has $b = 250$ mm, $d = 450$ mm, $A_{st} = 1000$ mm², M20 concrete and Fe415 steel. Using IS 456 : 2000, the ultimate moment of resistance is approximately :

- | | |
|----------------|----------------|
| (1) 118.6 kN·m | (2) 132.1 kN·m |
| (3) 139.7 kN·m | (4) 161.0 kN·m |

81. As per IS 800 : 2007, the design shear capacity of a single M20 bolt of grade 8.8 ($f_{ub} = 800$ MPa) in single shear with the threaded portion in the shear plane ($A_{nb} = 0.78 \times$ gross area, $\gamma_{mb} = 1.25$) is approximately :

- | | |
|--------------|--------------|
| (1) 62.8 kN | (2) 90.5 kN |
| (3) 113.2 kN | (4) 144.8 kN |

82. The water table is at 2 m depth in a deposit with $\gamma = 18$ kN/m³ above it and $\gamma_{sat} = 20$ kN/m³ below it. Taking $\gamma_w = 9.81$ kN/m³, the effective vertical stress at 6 m depth is :

- | | |
|--------------|---------------|
| (1) 36.0 kPa | (2) 76.8 kPa |
| (3) 96.0 kPa | (4) 120.0 kPa |

83. Water flows at 2 m/s in a rigid pipe in which the wave speed is 1400 m/s. If the flow is stopped suddenly, the pressure rise is :

- | | |
|--------------|--------------|
| (1) 0.28 MPa | (2) 0.56 MPa |
| (3) 1.4 MPa | (4) 2.8 MPa |

84. A rectangular channel of width 6 m carries water at a depth of 2 m. Taking Manning's $n = 0.015$ and bed slope 0.0004, the discharge is approximately :

- | | |
|----------------------------|----------------------------|
| (1) 9.0 m ³ /s | (2) 12.0 m ³ /s |
| (3) 15.1 m ³ /s | (4) 18.1 m ³ /s |

85. A pump delivers 0.05 m³/s against a total head of 30 m with an overall efficiency of 70%. Taking $\gamma_w = 9.81$ kN/m³, the input power required is approximately :

- | | |
|-------------|-------------|
| (1) 10.3 kW | (2) 14.7 kW |
| (3) 21.0 kW | (4) 30.0 kW |

86. The probability that a 50-year flood is equalled or exceeded at least once in the next 10 years is approximately :

- | | |
|----------|----------|
| (1) 0.18 | (2) 0.20 |
| (3) 0.40 | (4) 0.50 |

87. Hourly rainfall of 20, 40 and 30 mm/h on a catchment produces a direct runoff depth of 40 mm. The ϕ -index is :

- | | |
|---------------|---------------|
| (1) 16.7 mm/h | (2) 20.0 mm/h |
| (3) 25.0 mm/h | (4) 30.0 mm/h |

88. A canal commands 1000 ha with a peak consumptive use of 8 mm/day. With field application efficiency of 60% and conveyance efficiency of 80%, the required discharge at the canal head is approximately :

- | | |
|----------------------------|----------------------------|
| (1) 0.93 m ³ /s | (2) 1.45 m ³ /s |
| (3) 1.93 m ³ /s | (4) 3.86 m ³ /s |

89. A wastewater has a 5-day BOD of 200 mg/L at 20 °C and a BOD rate constant $k = 0.23 \text{ d}^{-1}$ (base e). Its ultimate BOD is approximately :

- | | |
|--------------|--------------|
| (1) 150 mg/L | (2) 200 mg/L |
| (3) 244 mg/L | (4) 293 mg/L |

90. In an activated sludge process, the settled sludge volume after 30 min is 250 mL/L and the MLSS is 2500 mg/L. The sludge volume index (SVI) is :

- | | |
|---------------|--------------|
| (1) 25 mL/g | (2) 40 mL/g |
| (3) 62.5 mL/g | (4) 100 mL/g |

91. A spherical particle of diameter 0.05 mm and density 2650 kg/m³ settles in water ($\rho = 1000 \text{ kg/m}^3$, $\mu = 1 \times 10^{-3} \text{ Pa.s}$) under Stokes' law. The settling velocity is approximately :

- | | |
|----------------|---------------|
| (1) 0.225 mm/s | (2) 2.25 mm/s |
| (3) 22.5 mm/s | (4) 225 mm/s |

92. As per Greenshields' model, free-flow speed is 80 km/h and jam density is 120 veh/km. The maximum flow (capacity) is :

- | | |
|----------------|----------------|
| (1) 600 veh/h | (2) 1200 veh/h |
| (3) 2400 veh/h | (4) 4800 veh/h |

93. A transition curve is to be provided for a design speed of 80 km/h and a circular curve radius of 300 m. Taking the rate of change of centripetal acceleration as 0.5 m/s³, the length of transition is approximately :

- | | |
|----------|-----------|
| (1) 37 m | (2) 55 m |
| (3) 73 m | (4) 146 m |

