



## ONLINE APPLICATION FOR MANAGEMENT TRAINEES 2016-17

### Section : Professional Knowledge

**Q.1** A series of wells were dug in a confined aquifer. The surface obtained by connecting the static water levels would be called as:

- Ans  1. Piezometric surface  
 2. Cone of depression  
 3. Phreatic line  
 4. Perched water table

Question ID : 239130620

**Q.2** What is the major pollutant present in photochemical smog?

- Ans  1. Nitrogen oxide  
 2. Carbon dioxide  
 3. Hydrocarbon  
 4. Sulphur dioxide

Question ID : 239130679

**Q.3** Which of the following is NOT a fully non-destructive testing of concrete?

- Ans  1. Core  
 2. Rebound hammer  
 3. Profometer for rebar  
 4. Ultrasonic pulse velocity

Question ID : 239130661

**Q.4** The fertility of soil starts getting badly impacted when pH of soil exceeds:

- Ans  1. 13  
 2. 10  
 3. 11  
 4. 9

Question ID : 239130615

**Q.5** According to IS 800, in case of structural steel design, the span length of a flexural member in a continuous frame system shall be taken as the distance between:

- Ans  1. diametrically opposite ends of the support  
 2. centre to centre of the support + twice the eccentricity  
 3. centre to centre of the support  
 4. edge to edge of the support

Question ID : 239130640

**Q.6** Which of the following equals the number of unknowns to be determined, in stiffness method of structural analysis?

- Ans  1. Kinetic indeterminacy  
 2. Static indeterminacy  
 3. Kinematic indeterminacy  
 4. Sum of static and kinematic indeterminacy

Question ID : 239130647

**Q.7** Which of the following is NOT a recognized failure type of soil as support beneath the foundations, depending upon the deformations associated with the load and the extent of development of failure surface?

- Ans  1. General shear  
 2. Punching shear

Question ID : 239130635

3. Local shear

4. Bending

Q.8 According to the Indian Roads Congress, which of the following is the minimum grade of cement concrete for highways?

- Ans  1. M40  
 2. M50  
 3. M30  
 4. M60

Question ID : 239130689

Q.9 On which of the following parameters are the slow sand filters better than rapid sand filters?

- Ans  1. Ease of construction  
 2. Land requirement for constructing a unit  
 3. Flexibility in meeting the demand  
 4. Rate of filtration

Question ID : 239130629

Q.10 Which of the following spillway gates cannot be seen from a distance, when lowered?

- Ans  1. Sliding gate  
 2. USBR drum gate  
 3. Tainter gate  
 4. Roller gate

Question ID : 239130614

Q.11 What is the maximum width of all vehicles limited by the Indian Roads Congress?

- Ans  1. 2.8 m  
 2. 2.5 m  
 3. 2.0 m  
 4. 1.75 m

Question ID : 239130696

Q.12 If the undisturbed strength of a soil sample is 50 units while the remoulded strength is 20 units, then what is the sensitivity of this soil?

- Ans  1. 1.25  
 2. 0.4  
 3. 2.5  
 4. 2

Question ID : 239130673

Q.13 Which of the following is an expansive soil?

- Ans  1. Dune sand  
 2. Black cotton soil  
 3. Loess  
 4. Lateritic soil

Question ID : 239130672

Q.14 Which of the following is NOT a Rabi crop?

- Ans  1. Sesame  
 2. Onion  
 3. Barley  
 4. Groundnut

Question ID : 239130617

Q.15 What is the Poisson's ratio for structural steel as recommended in IS 800?

- Ans  1. 0.2

Question ID : 239130655

2. 0.25

3. 0.3

4. 0.15

**Q.16** If the radius of curvature on a road is 600 m and the allowable speed is 75 kmph, then what will be the required super elevation?

Ans  1. 0.02

2. 0.03

3. 0.04

4. 0.06

Question ID : 239130683

**Q.17** Which of the following curves is usually NOT adopted for transitioning in horizontal alignment?

Ans  1. Reverse

2. Lemniscate

3. Spiral

4. Cubic parabola

Question ID : 239130684

**Q.18** For which of the following purposes can the Geographic Information Systems not be used?

Ans  1. Studying the relative motions of planets

2. Disaster and business continuity planning

3.

