B.Tech Civil Engineering 3 Semester

SUBJECT: STRUCTURAL ANALYSIS-I

1. The deflection at the mid-span of a simply supported beam with a udl of w per unit length, flexural rigidity EI and length L is _____.

   (i) $\frac{3wL^4}{584EI}$ (ii) $\frac{5wL^4}{384EI}$ (iii) $\frac{5wL^4}{348EI}$ (iv) $\frac{5wL^4}{548EI}$

2. The maximum deflection of a cantilever beam with a point load at its free end is given by–

   (i) $\frac{WL^3}{3EI}$ (ii) $\frac{WL^3}{8EI}$ (iii) $\frac{WL^3}{48EI}$ (iv) $\frac{WL^3}{24EI}$

3. If the boundary condition for a real beam end is slope, θ=0 and displacement, y=0, then, the boundary condition for the corresponding conjugate beam is:

   (i) θ=0; y=0 (ii) y=0; V=0 (iii) M = 0; V=0 (iv) M=0; θ=0

   where, M is the bending moment and V is the shear force of the conjugate beam.

4. Total number of static equilibrium equations for 3D structure is _____.

   (i) 0 (ii) 4 (iii) 3 (iv) 6

5. The degree of Statical indeterminacy of beam with hinge at one end and roller at the other is _____.

   (i) 1 (ii) 0 (iii) 3 (iv) 2

6. If a truss is loaded vertically downward with a load, top chord members are subjected to _____.

   (i) Compression (ii) Tension (iii) Flexure (iv) Torsion

7. The value of bending moment at the point of contraflexure is _____.

   (i) Positive (ii) Negative (iii) Zero (iv) Positive & Negative

8. What is the horizontal thrust for the two hinged semicircular arch (Radius, R) loaded with point load, W at its crown?

   (i) $\frac{W}{2\pi}$ (ii) $\frac{4WR}{3\pi}$ (iii) $\frac{WR}{\pi}$ (iv) $\frac{W}{\pi}$

9. Which structure will perform better during earthquake?

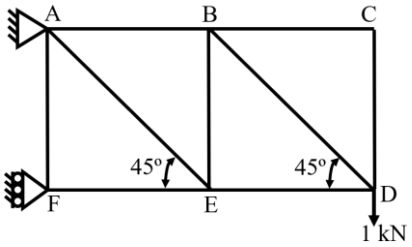
   i) Statically determinate and indeterminate

   ii) Depends upon magnitude of earthquake

   iii) Statically indeterminate

   iv) Statically determinate

10. What is the force in member BC?



   (i) 1 kN (Tensile) (ii) 1 kN (Compression) (iii) $\sqrt{2}$ kN (iv) 0

11. The strain energy stored in a member subjected to an axial force, *P* is

   (i) $\int \frac{P^2 dx}{2EI}$ (ii) $\int \frac{P^2 dx}{2AE}$ (iii) $\int \frac{P dx}{2AE}$ (iv) $\int \frac{P^2 dx}{EI}$

12. Cables of suspension bridges supports load mainly by

   (i) Direct tension (ii) Tension (iii) Torsion (iv) Compression

13. The horizontal thrust produced at supports of cable when loaded with uniformly throughout the span is ____.

   (i) $\frac{WL^2}{32H}$ (ii) $\frac{WL^2}{16H}$ (iii) $\frac{WL^2}{8H}$ (iv) $\frac{WL^2}{2H}$

14. The change in slope between any two points on the elastic curve equals the area of M/EI diagram between both end points of beam.

   (i) True (ii) False

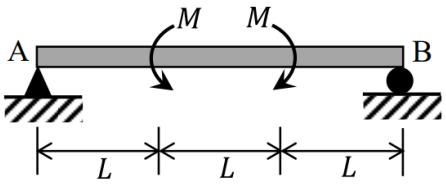
15. What is kinematic indeterminacy for a beam with roller supports at both ends (without considering axial deformation)?

   (i) 6 (ii) 4 (iii) 2 (iv) 0

16. If there are m unknown member forces, r unknown reaction components and j number of joints, then the degree of static indeterminacy of a pin-jointed plane frame is given by_____.

(i) m + r – 2j (ii) m – r + 2j (iii) m + r + 2j (iv) m + r – 3j

17. Consider the beam shown in the figure, on a hinge support at end A and a roller support at end B. The beam has a constant flexural rigidity, and is subjected to the external moments of magnitude *M* at one-third spans, as shown. Which of the following statements is/are TRUE?



A) Support reactions are zero

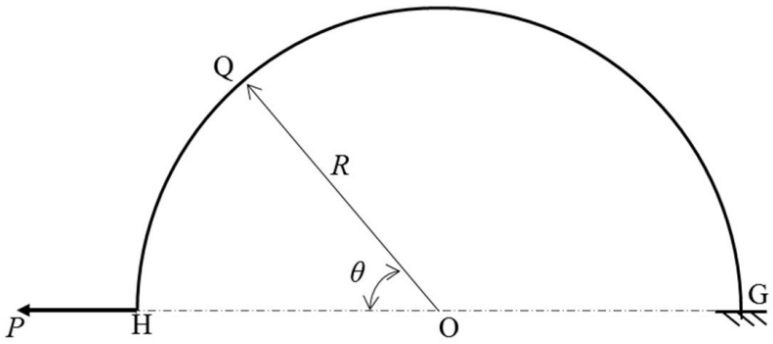
B) Shear force is zero everywhere

C) Bending moment is zero everywhere

D) Deflection is zero everywhere

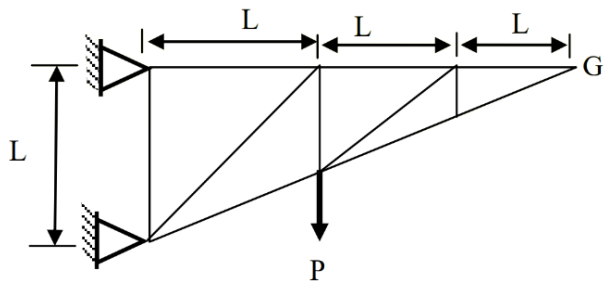
(i) B & D (ii) A & C (iii) B & C (iv) A & B

18. A semi-circular bar of radius R m, in a vertical plane, is fixed at the end G, as shown in the figure. A horizontal load of magnitude P kN is applied at the end H. The magnitude of bending moment at point Q for θ = 45° is



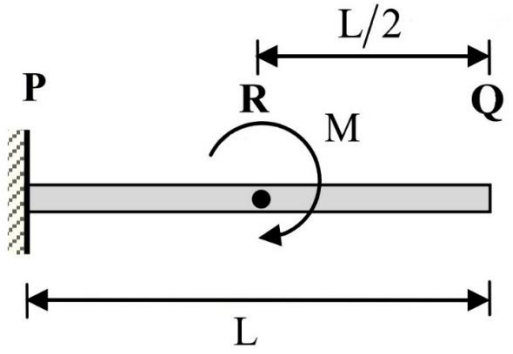
(i) $\frac{PR}{\sqrt{2}}kNm$ (ii) $\frac{P}{\sqrt{2}}kNm$ (iii) $0\ kNm$ (iv) $\frac{PR}{2}kNm$

19. Consider the planar truss shown in the figure given below. Neglecting self-weight of the members, the number of zero-force members in the truss under the action of the load P, is



(i) 6 (ii) 9 (iii) 8 (iv) 7

20. A cantilever beam PQ of uniform flexural rigidity (EI) is subjected to a concentrated moment M at R as shown in the figure. The deflection at the free end Q is



(i) $\frac{ML^2}{6EI}$ (ii) $\frac{ML^2}{4EI}$ (iii) $\frac{3ML^2}{4EI}$ (iv) $\frac{3ML^2}{8EI}$

ANSWER KEY

SUBJECT: STRUCTURAL ANALYSIS-I

1	(ii) $\frac{5wL^4}{384EI}$	**11**	(ii) $\int \frac{P^2 dx}{2AE}$
2	(i) $\frac{WL^3}{3EI}$	**12**	(i) Direct tension
3	(iii) $M = 0$; $V=0$	**13**	(iii) $\frac{WL^2}{8H}$
4	(iv) 6	**14**	(ii) False
5	(ii) 0	**15**	(iii) 2
6	(i) Compression	**16**	(i) m + r – 2j
7	(iii) Zero	**17**	(iv) A & B
8	(iv) $\frac{W}{\pi}$	**18**	(i) $\frac{PR}{\sqrt{2}} kNm$
9	iii) Statically indeterminate	**19**	(iii) 8
10	(iv) 0	**20**	(iv) $\frac{3ML^2}{8EI}$

SUBJECT: BUILDING CONSTRUCTION AND PLANNING

1. What are Plasticizers?
   a) Which reduces water for workability
   b) Which oxidizes water for workability
   c) Which decreases workability at the same water content
   d) Which adds water for workability
2. What are building materials?
   a) Substance that which cannot be utilised in the construction of a structure
   b) Substance that is utilised in the construction of a structure
   c) Substance that is utilised in the manufacturing of construction materials
   d) None of the mentioned

3. Which of the following is/are basic building materials?
   a) Wood
   b) Cement
   c) Brick
   d) All of the mentioned
4. Which of the following is/are the classification of building materials?
   a) Inorganic materials and Organic materials
   b) Waterproofing compounds
   c) Binders
   d) All of the mentioned
5. Which of the following is not a type of Inorganic building materials?
   a) Mud
   b) Gypsum
   c) Wood
   d) Lime

6. Construction of cavity walls as external walls to protect the building from the outside heat or cold as the hollow space between two walls act as an _____
   a) Destructive material
   b) Burning material
   c) Building material
   d) Insulating material
7. Which of the following type of foundation is used for the construction of building on black cotton soil?
   a) Grillage foundation
   b) Inverted arch foundation
   c) Floating foundation
   d) Mat foundation
8. In old times, the construction of superstructure was done by using which of the following building material?
   a) Rubber
   b) Timber
   c) Bamboo
   d) Mud
9. Which of the following is defined at the uppermost part of the building which is constructed in the form of a framework to give protection to the building against rain,

heat, snow, wind, etc?
a) Lintels
b) Roof
c) Chajja
d) Truss

10. In which of the following type of construction, the square or rectangular blocks of stones are used?
a) Rubble masonry
b) Rock Masonry
c) Ashlar masonry
d) Brick masonry
11. Which of the following types of walls is constructed to divide the space within the building?
a) Curtain wall
b) Party wall
c) Partition wall
d) Cavity wall
12. Which of the following reasons is not a type of mortar?
a) Lime mortar
b) Lemon mortar
c) Cement-lime mortar
d) Cement mortar
13. Which of the following is provided on the horizontal shores when one building is higher than the other?
a) Flying shore
b) Pile Underpinning
c) Pit Underpinning
d) Raking shore
14. Which of the following term in the buildings is used to mean the coming out of water from components like walls and floors of the buildings?
a) Water proofing
b) Dampness
c) Termite proofing
d) Damp proofing
15. Which of the following is a mixture of cement, sand, pebbles or crushed rock and water, which, when placed in the skeleton of forms and are allowed to cure, becomes hard like a stone?
a) Cement mortar
b) Cement grouting
c) Cement concrete
d) Cement slurry
16. Which of the following is a non-combustible building material with low coefficient of expansion?
a) Glass
b) Asbestos cement
c) Brick
d) Sandstone

17. In _____ type of bond, all the brakes are arranged in the stretcher courses.
    a) English bond
    b) Header bond
    c) Stretcher bond
    d) Flemish bond
18. In _____ type of bond, a header course place after several Stretcher courses.
    a) Header bond
    b) Stretcher bond
    c) Flemish bond
    d) Facing bond
19. The construction of which piles proves to be very useful in case of sandy soil or soft.
    a) Cast iron pile
    b) Sand pile
    c) Steel pile
    d) Timber pile
20. The movement of soil under the action of load can be prevented by confining the ground by use of _____
    a) Steel pile
    b) Sand pile
    c) Timber pile
    d) Sheet pile
21. The commercial method which combines the effect of vibration with jetting is known as _____
    a) Flooding
    b) Ramming
    c) Vibration
    d) Vibroflotation

ANSWER KEY

SUBJECT: BUILDING CONSTRUCTION AND PLANNING

1	A	**11**	B
2	B	**12**	D
3	D	**13**	A
4	A	**14**	C
5	C	**15**	B

6	D	**16**	C
7	D	**17**	D
8	D	**18**	B
9	B	**19**	D
10	C	**20**	D

SUBJECT : FLUID MECHANICS

1. What is fluid mechanics?
   a) Study of fluid behavior at rest
   b) Study of fluid behavior in motion
   c) Study of fluid behavior at rest and in motion
   d) None of the above

2. Which of the following is the basic principle of fluid mechanics?
   a) Momentum principle
   b) Energy equation
   c) Continuity equation
   d) All of the above

3. When a fluid is called turbulent?
   a) High viscosity of fluid
   b) Reynolds number is greater than 2000
   c) Reynolds number is less than 2000
   d) The density of the fluid is low

4. Stagnation point is the point in fluid mechanics where the velocity of the fluid at that point is _____
   a) unity
   b) constant
   c) infinite
   d) zero

5. The dimension of coefficient of viscosity is

a. $M^1L^{-1}T^{-1}$
b. $M^{-1}L^1T^{-1}$
c. $M^{-1}L^1T^1$
d. $M^{-1}L^{-1}T^1$

6. Specific weight of sea water is more than that of pure water because it contains _____

a. Dissolved air
b. Dissolved salt
c. Suspended matter
d. All of the above

7. Match List – I and List – II and select the correct answer using the codes given below the lists

List-I	List-II
A. Lubrication	1. Capillary
B. Rise of sap in trees	2. Vapour pressure
C. Formation of droplets	3. Viscosity
D. Cavitation	4. Surface tension

a. A-2; B-4; C-1;D-3
b. A-3; B-4;C-1; D-2
c. A-2; B-1; C-4; D-3
d. A-3; B-1; C-4; D-2

8. A pitot tube is used to measure
   a) Pressure
   b) difference in pressure
   c) velocity of flow
   d) none of these.

