001. Calculate the residential waste generated by a city in kilograms per day, which has a population of 2.75 lakhs and waste generation rate of 0.21 kg/capita/day.

a) 57,750 kg/day
b) 55,000 kg/day
c) 5500 kg/day
d) 5,775 kg/day

002. Calculate the maximum total waste in kilograms carried by a refuse collection vehicle of 20 cu.m. capacity in 2 trips. Consider the density of collected waste as 500 kg/cu.m.

a) 2,000 kg
b) 10,000 kg
c) 20,000 kg
d) 5,000 kg

003. According to Solid Waste Management Rules 2016, recyclable waste bins are denoted by which colour?

a) Black
b) Green
c) Blue
d) White

004. MSW quantity, composition, and other characteristics are **NOT** based on _____

a) Degree of Industrialization
b) Natural Resources, Affluence and Climate
c) Skills of Sanitary Workers
d) Socio Economic Development

005. In a building, to provide ultimate comfort to occupants _____ can be used.

a) AC
b) HVAC
c) Ventilators
d) HAC

006. Which IS codes gives details about elevators?

a) IS 27752
b) IS 38665
c) IS 14665
d) IS 27855

007. A fire detector cannot detect

a) Radiation
b) Heat
c) Light
d) Smoke

008. When exposed to fire, concrete has very little strength left after

a) 500°C
b) 300°C
c) 200°C
d) 600°C

009. Which statement is not true in the case of surveying?

a) The curvature of the earth is taken into consideration in plane surveying

b) The principle of surveying is to work from whole to part

c) Archeological survey is carried out to trace the residue of civilization, towns, temples etc.

d) Cadastral survey is conducted to locate boundaries of agricultural fields, buildings houses etc.

010. Which of the following instrument is used for setting out 45° on chain line?

a) Cross-staff

b) French cross-staff

c) Prism square

d) Optical square

011. The true bearing of line is 124°. What is its magnetic bearing if magnetic declination is 2°E?

a) 126°

b) 124°

c) 122°

d) 120°

012. Read the following statement for the case of compass surveying

1) The difference between fore bearing and back bearing of a line is always 1800 in whole circle bearing system

2) The numerical value of back bearing differs by 90° from its fore bearing in the case of reduced bearing system

3) Angle of dip is 0° at equator

4) The imaginary line joining the points of equal magnetic declination is called isogonic line

Which option is correct?

a) 1, 2 and 3 are true

b) 1, 2 and 4 are true

c) 2, 3 and 4 are true

d) 1, 3 and 4 are true

013. The elevation of various points across the center line of a road is obtained in

a) Cross-sectioning

b) Profile levelling

c) Reciprocal levelling

d) Fly levelling

014. Which method is not applied to determine area of a longitudinal strip of road?

a) Mid-ordinate method

b) Trapezoidal method

c) Simpson's method

d) Synder's method

015. Which is not a method of plane table surveying?

a) Radiation

b) Resection

c) Bisection

d) Traversing

016. The staff readings of point B taken from tacheometer installed at point A are 0.5 m, 0.7 m and 0.9 m. What will be the distance between point A and B? (Consider tacheometer constants equal to 100 and zero)

(a) 20 m
(b) 40 m
(c) 60 m
(d) 100 m

017. Which chain is used in cadastral survey or public land survey

a) Metric chain
b) Revenue chain
c) Gunter's chain
d) Engineer's chain

018. If L = length of transition curve and R = Radius of curve

The correct expression for shift of transition curve is

a) $L^2/24\ R$
b) $L^2\ R/24$
c) $24L^2/\ R$
d) L^2 x 24 R

019. Moment of inertia of a rectangular beam of width b & depth d about its top of width is

a) $bd^3/12$
b) $db^3/12$
c) $bd^3/3$
d) $db^3/3$

020. The permissible stresses in rivets under wind / earthquake load conditions as per IS : 800 can be exceeded by

a) 20 %
b) 25%
c) 50%
d) 100%

021. Poisson's ratio can be represented as

a) Linear stress / Lateral stress
b) Lateral stress/Linear stress
c) Lateral strain / Linear strain
d) Linear strain/Lateral strain

022. What is the moment at mid-span for a fixed beam of span L subject to udl w/unit length?

a) $wl^2/8$
b) $wl^2/12$
c) $wl^2/24$
d) $wl^3/48$

023. Side face reinforcement as per IS 456 2000 should be provided, when depth of a beam exceeds

a) 500 mm
b) 750 m
c) 900 mm
d) 1200 mm

024. What is the effective length of column recommended by code for a column hinged at both ends?

a) 0.5 L
b) 0.65 L
c) L
d) 2.0 L

025. What is the function of Lug angles?

a) Increase the shear resistance of joint
b) Increase torsional capacity
c) Increase bending capacity
d) reduce the length of joint