Development of public infrastructure facilities

4. Deforestation

Question ID : 239130703

**Q.19** Which of the following does NOT cause depletion of ozone layer?

Ans  1. H<sub>2</sub>SO<sub>4</sub>

2. HCFCs

3. Methyl bromide

4. CFCs

Question ID : 239130682

**Q.20** The reciprocal theorem of Maxwell is valid for structures:

Ans  1. that are plastic

2. that are elastic

3. having linear force-displacement relation

4. irrespective of their type

Question ID : 239130646

**Q.21** Which of the following grades of bitumen is the most suitable for a 7-day maximum average air temperature of 15 °C?

Ans  1. VG10

2. VG20

3. VG30

4. VG40

Question ID : 239130690

**Q.22** Which of the following soil types is suitable for sprinkler irrigation?

Ans  1.

When land is steep and soil is easily erodable

2. When soil of low permeability is used

3. When water table is very low

Question ID : 239130616

4. When the crops are deeply rooted

**Q.23** In reinforced cement concrete construction, lap splices are not recommended to be used for rebars when the bar diameter is more than:

- Ans
- 1. 36 mm
  - 2. 25 mm
  - 3. 32 mm
  - 4. 30 mm

Question ID : 239130607

**Q.24** On a single lane road in one direction, if the average spacing between vehicles is 10 m, then what is the jam density (number/km)?

- Ans
- 1. 10
  - 2. 0.1
  - 3. 100
  - 4. 1

Question ID : 239130693

**Q.25** What shall be the minimum effective throat thickness of a fillet weld in case of structural steel design?

- Ans
- 1. 4 mm
  - 2. 3 mm
  - 3. 5 mm
  - 4. 2 mm

Question ID : 239130638

**Q.26** Which of the following is NOT an indirect method of estimating the permeability of soil in field?

- Ans
- 1. Calculations from grain size and specific surface
  - 2. Pumping out test
  - 3. Horizontal capillary tests
  - 4. Consolidation of test data

Question ID : 239130670

**Q.27** The in-plane shear deformation effect by which concentrated forces tangential to the surface of a plate get distributed over the entire section perpendicular to the load over a finite length of the plate along the direction of the load is called:

- Ans
- 1. Shear force
  - 2. Point of contraflexure
  - 3. Angle of repose
  - 4. Shear lag

Question ID : 239130644

**Q.28** If Rankine's criteria is applied for failure of brittle material, then which of the following will be a necessary condition?

- Ans
- 1. Maximum shear stress
  - 2. Maximum principal stress
  - 3. Maximum shear strain energy
  - 4. Maximum strain energy

Question ID : 239130652

**Q.29** The travel time per unit length of road is \_\_\_\_\_ proportional to the speed.

- Ans
- 1. cubically
  - 2. directly
  - 3. logarithmically
  - 4. inversely

Question ID : 239130694

**Q.30** The net intensity of loading which the foundation will carry without undergoing settlement in excess of the permissible value for the structure under consideration but not exceeding net safe bearing capacity is termed as:

Ans

Question ID : 239130634

1. Net loading intensity

2. Allowable bearing capacity

3. Safe bearing capacity

4. Ultimate bearing capacity

Q.31 What will be the estimated value of modulus of elasticity (GPa) for a concrete of compressive strength 25 MPa?

Ans  1. 30

2. 25

3. 27.5

4. 32.5

Question ID : 239130662

Q.32 An engineer is designing a two-phase traffic signal system with an all-red time for pedestrian crossing as 15 s. If Webster's method is used, then what will be the total lost time?

Ans  1. 19 s

2. 15 s

3. 17 s

4. 13 s

Question ID : 239130692

Q.33 What is the maximum allowable water absorption (%) of Indian burnt brick of class 20?