9. If a person studies about a fluid which is at rest, what will you call his domain of study?
   a) Fluid Dynamics
   b) Fluid Mechanics
   c) Fluid Statics
   d) Fluid Kinematics

10. Which among the following is the standard symbol for Archimedes number?
   a) A_r
   b) A
   c) a
   d) AR

11. Open channel flow takes place _____
   a) In a pump
   b) Within a cylindrical depth
   c) On a free surface
   d) In the pipe

12. Which among the following is an assumption of Hagen-Poiseuille equation?
    a) Fluid is uniform
    b) Fluid is laminar
    c) Fluid is turbulent
    d) Fluid is compressible

13. Which of the following is a formula for the friction factor of circular pipes?
    a) Re/64
    b) 16/Re
    c) 64/Re
    d) Re/16

14. Which among the following have the same forces acting on them?
    a) Dynamic similarity
    b) Geometric similarity
    c) Conditional similarity
    d) Kinematic similarity

15. What is the function of a surge tank?
    a) It causes water hammer
    b) Produces surge in the pipeline
    c) Relieves water hammer
    d) Supplies water at constant pressure

16. The total head loss for the system is equal to_____
    a) Pipe length
    b) Pipe diameter
    c) Width of the reservoir
    d) Height difference of reservoir

17. Define Viscosity.
    a) Resistance to flow of object
    b) Resistance to flow of air
    c) Resistance to flow of fluid
    d) Resistance to flow of heat

18. Which among the following is the standard symbol for Froude number?
    a) F
    b) Fo
    c) F_r
    d) f

19. Proper explanation for metacentre is:
    a) Point at which line of action of force meets the normal axis of body when it is given angular displacement
    b) Intersection of line passing through new centre of buoyancy and centre of gravity.
    c) point about which body starts oscillating when it is given small angular displacement
    d) All of the above

20. Which of the following contribute to the reason behind the origin of surface tension?
    a) only cohesive forces
    b) only adhesive forces
    c) neither cohesive forces nor adhesive forces
    d) both cohesive forces and adhesive forces

ANSWER KEY

SUBJECT: FLUID MECHANICS

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	c	d	b	d	a	d	d	c	c	a	c	b	c	a	c	d	c	c	d	d

SUBJECT: SOLID MECHANICS

Q1) The Rankine-Golden formula accounts for direct as well as buckling stress and is applicable to:

(A) Very long columns
(B) Long columns
(C) Short columns
(D) Intermediate columns

Q2) The length of a wire is increased by 1 mm on the application of a given load. In a wire of the same material, but of length and radius twice that of the first, on application of the same load, extension is

A. 0.25 mm
B. 2 mm
C. 0.5 mm
D. 4 mm

Q3) The ratio of strengths of solid to hollow shafts, both having outside diameter *D* and hollow having inside diameter *D*/2, in torsion, is

(A) 16/15
(B) 7/8
(C) 8/7
(D) 15/16

Q4) In case of a hollow shaft the average torsional energy/unit volume is given by:

(A)$(\tau^2 /4C) \times (D^2+d^2 /D^2)$
(B) $(\tau^2 /C) \times (D^2+d^2 /D^2)$
(C)$(\tau^2 /4C) \times (D+d/D^2)$
(D) $(\tau/C) \times (D^2+d^2 /D^2)$

Q5)Torque and bending moment of 100 kNm and 200 kNm acts on a shaft which has external diameter twice of internal diameter. What is the external diameter of the shaft which is subjected to a maximum shear stress of 90 N/mm^2?

(A) 116.5 mm
(B) 233.025 mm
(C) 587.1 mm
(D) 900 mm

Q6) Which of the following statements is/are true for a simply supported beam?

(A) Deflection at supports in a simply supported beam is maximum.
(B) Deflection is maximum at a point where slope is zero .
(C) Slope is minimum at supports in a simply supported beam.
(D) All of the above.

Q7) The shafts will have same strength on the basis of torsional rigidity, if

(A) diameter and length of both shafts is same
(B) material of both shafts is same
(C) angle of twist for both shafts is same
(D) all of above conditions are satisfied

Q8) The ratio of the theoretical critical buckling load for a column with fixed ends to that of another column with the same dimensions and material, but with pinned ends, is equal to:

(A) 0.5
(B) 1.0
(C) 2.0
(D) 4.0

Q9) The Poisson's ratio for a perfectly incompressible linear elastic material is:

(A) 1
(B) 0.5
(C) 0
(D) Infinity

Q10) A metallic rod of 500mm length and 50mm diameter, when subjected to a tensile force of 100kN at the ends, experiences an increase in its length by 0.5mm and a reduction in its diameter by 0.015mm. The Poisson's ratio of the rod material is:

A. 0.2
B. 0.3
C. 0.5
D. 0.1

Q11) The number of independent elastic constants required to define the stress-strain relationship for an isotropic elastic solid is:

A. 2
B. 5
C. 1
D. 3

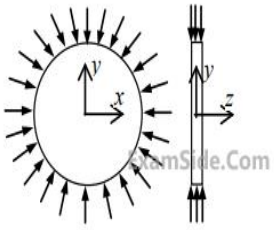
Q12) Two identical circular rods of same diameter and same length are subjected to same magnitude of axial tensile force. One of the rods is made out of mild steel having the modulus of elasticity of 206 GPa. The other rod is made out of cast iron having he modulus of elasticity of 100 GPa. Assume both the materials to be homogeneous and isotropic and the axial force causes the same amount of uniform stress in both the rods. The stresses developed are within the proportional limit of the respective materials. Which of the following observations is correct?

A. Both rods elongate by the same amount
B. Mild steel rod elongates more than the cast iron rod
C. Cast iron rod elongates more than the mild steel rod
D. As the stresses are equal strains are also equal in both the rods.

Q13) A shaft with a circular cross-section is subjected to pure twisting moment. The ratio of the maximum shear stress to the largest principal stress is:

A. 2
B. 1
C. 0.5
D. 0

Q14) A thin plate of uniform thickness is subject to pressure as shown in the figure below:



Under the assumption of plane stress, which one of the following is correct:

A. Normal stress is zero in the z- direction
B. Normal stress is tensile in the z- direction
C. Normal stress is compressive in the z- direction
D. Normal stress varies in the z- direction

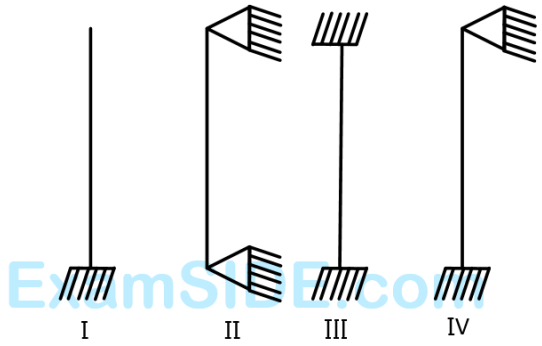
Q15) For linear elastic systems, the type of displacement function for the strain energy is:

A. Linear
B. Quadratic
C. Cubic
D. Quartic

Q16) The effective length of a column of length L fixed against rotation and translation at one end is:

A. 0.5L
B. 0.7L
C. 1.414 L
D. 2 L

Q17) Four column of the same material having identical geometric properties are supported in different ways as shown below:



It is required to order these four beams in the increasing order of their respective first buckling loads. The correct order is given by:

A. I,II,III,IV
B. III,IV,II,I
C. II,I,IV,III
D. I,II,IV,III

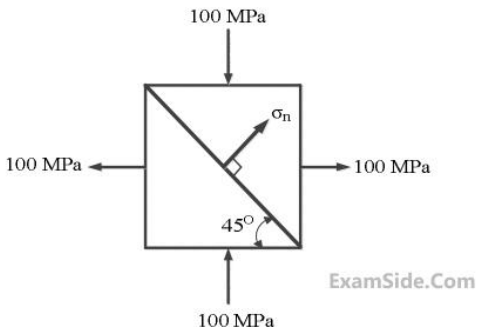
Q 18) A thin walled cylindrical pressure vessel having a radius of 0.5m and wall thickness of 25mm is subjected to an internal pressure of 700kPa. The hoop stress developed is:

A. 14 Mpa
B. 1.4MPa
C. 0.14MPa
D. 0.014MPa

Q19) The first moment of area about the axis of bending for a beam cross-section is:

A. Moment of inertia
B. Section modulus
C. Shape factor
D. Polar moment of inertia

Q20) Two triangular wedges are glued together as shown in the following figure. The stress acting normal to the interface, σ_n is _____MPa



A. 0
B. 2.0
C. 5.0
D. 1.0

ANSWER KEY

SUBJECT: SOLID MECHANICS

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	D	C	D	A	C	B	D	D	B	B	A	C	B	A	B	D	D	A	B	A

SUBJECT: SURVEYING I

1. Which of the following is the first principle of surveying?
a) Whole to whole
b) Part to part
c) Part to whole
d) Whole to part

2. Which of the following type of surveying is used for exploring mineral wealth?
a) Military surveying
b) Mine surveying
c) Topographic surveying
d) Engineering surveying

3. In which of the following type of surveying only linear measurements are made?
a) Dumpy level
b) Theodolite surveying
c) Chain surveying
d) Contouring

4. Which of the following classification in surveying is based on the instrument used?
a) Traverse surveying
b) Cadastral surveying
c) Topographic surveying
d) Hydrographic surveying

5. In which of the following areas does compass surveying is not recommended?
a) Large areas
b) Undulating areas
c) Crowded with many details
d) Local attraction suspected area

6. The direction of a survey line can either be established with relation to _____
a) each other
b) main station
c) arrows
d) tie station

7. What is the direction of line relative to a given meridian?
a) Bearing of a line
b) Length of a line
c) Slope of a line
d) Reciprocal of slope of a line

8. Which line passes through true north and true south?
a) True Meridian
b) Magnetic Meridian
c) Arbitrary Meridian
d) Dip

9. Which meridian direction can be established with the help of a magnetic compass?
a) True Meridian
b) Magnetic Meridian
c) Arbitrary Meridian
d) All meridians

10. Which meridians are used to determine the relative positions of the lines in a small area?
a) True Meridian
b) Magnetic Meridian
c) Arbitrary Meridian
d) All meridian

11. By balancing back sight and fore sight error due to curvature can be eliminated.
a) True
b) False

12. By balancing back sight and fore sight error due to non parallelism of the line of collimation can be eliminated.
a) True
b) False

13. By which of the following, the difference in elevation between two points can be calculated by taking a difference between the two readings and no correction for the inclination of the line of sight is necessary?
a) Levelling
b) Centering
c) Contouring
d) Balancing

14. If the observed back sight and fore sight are x1 and x2. The correction back sight on A will be equal to x1-y1, where y1= D1 tan i°. The correct fore sight on B will be equal to x2-y2 where, y2 = D2 tan i°. Then what is the correction difference in level between A and B.
a) x1 – x2
b) x2 – x1
c) x1 – x2 + (D2 tan i° – D1 tan i°)
d) x2 – x1 + (D1tan i° + D2 tan i°)