026. What is the percentage increase in load carrying capacity of column when helical reinforcement is provided as a transverse reinforcement?

a) 5
b) 10
c) 20
d) No change

027. Bar A has diameter d and bar B has diameter 2d. Both of them having same length and are made up of same material. If they are subjected to same axial load P, the ratio of elongation of bar A to elongation of bar B is

a) 0.25
b) 0.5
c) 2.0
d) 4.0

028. Which IS Code is used for design loads for buildings and structures for Earthquake Force?

a) IS 456
b) IS 800
c) IS 875
d) IS 1893

029. Which rock has primary source as magma

a) Sedimentary rock
b) Metamorphic rock
c) Igneous rock
d) All of the above

030. If P is the axial load and Pu is the factored axial load on the footing, area of footing required is

a) P/SBC
b) 1.1P/SBC
c) Pu/SBC
d) 1.1Pu/SBC

031. Escape of pore water because of compression due to long term static load is known as

a) Compaction
b) Consolidation
c) Liquefaction
d) Stratification

032. Black cotton soil has properties of

a) Low bearing capacity
b) Volumetric changes
c) Stickiness while rolling
d) All of the above

033. What roller is better for compacting granular material in wide area

a) sheep foot roller
b) vibratory roller
c) pneumatic tyre roller
d) All of the above

034. The reason for Efflorescence of bricks is

a) High porosity of bricks
b) Soluble salts present in parent clay
c) High clay content in brick clay
d) Excessive burning of bricks

035. Which of the following is associated with use of high carbon steel?

a) high strength
b) reduced ductility
c) high toughness
d) reduced strength

036. The strength of timber is maximum when load is applied

a) perpendicular to grain
b) inclined at 45° to grain
c) parallel to grain
d) same in all direction

037. What is the quantity of water added to one bag of cement if the water cement ratio prescribed is 0.4?

a) 20 kg
b) 25 kg
c) 10 kg
d) 30 kg

038. The approximate ratio between the strengths of concrete cube at 7 days and at 28 days is

a) 0.5
b) 0.67
c) 0.75
d) 0.95

039. The best suited cement for marine works is

a) Ordinary Portland cement
b) Portland Pozzolana cement
c) Sulphate resisting cement
d) Low heat Portland cement

040. What is the correct sequence of operations involved in concrete production?

a) Transportation – handling – mixing – batching
b) Mixing – batching – handling – transportation
c) Batching – mixing – handling – transportation
d) Handling – transportation – mixing – batching

041. What is the purpose of Carbonation test of concrete member? To determine

a) Proportion of concrete
b) Proportion of aggregates
c) Corrosion ingress depth
d) Depth of reinforcement

042. Which one of the following is not required inconcrete mix-design?

(a) Degree of quality control of concrete
(b) Workability of concrete
(c) Characteristic compressive strength of concrete at 28 days
(d) Initial setting time of cement

043. Which method of curing of concrete is recommendable for rapid gain of straight of concrete?

(a) Sprinkling water
(b) Membrane curing
(c) High-pressure steam curing
(d) Infrared radiation curing

044. GDCR stands for

a) Gujarat Development Control Regulations
b) General Development Control Regulations
c) General Development Central Regulations
d) General Development Critical Regulations

045. For a public building having storey height of 3.0 m, how many treads would be required if GDCR permits maximum riser of 12 cm

a) 25
b) 24
c) 27
d) 30

046. The strain on the boom of a hoist is minimum when it is in the

a) 30° inclined position
b) 45° inclined position
c) Horizontal position
d) Vertical position

047. Which component is considered as Non- Structural Component in RCC structure?

a) Slab
b) Beam- Column joint
c) Column
d) Partition walls

048. Which one of the following parameters is not included in the routine characterization of solid waste for its physical composition?

a) Density
b) Moisture content
c) Energy value
d) Particle size analysis

049. What is the general design life (in years) of capital-intensive infrastructure projects?

a) 5
b) 10
c) 30
d) 50

050. On what parameters does Municipal Solid waste generation of a city depend on?

a) Population and Demographic Characteristics
b) Income Groups in the city
c) Nature of City and Lifestyle of People
d) All of these

051. Barbed wire fencing and rolling shutter are measured respectively in which unit?

a) Running meter and square meter
b) Square meter and square meter
c) Square meter and cubic meter
d) Running meter and cubic meter

052. Which is not a type of estimate?

a) Revised estimate
b) Supplementary estimate
c) Abstract estimate
d) Lump-sum estimate

