

038/2016

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. The unit of force in S.I. system of units is :
(A) Dyne (B) Kilogram
(C) Newton (D) Watt
2. One kg force is equal to :
(A) 9.8 N (B) 7.8 N
(C) 8.9 N (D) 12 N
3. The angle between two forces when the resultant is maximum and minimum respectively are :
(A) 180° and 0° (B) 0° and 180°
(C) 90° and 180° (D) 90° and 0°
4. If the resultant of two equal forces has the same magnitude as either of the forces, the angle between the two forces is :
(A) 30° (B) 60°
(C) 90° (D) 120°
5. The resultant of the two forces P and Q is R. If Q is doubled, the new resultant is perpendicular to P. Then :
(A) $P = Q$ (B) $Q = R$
(C) $Q = 2R$ (D) None of these
6. Two forces are acting at an angle of 120° . The bigger force is 40 N and the resultant is perpendicular to the smaller one. The smaller force is :
(A) 20 N (B) 40 N
(C) 80 N (D) None of these
7. Concurrent forces are those forces whose lines of action :
(A) Lie on the same line (B) Meet at one point
(C) Meet on the same plane (D) None of these
8. A number of forces acting at a point will be in equilibrium, if :
(A) All the forces are equally inclined
(B) Sum of all the forces is zero
(C) Sum of resolved parts in the vertical direction and horizontal direction is zero
(D) All the forces are equally perpendicular

9. The forces, which meet at one point and their lines of action also lie on the same plane, are known as :
- (A) Coplanar concurrent forces
 - (B) Coplanar non-concurrent forces
 - (C) Non-coplanar concurrent forces
 - (D) Non-coplanar non-concurrent forces
10. A couple produces :
- (A) Translatory motion
 - (B) Rotational motion
 - (C) Combined translatory and rotational motion
 - (D) None of the above
11. Elasticity of a body is :
- (A) The property by which a body returns to its original shape after removal of the load
 - (B) The ratio of stress to strain
 - (C) The resistance to the force acting
 - (D) Large deformability as in case of rubber
12. The stress in a member subjected to a force is :
- (A) Continued deformation under sustained loading
 - (B) Load per unit area
 - (C) The resistance offered by the material per unit area to a force
 - (D) The strain per unit length
13. The volumetric strain is the ratio of the :
- (A) Original thickness to the change in thickness
 - (B) Change in volume to the original volume
 - (C) Change in thickness to the original thickness
 - (D) Original volume to the change in volume
14. The law "Stress is proportional to strain within certain limits" is formulated by :
- (A) Thomas Young
 - (B) Poisson
 - (C) Mohr
 - (D) Robert Hook
15. Young's Modulus is the ratio of the normal stress to the :
- (A) Normal strain within elastic limit
 - (B) Reciprocal of normal strain within elastic limit
 - (C) Normal strain within proportional limit
 - (D) Normal strain at yield point

16. The stress due to temperature change in a member depends on :
- (A) Length of the member
 - (B) Supporting conditions at the two ends
 - (C) Area of cross section
 - (D) None of the above
17. The percentage of elongation of a material from a direct tensile test indicates :
- (A) Ductility
 - (B) Elasticity
 - (C) Malleability
 - (D) Brittleness
18. The energy stored in a body when strained within elastic limit is known as :
- (A) Resilience
 - (B) Proof resilience
 - (C) Impact energy
 - (D) Strain energy
19. The Poisson's Ratio is the ratio of :
- (A) Lateral elongation to linear elongation
 - (B) Lateral stress to linear stress
 - (C) Lateral strain to longitudinal strain
 - (D) Young's Modulus to Modulus of Rigidity
20. Modulus of Rigidity is the ratio of :
- (A) Normal stress to normal strain
 - (B) Shear stress to shear strain
 - (C) Poisson's ratio to ultimate strength in compression
 - (D) Lateral stress to lateral strain
21. In order to determine the natural features such as valleys, rivers, lakes etc. the surveying preferred is :
- (A) City surveying
 - (B) Location surveying
 - (C) Cadastral surveying
 - (D) Topographical surveying
22. The fundamental principle of surveying is to work from the :
- (A) Whole to the part
 - (B) Part to whole
 - (C) Lower level to higher level
 - (D) Higher level to lower level
23. The method of measuring distance by pacing is chiefly used in :
- (A) Location survey
 - (B) Preliminary surveys
 - (C) Reconnaissance surveys
 - (D) All of these

24. The instrument attached to the wheel of a vehicle in order to measure the distance travelled, is called :
- (A) Passometer (B) Odometer
(C) Pedometer (D) Speedometer
25. Direct ranging is possible only when the end stations are :
- (A) Close each other (B) Not more than 100m apart
(C) Located at highest points in the sea (D) Mutually inter visible
26. The error in measured length due to sag of chain or tape is known as :
- (A) Positive error (B) Negative error
(C) Compensating error (D) Instrumental error
27. When the position of a point is to be located accurately by a perpendicular offset, the direction of perpendicular is set out by means of :
- (A) Theodolite (B) Optical square
(C) Dumpy level (D) Planimeter
28. In an optical square, the angle between the first incident ray and the last reflected ray is :
- (A) 60° (B) 120°
(C) 90° (D) 150°
29. The angle between the reflecting surfaces of a prism square is :
- (A) 30° (B) 60°
(C) 75° (D) 45°
30. The horizontal angle between the true meridian and survey line is called :
- (A) Azimuth (B) Magnetic bearing
(C) Dip (D) Magnetic declination
31. The number of reaction components possible at a hinge on rollers support is :
- (A) 2 (B) 1
(C) 0 (D) 3
32. A simply supported beam is subjected to a pure moment. This will be resisted through :
- (A) A moment reaction at hinged end
(B) A moment reaction at hinge on rollers end
(C) A couple formed by the reactions from the two supports
(D) External support capable of resisting moment which is necessarily to be provided