15. If the observed back sight and fore sight are x1 and x2. The correction back sight on A will be equal to x1-y1, where y1= D1 tan i°. The correct fore sight on B will be equal to x2-y2 where, y2 = D2 tan i°. Then what is the correction difference in level between A and B, if D1 = D2?
a) x1 – x2
b) x2 + x1
c) x1 – x2 + (D2 tan i° – D1 tan i°)
d) x2 – x1 + (D1tan i° + D2 tan i°)

16. If the observed back sight and fore sight are 20 m and 18 m. The correction back sight on A will be equal to 16 m, The correct fore sight on B will be equal to 14 m where then what is the correction difference in level between A and B?

a) 4 m
b) 3 m
c) 2 m
d) 6 m

17. If the staff reading at point A = ha and at a point B = hb. The correct staff reading should have been Ha and Hb, then the correction difference in elevation between A and B is given by _____
a) ha – hb
b) ha + hb
c) Ha – Hb
d) Ha + Hb

18. If the staff reading at point A = ha and at a point B = hb. The correct staff reading should have been Ha and Hb, where Ha = ha – ha' and Hb = hb – hb' then the correction difference in elevation between A and B is given by _____
a) ha – hb – ha' + hb'
b) ha + hb + ha' + hb'
c) Ha – Hb + ha' – hb'
d) Ha + Hb

19. If the back sight and fore sight distances are balanced, the elevation between two points is equal to the difference between the rod readings taken to the two points and correction for curvature and refraction is necessary.
a) True
b) False

20. Turning point is also called _____
a) intermediate point
b) level point
c) change point
d) end point

Answer keys

1 d	6 a	11 a	16 c
2 b	7 a	12 a	17 c
3 c	8 a	13 d	18 a
4 a	9 b	14 c	19 b
5 d	10 c	15 c	20 c

B.Tech Civil Engineering 4th Semester

SUBJECT: CONCRETE TECHNOLOGY

1. What is Concrete Technology?
   a) Concrete Technology deals with the study of bricks
   b) Concrete Technology is the study of building materials
   c) Concrete Technology deals with the study of properties of concrete
   d) None of the mentioned.
2. 2. What is concrete?
   a) A mixture of homogenous materials
   b) A mixture of material and hydrogen
   c) A mixture of cement and hydrogen sulphide
   d) A mixture of cement, water, and aggregates
3. 4. Concrete technology is useful for civil engineers because it allows them to _____
   a) know how to appropriately stock the materials needed for concrete
   b) conduct various concrete tests
   c) familiarise them with the fundamental principles of concrete
   d) all of the mentioned
4. 6. Which type of concrete is classified based on the design of concrete?
   a) Plain
   b) Reinforced
   c) Prestressed
   d) All of the above
5. 9. What are the ingredients of concrete?
   a) Binding material
   b) Fine aggregate
   c) Admixtures
   d) All of the above
6. 10. What is the objective of concrete technology?
   a) To find the material strength
   b) Calculate the amount of cement required
   c) To define and understand concepts related to Cement
   d) To define and understand concepts related to Concrete technology
7. 12. What is the importance of the Standard Consistency Test?
   a) It is used to determine the quality of water
   b) It is used to determine the quality of aggregates
   c) It is used to determine the quality of cement
   d) None of the above
8. 13. Hydration of cement is chemical reaction of cement with _____
   a) base
   b) acid

c) salt and acid
d) water

9. 14. Which of the following cement is used in sewage and water treatment plants?
   a) Sulphate Resisting Cement
   b) Quick Setting Cement
   c) Low Heat Cement
   d) Rapid Hardening Cement
10. 18. What is the total percentage of aggregates in concrete in terms of volume?
   a) 65-80%
   b) 90%
   c) 60-75%
   d) 40%
11. 19. Crushed stone, gravel, and ordinary sand are examples of which type of cement aggregate?
   a) Heavy-weight aggregate
   b) Lightweight aggregate
   c) Normal-weight aggregate
   d) Both Normal-weight and Heavy-weight aggregate
12. 21. What happens if mineral oil is present in mixing for concrete?
   a) Gives more slump
   b) Improves strength
   c) Gives a smooth surface
   d) Reduces strength
13. 23. Which of the following increases the workability of concrete?
   a) Decreasing size of aggregates
   b) Increasing flaky aggregates
   c) Increasing size of aggregates
   d) Increasing fine aggregates
14. 25. How is Creep related to the strength of concrete?
   a) Directly proportional
   b) Inversely proportional
   c) Equal
   d) Similar
15. 26. What is equivalent flexural strength?
   a) The load value, which represents the average load-carrying capacity in the post-peak region up to a deflection of L/n
   b) The value of mean equivalent flexural strength adjusted to mean flexural strength
   c) The stress is derived when the peak load value is included in the rupture modulus equation
   d) The stress value produced when Pen is utilized in the equation of modulus of rupture to represent the average flexural strength in the post-peak zone up to a specific deflection of L/n

16. Which of the following is a discontinuity that occurs during the casting of molten metal and is caused by splashing, surging, or interrupted pouring?
   a) Flaking
   b) Blow hole

c) Cold shut
d) Burst

17. Which of the following property of a substance that resists abrasion or scratching that causes penetration or indentation?
    a) Hardness
    b) Stiffness
    c) Toughness
    d) Strength

18. Which of the following is not a type of Non-destructive testing?
    a) Ultrasonic test
    b) Eddy current testing
    c) Compression testing
    d) Visual testing
19. For a compressive strength of 4000 psi, the light weight cement content is _____ pounds per cubic yard.
    a) 630-750
    b) 440-560
    c) 740-840
    d) 530-660

ANSWER KEY

SUBJECT: CONCRETE TECHNOLOGY

1	C	**11**	C
2	B	**12**	B
3	D	**13**	C
4	D	**14**	B
5	A	**15**	D
6	D	**16**	C
7	A	**17**	A
8	D	**18**	A
9	A	**19**	D

10	C	**20**	

SUBJECT: HYDRAULICS AND HYDRAULIC MACHINES

Q1. The efficiency of a centrifugal pump is maximum when its blades are

a. Straight
b. Bent forward
c. Bent backwards
d. Bent forward first and then backwards

Q2. In a centrifugal pump casing, the flow of water leaving the …

a. Radial
b. Centrifugal
c. Rectilinear
d. Vortex

Q3. Axial flow pump is started with its delivery valve

a. Kept fully closed
b. Kept fully open
c. Kept 50% open
d. Irrespective of any position

Q4. One horsepower is equal to

a. 102 watts
b. 75 watts
c. 550 watts
d. 735 watts

Q5. Multistage centrifugal pumps are used to obtain

a. High discharge
b. High head
c. High efficiency
d. Pumping of viscous fluids

Q6. When a piping system is made up primarily of friction head and very little of vertical lift, then the pump characteristics should be of

a. Horizontal
b. Nearly horizontal
c. Steep
d. First rise and then fall

Q7. Low specific speed of a pump implies it is

a. Centrifugal pump
b. Mixed flow pump
c. Axial flow pump

d. Any one of the above

Q8. In a centrifugal pump, the liquid enters the pump

a. At the top
b. At the bottom
c. At the center
d. From sides

Q9. Motion of a liquid in a volute casing of a centrifugal pump is an example of

a. Rotational flow
b. Radial
c. Spiral vortex flow
d. Forced cylindrical vortex flow

Q10. Medium specific speed of a pump implies it is

a. Centrifugal pump
b. Mixed flow pump
c. Axial flow pump
d. Any one of the above

Q11. Indicator diagram of a reciprocating pump is a graph between

a. Flow vs swept volume
b. Pressure in cylinder vs swept volume
c. Flow vs speed
d. Pressure vs speed

Q12. Any change in loading is adjusted by adjusting following parameter on turbine

a. Net head
b. Absolute velocity
c. Flow
d. Blade velocity

Q13. Casting of a centrifugal pump is designed so as to minimize

a. Friction loss
b. Cavitation
c. Loss of kinetic energy
d. Starting time

Q14. The flow rate in gear pump

a. Increase with increase in pressure
b. Decrease with increase in pressure
c. More or less remains constant with increase in pressure
d. Unpredictable

Q15. Francis, Kaplan and Propeller turbines fall under the category of

a. Impulse turbines
b. Reaction turbines

c. Axial flow turbines
d. Reaction cum impulse turbines

Q16. The angle of taper on draft tube is

a. Greater than 15degree
b. Greater than 8 degrees
c. Greater than 5 degrees
d. Less than 8 degrees

Q17. Which place in hydraulic turbine is most susceptible for cavitation

a. Inlet of draft rube
b. Blade inlet
c. Guide blade
d. Penstock

Q18. According to fan laws, for the fans having constant wheel diameters, the power demand varies

a. Directly as fan speed
b. Square of fan speed
c. Cube of fan speed
d. Square root of fan speed

Q19. Hydraulic accumulator is used for

a. Accumulating oil
b. Accumulating hydraulic energy
c. Supplying energy when main supply fails
d. Generally high pressure to operate hydraulic machines

Q20. Maximum impulse will be developed in hydraulic ram when

a. Waste valve closes suddenly
b. Supply pipe is long
c. Supply pipe is short
d. Supply pipe has critical diameter

ANSWER KEY

SUBJECT: HYDRAULICS AND HYDRAULIC MACHINES

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	c	d	b	d	b	b	a	c	c	b	b	c	c	c	b	d	a	b	c	a

SUBJECT: ENGINEERING GEOLOGY

1. The main processes which does not come under chemical weathering are _____
A. Solution
B. Hydration and hydrolysis
C. Insolation
D. Carbonation

2. The rock-mineral insoluble in water is _____
A. Rock salt
B. Gypsum
C. Calcite
D. Pyrite

3. Limestone is not easily soluble in pure water but carbonated water dissolves the rock effectively.
A. False
B.True

4. Minerals like Orthoclase and Felspar undergo which method of chemical decomposition?
A. Hydration
B. Hydrolysis
C. Oxidation
D. Reduction

5. Which of the following is reduction?
A. Removal of hydrogen
B. Removal of electron
C. Removal of oxygen
D. Addition of oxygen

6. $2KaISi_3O_8 + 2H_2O + CO_2 \rightarrow Al_2Si_2O_5(OH)_4 + K_2CO_3 + 4SiO_2$
Orthoclase + Carbonic acid → _____ + Pot. Carbonate + Silica
Identify the mineral in the blank space of the equation.
A. Illite
B. Kaolinite
C. Montmorillonite
D. Halloysite

7. Which of the following about Spheroidal weathering is not true?
A. It is a complex type of weathering
B. Both mechanical and chemical weathering are believed to happen
C. Formation of joints is involved
D. Formation of joints is not involved

8. Factor not affecting weathering is _____
A. Colour of the rock

B. Nature of the rock
C. Climate
D. Physical environment

9. It is said that Sandstone is more resistant to weathering compared to Granite. What is the basic reason behind this phenomenon?
A. The external outline form of sandstone
B. Sandstone is harder than granite
C. Granite is mainly made of quartz
D. Sandstone is mainly made of quartz

10. Identify the pair mismatched.
A. Cold and humid – Both mechanical and chemical weathering
B. Dry and cold – Neither of them
C. Hot and humid – Mechanical weathering is predominant
D. Hot and dry – Mechanical weathering is predominant

11. Which of the following rock forming minerals is more resistant to weathering compared to Hornblende?
A. Augite
B. Biotite
C. Olivine
D. Calcite

12. Which of the following is true about Eluvium?
A. It is that category of end product of weathering that has been moved to some distance after its formation
B. It is associated with weathering of slopes
C. It is the end product of weathering that happens to lie over and above the parent rock
D. Regolith is not the other name for Eluvium

13. The zone consisting of mixed composition is _____
A. Zone A
B. Zone B
C. Zone C
D. Zone D

14. Among the following the term which is not effect of chemical weathering is _____
A. Scree formation
B. Disfiguring
C. Pitting
D. Honeycombing

15. Formation of colloids is sometimes the end product of weathering.
A. True
B. False

16. The type of fold which is actually a group of folds is _____
A. Symmetrical folds
B. Asymmetrical folds
C. Isoclinal folds
D. Recumbent folds

17. Which is the type of fold with a similar degree of folding for indefinite depths?
A. Concentric fold
B. Similar fold
C. Conjugate fold
D. Uniform fold

18. The fold which is associated with the formation of mountains is _____
A. Geanticline
B. Geosyncline
C. Homocline
D. Basin

19. The classification which is not considered under study is _____
A. Spatial relationship
B. Number of joints
C. Geometry
D. Genesis

20. The type of joint not studied under the geometry as basis is _____
A. Strike joints
B. Dip joints
C. Hade joints
D. Oblique joints

ANSWER KEY

SUBJECT: ENGINEERING GEOLOGY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	C	D	B	B	C	B	D	A	D	C	B	C	B	A	A	C	B	B	B	C