053. Which is not true in the case of specification

a) Specification describes nature and class of work, material to be used, workmanship etc.
b) The word 'should be' or 'shall be' are used in specification
c) Specification does not form an important part of contract document
d) The cost of a work depends on specification

054. The value at the end of utility period without being dismantled is termed as

a) Scrap value
b) Salvage value
c) Market value
d) Book value

055. What is the collective term for the physical problems such as cracks, spalls, staining in structures?

a) Defect
b) Deterioration
c) Distress
d) Degradation factor

056. Which one of the following is not an ingredient of the Epoxy Mortar?

a) Cement
b) Resin
c) Silica Sand
d) Hardener

057. Earthquake resistance of masonry building can be enhanced by

a) Providing lintel band
b) Providing plinth band
c) Providing corner steel
d) All of the above

058. Which of the following test is used to determine the bond strength of the surface repairs?

a) Rebound Hammer test
b) Ultrasonic Pulse Velocity
c) Pull out test
d) Vibration Test

059. Diagonal crack at the support of simply supported beam is

a) Shear crack
b) Flexural crack
c) Non-structural crack
d) Torsion crack

060. What is the height of Statue of Unity?

a) 182 yard
b) 182 meter
c) 182 feet
d) 1820 feet

061. Which Gujarati architect contributed in planning of Central Vista project New parliament Building?

a) B V Doshi
b) Bimal Patel
c) Nari Gandhi
d) Hafeez Contractor

062. Kirti Toran is located in

a) Patan
b) Vadnagar
c) Sarkhej
d) Modhera

063. What are the latest technologies used in construction?
a) Artificial intelligence
b) 3 D Printing
c) Drones
d) All of the above

064. Which of the following famous monumental place is not located in Gujarat?
a) Somnath Temple
b) Sun Temple
c) Lotus Temple
d) Ran ki vav

065. Which criteria is correct to determination of allowable bearing pressure of a foundation?
a) Shear failure and settlement
b) Tensile failure and bending failure
c) Bending failure and settlement
d) Torsion failure and bending failure

066. In-site bulk density for cohesionless soils can be determined by _____
a) Pycnometer method
b) Sand replacement method
c) Calcium carbide method
d) Core cutter method

067. As per IS classification system, size of silt particle is
a) < 0.002 mm
b) 0.002 to 0.075 mm
c) 0.075 to 4.75 mm
d) > 4.75 mm

068. If $\Phi=26°$ then suggested shear failure in the soil is
a) Local shear failure
b) General shear failure
c) Punching shear failure
d) All of the above

069. A raft foundation is provided when the area of foundations exceed the plan area of the building by more than
a) 10%
b) 25%
c) 50%
d) 75%

070. What is the permissible limit of iron and manganese in potable water
a) 0.1 ppm
b) 0.2 ppm
c) 0.3 ppm
d) 0.4 ppm

071. Read the following statements
1. The presence of nitrogen in the water indicates the presence of organic matter in the water
2. The residual chlorine presence can be determined by zeolite process
3. The most probable number (MPN) is one number in 100 ml of water
4. The permissible limit of chloride in water is 300 ppm

Which option is correct
a) 1, and 2 are true
b) 2 and 3 are true
c) 1, and 3 are true
d) 2 and 4 are true

072. Which is not the method of disinfection of water?

a) Use of activated carbon
b) Use of excess lime
c) Use of potassium permanganate
d) Use of ultra-violet rays

073. Which water distribution system is suitable for town having rectangular layout of roads

a) Dead end system
b) Grid iron system
c) Ring system
d) Radial system

074. Which formula is not used in the hydraulic design of pressure pipe?

a) Manning's formula
b) Hazen-William's formula
c) Darcy-weisbach formula
d) Prandtl's formula

075. Read the following statement in relation of quality of waste water

1) Biochemical oxygen demand of sewage is the quantity of oxygen required for biochemical oxidation of decomposable matter

2) The chemical oxygen demand is a measure of presence of carbon in the organic matter of sewage

3) Chloride in the sewage can be determined by titration with standard silver nitrate solution

Which one is correct option

a) 1 and 2 are true
b) 2 and 3 are true
c) 1 and 3 are true
d) 1, 2, and 3 are true

076. Identify the correct sequence for the theory of filtration in water treatment process

a) Mechanical straining, sedimentation, electrolytic action, biological action
b) Sedimentation, mechanical straining, electrolytic action, biological action
c) Mechanical straining, sedimentation, biological action, electrolytic action
d) Sedimentation, mechanical straining, biological action, electrolytic action

