Q: 1) Match List-I (Type of soil) with List-II (Mode of transportation and deposition) and select the correct answer using the codes given below the lists:

List – I	List – II
A: Lacustrine soils	1: Transportation by wind
B: Alluvial soils	2: Transportation by running water
C: Aeolian soils	3: Deposited at the bottom of lakes
D: Marine soils	4: Deposited in sea water

Codes:

A : A – 1, B – 2, C – 3, D – 4

B : A – 3, B – 2, C – 1, D – 4

C : A – 3, B – 2, C – 4, D – 1

D : A – 1, B – 3, C – 2, D – 4

Q: 2) Consider the following statements in the context of aeolian soils.

1: The soil has low density and low compressibility

2: The soil is deposited by wind.

3: The soil has large permeability.

Of these statements

A : 1, 2 and 3 are correct

B : 2 and 3 are correct

C : 1 and 3 are correct

D : 1 and 2 are correct

Q: 3) Acidic soils are reclaimed by

A : leaching of the soil

B : using limestone as a soil amendment

C : using gypsum as a soil amendment

D : provision of drainage

Q: 4) The collapsible soil is associated with

A : Dune sands

B : Laterite soils

C : Loess

D : Black cotton soils

Q: 5) Consider the following statements:

1: Peat and muck are organic soils.

2: Peat is an inorganic soil whereas' muck is an organic soil.

3: Indurated clay is a type of clay which does not soften under prolonged wetting.

4: Which of the above statements is/are correct?
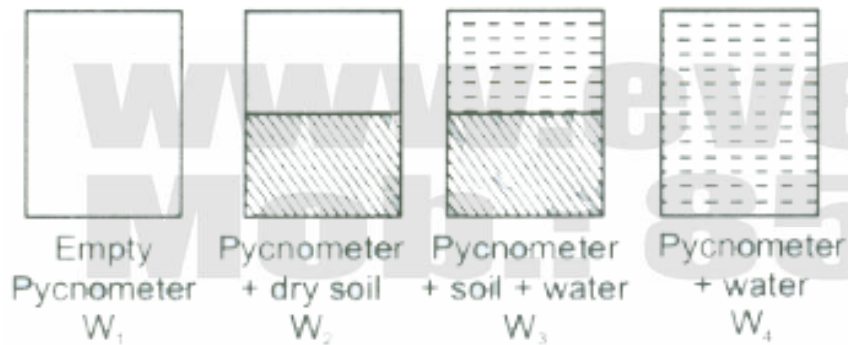
A : 1, 2 and 3

B : 2 only

C : 3 only

D : 1 and 3 only

Q: 6) The given figure indicate the weights of different pycnometers:

| Empty Pycnometer W_1 | Pycnometer + dry soil W_2 | Pycnometer + soil + water W_3 | Pycnometer + water W_4 |

The specific gravity of the soils is given by

A : $\dfrac{W_2}{W_4 - W_2}$

B : $\dfrac{W_2 - W_1}{(W_3 - W_4)(W_2 - W_1)}$

C : $\dfrac{W_2}{(W_3 - W_4)}$

D : $\dfrac{W_2 - W_1}{(W_2 - W_1) - (W_3 - W_4)}$

Q: 7) In a wet soil mass, air occupies one-sixth of its volume and water occupies one-third of its volume. The void ratio of the soil is

A : 0.25

B : 0.5

C : 1.00

D : 1.50

Q: 8) The standard plasticity chart to classify fine grained soils is shown in the given figure.

The area marked X represents

A : silt of low plasticity

B : clay of high plasticity

C : organic soil of medium plasticity

D : clay of intermediate plasticity

Q: 9) A dry soil has mass specific gravity of 1.35. If the specific gravity of solids is 2.7, then the void ratio will be

A : 0.5

B : 1.0

C : 1.5

D : 2.0

Q: 10) A soil has liquid limit of 60% plastic limit of 35% and shrinkage limit of 20% and it has a natural moisture content of 50%. The liquidity index of soil is

A : 1.5

B : 1.25

C : 0.6

D : 0.4

Q: 11) A fill having a volume of 1,50,000 cum is to be constructed at a void ratio of 0.8. The borrow pit soil has void ratio of 1.4. The volume of soil required (in cubic metres) to be excavated from the borrow pit will be

A : 1,87,500

B : 2,00,000

C : 2,10,000

D : 2,50,000

Q: 12) Which one of the following tests CANNOT be done without undisturbed sampling?

A : Shear strength of sand

B : Shear strength of clay

C : Determination of compaction parameters

D : Atterberg limits

Q: 13) Consider the following statements:

A well-graded sand should have

1: Uniformity coefficient greater than 6

2: Coefficient of curvature between 1 and 3

3: Effective size greater than 1 mm.