SUBJECT: STRUCTURAL ANALYSIS-II

1. Which of the following is false for deflection of a point nearby a fixed support?

    a. Displacement and slope is zero
    b. Displacement as well as slope is non-zero
    c. Displacement is zero
    d. Slope is zero

2. What is the stiffness factor for a beam simply supported at both ends?

    a. 3EI/L
    b. 4EI/L
    c. 2EI/L
    d. EI/L

3. In slope deflection method, all the joints of the frame are assumed to be

    a. Moving
    b. Simply Supported
    c. Rigid
    d. Rolling

4. Which of the following is a statically indeterminate structure

    a. Simply Supported Beam
    b. Three Hinged Arch
    c. Cantilever Beam
    d. Two Hinged Arch

5. Which of the following is unknown in Displacement Method?

    a. Force
    b. Displacement
    c. Support Reaction
    d. Can’t Say

6. How many slope deflection equations are possible if 4 supports are there in a beam.

    a. 0
    b. 3
    c. 4
    d. 6

7. The carry over factor for a prismatic beam is

    a. 0
    b. 1/2
    c. 1/4
    d. 1

8. The sum of distribution factor at a joint is

    a. 0
    b. 2
    c. 1
    d. ½

9. Sway occurs when the portal frames are ……..in both geometry and loading.

    a. Unsymmetric
    b. Symmetric
    c. Prismatic
    d. Non Prismatic

10. As per Muller Breslau principle, the influence line of a function is same as the……of the beam
    a. Shear Force
    b. Bending Moment
    c. Deflection
    d. Slope

11. The area of the influence line diagram for the reaction of a simply supported beam of span L is……..

    a. Semi Circle
    b. Square
    c. Triangle
    d. Rectangle

12. The maximum bending moment due to train of wheel loads on a simply supported beam always occurs ……
    a. At ends
    b. At center
    c. At $1/4^{th}$ of span
    d. At 1/3ed of span

13. The final moment at the hinged support of a beam is
    a. $WL^2/8$
    b. $WL^2/12$
    c. $WL^2/24$
    d. Zero

14. In the theory of plastic bending of beams, the ratio of plastic moment to yield moment is called
    a. Shape factor
    b. Plastic Section Modulus
    c. Modulus of Resilience
    d. Rigidity Modulus

15. The number of simultaneous equations to be solved in the slope deflection method is equal to
    a. Static indeterminacy
    b. Kinematic indeterminacy
    c. Number of joint displacements in the structure
    d. None of the above

16. Influence line for redundant structures can be obtained by
    a. Castigliano's theorem
    b. Muller Breslau principle
    c. Unit Load Method
    d. Maxwell Betti reciprocal theorem.

17. What is the relation between the shear carried by interior and exterior columns of a bent.
    a. Interior is doubled of exterior
    b. Exterior is doubled of interior
    c. Both carry same shear
    d. Depends upon magnitude of load carried.

18. Portal method is more suitable for buildings with .
    a. High elevation
    b. Low elevation
    c. Medium elevation
    d. Elevation doesn't matters.

19. In case of Cantilever method how does the axial stress vary from the neutral axis .
    a. Parabolic
    b. Hyperbolic
    c. Linear
    d. Arbitrarily

20. How many assumptions are made in cantilever method of analysis?
    a. 1
    b. 2
    c. 3
    d. 4

ANSWER KEY

SUBJECT: STRUCTURAL ANALYSIS-II

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	b	a	c	d	b	d	b	c	a	c	c	b	d	a	c	b	a	b	c	c

SUBJECT: SURVEYING - II

1 . Among the classification of triangulation system, which posses the highest order?
a) Primary
b) Secondary
c) Tertiary
d) Quaternary

2. In which of the following areas, the usage of primary triangulation is done?
a) Measuring fields
b) Measuring built up lands
c) Measuring earths figure
d) Measuring unused lands

3. Length of base line in primary triangulation is given as_____
a) 1.5 – 5 km
b) 0.5 – 10 km
c) 0.5 – 3 km
d) 5 – 15 km

4. When compared to primary triangulation, secondary triangulation is having smaller triangles.
a) True
b) False

5. Among the classification of triangulation, which will give the precise value?
a) Quaternary
b) Tertiary
c) Secondary
d) Primary

6. Which classification involves the formation of more number of triangles?
a) Primary
b) Secondary
c) Tertiary
d) Quaternary

7. Difference in parallax can be obtained due to_____
a) Distance between zenith
b) Distance between bearing
c) Distance between azimuth
d) Distance between points sights

8. Which of the following can be used to view stereo pair?
a) Aerial camera
b) Stereoscope
c) Stereoscopic camera
d) Telescope

9. Which of the following doesn't come under the category of depth perception?
a) Accommodation
b) Head parallax
c) Divergence
d) Retinal display

10. Which of the following indicates the correct set of stereoscope classifications?
a) Lens and azimuth stereoscope
b) Mirror and azimuth stereoscope
c) Mirror and lens stereoscope
d) Mirror stereoscope and stereo pair

11. Which of the following indicate parallax equation for ground co-ordinate point?
a) X = B*x + p
b) X = B*x – p
c) X = B*x * p
d) X = B*x / p

12. The relation between velocity, wavelength and frequency can be given as _____
a) $\lambda = c / r$
b) $\lambda = c / f$
c) $\lambda = c / h$
d) $\lambda = h*c / f$

13. Remote sensing uses which of the following waves in its procedure?
a) Electric field
b) Sonar waves
c) Gamma- rays
d) Electro-magnetic waves

14. Which of the following is not a principle of remote sensing?
a) Interaction of energy with satellite
b) Electromagnetic energy
c) Electro-magnetic spectrum
d) Interaction of energy with atmosphere

15. Which among the following waves is having less wavelength range?
a) 0.03mm

b) 0.03nm
c) 0.03m
d) 0.03km

16. In visible region, the blue light is having a wave length range of _____
a) 0.42-0.52 micrometer
b) 0.24-0.52 micrometer
c) 0.42-0.92 micrometer
d) 0.22-0.32 micrometer

17. In total station, data is stored in _____
a) Pen drive
b) Data card
c) Micro processor
d) External hardware

18. Compensator can make complete adjustments in total station.
a) True
b) False

19. Vertical angle is measured in the total station as Zenith angle.
a) False
b) True

20. Which of the following indicates the formula for converting slope distance to horizontal distance?
a) S = H (sin z)
b) H = S* S (sin z)
c) H*H = S (sin z)
d) H = S (sin z)

Answer Key

1 a	6 c	11 d	16 a
2 c	7 d	12 b	17 c
3 d	8 b	13 d	18 b
4 a	9 c	14 a	19 b
5 d	10 c	15 b	20 d

B.Tech Civil Engineering 5th Semester

SUBJECT: STRUCTURAL DESIGN-I

1. Flexural strength of concrete is given by

   (i) $0.5\sqrt{f_{ck}}$ (ii) $0.75\sqrt{f_{ck}}$ (iii) $0.7\sqrt{f_{ck}}$ (iv) $5000\sqrt{f_{ck}}$

   where, f_{ck} is the characteristic compressive strength of concrete in MPa.

2. The singly reinforced concrete beam of section 300 mm x 450 mm is made of M25 grade concrete and Fe500 grade reinforcing steel. The total cross-sectional area of the tension steel is 942 mm^2. As per Limit State Design of IS 456: 2000, the design moment capacity (in kNm round off to two decimal places) of the beam section, is _____.

   (i) 158.22 kNm (ii) 178.11 kNm (iii) 151.76 kNm (iv) 127.55 kNm

3. A singly reinforced rectangular concrete beam of width 300 mm and effective depth 400 mm is to be designed using M25 grade concrete and Fe500 grade reinforcing steel. For the beam to be under-reinforced, the maximum number of 16 mm diameter reinforcing bars that can be provided is

   (i) 3 (ii) 4 (iii) 5 (iv) 6

4. A part of the slab may be considered as the flange of the T-beam if

   (i) Flange has adequate reinforcement transverse to beam

   (ii) It is built integrally with the beam

   (iii) It is effectively bonded together with the beam

   (iv) All the above

5. The maximum area of tension reinforcement in beams shall not exceed _____.

   (i) 2% (ii) 4% (iii) 3.5% (iv) 1.5%

6. The width of the flange of a T-beam should be less than

   (i) one-third of the effective span of the T-beam

   (ii) distance between the centres of T-beam

   (iii) breadth of the rib plus twelve times the thickness of the slab

   (iv) least of the above

7. According to IS 456, slabs which span in two directions with corners held down, are assumed to be divided in each direction into middle strips and edge strips such that the width of the middle strip, is

   (i) Half of the width of the slab

   (ii) Two-third of the width of the slab

   (iii) Three-fourth of the width of the slab

   (iv) Four-fifth of the width of the slab

8. Minimum Grade of concrete for R.C.C work is

   (i) M15 (ii) M20 (iii) M25 (iv) M30

9. For steel of grade Fe 500, the value of $X_{u\max}/d$ is

   (i) 0.48 (ii) 0.43 (iii) 0.53
   (iv) 0.46

10. The stress strain curve of concrete as per IS-456 is

    (i) Perfect straight line up to failure

    (ii) Straight line up to 0.002 strain value and then parabolic up to failure

    (iii) Parabolic up to 0.002 strain value and then uniform up to failure

    (iv) Linear up to 0.002 strain value and then uniform up to failure

11. The lever arm in limit state design is expressed as

    (i) $d-0.446X_u$ (ii) $d-0.87X_u$ (iii) $d-0.36X_u$ (iv) $d-0.42X_u$

12. Limiting moment of Resistance of R.C. beam for Fe415 grade steel is

    (i) $M_{u\lim}=0.138f_{ck}bd^2$ (ii) $M_{u\lim}=0.148f_{ck}bd^2$

    (iii) $M_{u\lim}=0.133f_{ck}bd^2$ (iv) $M_{u\lim}=0.125f_{ck}bd^2$

13. As per IS-456, Development length of Bar is expressed as

    (i) $L_d=\dfrac{\varphi\sigma_s}{8\tau_{bd}}$ (ii) $L_d=\dfrac{\varphi\sigma_s}{4\tau_{bd}}$ (iii) $L_d=\dfrac{8\varphi\sigma_s}{\tau_{bd}}$ (iv) $L_d=\dfrac{4\varphi\sigma_s}{\tau_{bd}}$

14. An R.C.C. column is treated as long if its slenderness ratio is greater than 60.

    (i) True (ii) False

15. Maximum strain in concrete at failure is

(i) 0.0035 (ii) 0.002 (iii) 0.035 (iv) 0.02

16. The length of torsion reinforcement in two-way slab is provided as

(i) $L_x/4$ (ii) $L_x/5$ (iii) $L_x/8$ (iv) $L_x/10$

17. The self-weight of the footing, is

(i) Not considered for calculating the upward pressure on footing

(ii) Also considered for calculating the upward pressure on footing

(iii) Not considered for calculating the area of the footing

(iv) Both (ii) and (iii)

18. Under the action of a concentric axial compressive load, a reinforced concrete short square column of size 300 mm is reinforced with 4 numbers of 25 mm diameter longitudinal bars of Fe415 steel, Concrete used is of grade M30. The ultimate axial load carrying capacity of the column is _____.