077. Leachate is colored liquid that comes out of

a) Aerated lagoons
b) Septic tank
c) Compost plant
d) Sanitary landfills

078. Which one of the following is not an anthropogenic cause of air pollution?

a) Agricultural activities
b) Thermal power plant
c) Swamps and marshy land
d) Combustion of fossil fuels

079. Which one of the following methods is used for disposal of garbage from hospital?

a) Compositing
b) Incineration
c) Open dumping
d) All of the above

080. Which factor does not affect the stopping sight distance?

a) Features on the road ahead
b) Height of driver's eye above the road surface
c) Height of the object above the road surface
d) Shape of the vehicle

081. What is the maximum limit of super-elevation in plain and rolling terrains taking mixed traffic into consideration?

a) 3 %
b) 5 %
c) 7 %
d) 10 %

082. Which is not the function of transition curve in the horizontal alignment?

a) To enable gradual introduction of the designed superelevation
b) To provide sufficient stopping sight distance
c) To introduce gradually the centrifugal force
d) To enable driver to turn steering gradually for his comfort

083. Which is not a method of speed and delay studies?

a) Home interview method
b) License plate method
c) Riding check method
d) Photographic technique

084. "Before and after studies" in case of accident study falls under which measure for the reduction of accident rate?

a) Engineering measures
b) Education measures
c) Enforcement measures
d) Enlighten measures

085. The maximum number of passenger cars that can pass a given point on a lane or roadway during one hour under nearly ideal roadway and traffic condition is termed as

a) Practical capacity
b) Highway capacity
c) Basic capacity
d) Possible capacity

086. No parking or No stopping signs come under category of

a) Regulatory sign
b) Informatory sign
c) Warning sign
d) Compulsory direction sign

087. Which is not an advantage of a traffic rotary?

a) Possible numbers of accidents and severity of accident is low because of low speed
b) Rotary requires comparatively small area of land
c) Crossing manoeuver is converted into weaving or merging and diverging
d) In general, no necessity of traffic police or signal to control the traffic

088. Which test is not conducted to evaluate the properties of bitumen binders?

a) Softening point test
b) Penetration test
c) Ductility test
d) Abrasion test

089. The correct sequence of component of typical flexible pavement is

a) Sub-base, subgrade, base course and binder course
b) Subgrade, sub-base, base course and binder course
c) Subgrade, base course, sub-base and binder course
d) Sub-base, base course, subgrade and binder course

090. Read the following statements in relation to concrete pavement

1) Pavement slab is constructed using pavement quality concrete (PQC)
2) Contraction joints are essentially transverse joints provided during the construction of concrete pavements
3) Longitudinal joints are provided in concrete pavement if its width exceeds 5.0m

Which option is correct

a) 1, 2 are true
b) 1, 3 are true
c) 2, 3 are true
d) 1,2, and 3 are true

091. Which is not the function of road arboriculture?

a) To provide fruit bearing tree and timber
b) To provide shade and pleasant drive to road users
c) To prevent bleeding of bituminous road
d) To intercept annoying sand waves and fumes from road vehicles

092. Which is not a type of transition curve provided in pavement

a) Circular curve
b) Spiral
c) Leminscate
d) Cubic parabola

093. 80/100 or 30/40 grade bitumen indicate which values?

a) Viscosity
b) Penetration
c) Ductility
d) Flash and fire value

094. Which is not the functional deterioration of cement concrete pavement?

a) Scaling and raveling
b) Spalling of joints
c) Segregation
d) Shrinkage cracks

095. Read the following statement in relation to network methods PERT and CPM

1) In CPM cost is direct controlling factor
2) In CPM time is direct controlling factor
3) In PERT cost is direct controlling factor
4) In PERT time is direct controlling factor

Which option is correct?

a) 1 and 4 are true
b) 2 and 3 are true
c) 1 and 3 are true
d) 2 and 4 are true

096. Which rule is adopted for numbering the events of a project network?

a) Bowditch's rule
b) Fulkerson's rule
c) Prandtl's rule
d) Gale's rule

097. Which is not the time estimate in PERT?

a) Optimistic time
b) Pessimistic time
c) Earliest finish time
d) Most likely time

098. Which statement is not true in the case of PERT analysis?

a) Slack can be negative, positive or zero
b) Slack is defined as difference between latest allowable time and earliest expected time of an event
c) A critical path connects the event having zero or minimum slack times
d) Critical path is not the longest path in a network

099. Read the following statements in relation of project cost

a) Indirect cost rises with the increased duration

b) Indirect cost includes expenditure related to overhead, supervision etc.

c) Material, labour and equipment cost fall under direct cost

d) Project cost is maximum at some optimum project duration

100. The number of bricks needed to carry out 1 cubic meter of brick work is

a) 50

b) 500

c) 5000

d) 1000