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ENTRANCE EXAMINATION – JULY 2016

QUESTION PAPER

PROGRAMME : Ph. D

CIVIL ENGINEERING

Time : 2 hours

Marks: 100

INSTRUCTION TO THE CANDIDATES

1. Use only Pencil to indicate your answers. Use Ball-Point only for writing Name, Register Number and Signature.
2. Darken the square completely. Mark your answers like this

1	2	3	4
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3. Part A is common to all.

Name of the Student: Programme Applied:	Register Number <table border="1" style="margin: auto; width: 100%; height: 20px;"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> Exam Centre Seal										
Signature of the Student	Signature of the Invigilator										

NIUEE 2016

Part A

- The development of a solid foundation of reliable knowledge typically is built from which type of research?
 - a. basic research
 - b. action research
 - c. evaluation research
 - d. orientational research
- The idea that when selecting between two different theories with equal explanatory value, one should select the theory that is the most simple, concise, and succinct is known as _____.
 - a. criterion of falsifiability
 - b. critical theory
 - c. guide of simplicity
 - d. rule of parsimony
- Research that is done to examine the findings of someone else using the "same variables but different people" is which of the following?
 - a. exploration
 - b. Hypothesis
 - c. Replication
 - d. empiricism
- A researcher designs an experiment to test how variables interact to influence how well children learn spelling words. In this case, the main purpose of the study was:
 - a. Explanation
 - b. Description
 - c. Influence
 - d. Prediction
- What is the key defining characteristic of experimental research?
 - a. extraneous variables are never present
 - b. a positive correlation usually exists
 - c. a negative correlation usually exists
 - d. manipulation of the independent variable
- Which of the following includes examples of quantitative variables?
 - a. age, temperature, income, height
 - b. grade point average, anxiety level, reading performance
 - c. gender, religion, ethnic group
 - d. both a and b
- One step that is not included in planning a research study is:
 - a. Identifying a researchable problem
 - b. A review of current research
 - c. Statement of the research question
 - d. Developing a research plan
- Sources of researchable problems can include:
 - a. Researchers' own experiences as educators
 - b. Practical issues that require solutions
 - c. Theory and past research
 - d. All of the above
- The feasibility of a research study should be considered in light of:
 - a. Cost and time required to conduct the study
 - b. Skills required of the researcher
 - c. Potential ethical concerns
 - d. All of the above
- A formal statement of the research question or "purpose of research study" generally _____.
 - a. Is made prior to the literature review
 - b. Is made after the literature review
 - c. Will help guide the research process
 - d. b and c

11. Which term refers to publishing several articles from the data collected in one large study?
 - a. Duplicate publication
 - b. Partial publication
 - c. Triplicate publication
 - d. None of these
12. Which of the following is a right of each participant according to the AERA?
 - a. Deception
 - b. Utilitarianism
 - c. Freedom to withdraw
 - d. Participants have no rights
13. Which of the following is a type of criterion-related validity evidence?
 - a. Concurrent evidence
 - b. Predictive evidence
 - c. Internal consistency
 - d. Both a and b are correct answers
14. Which of the following is not a type of reliability?
 - a. Test-retest
 - b. Split-half
 - c. Content
 - d. Internal consistency
15. Which of the following types of reliability refers to the consistency of test scores over time?
 - a. Equivalent forms reliability
 - b. Split-half reliability
 - c. Test-retest reliability
 - d. Inter-scorer reliability
16. Which type of reliability refers to the consistency of a group of individuals' scores on two equivalent forms of a test designed to measure the same characteristic?
 - a. Split-half
 - b. Test-retest
 - c. Split-forms
 - d. Equivalent forms
17. _____ refers to how well the particular sample of behaviors used to measure a characteristic reflects the entire domain of behaviors that constitutes that characteristic.
 - a. Construct validity evidence
 - b. Criterion-related validity evidence
 - c. Content validity evidence
 - d. Face validity evidence
18. Which of these is not a method of data collection.
 - a. Questionnaires
 - b. Interviews
 - c. Experiments
 - d. Observations
19. Another name for a Likert Scale is a(n):
 - a. Interview protocol
 - b. Event sampling
 - c. Summated rating scale
 - d. Ranking
20. A question during an interview such as "Why do you feel that way?" is known as a:
 - a. Probe
 - b. Filter question
 - c. Response
 - d. Pilot
21. A census taker often collects data through which of the following?
 - a. Standardized tests
 - b. Interviews
 - c. Secondary data
 - d. Observations
22. In which of the following nonrandom sampling techniques does the researcher ask the research participants to identify other potential research participants?
 - a. Snowball
 - b. Convenience
 - c. Purposive
 - d. Quota
23. Which of the following is the most efficient random sampling technique?
 - a. Simple random sampling
 - b. Proportional stratified sampling
 - c. Cluster random sampling
 - d. Systematic sampling