Ans  1. 15

2. 5

3. 10

4. 20

Question ID : 239130665

Q.34 What will be the minimum yield strength (MPa) of Fe500 steel used as reinforcement in concrete?

Ans  1. 250

2. 415

3. 550

4. 500

Question ID : 239130666

Q.35 In photogrammetric surveying, the stereoscopic view in which the overlaps are kept outwards and in which natural order is reversed is called:

Ans  1. Orthoscopic view

2. Pseudoscopic view

3. Perspective view

4. Parallitic view

Question ID : 239130701

Q.36 Which of the following is a reason for using pile caps over a group of piles?

Ans  1.

For spreading vertical and horizontal loads to all piles

2.

For protecting piles from displacing laterally

3. For protecting piles from rising up

4.

For enhancing the load bearing capacity of each pile

Question ID : 239130676

Q.37 What is the IRC recommended width of a single lane carriageway?

Ans  1. 3.50 m

2. 3.75 m

Question ID : 239130685

3. 2.50 m

4. 3.00 m

Q.38 If the Euler load for a column is 1000 kN and crushing load is 1200 kN, then the Rankine load will approximately be:

Ans  1. 1200

2. 600

3. 900

4. 545

Question ID : 239130649

Q.39 What value of flow is usually considered for designing sewage treatment units?

Ans  1. Average

2. Harmonic mean

3. Maximum

4. Minimum

Question ID : 239130626

Q.40 The timber whose moisture content has been reduced to the specified minimum under more or less controlled processes of drying is called:

Ans  1. Shingle

2. Sleeper

3. Shook

4. Seasoned timber

Question ID : 239130656

Q.41 Cable, as a structural element, resists load by:

Ans  1. bending

2. compression

3. torsion

4. tension

Question ID : 239130648

Q.42 Which of the following assumptions is wrongly stated in regard to the Rankine's theory of earth pressure?

Ans  1. The back of the wall is not smooth.

2.

The soil mass is semi-infinite and homogeneous.

3. The ground surface is plane.

4. The retaining wall yields about the base.

Question ID : 239130632

Q.43 Which of the following is NOT a method recommended by IS 800 for assessing the period of structural adequacy of structural steel design?

Ans  1. By direct application of single test

2.

Based on previous case studies in the local area

3.

By calculating the limiting temperature of steel

4. Methods given in specialist literature

Question ID : 239130637

Q.44 Gravity dams are designed with the consideration of main overturning force as that coming from:

Ans  1. dead weight

2. water pressure

Question ID : 239130618

3. wind pressure

4. uplift pressure

Q.45 Which of the following is NOT an ideal figure for triangulation survey?

Ans  1. Regular polygons

2. Triangle with one of the angle as  $25^\circ$

3. Equilateral triangle of sufficient length

4. Braced quadrilaterals with squares

Question ID : 239130700

Q.46 While designing reinforced cement concrete wall carrying inplane loads, what is the permissible ratio of effective height to thickness?

Ans  1. 20

2. 25

3. 30

4. 35

Question ID : 239130609

Q.47 A simply supported reinforced cement concrete beam shall be deemed to be a deep beam, if its effective span to depth ratio is less than:

Ans  1. 3.00

2. 2.50

3. 1.50

4. 2.00

Question ID : 239130605

Q.48 Which of the following combinations of factors is used for determining allowable bearing capacity of a foundation?

Ans  1. Settlement, shear failure

2. Tensile failure, compression failure

3. Settlement, tensile failure

4. Settlement, bond failure

Question ID : 239130675

Q.49 If the plasticity index of a soil is 45%, then the soil will be:

Ans  1. with medium plasticity

2. with high plasticity

3. non-plastic

4. with low plasticity

Question ID : 239130677

Q.50 A hydrological study conducted in a small town revealed that the intensity of rainfall is more than the infiltration capacity of soil. The infiltration rate in this case will be:

Ans  1.  $>$  rate of rainfall

2. = infiltration capacity

3. = rate of rainfall

4.  $>$  infiltration capacity

Question ID : 239130621

Q.51 As compared to lime soda process, the zeolite process:

Ans  1. leads to large quantity of sludge formation

2. requires careful and skilled supervision

3. is bulky

4. is costlier

Question ID : 239130628

Q.52 Usually, what is the maximum permissible Los Angeles abrasion value (%) for dense bituminous macadam?

