Answer Key :Civil Engg.

Type: Civil Engg.

1) A simply supported beam AB of span 5 m carries point loads of 3 kN and 4 kN at a distance of 1 m and 3 m from the left end A. Find distance from A at which vertical force at the section is zero.

Options:

- 1.1 m
- 2.3 m
- 3.4 m
- 4.5 m

Correct Option: 2

Type: Civil Engg.

2) System of forces wherein line of action of all forces meet at one common point is referred as:

Options:

- 1.Coplanar forces
- 2.Concurrent forces
- 3.Collinear forces
- 4.none of these

Correct Option: 2

Type: Civil Engg.

3) A metal bar of length 75mm is inserted between two rigid supports and its temperature is increased by 20°C. If the coefficient of thermal expansion is 8×10^-6 per °C and the Young's modulus is 2.5×10^5 MPa, the stress in the bar is:

Options:

- 1.30 MPa
- 2.120 MPa
- 3.40 MPa
- 4.zero

Correct Option: 3

Type: Civil Engg.

4) A long shaft of diameter d is subjected to twisting moment 2T at its ends. The maximum normal stress acting at its cross-section is equal to:

Options:

- 1.Zero
- 2.16T/πd^3
- 3.32T/πd^3
- 4.64T/πd^3

Correct Option: 3

Type: Civil Engg.

5) For a linear elastic frame, if the stiffness matrix is reduced to half of its original value, the deflection of the resulting frame will be

Options:

- 1.Cannot be determined
- 2.Half the original value
- 3.The same as the original value
- 4.Twice the original value

Correct Option: 4

Type: Civil Engg.

6) The stiffness coefficient kij indicates

Options:

- 1.Deformation at i due to a unit force at j
- 2.Deformation at j due to a unit force at i
- 3.Force at i due to a unit deformation at j
- 4.Force at j due to a unit deformation at I

Correct Option: 3

Type: Civil Engg.

7) The compound which is largely responsible for initial setting and early strength gain of Ordinary Portland Cement is

Options:

- 1.C3A
- 2.C4AF
- 3.C2S
- 4.C3S

Correct Option: 4

Type: Civil Engg.

8) A dummy activity used for accurate representation of a network is an activity with

Options:

- 1.zero duration
- 2.fixed duration
- 3.duration equal to the slack period
- 4.none of these

Correct Option: 1

Type: Civil Engg.

9) In the limit state design method of concrete structures, the recommended partial material safety factor for steel according to IS:456-2000 is

Options:

- 1.0.87
- 2.1
- 3.1.15
- 4.1.5

Correct Option: 3

Type: Civil Engg.

10) Which one of the following is categorized as a long term loss of prestress in a prestressed concrete member

Options:

- 1.Loss due to anchorage slip
- 2.loss due to friction
- 3.loss due to elastic shortening
- 4.loss due to relaxation of strands

Correct Option: 4

Type: Civil Engg.

11) A steel column pinned at both ends has a buckling load of 100 kN. If the column is restrained against lateral movement at its mid-height, its buckling load will be

Options:

- 1.100 kN
- 2.200 kN
- 3.400 kN
- 4.800 kN

Correct Option: 3

Type: Civil Engg.

12) The permissible stress in axial tension σst in steel member on the net effective area of the section shall not exceed the following value (fy is the yield stress)

Options:

- 1.0.5 fy
- 2.0.6 fy
- 3.0.75 fy
- 4.0.8 fy

Correct Option: 2

Type: Civil Engg.

13) The ratio of saturated unit weight to dry unit weight of a soil is 1.4. If the specific gravity of solid (Gs) is 2.40, the void ratio of the soil is

Options:

- 1.0.64
- 2.0.8
- 3.0.96
- 4.1.2

Correct Option: 3

Type: Civil Engg.

14) Group symbols assigned to clayey sand and silty sand are respectively

Options:

- 1.SC and SM
- 2.SM and SC
- 3.CL and ML
- 4.SP and SW

Correct Option: 1

Type: Civil Engg.

15) In a consolidated-drained triaxial test on clay, the pore water pressure developed during shearing is:

Options:

- 1.Equal to cell pressure
- 2.Equal to deviator stress
- 3.Half the deviator stress
- 4.Zero

Correct Option: 4

Type: Civil Engg.