24. Which of the following would usually require the smallest sample size because of its efficiency?
- One stage cluster sampling
 - Simple random sampling
 - Two stage cluster sampling
 - Quota sampling
25. _____ is a set of elements taken from a larger population according to certain rules.
- Sample
 - Population
 - Statistic
 - Element

Part B

26. Consider the following statements:
- Standard penetration test is commonly used for cohesionless soils.
 - Standard penetration test results in respect of a cohesionless soil are correlated to its density index and friction angle.
 - Use of H-value not corrected for overburden pressure leads to highly conservative design of footings at shallow depths.
- Which of these statements are correct?
- 1, 2 & 3
 - 1 & 2 only
 - 2 & 3 only
 - 1 & 3 only
27. Consider the following statements:
- The benefit of surcharge and depth of foundation is only marginal in case of footings on purely cohesive soils.
 - The bearing capacity of a footing in pure clay increases with increase in size of the footing.
 - Size effects in plate load tests are more important in case of cohesionless soils.
- Which of these statements are correct?
- 1, 2 & 3
 - 1 & 2 only
 - 2 & 3 only
 - 1 & 3 only
28. The mean unconfined compressive strength of a purely cohesive soil was found to be 50 kN/m². The ultimate bearing capacity of a square footing calculated by Terzaghi's concept (bearing capacity factor $N_c = 5.7$) will be
- 185.25 kN/m²
 - 390.5 kN/m²
 - 285 kN/m²
 - 142.5 kN/m²
29. The field density and field moisture content of a soil can be determined by
- Core cutter method
 - Sand replacement method
 - Proctor compaction test
 - Modified proctor compaction test
- 1, 2, 3 & 4
 - 1 & 2 only
 - 2 & 3 only
 - 2 & 4 only
30. Consider the following statements:
- Friction piles are also called floating piles
 - Minimum number of piles to qualify as a pile group is three.
- The group efficiency of a pile group may be either less than 100% or more than 100%. Which of these statements are correct?
- 1, 2 & 3
 - 1 & 2 only
 - 2 & 3 only
 - 1 & 3 only
31. Consider the following statements relating to foundations on expansive soils:
- Strength should be improved and compressibility should be reduced.
 - Compressibility should be increased.
 - No stabilization should be done.
- Which of these statements is/are correct?
- 1, 2 & 3
 - 2 only
 - 1 only
 - 3 only

32. Consider the following statements:

1. Buried service lines should be avoided in an expansive soil region.
2. A swelling pressure less than 20 kN/m^2 is not of much consequence.
3. If soil is not black in color, it is unlikely to be an expansive soil.

Which of these statements are correct?