- Ans
- 1. 45
  - 2. 25
  - 3. 55
  - 4. 35

Question ID : 239130691

Q.53 In case of a strong hydraulic jump, the Froude Number is minimum of:

- Ans
- 1. 4.5
  - 2. 1.0
  - 3. 9.0
  - 4. 2.5

Question ID : 239130622

Q.54 Which of the following roller types is the most suitable for compacting fatty clay in field?

- Ans
- 1. Sheepfoot
  - 2. Rubber tyred
  - 3. Tandem
  - 4. Vibratory

Question ID : 239130669

Q.55 While designing a pile, negative skin friction is considered when the pile is constructed in:

- Ans
- 1. Dense fine sand
  - 2. Fill material
  - 3. Black cotton soil
  - 4. Dense coarse sand

Question ID : 239130671

Q.56 Which of the following properties of water is determined using ethylene diamine tetra acetic acid solution?

- Ans
- 1. BOD
  - 2. Turbidity
  - 3. Chlorine
  - 4. Hardness

Question ID : 239130630

Q.57 Which of the following is NOT a limitation of the California Bearing Ratio (CBR) used for designing flexible pavement?

- Ans
- 1. It is an empirical test for assessing strength of subgrade.
  - 2. Specified soaking period of 4 days may not be sufficient in some soils.
  - 3. Test cannot stress on subgrades.
  - 4. Ease and simplicity .

Question ID : 239130688

Q.58 The shape factor of structural steel sections primarily depends on:

- Ans
- 1. proof stress of the material
  - 2. loading conditions
  - 3. Poisson's ratio
  - 4. cross sectional geometry

Question ID : 239130642

Q.59 In regard to pre-stressed concrete design, the final deflection, due to all loads including the effects of temperature, creep and shrinkage and measure from the as-cast level of the supports of floors, roofs and all other horizontal members, should not normally exceed span/X, where X is:

- Ans
- 1. 300
  - 2. 350

Question ID : 239130613



3. 250

4. 200

**Q.60** As per IS 800, what is the maximum allowable effective slenderness ratio for structural steel that is always under tension?

Ans  1. 180

2. 350

3. 400

4. 250

Question ID : 239130643

**Q.61** What will be the load carrying capacity (kN) of a group of 6 piles, if the individual load carrying capacity is 150 kN and group efficiency is 75%?

Ans  1. 621

2. 542

3. 675

4. 500

Question ID : 239130636

**Q.62** Which of the following human organs is badly impacted with unbearable levels of Carbon monoxide in air?

Ans  1. Eyes

2. Hair

3. Heart

4. Ears

Question ID : 239130680

**Q.63** Under a beam loading condition, if the bending moment is constant over a certain span length, then the shear force would be:

Ans  1. zero

2. decreasing

3. constant and a non-zero value

4. increasing

Question ID : 239130650

**Q.64** A surface tangential to the level surface at any point is known as:

Ans  1. Datum surface

2. Collimation surface

3. Horizontal surface

4. Mean sea level

Question ID : 239130699

**Q.65** Under compression loading, what would the area under the stress-strain curve represent?

Ans  1. Fatigue

2. Energy required to cause failure

3. Elasticity of the material

4. Breaking stress of the material

Question ID : 239130651

**Q.66** What is the minimum number of longitudinal bars required to be provided in a circular column, when designed according to IS 456?

Ans  1. 4

2. 6

3. 8

4. 10

Question ID : 239130606

**Q.67** For sewage disposal in a water body without any treatment, the minimum available dilution level should be 1 in:

Ans  1. 200

Question ID : 239130625

2. 500

3. 300

4. 150

Q.68 Concrete exposed to severe freezing-thawing condition shall be classified as exposed to:

Ans  1. Extreme

2. Severe

3. Very severe

4. Moderate

Question ID : 239130664

Q.69 In regard to structural steel design and analysis, which of the following conditions should be satisfied in order to do elastic and plastic analysis?