Of these statements

A : 1, 2 and 3 are correct

B : 1 and 2 are correct

C : 2 and 3 are correct

D : 1 and 3 are correct

Q: 14) A clayey soil has liquid limit = w_L ; plastic limit = W_p and natural moisture content = w. The consistency index of the soil is given by

A : $W_L - W / W_L - W_P$

B : $W_L - W_P / W_L - W$

C : $W_P - W / W_L - W_P$

D : $W_L - W_P / W_P - W$

Q: 15) A soil has mass unit weight' y '' water content 'w' (as ratio), the specific gravity of soil solids = G, unit weight of water = y w ; 'S' the degree of saturation of the soil is given by

A : $S = \dfrac{1+W}{\dfrac{\gamma^W}{\gamma}(1+W)-\dfrac{1}{G}}$

B : $S = \dfrac{W}{\dfrac{\gamma^W}{\gamma}(1+W)-\dfrac{1}{G}}$

C : $S = \dfrac{(1+W)}{\dfrac{\gamma^W}{\gamma}(1+W)-\dfrac{1}{WG}}$

D : $S = \dfrac{W}{\dfrac{\gamma^W}{\gamma}(1+W)-\dfrac{1}{WG}}$

Q: 16) If a soil sample of weight 0.18 kg having a volume of 10^{-4} m^3 and dry unit wt. of 1600 kg! m^3 is mixed with 0.02 kg of water then the water content in the sample will be

A : 30 %

B : 25 %

C : 20%

D : 15 %

Q: 17) If a soil sample of weight 0.18 kg having a volume of $10-4_m3$ and dry unit wt. of 1600 kg! m^3 is mixed with 0.02 kg of water then the water content in the sample will be

List – I	List – II
A: Void Ratio	1: V_V /V
B: Porosity	2: W_W /W_s
C: Degree of saturation	3: V_W /V_v
D: Water content	4: W/V
	5: V_V / V_s

Codes:

A : A – 4, B – 2, C – 5, D – 1

B : A – 5, B – 4, C – 3, D – 1

C : A – 4, B – 2, C – 5, D – 2

D : A – 5, B – 1, C – 3, D – 2

Q: 18) If the proportion of soil passing 75 micron sieve is 50% and the liquid limit and plastic limit are 40% and 20% respectively, then the group index of the soil is

A : 3.8

B : 6.5

C : 38

D : 65

Q: 19) A sample of saturated sand has a dry unit weight of 18 kN/m³ and a specific gravity of 2.7. If water is 10 kN/m³, the void ratio of the soil sample will be

A : 0.5

B : 0.6

C : 0.4

D : 0.9

Q: 20) Based on grain distribution analysis, the 010' 030 and 060 values of a given soil are 0.23 mm, 0.3 mm and 0.41 mm respectively. As per IS Code, the soil classification will be

A : SW

B : SP

C : SM

D : SC

Q: 21) The plasticity index and the percentage of grain size finer than 2 microns of a clay sample are 25 and 15, respectively. Its activity ratio is

A : 2.5

B : 1.67

C : 1.0

D : 0.6

Q: 22) The natural void ratio of a sand sample is 0.6 and its density index is 0.6. If its void ratio in the loosest state is 0.9, then the void ratio in the densest state will be

A : 0.2

B : 0.3

C : 0.4

D : 0.5

Q: 23) Given that Coefficient of curvature = 1.4, D_{30} = 3 mm, D_{10} = 0.6 mm. Based on this information on particle size distribution for use as subgrade, this soil will be taken to be

A : Uniformly-graded sand

B : Well-graded sand

C : Very find sand

D : Poorly-graded sand

Q: 24) Which one of the following represents relative density of saturated sand deposit having moisture content of 25%, if maximum and minimum void ratio of sand are 0.95 and 0.45 respectively and specific gravity of sand particles is 2.6?

A : 40%

B : 50%

C : 60%

D : 70%

Q: 25) In a soil specimen, 70% of particles are passing through 4.75 mm I.S sieve and 40% of particles are passing through 75 u I.S, sieve. Its uniformity coefficient is 8 and coefficient of curvature is 2. As per I.S. classification, this soil is classified as

A : SP

B : GP

C : SW

D : GW

Q: 26) Match List! (Unit/Test)..with List II (Purpose) and select the correct answer using the codes

List – I	List – II
A: Cassagrande's apparatus	1: Determination of grain size distribution
B: Hydrometer	2: Consolidation characteristics
C: Plate load test	3: Determination of consistency limits
D: Oedometer	4: Determination of safe bearing capacity of soil

Codes:

A : A – 1, B – 3, C – 2, D – 4

B : A – 1, B – 3, C – 4, D – 2

C : A – 3, B – 1, C – 2, D – 4

D : A – 3, B – 1, C – 4, D – 2

Q: 27) What are the respective values of void ratio, porosity ratio and saturated density (in kNI m^3) for a soil sample which has saturation moisture content of 20% and specific gravity of grains as 2.6?

A : 0.52, 1.08, 18.07

B : 0.52, 0.34, 18.07

C : 0.77, 1.08, 16.64

D : 0.52, 0.34, 20.14

Q: 28) Embankment fill is to be compacted at a density of 18 kN/m³. The soil of the borrow area is at a density of 15 kN/m³. What is the estimated number of trips of 6 cu. m capacity truck for hauling the soil required for compacting 100 m³ fill of the embankment? (assume that the soil in the borrow area and that in the embankment are at the same moisture content)

A : 14

B : 18

C : 20

D : 23

Q: 29) The laboratory test on a sample yielded the following results:

Plasticity index   32%

Liquidity index   0.15

Activity number   1.58

Which of the following inferences can be drawn?

1: The soil is very stiff.

2: The soil is medium soft.

3: The soil is highly plastic.

4: The soil is medium plastic.

5: The soil is active.

Select the correct answer using the code given below:

A : 1, 3 and 5

B : 1, 3 and 4

C : 2, 3 and 5

D : 1, 2 and 4

Q: 30) In comparison to Atterberg limits of normal soils, the expansive soil have which of the following?

1: More liquid limit

2: Less plastic limit

3: Less shrinkage limit

4: More volumetric shrinkage

Select the correct answer using the code given below

A : 1, 2, 3 and 4

B : 1, 3 and 4 only

C : 2 and 3 only

D : 1, 2 and 4 only