- a. 1, 2 & 3 b. 1 & 2 only c. 2 & 3 only d. 1 & 3 only

33. If the whole circle bearing is $315^\circ 20'$, its quadrantal bearing would be

- a. $S 36^\circ 30' W$ b. $N 44^\circ 40' W$ c. $N 57^\circ 24' W$ d. $S 60^\circ 40' W$

34. If the observed fore bearing of a line xy is $16^\circ 26'$, the back bearing of this line is

- a. $103^\circ 26'$ b. $118^\circ 36'$ c. $196^\circ 26'$ d. $206^\circ 26'$

35. The subtense tacheometry method is adopted when the ground is

- a. Flat b. Inclined c. Undulating d. A waterbody

36. R.L. of floor at a building is 74.4 m, staff reading on the floor is 1.625 and staff reading when it is held inverted with bottom touching the ceiling of a hall is 2.870; then the height of the ceiling above the floor is

- a. 3.593 m b. 3.953 m c. 4.495 m d. 4.594 m

37. Consider the following pre-conditions for correct use of a theodolite:

1. The vertical axis need not be perpendicular to the plane of the plate level bubble.
2. The line of sight must be perpendicular to the horizontal axis.
3. The axis of the level tube attached to the telescope need not be parallel to the line of sight.
4. The vertical axis, the horizontal axis and the line of sight should all pass through a point known as stadia centre.

Which of these conditions is/are necessary?

- a. 1, 2, 3 & 4 b. 2 only c. 3 only d. 1 & 4 only

38. Following observations were taken during a reciprocal leveling:

Instrument near	P	Q
Staff reading at P	1.824	0.928
Staff reading at Q	2.748	1.606

If reduced level of P is 140.815 m, the reduced level of Q is

- a. 138.014 m b. 139.616 m c. 140.014 m d. 141.616 m

39. A counter may be defined as an imaginary line passing through

- a. Points on the longitudinal section b. Points of equal elevation
c. Point of equal local ground slope d. Points of transverse section surveys

40. A closed contour line with two or more higher contours inside it will represent a

- a. Depression b. Hill c. Cave d. Well

41. When compared with the co-latitude of the place of observation, the declination of a circumpolar star is always,

- a. Lesser b. Greater c. Equal d. Either lesser or equal

42. Which of the following reasons are responsible for adoption of post-chlorination of water?

1. Chlorine demand is reduced.
2. Possibility of taste and odour formation is reduced.
3. Possibility of carcinogenic compounds is reduced.

4. Chloramines are formed.
 a. 1, 2, 3 & 4 b. 1, 2 & 3 only c. 1, & 4 only d. 2, 3 & 4 only
43. Which one of the following tests employs Ethylene Diamine Tetra Acetic Acid as a titrating agent?
 a. Chlorides b. Dissolved oxygen c. Hardness d. Residual chlorine
44. Consider the following statements:
 For pure clay, the shear strength parameters will be
 1. Cohesion $c = 0$; and angle of internal friction ϕ will be maximum.
 2. Cohesion c is maximum; and angle of internal friction ϕ is also maximum.
 3. Angle of internal friction ϕ is zero, with some value of cohesion c .
 Which of these statements is/are correct?
 a. 1, 2 & 3 b. 1 only c. 3 only d. 2 only
45. On nephelometry turbidity unit (NTU) is equal to the turbidity produced by
 a. 1 mg SiO_2 dissolved in 1 l of distilled water with the test being run according to absorption principle
 b. 1 mg SiO_2 dissolved in 1 l of distilled water with the test being run according to scattering principle
 c. 1 mg Formazin dissolved in 1 l of distilled water with the test being run according to absorption principle
 d. 1 mg Formazin dissolved in 1 l of distilled water with the test being run according to scattering principle.
46. Consider the following statements:
 1. Relative density is a meaningful parameter for all types of soils
 2. Relative density is a meaningful parameter only for cohesion soils.
 3. Relative density is a better indicator of the denseness of an in-situ granular soil deposit than the void ratio.
 Which of these statements are correct?
 a. 1, 2 & 3 b. 1 & 2 only c. 2 & 3 only d. 1 & 3 only
47. An approximate estimation of total dissolved solids of a given water sample is often made by measuring
 a. Electrical conductivity of the water sample
 b. Electro-magnetic conductivity of the water sample
 c. Sound conductivity of the water sample
 d. Thermal conductivity of the water sample
48. The transitional property of a lemniscate curve is disrupted when its deflection angle is around
 a. 30° b. 45° c. 60° d. 90°
49. An ideal horizontal transition curve is a
 a. Parabola b. Circle c. Clothoid spiral d. Hyperbola
50. Total float in a planning network is
 a. Late start time – Early start time b. Early start time – Late start time
 c. Late start time – Late finish time d. Late finish time – Early finish time
51. The plotting of inaccessible points in a plane-table survey can be done by the method of