(i) 1000 kN (ii) 2000 kN (iii) 900 kN (iv) 1800 kN

19. The minimum eccentricity in column can be calculated as

(i) $\frac{L}{500}+\frac{D}{20}$ (ii) $\frac{L}{300}+\frac{D}{20}$ (iii) $\frac{L}{500}+\frac{D}{30}$ (iv) $\frac{L}{300}+\frac{D}{30}$

20. When a spirally reinforce short column is loaded axially, the concrete inside the core is subjected to

(i) Triaxial compression (ii) Biaxial compression

(iii) Bending and compression (iv) Uniaxial compression

ANSWER KEY

SUBJECT: STRUCTURAL DESIGN-I

1	(iii) $0.7\sqrt{f_{ck}}$	**11**	(iv) $d - 0.42X_u$
2	(i) 158.22 kNm	**12**	(i) $M_{u\lim} = 0.138 f_{ck} bd^2$
3	(iii) 5	**13**	(ii) $L_d = \dfrac{\varphi \sigma_s}{4\tau_{bd}}$
4	(iv) All the above	**14**	(i) True
5	(ii) 4%	**15**	(i) 0.0035
6	(iv) least of the above	**16**	(ii) $L_x/5$
7	(iii) Three-fourth of the width of the slab	**17**	(i) Not considered for calculating the upward pressure on footing
8	(ii) M20	**18**	(iv) 1800 kN
9	(iv) 0.46	**19**	(iii) $\dfrac{L}{500} + \dfrac{D}{30}$
10	(iii) Parabolic up to 0.002 strain value and then uniform up to failure	**20**	(i) Triaxial compression

SUBJECT: ENVIRONMENTAL ENGINEERING

1. The average quantity of water (in lpcd) required for domestic purposes according to IS code is _____
a) 100
b) 120
c) 70
d) 135

2. The average consumption of water required in factories in lpcd is _____
a) 10-15
b) 20-30
c) 30-45
d) 70-80

3. In which type of water demand, minimum average consumption of water takes place?
a) Domestic water demand
b) Industrial water demand
c) Institutional and commercial water demand
d) Fire demand

4. What is the fire demand of the city of 1lakh population by Buston's formula?
a) 5663
b) 56630
c) 566300
d) 5663000

5. Water lost in theft and waste contributes to how much % of total consumption?
a) 5
b) 10
c) 15
d) 20

6. What is formed when coagulant is added to water?
a) Scum
b) Soap
c) Bubbles
d) Floc

7. The chemical composition of Alum is _____
a) $Al_2 (SO_4)_3.18H_2O$
b) $Al_2 (SO_4)_2.18H_2O$
c) $Al_3 (SO_4)_2.18H_2O$
d) $Al_4 (SO_4)_3.18H_2O$

8. The chemical compound which is insoluble in water, formed when alum is added to water is _____
a) $Al(OH)_3$
b) $CaSO_4$
c) CO_2
d) $Ca(OH)_3$

9. Which gas is released when alum is added to water?
a) $Al(OH)_3$
b) $CaSO_4$
c) CO_2
d) $Ca(OH)_3$

10. What indicates the permanent hardness when alum is added to water?
a) $Al(OH)_3$
b) $CaSO_4$
c) CO_2
d) $Ca(OH)_3$

11. Which of the following constituent of photochemical smog causes the bronzing of plants?
a) PBN
b) PAN
c) PFN
d) Ketones

12. What is the reason behind the yellow colour of smog?
a) Nitrogen dioxide
b) Sulphur dioxide
c) Sulphate ions
d) Nitrate ions

13. Which of the following aerosols have the best absorbing properties?
a) Carbon black
b) Soot
c) Elemental Carbon
d) All of the mentioned

14. What is the size range of atmospheric particulate matter?
a) 0.1 – 10 microns
b) 0.1 – 1 micron
c) 1 – 10 microns
d) 10 – 100 microns

15. In rural areas, what has contributed significantly to particulate pollution?
a) Incomplete combustion in vehicles
b) Using wood for fire and cooking
c) Fertilizers
d) All of the mentioned

16. Which of the following is an end product formed from both the aerobic and anaerobic decomposition of organic matter?
a) NO_3
b) CH_4
c) H_2S
d) CO_2

17. The aerobic decomposition of carbonaceous organic matter gives _____
a) Nitrites and water
b) Carbon dioxide and water
c) Sulfates and water
d) Nitrogen and Ammonia

18. BOD of wastewater having aerobic oxidation is more than that, having anaerobic oxidation.
a) True
b) False

19. The aerobic decomposition of nitrogenous organic matter gives _____
a) Nitrites and water
b) Carbon dioxide and water
c) Nitrates and ammonia
d) Nitrogen and ammonia

20. Methane is formed due to the reduction of _____
a) Nitrates
b) Sulfates
c) Carbon dioxide
d) Organic acids

Answer Key

1 d	6 d	11 b	16 d
2 c	7 a	12 c	17 b
3 d	8 a	13 d	18 b
4 b	9 c	14 a	19 c
5 c	10 b	15 b	20 d

SUBJECT: GEOTECHNICAL ENGINEERING

1. In Geotechnical Engineering, soil is considered as a _____ phase material.
   a) 3
   b) 2
   c) 1
   d) 4
2. Percentage air voids is denoted as:
   a) v
   b) n_a
   c) s
   d) a_v
3. Porosity and void ratio are related by:
   a) $e = {}^{n}/_{(1-n)}$
   b) $n = {}^{e}/_{(1-e)}$
   c) 1-e = n
   d) ${}^{(1+n)}/_{n} = e-1$
4. According to Darcy's Law:
   a) q=iA
   b) q=kA
   c) q∞iA
   d) q∞kA
5. Based on Allen Hazen experiments, permeability can be expressed as _____
   a) $K=CD_{10}^2$
   b) $K=CD_{10}$
   c) $K=DC_{10}$
   d) $K=DC_{10}^2$
6. Triaxial compression test is used to find _____ of soil.
   a) Compressive strength
   b) Permeability
   c) Specific gravity
   d) Shear strength
7. Which of the following does not happen when compaction is done?
   a) Permeability decreases
   b) Water content increases
   c) Shear strength decreases
   d) Compressibility decreases
8. Which of the following factors affects the permeability of soil?
   a) Grain size
   b) Properties of pore fluid
   c) Void ratio of soils
   d) All of the above
9. A soil has a bulk density of 22 kN/m3 and water content 10 %. The dry density of soil is
   a) 20.0 kN/m3
   b) 18.6 kN/m3
   c) 22.0 kN/m3

d) 23.2 kN/m3

10. The active earth pressure of a soil is proportional to (where φ is the angle of friction of the soil)
    a) tan (45° - φ)
    b) $\tan^2$ (45° + φ/2)
    c) $\tan^2$ (45° - φ/2)
    d) tan (45° + φ)

11. The minimum water content at which the soil just begins to crumble when rolled into threads 3 mm in diameter, is known
    a) liquid limit
    b) plastic limit
    c) shrinkage limit
    d) permeability limit.

12. If N_f, N_d and H are total number flow channels, total number of potential drops and total hydraulic head differences respectively, the discharge q through the complete flow is given by (where K is a constant)
    a) $q = \sqrt{H} \cdot \frac{N_f}{N_d}$
    b) $q = KH \cdot \frac{N_d}{N_f}$
    c) $q = KH \cdot \frac{N_f}{N_d}$
    d) $q = KH \sqrt{\frac{N_f}{N_d}}$

13. Degree of saturation of a natural soil deposit having water content 15%, specific gravity 2.50 and void ratio 0.5, is
    a) 50%
    b) 60%
    c) 75%
    d) 80%

14. Accurate determination of water content, is made by
    a) calcium carbide method
    b) sand bath method
    c) alcohol method
    d) oven-drying method.

15. Back fill with a sloping surface exerts a total active pressure P_a on the wall of height H and acts at
    a) $H/4$ above the base parallel to base
    b) $H/2$ above the base parallel to base
    c) $H/3$ above the base parallel to base
    d) $H/5$ above the base parallel to base.

16. Geologic cycle for the formation of soil, is

a) Upheavel → transportation → deposition → weathering
b) Weathering → upheaval → transportation → deposition
c) Transportation → upheaval → weathering → deposition
d) Weathering → transportation → deposition → upheaval

17. The intensity of vertical pressure at a depth Z directly below the point load Q on its axis of loading is :

a) $\frac{0.4775\ Q}{Z}$
b) $\frac{0.4775\ Q}{Z^2}$
c) $\frac{0.4775\ Q}{Z^3}$
d) $\frac{0.4775\ Q}{\sqrt{Z}}$

18. The ratio of e_{max} and e_{min} of silty sand, is
a) 2.0
b) 5
c) 3.0
d) 3.5

19. A flow net may be utilised for the determination of
a) seepage
b) hydrostatic pressure
c) seepage pressure
d) All the above.

20. The load carrying capacity of a pile can be determined by which of the following methods?
a) Dynamic formulae
b) Static formulae
c) Plate load test
d) All of the mentioned

ANSWER KEY

SUBJECT: GEOTECHNICAL ENGINEERING

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	a	b	a	c	a	d	c	d	a	c	b	c	c	d	c	d	b	c	d	d

SUBJECT: OPEN CHANNEL FLOW AND IRRIGATION ENGINEERING

Q1) Calculate the aspect ratio having channel width of 6m and depth of 8m.

A. 0.75m
B. 1.33m
C. 1.50m
D. 1.68m

Q2) Which geometric parameter determines the efficiency of the channel?

A. Hydraulic depth
B. Hydraulic radius
C. Section factor
D. Normal depth

Q3) Calculate the discharge through a channel having a bed slope 1 in 1000, area 12 m^2, hydraulic radius of 1.2m and Chezy's constant being equal to 50.

A. 17.88m^3/s
B. 18.98 m^3/s
C. 19.98 m^3/s
D. 20.98 m^3/s

Q4) Energy per unit weight of water measured with respect to the datum is called

A. total energy
B. specific energy
C. velocity head
D. datum head

Q5) Fluid speed before the hydraulic jump is _____

A. critical
B. supercritical
C. subcritical
D. dynamic

Q6) In which case is the hydraulic jump not possible?

A. Initial speed > critical speed
B. Initial speed < critical speed
C. Initial speed = critical speed
D. Independent

Q7) The section factor of a rectangular channel is 111.80m. The discharge and velocity of water are 250m^3/s
and 5m/s respectively. Calculate the hydraulic depth of the channel.

A. 2m
B. 3m
C. 4m
D. 5m

Q8) Calculate the wetted perimeter for a rectangular channel having top width of 4.5m and depth of 3m.

A. 12m
B. 10.5m
C. 7.5m
D. 15m

Q9) Hydraulic jump depends upon

A. temperature
B. pressure
C. initial fluid speed
D. volumetric change

Q10) When the hydraulic jump is in a moving form it is called

A. negative surge
B. positive surge
C. turbulent surge
D. accelerated surge

Q11) Borrow pits should preferably be located in

A. field on the left side of the canal
B. field on the right side of the canal
C. fields on both sides of the canal
D. central half width of the section of the canal

Q 12) The length of a meander is the distance along the river between the tangent point of one curve to the tangent point of

A. reverse curve
B. next curve of the same order
C. reverse curve plus the width of the river
D. none of these.

Q13) Pick up the incorrect statement from the following

A. Side walls of a venturi head flume are splayed out from the end of the throat at 1 : 10 for a length of 4.5 m
B. Length of side walls should be such that the width of the flume is made equal to 2/3rd the bed width of the distributary
C. Once the width of the flume becomes 2/3rd of the width of the distributary, the splayed walls are increased to 1 in 3 to get full bed width
D. None of these.

Q14) Irrigation canals are generally aligned along

A. ridge line
B. contour line
C. valley line
D. straight line.

Q15) The consumptive use of water for a crop

A. is measured as the volume of water per unit area
B. is measured as depth of water on irrigated area
C. may be supplied partly by precipitation and partly by irrigation
D. all the above

Q16) Lacy's regime condition is obtained if:

A. silt grade in the channel is variable
B. discharge in the channel is variable
C. silt charge in the channel is variable
D. channel flows in unlimited, incoherent alluvium of the same character as that transported material

Q17) Canals constructed for draining off water from water logged areas, are known

A. drains
B. inundation canals
C. valley canals
D. contour canals

Q18) A minimum of 90 cm free board is provided if the discharge in the canal is between

A. 30 to 33 cumecs
B. 30 to 60 cumecs
C. Over 60 cumecs
D. Over 100 cumecs

Q19) The length and width of a meander and also the width of the river, vary roughly as

A. square root of the discharge
B. discharge
C. square of the discharge
D. cube of the discharge

Q20) Regime conditions in a channel may occur if

A. discharge is constant
B. channel flows uniformly in incoherent alluvium as that transported in suspension
C. silt grade and silt charge are constant
D. all the above

ANSWER KEY

SUBJECT: OPEN CHANNEL FLOW AND IRRIGATION ENGINEERING

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	B	B	D	B	B	B	D	B	C	B	B	B	D	A	D	D	A	C	A	D

SUBJECT: TRANSPORTATION ENGINEERING - I

1. The road foundation for modern highways construction, was developed by which of the following scientists?
a) Telford
b) Macadam
c) Tresguet
d) Both Telford and Macadam

2. Which of the following does not include in the phases of highway planning?
a) Financing
b) Showing the phasing of a plan in the five-year plan
c) Assessment of road length requirement
d) Preparation of master plan

3. As per the Nagpur plan, the un-surfaced roads were meant for _____
a) Other district road and village road
b) Major district road
c) State highway
d) National highway

4. Which of the following is not considered when designing highways?
a) Settlement
b) Cross section
c) Level of service
d) Sight distance

5. The design speed on a highway is 60kmph; calculate the super elevation if radius of curve is 150m and coefficient of friction is 0.15.
a) 0.15
b) 0.04
c) 0.038
d) 0.07

6. The vertical alignment of a highway includes?
a) Highway lighting
b) Design of valley curves and gradients
c) Sight distance and traffic intersection
d) Widening of pavements