94. In tacheometry with an inclined line of sight, the staff intercept is 1.5 m, the multiplying constant is 100, the additive constant is zero and the vertical angle is 10°. The horizontal distance is approximately :

- | | |
|-------------|-------------|
| (1) 145.5 m | (2) 147.7 m |
| (3) 150.0 m | (4) 151.0 m |

95. The offsets from a survey line at 10 m intervals are 2.0, 3.2, 4.0, 3.6 and 2.4 m. By Simpson's rule, the area between the line and the boundary is :

- | | |
|------------------------|------------------------|
| (1) 120 m ² | (2) 126 m ² |
| (3) 130 m ² | (4) 132 m ² |

96. The expected duration of a critical path is 36 days with a variance of 16 days². Assuming normal distribution ($z = 1.00 \Rightarrow 84.1\%$), the probability of completing the project in 40 days is :

- | | |
|-----------|-----------|
| (1) 68.3% | (2) 84.1% |
| (3) 97.7% | (4) 99.9% |

97. A rectangular channel carries a discharge per unit width of 4 m²/s. The critical depth is approximately :

- | | |
|------------|------------|
| (1) 0.82 m | (2) 1.18 m |
| (3) 1.50 m | (4) 2.00 m |

98. A solid circular steel shaft of diameter 100 mm transmits a torque of 10 kN·m. The maximum torsional shear stress is approximately :

- | | |
|--------------|---------------|
| (1) 25.5 MPa | (2) 40.0 MPa |
| (3) 50.9 MPa | (4) 101.9 MPa |

99. A crop has a duty of 1800 hectares per cumec over a base period of 120 days. Its corresponding delta is approximately :

- | | |
|------------|-------------|
| (1) 0.48 m | (2) 0.576 m |
| (3) 0.72 m | (4) 1.20 m |

100. The Mohr-Coulomb shear strength equation for soil is:

- | | |
|-----------------------------------|-----------------------------------|
| (1) $\tau = c + \sigma \tan \phi$ | (2) $\tau = c - \sigma \tan \phi$ |
| (3) $\tau = \sigma/c + \tan \phi$ | (4) $\tau = c\sigma \tan \phi$ |

Answer keys for Ph.D (CIVIL)-UIET entrance exam held on 23.10.2026

Q. NO.	A	B	C	D
1	1	2	4	2
2	3	1	4	1
3	4	4	1	3
4	2	2	4	3
5	2	3	1	4
6	3	4	1	2
7	2	3	1	4
8	2	2	4	3
9	3	1	2	1
10	3	3	3	3
11	2	1	3	3
12	1	3	2	1
13	4	3	1	3
14	2	2	3	4
15	3	4	2	2
16	4	4	1	2
17	3	4	3	3
18	2	1	3	2
19	1	4	4	2
20	3	1	2	3
21	1	1	4	3
22	3	1	3	2
23	3	4	1	1
24	2	2	3	4
25	4	3	3	2
26	4	3	1	3
27	4	2	3	4
28	1	1	4	3
29	4	3	2	2
30	1	2	2	1
31	1	1	3	3
32	1	3	2	1
33	4	3	2	3
34	2	4	3	3
35	3	2	3	2
36	3	4	2	4
37	2	3	1	4
38	1	1	4	4
39	3	3	2	1
40	2	3	3	4
41	1	1	4	1
42	3	3	3	1
43	3	4	2	1
44	4	2	1	4
45	2	2	3	2
46	4	3	1	3
47	3	2	3	3
48	1	2	3	2
49	3	3	2	1
50	3	3	4	3

Narayan Kumar
23/10/26

Mineet
23/10/26

[Signature]
23/10/26

Answer keys for Ph.D (CIVIL)-UIET entrance exam held on 23.10.2026

Q. NO.	A	B	C	D
51	4	4	3	3
52	1	3	4	3
53	4	2	4	3
54	1	2	2	4
55	4	4	3	3
56	2	3	3	1
57	2	2	1	1
58	2	2	4	4
59	3	2	2	1
60	2	4	2	3
61	4	4	3	1
62	3	3	2	1
63	2	1	1	1
64	2	1	3	4
65	4	3	3	1
66	3	4	3	4
67	2	4	4	1
68	2	2	3	4
69	2	3	1	2
70	4	3	1	2
71	4	1	4	2
72	3	4	1	3
73	1	2	3	2
74	1	2	1	4
75	3	3	1	3
76	4	2	1	2
77	4	1	4	2
78	2	3	1	4
79	3	3	4	3
80	3	3	1	2
81	1	4	4	2
82	4	3	2	2
83	2	1	2	4
84	2	1	2	4
85	3	4	3	3
86	2	1	2	1
87	1	3	4	1
88	3	1	3	3
89	3	1	2	4
90	3	1	2	4
91	4	4	4	2
92	3	1	3	3
93	1	4	2	3
94	1	1	2	1
95	4	4	2	4
96	1	2	4	2
97	3	2	4	2
98	1	2	3	3
99	1	3	1	2
100	1	2	1	1

Navin Khatkhat
23/10/26

Mineet
23/10/26

[Signature]
23/10/26