a. Interpolation b. Radiation c. Intersection d. Traversing

52. In a plane-table survey, the process of determining the plotted position of a station occupied by the plane-table by means of sights taken towards known points, the locations of which have already been plotted, is known as
a. Radiation b. Resection c. Intersection d. Traversing
53. Regarding plane-table survey, which of the following statements does **not** hold?
a. All the plotting work including contouring can be done in the field
b. It is quite suitable for small scale survey
c. Less number of control points are required
d. It can be done in all seasons
54. Consider the following types of turbines:
1. Francis 2. Pelton with a single jet 3. Kaplan
The correct sequence of these turbines in increasing order of their specific speeds is
a. 1, 3 & 2 b. 2, 1 & 3 c. 1, 2 & 3 d. 2, 3 & 1
55. Two Pelton turbines A and B have the same specific speed and are working under the same head. Turbine A produces 400 kW at 1000 rpm. If turbine B produces 100kW, then its rpm is
a. 4000 b. 2000 c. 1500 d. 3000
56. A turbine discharging $10 \text{ m}^3/\text{s}$ is to be designed so that a torque of 1600 kg-m is to exerted on the impeller turning at 200 rpm under the condition that the existing liquid exerts no moment in spite of its momentum. The tangential component of the velocity at the outer periphery of the impeller of radius 1.0 m is
a. 0.98 m/s b. 1.57 m/s c. 2.10 m/s d. 2.26 m/s
57. Consider the following statements:
Air vessels are fitted on the suction and delivery sides of a reciprocating pump to
1. Achieve higher speed without separation.
2. Reduce work in overcoming frictional resistance.
3. Avoid excessive vibration permanently.
4. Have nearly uniform discharge.
Which of these statements are corrects?
a. 1, 2 & 4 only b. 1, 2 & 3 only c. 2, 3 & 4 only d. 1, 2, 3 & 4
58. The velocity of pressure wave in water of infinite extent is 1414 m/s. The velocity of propagation of water hammer pressure in a pipe carrying water and having diameter = 40 cm, pipe thickness = 4 mm, with E (Modulus of elasticity) of the pipe material = $2.1 \times 10^{11} \text{ Pa}$, K (Bulk modulus of water) = $2.1 \times 10^9 \text{ Pa}$, is
a. 1410 m/s b. 2000 m/s c. 1000 m/s d. 700 m/s
59. Let C_1 be the velocity of pressure wave traveling along rigid pipe carrying water with its bulk modulus $2.16 \times 10^9 \text{ N/m}^2$. Let C_2 be the velocity of pressure wave traveling along a rigid pipe carrying oil of relative density 0.600 with its bulk modulus as $1.296 \times 10^9 \text{ N/m}^2$ through a similar pipe. What will be the ratio
a. 0.01 b. 0.1 c. 1.0 d. 10.0
60. Consider the following statements in respect of steady laminar flow through a circular pipe:
1. Shear stress is zero on the central axis of the pipe

2. Discharge varies directly with the viscosity of the fluid
3. Velocity is maximum at the centre of the pipe.
4. Hydraulic gradient varies as the square of the mean velocity of flow.

Which of these statements are correct?