Ans  1. Plastic moment condition

2. Visco-elastic condition

3. Equilibrium condition

4. Yield condition

Question ID : 239130641

Q.70 If the engineer's scale of a drawing is stated as 1 cm = 5 m, then the fraction scale would be 1 : x, where x is:

Ans  1. 500.0

2. 50.0

3. 5.0

4. 0.5

Question ID : 239130697

Q.71 Each term in Bernoulli's equation for flow through a pipeline represents energy per unit \_\_\_\_\_.

Ans  1. flow length

2. mass

3. weight

4. volume

Question ID : 239130623

Q.72 According to the basic considerations of Working Stress method for reinforced concrete design, the stress-strain relationship of steel and concrete under working loads is taken as \_\_\_\_\_.

Ans  1. logarithmic

2. linear

3. quadratic

4. parabolic

Question ID : 239130612

Q.73 Which of the following is primarily responsible for acid rains?

Ans  1.  $P_2O_5$

2.  $SO_2$

3. CO

4.  $CO_2$

Question ID : 239130678

Q.74 Which of the following is NOT an assumption in Terzaghi's one-dimensional consolidation theory?

Ans  1. Darcy's law is applicable.

2. Soil is laterally confined.

3. Soil is heterogeneous.

4. Soil is fully saturated.

Question ID : 239130668

For making reinforced cement concrete, the pH of water is restricted to a minimum of:

Question ID : 239130663

- Ans
- 1. 6
  - 2. 7
  - 3. 4
  - 4. 5

Q.76 What does the plate load test help in estimating?

Question ID : 239130674

- Ans
- 1. Lateral movement of foundation
  - 2. Depth of foundation
  - 3. Settlement of foundation
  - 4. Saturation in foundation

Q.77 In case of sewer design, on which of the following the velocity of flow does not depend?

Question ID : 239130627

- Ans
- 1. Length of the sewer
  - 2. Hydraulic mean depth
  - 3. Roughness of sewer material
  - 4. Grade of the sewer

Q.78 What is the acceptable limit for pH of drinking water?

Question ID : 239130631

- Ans
- 1. 7.5 – 9.5
  - 2. 6.5 – 8.5
  - 3. 9.5 – 10.5
  - 4. 5.5 – 7.5

Q.79 If a compression member of length  $L$  is restrained in rotation and translation at both the ends, then what is its effective length?

Question ID : 239130645

- Ans
- 1.  $0.65 L$
  - 2.  $0.80 L$
  - 3.  $1.0 L$
  - 4.  $1.2 L$

Q.80 Web stiffeners are to be provided where a concentrated load, which exceeds  $x$  percent of the shear capacity of the member, is applied within  $D/2$  of a plastic hinge location. What is  $x$ ?

Question ID : 239130639

- Ans
- 1. 10
  - 2. 15.0
  - 3. 25.0
  - 4. 20.0

Q.81 The velocity of a satellite to be attained to move along its elliptical orbit at which it escapes the earth's gravity and leaves the orbit is called:

Question ID : 239130702

- Ans
- 1. Radial speed
  - 2. Initial velocity
  - 3. Second astronomical velocity
  - 4. First astronomical velocity

Q.82 When assessing the strength of a structure or structural member for the limit state of collapse, the partial factor of safety for concrete is taken as:

Question ID : 239130611

- Ans
- 1. 1.75
  - 2. 1.5
  - 3. 1.15

Q.83 In critical path method, when a particular task is performed, it is called:

Question ID : 239130654

- Ans
- 1. Activity
  - 2. Event
  - 3. Float
  - 4. Contract

Q.84 In construction project planning, free float can affect which of the following?

Question ID : 239130660

- Ans
- 1. Succeeding activity
  - 2. Preceding activity
  - 3. Overall completion
  - 4. Only that particular activity

Q.85 Which of the following joints are provided in cement concrete pavements to address shrinkage cracking?