7. Which of the following is the maximum density that is desirable in highway embankments?
a) O.M.C
b) M.D.D
c) Dry density
d) Saturated density

8. The skid number for highways should not be less than ____
a) 25

b) 35
c) 45
d) 55

9. What is the temperature used in highway pavement in degrees centigrade?
a) 175
b) 115
c) 130
d) 120

10. What is the width of a pavement of 2 lane national highway?
a) 8.80 m
b) 3.00 m
c) 3.75 m
d) 7.0 m

11. Which of the following pavement is better for highway lighting?
a) Gravel roads
b) WBM
c) Black top surface
d) Cement concrete

12. The design thickness of the CC slab of important highway with heavy traffic is?
a) 300 mm
b) 275 mm
c) 125 mm
d) 250 mm

13. The aggregate for use in highway construction should have angularity number as
a. 11 to 22
b. 22 to 33
c. 33 to 55
d. 0 to 11

14. The type of transition curve generally provided on hilly tracks is
a. Spiral
b. Circular
c. Laminiscate
d. Cubic parabola

15. The lag distance is the distance travelled by the road vehicle during
a. Perception time
b. Volition time
c. Emotion time
d. Total reaction time

16. Which vehicle has the highest equivalent passenger car unit?
a. Passenger car
b. Scooter
c. Truck

d. Horse driven vehicle

17. If a Cross slope of a country is 10% to 25% the terrain is classified as
a. Rolling
b. Mountanious
c. Steep
d. Plain

18. The height of the shoulder kerb is usually kept about
a. 15 Centimetre
b. 7.5 Centimetre
c. 22.5 Centimetre
d. 2.5 Centimetre

19. For the movement of vehicles at an intersection of two roads, without any interference, the type of grade separator generally preferred to, is
a. Delta
b. Trumpet
c. Diamond intercharge
d. Clover teaf

20. Spot speed of a vehicle is found by
a. Enoscope
b. Tachometer
c. Periscope
d. Speedometer

21. The area of the most acute vision of a driver is a cone of
a. 1 degree
b. 3 degree
c. 5 degree
d. 2 degree

ANSWER KEY

SUBJECT: TRANSPORTATION ENGINEERING -I

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	d	a	a	a	c	b	b	d	a	d	d	a	d	a	d	d	a	b	a	b

B.Tech Civil Engineering 6th Semester

SUBJECT: ENGINEERING HYDROLOGY

1. What is the unit of discharge in hydrology?
   a) Liters per minute (L/min)
   b) Gallons per hour (gal/hr)
   c) Cubic feet per minute (ft^3/min)
   d) Cubic meters per second (m^3/s)
2. Which is not a form of precipitation?
   a) Water vapour
   b) Hail
   c) Drizzle
   d) Snow
3. Which of the following is not a common use of unit hydrographs?
   a) Extending flood flow records based on rainfall
   b) Flood forecasting and warning systems
   c) Estimation of time of concentration
   d) Design of hydraulic structures
4. Which factors govern the shape of hydrograph?
   a) Climatic and physiographic factors
   b) Climatic factors
   c) River characteristics
   d) Physiographic factors
5. What is ground rainfall?
   a) Difference between total rainfall and excess rainfall
   b) Difference between total rainfall and intercepted rainfall
   c) Difference between total rainfall and infiltration
   d) Difference between total rainfall and runoff
6. According to Dalton's law of evaporation, the process of evaporation ceases when which of the following conditions is met?
   a) Saturation vapour pressure = atmospheric pressure
   b) Saturation vapour pressure < actual vapour pressure
   c) Saturation vapour pressure > actual vapour pressure
   d) Saturation vapour pressure = actual vapour pressure
7. Which of the following is not a disadvantage of a floating evaporation pan?
   a) Low maintenance cost
   b) Difficulty in taking readings
   c) Impact of wave action
   d) High installation cost
8. Which of the following external changes cause the rate of transpiration to decrease?
   a) Increase in sunlight
   b) Increase in temperature
   c) Increase of carbon dioxide concentration
   d) Increase of available soil water
9. Which of the following factors is least significant while selecting a point for streamflow measurement?

a) Width of stream
b) Depth of stream
c) Presence of curve
d) Scouring effect on riverbank

10. What is the definition of a flood according to Gumbel?
    a) 29^{th} largest flow in a year
    b) Sum of three largest daily flows in a year
    c) Largest flow of a particular month in a year
    d) Largest of 365 daily flows in a year
11. Which of the following is not true regarding spillway design flood?
    a) Used for the design of spillway of a dam
    b) Maximum discharge that can be passed through a dam without damage
    c) Used for the design of a hydrologic structure
    d) Maximum discharge that can be passed through a dam without affecting its stability
12. Which of the following are known as the formation constants of an aquifer?
    a) Storativity and permeability
    b) Permeability and specific storage
    c) Specific storage and transmissibility
    d) Transmissibility and storativity
13. What does the term "runoff coefficient" represent in hydrology?
    a) The fraction of rainfall that becomes direct runoff
    b) The ratio of peak discharge to total rainfall
    c) The speed at which water flows in a channel
    d) The percentage of precipitation lost to evaporation
14. Which of the following is not an example of artificial aquifer recharge?
    a) Subsurface dykes
    b) Percolation tanks
    c) Sprinklers
    d) Injection wells
15. Which hydrological method is commonly used for estimating flood peaks in ungauged watersheds?
    a) Rational Method
    b) SCS Curve Number Method
    c) HEC-RAS Modelling
    d) Unit Hydrograph Method
16. Which of the following is a method used to estimate potential evapotranspiration?
    a) Hazen-Williams equation
    b) Manning's equation
    c) Chazy's equation
    d) Thornthwaite equation
17. Which one of the following is not a component of hydrograph?
    a) Recession limb
    b) Rising arm
    c) Crest
    d) Rising limb
18. What does the crest segment represent?
    a) Discharge

b) Baseflow
c) Peak flow
d) Depletion curve

19. When two or more storms occur in succession then which of the following hydrograph is obtained?
    a) Single-peaked hydrograph
    b) Single limb hydrograph
    c) Double-peaked hydrograph
    d) Multiple-peaked hydrograph
20. Which of the following is not a form of storage of basin?
    a) Underflow storage
    b) Interflow storage
    c) Surface storage
    d) Groundwater storage

ANSWER KEY

SUBJECT: ENGINEERING HYDROLOGY

1	D	**11**	C
2	A	**12**	D
3	C	**13**	A
4	A	**14**	D
5	B	**15**	B
6	D	**16**	D
7	A	**17**	B
8	C	**18**	C
9	B	**19**	D
10	D	**20**	A

SUBJECT: STRUCTURAL DESIGN-II

1. Which of the following is added to steel to increase resistance to corrosion?
a) Copper
b) Carbon
c) Manganese
d) Sulphur

2. Which of the following is the property of high carbon steel?
a) reduced strength
b) high toughness
c) reduced ductility
d) high strength

3. What is the minimum percentage of chromium and nickel added to stainless steel?
a) 10.5%, 0.5%
b) 0.5%, 10.5%
c) 30%, 50%
d) 2%, 20%

4. High carbon steel is used in _____
a) structural buildings
b) fire resistant buildings
c) for waterproofing
d) transmission lines and microwave towers

5. Which of the following load combination is not possible?
a) Dead load + imposed load
b) Dead load + wind load + earthquake load
c) Dead load + imposed load + wind load
d) Dead load + imposed load + earthquake load

6. Which of the following is true about bracket connections?
a) They are used to give aesthetic appearance to the structure
b) These connections are used to accommodate less number of bolts
c) Fabrication cost is low
d) More rigid than any other connection

7. Proof stress for minimum bolt tension is :
a) 0.7fyb
b) 0.5fyb
c) 0.7fub
d) 0.5fub

8. Which of the following is not an assumption of first-order elastic analysis of rigid jointed frame?
a) member instability effects cannot be ignored
b) materials behave linearly
c) frame instability effects can be ignored
d) yielding effects can be ignored

9. Which of the following is advantage of HSFG bolts over bearing type bolts?
a) high strength fatigue
b) joints are not rigid
c) low static strength
d) bolts are subjected to shearing and bearing stresses

10. Which of the following relation about plastic moment is correct?
a) Mp = Zp + fy
b) Mp = Zpfy
c) Mp = Zp – fy
d) Mp = Zp /fy

11. Which of the following is true regarding plastic design methods?
a) moments produced by different loading conditions can be added together
b) lateral bracing requirements are less stringent than for elastic design
c) difficult to design for fatigue
d) more saving in column design

12. Among which of the following is the location of plastic hinge?
a) at centre for uniformly distributed load
b) at points away from concentrated load
c) at supports
d) at centre of beam

13. Which load is obtained when equilibrium and plasticity conditions of plastic analysis are satisfied?
a) no solution
b) plastic limit load
c) upper bound solution of true ultimate load
d) lower bound solution of true ultimate load

14. Which of the following is true about torsional buckling?
a) failure occurs by bending about shear centre in longitudinal axis
b) failure occurs when torsional rigidity of member is greater than bending rigidity
c) standard hot rolled shapes are not susceptible to torsional buckling
d) it cannot occur with doubly symmetric cross section

15. Which of the following is true about beam-column?
a) net end moments are zero
b) member subjected to axial force and bending moment
c) member subjected to bending moment
d) member subjected to axial force only

16. Which of the following is not a compression member?
a) tie
b) strut
c) rafter
d) boom

17. What is the value of the imperfection factor for buckling class a?
a) 0.35
b) 0.73
c) 0.21
d) 0.23

18. In which of the following cases pin connections are not used?
a) tall buildings
b) truss bridge girders
c) diagonal bracing connection
d) hinged arches

19. Which of the following about rivet is correct?
a) labour cost is low
b) removing poorly installed rivet is costly
c) it does not require skilled work
d) causes low level of noise pollution

20. What is the net section area of steel plate 40cm wide and 10mm thick with one bolt if diameter of bolt hole is 18mm?
a) 38.2 cm2
b) 24 cm2
c) 578 mm2
d) 465 mm2

ANSWER KEY

SUBJECT: STRUCTURAL DESIGN-II

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	A	C	A	D	B	D	C	A	A	B	C	C	D	C	B	A	C	A	B	A

SUBJECT: TRANSPORTATION ENGINEERING - II

1. As per the Indian Railways, the maximum height and maximum width of the rolling stock for Broad Gauge (BG) is _____ mm and _____ mm respectively.
a) 3455 mm and 3250 mm
b) 4830 mm and 3600 mm
c) 4140 mm and 3250 mm
d) 3455 mm and 2745 mm

2. What does alignment of a railway track mean?
a) Direction and position @ 50mm distance on either side of centerline of track
b) Direction and position of the centerline of track in vertical plane only
c) Direction and position of the centerline of track in horizontal plane only
d) Direction and position of the centerline of track in both horizontal and vertical planes

3. Which of the following rail has been standardized for adoption on the Indian railways?
a) Combination of BH and DH
b) Flat footed
c) Double headed
d) Bull headed

4. At what angle should a railway line cross a road?
a) 45°
b) 60°
c) 30°
d) 90°

5. Which of the following method is used for the Tilting of rails?
a) Adzing the wooden sleepers or by providing canted bearing plates
b) Strain method
c) Providing canted bearing plates
d) Adzing the wooden sleepers

6. Which of the following ballast is used at points and crossings?
a) 40mm
b) 50mm
c) 72mm
d) 25mm

7. Railway rails are made of which of the following?
a) Cast iron
b) Mild steel
c) High carbon steel
d) Wrought iron

8. Which of the following are types of gauges present in Indian railways?
a) Broad gauge, standard gauge and metre gauge
b) Standard gauge, metre gauge and narrow gauge
c) Metre gauge, narrow gauge and 2 broad gauges

d) Broad gauge, metre gauge and 2 narrow gauges

9. Airports can be classified on how many basis?
a) 5
b) 4
c) 3
d) 2

10. The FAA classification of the airport is based on:
a) Function
b) Geometric design
c) Airport approach speed
d) Length of Runway

11. The wind intensity during a calm period in runways should be:
a) Below 4.6km/hr
b) Above 5km/hr
c) Between 5-10 km/hr
d) Below 6.4km/hr

12. The application of _____ diagram is used to find the orientation of the runway to get the desired wind coverage.
a) Wind Butterfly
b) Wind Cycle
c) Wind Star
d) Wind Rose

13. In car – centred approach, _____ has been considered.
a) Importance of transport
b) Managing existing roads for future traffic
c) Controlling demand for transportation
d) Future increase in traffic demand

14. _____ can provide a 3-5 dB reduction in tyre-pavement noise emissions.
a) Asphalt
b) Bituminous
c) Rubberised asphalt
d) Concrete