- a. 1, 2, 3 & 4 b. 1 & 3 only c. 2 & 4 only d. 3 & 4 only

61. The pressure drop in a 30 cm diameter horizontal pipe is 60 kPa in distance of 15m. The wall shear stress in kPa is

- a. 0.1 b. 0.2 c. 0.3 d. 0.4

62. Consider the following statements related to water surface profile in gradually varied flow in an open channel:

1. M_1 and S_1 curves approach Y_0 line asymptotically; and tend to be horizontal as y tends to ∞ .
2. M_2 and S_2 curves meet Y_0 line horizontally, and Y_0 line asymptotically.
3. M_3 and S_3 curves meet Y_0 line normally, and also meet the channel bed normally.
4. C_1 and C_2 curves will be slightly curved if Chezy's equation is used; otherwise they may tend to be straight lines.

Which of these statements are correct?

- a. 1, 2, 3 & 4 b. 1 & 4 only c. 2 & 3 only d. 3 & 4 only

63. The velocity with which an elementary surge wave can travel upstream in a channel with depth $y = 1.6$ m and velocity $V = 2.4$ m/s is (Take $g = 10$ m/s²)

- a. 16 m/s b. 13.6 m/s c. 2.4 m/s d. 1.6 m/s

64. For hydraulically efficient rectangular channel of bed width 4.0 m, the depth of flow is

- a. 4 m b. 0.5 m c. 1 m d. 2 m

65. Consider the following statements in respect of critical flow in a wide rectangular channel:

1. The specific energy is minimum for a given discharge.
2. The discharge is maximum for a given specific energy
3. The specific force is minimum for a given discharge.
4. The Froude number is equal to unity.

Which of these statements are correct?

- a. 1, 2 & 3 only b. 1, 2, 3 & 4 c. 1, 2 & 4 only d. 2, 3 & 4 only

66. A high tension cable 5 cm in diameter is strung-out between two towers. At a wind velocity of 22.22 m/s (corresponding Reynolds number being 7.4×10^4) the frequency of vortex shedding is

- a. 100 Hz b. 9.33 Hz c. 93.3 Hz d. 10.0 Hz

67. Consider the following assumption made in the analysis of a jet impinging normally on a moving plate to introduce the principle of moment of momentum:

1. Friction between jet and plate is neglected.
2. Flow is steady
3. Impinging momentum of jet is unchanged.
4. Plate moves at a constant velocity.

Which of these statements are relevant?

- a. 1, 2 & 4 only b. 1, 2 & 3 only c. 2, 3 and 4 only d. 1, 2, 3 & 4

68. The thickness of a laminar boundary layer over a flat plate at two different sections P and Q are 0.8 cm and 2.4 cm respectively. If the section Q is 3.6 m downstream of P, the distance of section P from the leading edge of the plate is

- a. 0.32 m b. 0.22 m c. 0.40 m d. 0.53 m

69. Which of the following pairs are correctly matched?

1. Piezometric head : Sum of datum head and pressure head
 2. Dynamic head : Sum of datum head and velocity head
 3. Stagnation head : Sum of Piezometric head and velocity head
 4. Total head : Sum of Piezometric head and dynamic head
- a. 1, 2 & 3 only b. 1, 3 & 4 only c. 2, 3 & 4 only d. 1, 2, 3 & 4

70. A rectangular tank 10 m x 5 m in plan and 3 m deep is divided by a partition wall parallel to the shorter wall of the tank. One of the compartments contains water to a depth of 3 m, and the other a lighter liquid of specific gravity 0.75 to a depth of 2 m. The resultant pressure thrust on the partition wall is

- a. 1000 kg b. 1500 kg c. 2000 kg d. 2500 kg

71. Which of the following are pertinent to the realization of hydrological cycle?

1. Latitudinal difference in solar heating of the Earth's surface
2. Inclination of the Earth's axis
3. Uneven distribution of land and water
4. Coriolis effect

- a. 1, 2 & 3 only b. 1, 2 & 4 only c. 2, 3 & 4 only d. 1, 2, 3 & 4

72. The rainfall on five successive days on a catchment was 3, 6, 9, 5 and 1 cm respectively. If the ϕ -index for the storm can be assumed to be 3 cm/day, the total direct runoff from the catchment due to this storm is

- a. 11 cm b. 24 cm c. 9 cm d. 20 cm

73. The excess runoff hydrograph from a catchment area 10km^2 due to a storm of 6 hrs duration has been observed to be triangular in shape. The peak flow is observed to be $10\text{m}^3/\text{s}$ and the base length is 20 hrs. The rainfall excess in the catchment is

- a. 5.1 cm b. 3.6 cm c. 4.5 cm d. 2.5 cm

74. Consider the following statements:

1. Over the oceans there is more evaporation than precipitation.
 2. On land it is more precipitation than evapo-transpiration.
- Which of these statements are correct?