16) A pile of 0.70 m diameter and 10 m length is driven into a clay deposit having undrained cohesion of 40 kN/m² and angle of internal friction equal to zero. If the adhesion factor is 0.5, what is the skin friction capacity of the pile?

Options:

- 1.220 kN
- 2.440 kN
- 3.660 kN
- 4.880 kN

Correct Option: 2

Type: Civil Engg.

17) When a retaining wall moved away from the backfill, the pressure exerted on the wall is termed as

Options:

- 1.Passive earth pressure
- 2.Active earth pressure
- 3.Pore pressure
- 4.Swelling pressure

Correct Option: 2

Type: Civil Engg.

18) The height of a hydraulic jump in the stilling pool of 1:25 scale model was observed to be 20 cm. The corresponding prototype height of the jump is

Options:

- 1.2.5 m
- 2.5 m
- 3.10 m
- 4.None of these

Correct Option: 2

Type: Civil Engg.

19) For a given discharge, the critical flow depth in an open channel depends on:

Options:

- 1.Channel geometry only
- 2.Channel geometry and bed slope
- 3.Channel geometry, bed slope, and roughness
- 4.Channel geometry, bed slope, roughness, and Reynolds number

Correct Option: 1

Type: Civil Engg.

20) An isohyet is a line joining points of

Options:

- 1.Equal evaporation
- 2.Equal rainfall depth
- 3.Equal temperature
- 4.Equal humidity

Correct Option: 2

Type: Civil Engg.

21) At a station, a storm of 3-hour duration with intensity 4 cm/h resulted in a runoff of 6 cm. The phi index (in cm/h) is?

Options:

- 1.1 cm/h
- 2.2 cm/h
- 3.3 cm/h
- 4.4 cm/h

Correct Option: 2

Type: Civil Engg.

22) A canal irrigates a portion of a culturable command area to grow sugarcane and wheat. The average discharges required to grow sugarcane and wheat are 0.34 and 0.26 cumecs, respectively. The time factor is 0.8. The required design capacity of the canal is

Options:

- 1.0.60 cumecs
- 2.0.65 cumecs
- 3.0.75 cumecs
- 4.0.85 cumecs

Correct Option: 3

Type: Civil Engg.

23) A sprinkler irrigation system is suitable when

Options:

- 1.the crops to be grown have deep roots
- 2.the soil is having low permeability
- 3.the water table is low
- 4.the land gradient is steep and the soil is easily erodible

Correct Option: 4

Type: Civil Engg.

24) Zero hardness of water is achieved by

Options:

- 1.ion exchange treatment
- 2.excess alum and lime treatment
- 3.excess lime treatment
- 4.lime soda process

Correct Option: 1

Type: Civil Engg.

25) The alkalinity and the hardness of a water sample are 320 mg/L and 470 mg/L as $CaCO_3$, respectively. If x is the carbonate hardness and y is the non-carbonate hardness, then the values of x and y are:

Options:

- 1.150 mg/L, 320 mg/L
- 2.320 mg/L, 150 mg/L
- 3.470 mg/L, 320 mg/L
- 4.320 mg/L, 470 mg/L

Correct Option: 2

Type: Civil Engg.

26) Consider four common air pollutants found in urban environments, NO, SO2, Soot and O3. Among these which one is the secondary air pollutant?

Options:

- 1.NO
- 2.SO2
- 3.Soot
- 4.O3

Correct Option: 4

Type: Civil Engg.

27) The amount of CO2 generated (in kg) while completely oxidizing 500 gms of CH4 to the end products is

Options:

- 1.1.125 kg
- 2.1.375 kg
- 3.1.625 kg
- 4.1.875 kg

Correct Option: 2

Type: Civil Engg.

28) The coefficient of friction in the longitudinal direction of a highway is estimated as 0.25. The braking distance for a car moving at a speed of 60 km/hr is

Options:

- 1.42.5 m
- 2.56.7 m
- 3.68.4 m
- 4.74.2 m

Correct Option: 2

Type: Civil Engg.

29) The plan of a map was photocopied to a reduced size such that a line originally 100 mm measures 80 mm. The original scale of the plan was 1:1000. The revised scale is

Options:

- 1.1:5000
- 2.1:2500
- 3.1:2000
- 4.1:1250

Correct Option: 4

Type: Civil Engg.

30) Curvature correction to a staff reading in a differential levelling survey is:

Options:

- 1.always zero
- 2.always subtractive
- 3.always additive
- 4.dependent on latitude

Correct Option: 2