15. How many types of pavement surfaces are there?
a) 4
b) 5
c) 6
d) 2

16. The design consideration of highways doesn’t include:
a) Settlement
b) Cross section
c) Level of service
d) Sight distance

17. What does “3-Es” of traffic engineering stand for?
a) Engineering, education and enthusiasm
b) Engineering, education and enforcement
c) Engineering, education and expulsion
d) Enforcement, empowerment and eradication

18. Which of the following is the traffic that is prepared based on 365 days of the year?
a) Annual average daily traffic
b) Average daily traffic
c) Average yearly traffic
d) Yearly traffic

19. What is the purpose of a Travel Time and Delay Study?
a) To evaluate the traffic stream
b) For survey data
c) To assess the quality of traffic movement
d) To assess the time taken to travel by various vehicles

20. Which of the following is not a parameter of traffic stream?
a) Speed
b) PCU
c) Density of traffic
d) Flow of traffic

21. Which of the following is not a way by which traffic volume data is presented?
a) Modal average
b) Traffic composition
c) Variation charts
d) AADT

ANSWER KEY

SUBJECT: TRANSPORTATION ENGINEERING-II

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	C	D	B	D	A	D	C	D	B	C	D	D	D	C	D	A	B	A	C	B

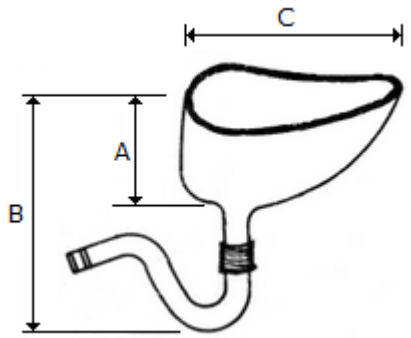
B.Tech Civil Engineering 7th Semester

SUBJECT: QUANTITY SURVEYING

1. The order of booking dimensions is
   a) Length, breadth, height
   b) Breadth, length, height
   c) Height, breadth, length
   d) None of these.

2. While preparing a detailed estimate
   a) Dimension should be measured correct to 0.01 m
   b) Area should be measured correct to 0.01 sqm
   c) Volume should be measured correct to 0.0l cum
   d) All the above.

3. The value of '*C*' of Indian type W.C. shown in the given figure is :



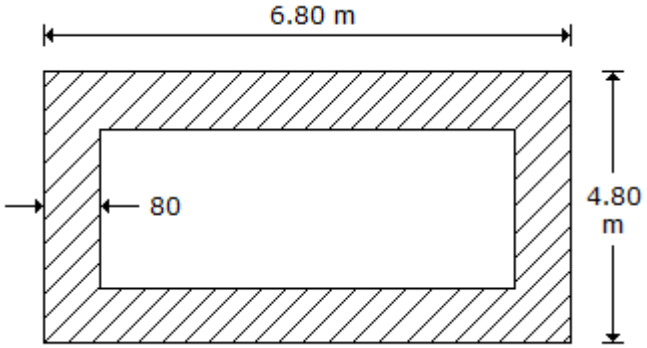
   a) 400 mm
   b) 450 mm
   c) 500 mm
   d) 550 mm

4. The most reliable estimate is
   a) Detailed estimate
   b) Preliminary estimate
   c) Plinth area estimate
   d) Cube rate estimate

5. The main factor to be considered while preparing a detailed estimate, is
   a) Quantity of the materials
   b) Transportation of materials
   c) Location of site and local labour charges
   d) All the above.

6. The damp proof course (D.P.C.) is measured in
   a) Cu.m
   b) Sq m
   c) Metres
   d) None of these

7. Referring of given figure, pick up the correct statement from the following:



a) The total length of centre line of four walls is 20 m
b) Length of long wall out-to-out is 6.80 m
c) Length of short walls in-to-in is 3.20 m
d) All the above.

8. If B is the width of formation, d is the height of the embankment, side slope S : 1, for a highway with no transverse slope, the area of cross-section is
a) B + d + Sd
b) $Bd + Sd^2$
c) $B \times d - Sd^{1/2}$
d) $1/2 (Bd + Sd^2)$

9. Due to change in price level, a revised estimate is prepared if the sanctioned estimate exceeds
a) 2.0%
b) 2.5%
c) 4.0%
d) 5.0%

10. The rate of an item of work depends on
a) Specifications of works
b) Specifications of materials
c) Proportion of mortar
d) All the above

11. To make out an estimate for a work the following data are necessary-Drawing, Specification and ------
a) materials
b) rates
c) labours
d) transportation

12. In this method approx. total length of walls is found in running metre and this total length multiplied by the rate per running metre of wall gives a fairly accurate cost.
a) Annual repair
b) Item rate estimate
c) Approximate quantity method estimate
d) Cubical content estimate

13. Depreciation refers to
    a) An increase in the value of an asset over time.
    b) Resource diminishes over the long run because of utilization.
    c) Assets that can quickly be turned into cash.
    d) Possession of assets over liabilities.

14. The Depreciation remains constant according to which method?
    a) Sum of years digit
    b) Units of production
    c) Declining Balance
    d) Straight Line Method

15. _____ is required for preliminary studies of various aspects of a work or project.
    a) Supplementary Estimate
    b) Plinth Area Estimate
    c) Revised Estimate
    d) Abstract Estimate

16. The 'centre line method' is specially adopted for estimating
    a) bridge buildings
    b) rectangular buildings
    c) steel buildings
    d) earthen building

17. In the mid-section formula

    a) the mean depth is the average of depths of two consecutive sections
    b) the area mean
    c) same as prizmoidal formula
    d) same as trapezoidal formula

18. The volume of one bag cement is

    a) 0.035 m3
    b) 0.027 m3
    c) 0.015 m3
    d) 0.045 m3

19. The estimated value of an item without dismantling at the end of its useful life is known as

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

20. Earthwork in excavation is measured in terms of

a) Sq m
b) Cu m
c) Running metre
d) Quintal

ANSWER KEY

SUBJECT: QUANTITY SURVEYING

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	a	d	c	a	d	b	d	b	d	d	b	c	b	d	d	b	a	a	a	b

SUBJECT: EARTHQUAKE ENGINEERING

1. Which of the following earthquake waves is first recorded on Seismograph.
   a. P-wave
   b. S-wave
   c. Rayleigh wave
   d. Love wave

2. The intensity scale of the earthquake is called.
   a. Mercalli scale
   b. Ritcher Scale
   c. Number scale
   d. None of the above

3. Which theory acclaimed as a satisfactory explanation about the cause of an earthquake.
   a. Classic theory
   b. Tremor theory
   c. Elastic Rebound theory
   d. Seismology theory

4. The earthquakes which occur along the boundaries of the tectonic plates are known as
   a. Inter-Plate Earthquakes
   b. Intra-Plate Earthquakes
   c. Internal earthquakes
   d. External earthquakes

5. The depth of the focus from the epicentre is known as
   a. Shock depth
   b. Epicentral depth
   c. Focal depth
   d. Earthquake depth

6. Modified Mercalli Intensity Scale ranges from _____
   a. I-XII
   b. I-V
   c. I-IX
   d. I-VIII

7. Indian standard criteria for earthquake resistant design of structures (first part, fifth revision) is stated by
   a. IS 1899, 2000
   b. IS 1893, 2002
   c. IS 1894, 2000
   d. IS 1896, 2001

8. Time required to complete one cycle of free vibration is known as
   a. Natural Time Period
   b. Frequency
   c. Angular Frequency

d. None of the Above

9. The fundamental mode of vibrating of a structure is the mode having the _____Natural Frequency.
   a. Highest
   b. Lowest
   c. Average
   d. None of the above

10. Frequency of external force is match with one the natural frequency of vibrating system. This phenomenon is known as.
   a. Critical Damping
   b. Resonance
   c. Amplitude
   d. None of the above

11. Which is the equation of free undamped vibration of SDOF system?
   a. m$\ddot{x}$ + k$\ddot{x}$ + cx = 0
   b. m$\ddot{x}$ + k$\ddot{x}$ = 0
   c. m$\ddot{x}$ + cx = 0
   d. None of the above.

12. A simply supported rectangular beam has weight at center of beam. What will be the stiffness of the beam?
   a. $48EI/L^3$
   b. $12EI/L^3$
   c. $3EI/L^3$
   d. None of the above

13. Seismic waves which travel through interior part of earth are known as
   a. body waves
   b. surface waves
   c. inner waves
   d. deep waves

14. _____ is the graphical representation of the relative amplitudes of the two coordinates and their phase angle relationship.
   a. Stiffness
   b. Mode shape
   c. Node
   d. Flexibility

15. Mass = 10 kg, K = 10 N/m, C = 10 Ns/m, The system is
   a. Underdamped
   b. Overdamped
   c. Critically damped
   d. Viscous damped

16. Mass = 10 kg, K = 10 N/m, C = 10 Ns/m, The system is
    a. Displacement
    b. Velocity
    c. Acceleration
    d. Displacement, Velocity, Acceleration

17. How many seismograph stations are needed to locate the epicenter of an earthquake?
    a. 1
    b. 2
    c. 3
    d. 4

18. How do rock particles move during the passage of a P wave through the rock?
    a. back and forth parallel to the direction of wave travel
    b. back and forth perpendicular to the direction of wave travel
    c. in a rolling circular motion
    d. the particles do not move

19. Earthquake A has a Richter magnitude of 7 as compared with earthquake B's 6. The amount of ground motion is one measure of earthquake intensity.
    a. A is 10X more intense than B
    b. A is 1000 more intense than B
    c. Richter magnitude does not measure intensity
    d. B is 0.01X as intense than A

20. The point where the energy is released during the earthquake is called.
    a. Epicenter
    b. Hypocenter
    c. Circumcenter
    d. None of the above

ANSWER KEY

SUBJECT: EARTHQUAKE ENGINEERING

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	a	a	c	a	c	a	b	a	b	b	b	a	a	b	b	d	c	a	c	b

SUBJECT: ADVANCED STRUCTURAL ANALYSIS

1. In the stiffness matrix method of analysis, the quantity taken as redundant is,
   a. Both rotation and deflection
   b. Rotation
   c. Deflection
   d. None of the above

2. The stiffness coefficients K_{ij} indicates
   a. force at i due to unit deformation at j
   b. deformation at i due to unit at force j
   c. force at j due to unit deformation at i
   d. deformation at j due to unit at force i

3. Elements of the stiffness matrix are
   a. deformations
   b. forces
   c. both forces and deformations
   d. None of the above

4. Elements of the flexibility matrix are
   a. deformations
   b. forces
   c. both forces and deformations
   d. None of the above

5. Stiffness matrix method is also called as
   a. Unit load method
   b. Displacement Method
   c. Force Method
   d. None of the above

6. A rigid-jointed plane frame is stable and statically determinate if
   a. (m + r) = 2j
   b. (m + r) = 3j
   c. (3m + r) = 3j
   d. (m + 3r) = 3j

7. Select the correct statement
   a. Flexibility matrix is a square symmetrical matrix
   b. Stiffness matrix is a square symmetrical matrix
   c. Both (A) and (B)
   d. None of the above

8. The number of independent displacement components at each joint of a rigid-jointed space frame is
   a. 1
   b. 2
   c. 3
   d. 6

9. Independent displacement components at each joint of a rigid-jointed plane frame are
   a. Three linear movements
   b. Two linear movements and one rotation
   c. One linear movement and two rotations
   d. Three rotations

10. A continuous beam ABC consists of spans AB = 3m and BC = 4m, the ends A and C being fixed carry UDL of intensity 4 kN/m and 5 kN/m respectively. Find the fixed end moments of the span BA and BC
    a. + 3 kN-m and + 6.67 kN-m
    b. - 3 kN-m and - 6.67 kN-m
    c. - 3 kN-m and + 6.67 kN-m
    d. + 3 kN-m and - 6.67 kN-m

11. A single bay single storey portal frame has hinged at left and right supports. It is loaded with uniformly distributed load on the beam. Which one of the following statements is true with regard to the deformation of the frame?
    a. It would sway to the left side
    b. It would not sway at all
    c. It would sway to the right
    d. None of the above

12. If a beam is uniformly varying load throughout the span, the bending moment diagram of the beam is
    a. Cubic
    b. Parabolic
    c. Straight
    d. Linear

13. The fixed end moment at support 'B' of uniform beam of span 'L' when an eccentric point load 'W' on the fixed beam AB is
    a. $- Wba^2 / L^2$
    b. $+ Wab^2 / L^2$
    c. $+ Wa^2 b / L^2$
    d. $- Wa^2 b / L^2$