- a. Both 1 & 2 b. Neither 1 nor 2 c. 1 only d. 2 only

75. The hydrologic risk of a 100-year flood occurring during the 2-year service life of a project is

- a. 9.8% b. 9.9% c. 19.9% d. 1.99%

76. The design flood commonly adopted in India for barrages and minor dams is

- a. Probable maximum flood
- b. A flood of 50– 100 years return period
- c. Peak flood
- d. Standard project flood or a 100-year flood, whichever is higher

77. The Muskingum method of flood routing is a

- a. Form of hydraulic routing of a flood
- b. Form of reservoir routing
- c. Complete numerical solution of St. Venant equations
- d. Hydrological channel routing method

78. What would be the volume of water stored in a saturated column with a porosity of 0.35 with a cross-sectional area of 1 m^2 and depth of 3 m?

- a. 2.0 m^3 b. 0.105 m^3 c. 1.05 m^3 d. 3.0 m^3

79. The surface joining the static levels in several non-pumping wells penetrating a continuous confined aquifer represents
- Water-table surface
 - Capillary fringe
 - Piezometric surface of the aquifer
 - Physical top surface of the aquifer
80. Two observation wells penetrating into a confined aquifer are located 1500 m apart in the direction of flow. Heads of 50 m and 25 m are indicated at these two observation wells. If the coefficient of permeability for the aquifer is 30 m/day and its porosity is 0.25, the time of is
- 75 days
 - 750 days
 - 1200 days
 - 3000 days
81. The local scour depth in front of a semicircular shaped rectangular pier having width equal to W aligned parallel to the flow below the surrounding bed is
- $2.0 W$
 - $1.5 W$
 - $1.2 W$
 - $1.0 W$
82. Critical shear stress of cohesive sediment
- Decreases with the void ratio for a given plasticity index
 - Increases with the plasticity index for a given void ratio
 - Increases with shear strength for a given clay content
 - All of the above.
83. A discharge of $72 \text{ m}^3/\text{s}$ is to be allowed through siphon spillways of 2 m width and 75 m depth with working head of 8 m. The number of spillways to be provided will be (Take coefficient of discharge for the spillways = 0.64)
- 2
 - 4
 - 6
 - 8
84. Coefficient of permeability of an underground stratum is 0.001 m/s. Discharge obtained from a well of area 20 m^2 dug into this stratum (with drawdown of 2 m) will be
- 2400 lpm
 - 2000 lpm
 - 1200 lpm
 - 1000 lpm
85. EDTA titration method of hardness determination of water sample uses an indicator which combines with hardness-causing divalent cations and forms a coloured complex. The name of the indicator and the colour of the formed complex respectively are
- Ferroin and dark blue
 - Ferroin and wine red
 - Eriochrome Black T and dark blue
 - Eriochrome Black T and wine red
86. Consider the following statements:
- Carbonate hardness is due to bicarbonates
 - Non-carbonate hardness is due to sulphates and chlorides of Ca and Mg.
 - Both the hardnesses can be removed by lime-soda method.
 - Both the hardnesses can be removed by ion-exchange method.
- Which of these statements are correct?
- 1, 2 & 3 only
 - 1, 2 & 4 only
 - 2, 3 & 4 only
 - 1, 2, 3 & 4
87. If the velocity of flow as well as the diameter of the flowing pipe are respectively doubled through a pipe system in use since long, the head loss will thereafter be
- Halved
 - Doubled
 - Increased 4 times
 - No change
88. Consider the following statements:

The total head against which a pump has to work must include, besides any other items

1. the suction lift.
2. the delivery head.
3. the head lost due to friction at entrance in the rising main.
4. the head lost due to friction at exit in the rising main.