Question ID : 239130687

- Ans
- 1. Contraction joints
  - 2. Pin joints
  - 3. Construction joints
  - 4. Expansion joints

Q.86 Which of the following is NOT a test for estimating the workability of fresh cement concrete?

Question ID : 239130667

- Ans
- 1. Kelly-ball test
  - 2. Compaction factor
  - 3. Rapid chloride penetration test
  - 4. Slump flow

Q.87 Which of the following is a primary cause of flexural collapse in over-reinforced beams?

Question ID : 239130604

- Ans
- 1. Relative movement between steel and concrete
  - 2. Failure of bond
  - 3. Primary compression failure
  - 4. Primary tension failure

Q.88 In reinforced concrete construction, the structures in which marked changes in plan dimensions take place abruptly, shall be provided with:

Question ID : 239130653

- Ans
- 1. vertical cut
  - 2. expansion joints
  - 3. contraction joints
  - 4. construction joints

Q.89 Which of the following is NOT applicable in contracts as far as security deposit is concerned?

Question ID : 239130657

- Ans
- 1. Amount can be withheld from any other contract with the same client
  - 2. Necessary before entering into a contract
  - 3. Refundable after maintenance period
  - 4. Amount depends on tendered amount

Q.90 In case of statically indeterminate beam, what is the limiting value of redistribution of moments (%) as per IS 456, while using limit state method?

- Ans
- 1. 40
  - 2. 20
  - 3. 30
  - 4. 10

Question ID : 239130610

Q.91 The horizontal angle that a line makes with the magnetic meridian is called:

- Ans
- 1. Grid Meridian
  - 2. Arbitrary Meridian
  - 3. True Meridian
  - 4. Magnetic Meridian

Question ID : 239130698

Q.92 Which of the following is NOT a distress in cement concrete pavements?

- Ans
- 1. Rutting
  - 2. Spalling
  - 3. Ravelling
  - 4. Shrinkage cracking

Question ID : 239130686

Q.93 When time to completion of a project is reduced, it usually results in:

- Ans
- 1. a decrease in resource deployment
  - 2. an increase in indirect cost
  - 3. a decrease in indirect cost
  - 4. a decrease in taxes

Question ID : 239130659

Q.94 Which of the following contract types is usually followed by Railway Department for construction purposes?

- Ans
- 1. Percentage rate
  - 2. Piece work
  - 3. Item rate
  - 4. Lump-sum

Question ID : 239130658

Q.95 What is the nominal cover to rebar in reinforced cement concrete exposed to very severe conditions?

- Ans
- 1. 50 mm
  - 2. 40 mm
  - 3. 60 mm
  - 4. 75 mm

Question ID : 239130608

Q.96 Which of the following is used in removing the dust particles from a gaseous medium using electrostatic forces?

- Ans
- 1. Filter
  - 2. Cyclone scrubber
  - 3. Dust collector
  - 4. Electrostatic precipitator

Question ID : 239130681

Q.97 In shallow foundation design, the correction factor for water table correction in case of water table permanently remaining at or below a depth of (depth + width) of the foundation is taken as:

- Ans
- 1. 0.50
  - 2. 1.00
  - 3. 0.75

Question ID : 239130633

Q.98 In case of unconfined aquifer, the specific yield is:

Question ID : 239130619

- Ans
- 1. less than porosity
  - 2. equal to porosity
  - 3. not related to porosity of the ground mass
  - 4. greater than porosity

Q.99 In regard to waste water treatment, the characterization of non-biodegradable organic content is usually done in terms of:

Question ID : 239130624

- Ans
- 1. dissolved oxygen
  - 2. chemical oxygen demand
  - 3. total oxygen demand
  - 4. biological oxygen demand

Q.10 Which of the following is NOT a method of conducting Origin & Destination studies?  
0

Question ID : 239130695

- Ans
- 1. Return post card method
  - 2. Trapezoidal rule method
  - 3. Tag on car method
  - 4. Road side interview