14. The fixed end moment of uniform beam of span 'L' and fixed at the ends to uniformly distribution load 'P' is
    a. $PL^2/2$
    b. $PL^2/8$
    c. $PL^2/12$
    d. $PL^2/16$

15. If a continuous beam ABC is simply supported at A, B and C, then the size of matrix in stiffness matrix method is (01)
    a. 3 x 2
    b. 2 x 2
    c. 2 x 3
    d. 3 x 3

ANSWER KEY

SUBJECT: ADVANCED STRUCTURAL ANALYSIS

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer option	a	a	b	b	b	c	c	d	b	d	b	b	c	c	d

B.Tech Civil Engineering 8th Semester

SUBJECT: ADVANCED STRUCTURAL DESIGN

1. A flat slab is supported

   (i) on beams

   (ii) on columns

   (iii) on beams and columns

   (iv) on columns monolithically built with slab

2. A pre-stressed concrete member

   (i) is made of concrete

   (ii) is made of reinforced concrete

   (iii) possesses internal stress

   (iv) is stressed after casting

3. A pre-stressed rectangular beam which carries two concentrated loads W at L/3 from either end, is provided with a bent tendon with tension P such that central one-third portion of the tendon remains parallel to the longitudinal axis, the maximum dip h is

   (i) $WL/3P$ (ii) $WL/6P$ (iii) $WL/2P$ (iv) WL/P

4. Which design method is used for the design of water tank

   (i) Limit State Method (ii) Working Stress Method

   (iii) Both (i) & (ii) (iv) None of the above

5. A concrete beam of rectangular cross section of 200mm × 400mm is pre-stressed with a force 400 kN at eccentricity 100 mm. the maximum compressive stress in the concrete is

   (i) 2.5 N/mm^2 (ii) 5.0 N/mm^2 (iii) 7.5 N/mm^2 (iv) 12.5 N/mm^2

6. For the design of ground supported water tank which cases is considered?

   (i) Water tank is full of water

   (ii) Water is empty

   (iii) Water is half full with water

   (iv) Only self-weight of tank

7. A 6 m high retaining wall having a smooth vertical back face retains a layered horizontal backfill. Top 3 m thick layer of the backfill is sand having an angle of internal friction, $\Phi = 30°$ while the bottom layer is 3 m thick clay with cohesion, C = 20 kPa. Assume unit weight for both sand and clay as 18 kN/m³. The total active earth pressure per unit length of the wall (in kN/m) is:

   (i) 196 (ii) 210 (iii) 150 (iv) 156

8. Consider the below statements with respect to retaining walls subjected to earth pressure and identify the correct answer. (Assume identical conditions for the soil)

   Statement A: Active earth pressure is developed when the wall moves away from the backfill.

   Statement B: The active earth pressure is greater than the earth pressure at rest.

   (i) Both the statements are incorrect

   (ii) Both the statements are correct

   (iii) Statement B is correct and A is incorrect

   (iv) Statement A is correct and B is incorrect

9. From serviceability criteria, when no transverse stiffeners are provided, depth to thickness of web ratio should be:

   (i) $\frac{d}{t_w} \le 340\varepsilon$ (ii) $\frac{d}{t_w} \le 250\varepsilon$ (iii) $\frac{d}{t_w} \le 200\varepsilon$ (iv) $\frac{d}{t_w} \le 90\varepsilon$

10. As per IS-875 (Part 3): 2015, the design wind speed at height in m/sec is given as:

    (i) $V_z = V_b k_1 k_2 k_3 k_4$ (ii) $V_z = V_b k_1 k_2 k_3$

    (iii) $V_z = V_b k_d k_a k_c$ (iv) $V_z = p_z k_d k_a k_c$

11. The flange of a plate girder is designed for

    (i) shear force (ii) bending moment (iii) torsion (iv) high shear

12. The coefficient of internal pressure, for building with openings larger than 20% is

    (i) ±0.2 (ii) ±0.5 (iii) ±0.7 (iv) ±0.9

13. As per IS-875 (Part 3): 2015, the angle between the direction of wind and a reference axis of the structure is called the

    (i) angle of wind (ii) angle of reference

    (iii) angle of attack (iv) angle of attacking wind

14. The web of a plate girder is designed for shear. True or false?

(i) True (ii) False

15. For a welded plate girder with vertical stiffeners, what is the maximum depth of web provisional in design when the thickness of the web plate is 5 mm?

    (i) 425 mm (ii) 1000 mm (iii) 1250 mm (iv) 2000 mm

16. Critical section for shear in case of flat slabs is at a distance of

    (i) d/2 from periphery of column/capital/drop panel

    (ii) effective depth of slab from periphery of column/drop panel

    (iii) at the drop panel of the slab

    (iv) at the periphery of the column

17. The web crippling due to excessive bearing stress can be avoided by

    (i) increasing the web thickness

    (ii) providing suitable stiffeners

    (iii) increasing the length of the bearing plates

    (iv) none of the above

18. Column strip shall be designed to resist _____percent of the total positive moment

    (i) 10% (ii) 25% (iii) 60% (iv) 90%

19. How many types of losses in prestress are observed in pretensioned members?

    (i) 2 (ii) 4 (iii) 8 (iv) 7

20. Horizontal stiffener in a plate girder is provided to safeguard against

    (i) shear buckling of web plate (ii) compression buckling of web plate

    (iii) yielding (iv) all of the above

ANSWER KEY: ADVANCED STRUCTURAL DESIGN

1	(iv) on columns monolithically built with slab	**11**	(ii) bending moment
2	(iii) possesses internal stress	**12**	(iii) ± 0.7
3	(i) $WL/3P$	**13**	(iii) angle of attack
4	(ii) Working Stress Method	**14**	(i) True
5	(iv) 12.5 N/mm^2	**15**	(ii) 1000 mm
6	(i) Water tank is full of water	**16**	(i) d/2 from periphery of column/capital/drop panel
7	(iii) 150	**17**	(iii) increasing the length of the bearing plates
8	(iv) Statement A is correct and B is incorrect	**18**	(iii) 60%
9	(iii) $\frac{d}{t_w} \leq 200\varepsilon$	**19**	(ii) 4
10	(i) $V_z = V_b k_1 k_2 k_3 k_4$	**20**	(ii) compression buckling of web plate

SUBJECT: DESIGN OF SUBSTRUCTURES

Q1. Which of the following is not a flood proofing measures for houses?

a. Dry flood proofing
b. Flood walls
c. Detention basins
d. Elevation

Q2.A layer provided to prevent entry of unwanted moisture inside the building either by seepage or by leakage is known as

a. Roof
b. Sunshade
c. Damp roof course
d. Lintel

Q3. The process of marking the positions of various foundations and other elements on to the ground as per the drawing is called

a. Settlement of foundations
b. Settling of foundations
c. Siting of foundations
d. Setting out of foundations

Q4. The portion of the structure below the ground level are called as

a. Submerged structure
b. Sub-structure
c. Sustainable structures
d. Super-structure

Q5. The steps used for changing the direction of the staircases are called as

a. Winders
b. Nosing
c. Line of nosing
d. Riser

Q6. ……. Support the masonry in opening of doors and windows.

a. Lintels
b. Purlins
c. Girders
d. Rafters

Q7. Temporary arrangement of boardings, wailings and struts which is provided to give support to sides of trench is known as …….

a. Centering
b. Timbering
c. Shuttering
d. Poling

Q8. The foundation in which a cantilever beam is provided to joint two footings is called

a. Raft footing
b. Strap footing
c. Combined footing
d. Strip footing

Q9. The structure which is used to divide the stages in different levels is termed as-

a. Damp proof course
b. Roof
c. Lintels
d. Floor

Q10. The size of step commonly adopted for residential buildings is

a. 25cm x 16cm
b. 17cm x 15cm
c. 30cm x 13cm
d. 35cm x 10cm

Q11. The part of a building constructed below the ground level is known as

a. Plinth
b. Superstructure
c. Basement
d. Foundation

Q12. The load of the structure distributed by the foundation is …….

a. Concentrated
b. Varying
c. Uniform
d. Eccentric

Q13. For loose soil, the formula used to find the minimum depth of foundation is given by …….

a. Rankine's formula
b. Hiley formula
c. Bernoulli's formula
d. Newtonian formula

Q14. The foundation in which the loading on the soil remains practically the same after the construction of the building is known as …….

a. Step foundation
b. Grillage foundation
c. Raft foundation
d. Inverted arch foundation

Q15. …….. method of increasing the bearing power of soil becomes very useful when the load coming on the soil is practically uniform.

a. Raft foundation
b. Grillage foundation

c. Mat foundation
d. Inverted arch foundation

Q16. When the ground is sloping …….. foundations are used to correct the levels of the sloping ground on which the building is to be constructed.

a. Shallow foundation
b. Combined foundation
c. Cantilever foundation
d. Stepped foundation

Q17. Which type of foundation is used for the construction of building on back cotton soil?

a. Inverted arch foundation
b. Floating foundation
c. Mat foundation
d. Grillage foundation

Q18. …….. is applied to the process of laying down certain lines and marks on the ground before the exaction of foundation trenches.

a. Ground tracing
b. Surveying
c. Dumpy level
d. Digging

Q19. If the foundation of the structure is to be divided into two or more independent units …….. are provided to take care of unequal settlement.

a. Construction joints
b. Mechanical joints
c. Slip joints
d. Connecting joints

Q20. A common footing provided for two or more columns is known as ……..

a. Continuous footing
b. Combined footing
c. Cantilever footing
d. Eccentric footing

ANSWER KEY : DESIGN OF SUBSTRUCTURES

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	c	c	d	b	a	a	b	b	d	a	d	c	a	b	a	d	c	a	c	b

SUBJECT : REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM

Q1. Remote sensing is a _____ recording of information.

a. Contact
b. Non - contact
c. Both A and B
d. None

Q2. LANDSAT is a satellite series of _____.

a. Canada
b. European Union
c. USA
d. Russia

Q3. In 1860s, _____ conceptualized the EM Radiation as an EM energy or wave which travels through space at the speed of light.

a. James Maxwell
b. James Watt
c. Sir Issac Newton
d. None of the above

Q4. What is SAR?

a. Synthetic Array Radar
b. Synthetic Aperture Radar
c. Synthetic Apron Radar
d. None of the above

Q5. LISS is an example of _____.

a. Active Sensor
b. Passive Sensor
c. Both Active and Passive Sensor
d. None of the above

Q6. RISAT stands for _____.

a. Radio satellite
b. Radio navigation and ranging satellite
c. Radar Imaging Satellite
d. None

Q7. Which colour of EM spectrum is used for bathymetry studies?

a. Red
b. UV
c. Blue
d. Green

Q8. Which colour radiation is useful for coastal morphology?

a. red
b. blue
c. green
d. all of the above

Q9. reflection occurs when all of energy is directed away from surface in a single direction.

a. Mirror like
b. Specular
c. Both A and B
d. None of the above

Q10. On _____ surface, perfect diffuse reflection occurs.

a. Ideal
b. Ideal and smooth
c. Lambertian
d. None of the above

Q11. When EM radiation enters the atmosphere, it is subjected to

a. Scattering
b. Absorption
c. Transmission
d. All the above

Q12. The fact that sky appears to be blue is due to _____.

a. Rayleigh scattering
b. Mie scattering
c. Non selective scattering
d. All of above

Q13. Rayleigh scattering occurs when particle size is _____than wavelength of incoming radiation.

a. Very small
b. Equal
c. Smaller than or equal
d. None of the above

Q14. Dust, smoke or pollen exhibits _____ scattering.

a. Rayleigh
b. Mie
c. Non selective
d. All of above

Q15. _____ scattering occurs when the particle size is nearly 8 - 10 times than that of wavelength of incoming radiation.

a. Rayleigh
b. Mie
c. Non selective
d. None of the above

Q16. Those areas of the spectrum which are not severely influenced by atmospheric absorption and thus, are useful to remote sensors, are called _____.

a. Special bands of EM spectrum
b. Atmospheric Windows
c. Radio waves
d. None of the above

Q17. Clear water reflects _____ energy.

a. Consistent
b. Less
c. More
d. None of the above

Q18. In healthy vegetation (also during summer), there is _____ absorption of blue & red energy.

a. More
b. Less
c. Both A and B
d. None of the above

Q19. In case of soil, there is nearly _____ transmittance of energy.

a. More
b. Minimum
c. Zero
d. None of the above

Q20. In soil, reflectance _____ with presence of moisture, surface roughness or organic content.

a. Increases
b. Decreases
c. Remains same
d. None of the above

ANSWER KEY : REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer option	b	c	a	b	b	c	d	b	c	c	d	a	a	b	c	b	b	a	c	d