Which of these statements are correct?

- a. 1, 2 & 3 only b. 2 & 3 only c. 1, 2, 3 & 4 d. 3 & 4 only

89. An urban area is located in plains having “average climatic conditions”. The impervious area thereof for which drainage must be provided is 3.6 ha and the design rainfall intensity is 2.0 cm/hr. The drains will be designed for a runoff of

- a. 0.05 m³/s b. 0.10 m³/s c. 0.20 m³/s d. 0.40 m³/s

90. If water table is encountered in the standard pit while conducting plate load test

- a. The load test should be abandoned
- b. The pit is considered unsafe
- c. Test should be conducted with complete dewatering continuously throughout the test duration
- d. The bearing capacity of soil cannot be determined in this condition

91. Consider the following statements regarding Coulomb’s theory of earth pressure:

1. It is based on wedge theory of earth pressure.
2. It assumes the wall surface to be rough.
3. It may or may not satisfy the static equilibrium condition occurring in nature.

Which of these statements are correct?

- a. 1, 2 & 3 b. 1 & 2 only c. 2 & 3 only d. 1 & 3 only

92. An isobar is a line which connects all points below the ground surface at which

- a. The local ground elevation is same
- b. The settlement is same
- c. The vertical stress is the same
- d. The ground elevation is varying

93. For the determination of shear strength the parameters, c and ϕ , of soil in the laboratory, the test to be conducted will be

- a. Triaxial compression test
- b. Sieve analysis
- c. Compaction test
- d. Relative density test

94. Consider the following statements:

1. For a saturated soil, Skempton’s B-parameter is nearly equal to unity.
2. For an undisturbed sensitive clay, the stress-strain curve shows a peak.
3. Interlocking contributes significantly to the shearing strength in case of dense sand.

Which of these statements are correct?

- a. 1, 2 & 3 b. 1 & 2 only c. 2 & 3 only d. 1 & 3 only

95. Consider the following statements:

1. Mathematically speaking, the time taken for 100% consolidation is infinite.
2. The time factor for a particular average degree of consolidation depends upon the distribution of initial excess hydrostatic pressure.
3. Secondary consolidation obeys Terzaghi’s one-dimensional theory of consolidation.

Which of these statements are correct?

- a. 1, 2 & 3 b. 1 & 2 only c. 2 & 3 only d. 1 & 3 only

96. Consider the following statements:

1. Organic matter decreases the permeability of a soil.
2. Entrapped air decreases the permeability of a soil.

Which of these statements are correct?

- a. 1 only b. 2 only c. Both 1 & 2 d. Neither 1 nor 2

97. The porosity of a certain soil sample was found to be 80% and its specific gravity was 2.7; the critical hydraulic gradient will be estimated as

- a. 0.34 b. 0.92 c. 1.0 d. 1.5

98. The porosity of a soil sample having its void ratio equal unity would be

- a. 33.33% b. 50.0% c. 66.66% d. 75.0%

99. The natural water content of the soil sample was found to be 40%, specific gravity is 2.7 and void ratio 1.2; then the degree of saturation of the soil will be

- a. 100% b. 69% c. 87% d. 90%

100. Consider the following statements:

1. Particulates have irregular shapes.
2. Size can be determined by an equivalent aerodynamic diameter by comparing with a perfect sphere.
3. Particulates larger than 10 μ m are said to settle relatively quickly since their settling velocity is not less than 10 cm/min.
4. The particles roughly the size of bacteria have aerodynamic diameter of 0.1 μ m to 10 μ m.

Which of these statements are correct?

- a. 1, 2, 3 & 4 b. 1 & 3 only c. 1, 2 & 4 only d. 2, 3 & 4 only