33. A cantilever beam is the one which is supported with :
- (A) One end hinge and other on rollers
 - (B) One end fixed and the other on rollers
 - (C) Both end on rollers
 - (D) One end fixed and the other free
34. The bending moment in a beam will be maximum where :
- (A) The S.F is zero
 - (B) The S.F. is uniform
 - (C) The S.F is maximum
 - (D) None of these
35. Points of contra flexure are the points where :
- (A) The S.F. is zero
 - (B) Where the B.M. changes its sign
 - (C) The B.M. is zero
 - (D) The beam is supported
36. In a simple bending theory, one of the assumption is that the plane section before Bending remains plane after bending. This assumption means that :
- (A) Strain is uniform throughout the beam
 - (B) Stress is proportional to the distance from the neutral axis
 - (C) Stress is uniform throughout the beam
 - (D) Strain is proportional to the distance from the neutral axis
37. The neutral axis of any section is :
- (A) The axis passing through middle point of the height
 - (B) The axis about which the moment of inertia is minimum
 - (C) Longitudinal axis of the member
 - (D) The line of intersection of neutral plane with cross section
38. Which of the following section is the most efficient in carrying bending moments?
- (A) I-section
 - (B) Rectangle section
 - (C) Circular section
 - (D) T-section
39. The maximum shear stress will always occur at :
- (A) Neutral axis
 - (B) A fibre in the cross-section depending on the configuration
 - (C) The top extreme fibre
 - (D) The bottom extreme fibre
40. In an I section almost all the maximum shear stress will occur at :
- (A) Top flange
 - (B) Bottom flange
 - (C) Web
 - (D) Half the depth of the flange

41. When a cantilever beam is loaded at its free end, the maximum compressive stress shall develop at :
- (A) Top fibre (B) Neutral axis
(C) Centre of gravity (D) Bottom fibre
42. A beam of uniform strength has :
- (A) Same bending stress at every section
(B) Same cross section throughout the beam
(C) Same bending moment at every section
(D) Same shear stress at every section
43. The neutral axis of a beam is subjected to _____ stress.
- (A) Maximum tensile (B) Zero
(C) Minimum tensile (D) Maximum compressive
44. When a simply supported rectangular beam is loaded transversely, the maximum tensile stress is developed on the :
- (A) Top layer (B) Neutral axis
(C) Bottom layer (D) Every cross-section
45. A flitched beam is used to :
- (A) Change the shape of the beam
(B) Effect the saving in material
(C) Increase the cross-section of the beam
(D) Equalise the strength in tension and compression
46. A rectangular beam of length l supported at its two ends carries a central point load W . The maximum deflection occurs :
- (A) At the centre (B) At the ends
(C) At $l/3$ from both ends (D) None of these
47. The product of Young's modulus (E) and moment of inertia (I) is known as :
- (A) Modulus rigidity (B) Flexural rigidity
(C) Bulk modulus (D) Torsional rigidity
48. The product of the tangential force acting on the shaft and its distance from the axis of the shaft (i.e. radius of shaft) is known as :
- (A) Bending moment (B) Torsional rigidity
(C) Twisting moment (D) Flexural rigidity

49. When a shaft is subjected to torsion, the shear stress induced in the shaft varies from?
(A) Minimum at the centre to maximum at the circumference
(B) Maximum at the centre to minimum at the circumference
(C) Maximum at the centre to zero at the circumference
(D) Zero at the centre to maximum at the circumference
50. The shear stress at the centre of a circular shaft under torsion is :
(A) Zero (B) Minimum
(C) Maximum (D) Infinity
51. Laterite is chemically classified as :
(A) Calcareous rock (B) Argillaceous rock
(C) Siliceous rock (D) Metamorphic rock
52. Which of the following is an example of argillaceous rock?
(A) Kaolin (B) Slate
(C) Laterite (D) All of these
53. Marble is an example of
(A) Aqueous rock (B) Sedimentary rock
(C) Metamorphic rock (D) Igneous rock
54. A first class brick should have a minimum crushing strength of :
(A) 10.5 MN/m² (B) 7 MN/m²
(C) 12.5 MN/m² (D) 14 MN/m²
55. Which of the following constituent, when present in excess quantity in clay causes the bricks to melt and distort during burning?
(A) Alumina (B) Silica
(C) Lime (D) Alkalies
56. Efflorescence is caused if :
(A) The alkaline salt is present in the bricks
(B) The clay used for making bricks contain pyrite
(C) The water used for pugging the clay contains gypsum
(D) All of the above

57. Quick lime is a :
- (A) Carbonate of lime
 - (B) Product left immediately after the calcinations of pure limestone
 - (C) Oxide of calcium
 - (D) Lime quickly treated with water
58. The silica in Portland cement should be :
- (A) 20 to 25%
 - (B) 10 to 20%
 - (C) 25 to 40%
 - (D) 40 to 60%
59. The cementing property in cement is mainly due to :
- (A) Silica
 - (B) Lime
 - (C) Iron oxide
 - (D) Alumina
60. The slump test of concrete is used to measure its :
- (A) Tensile and compressive strength
 - (B) Impact value
 - (C) Consistency
 - (D) Homogeneity
61. Which of the following is the most correct estimate?
- (A) Plinth area estimate
 - (B) Cube rate estimate
 - (C) Building cost index estimate
 - (D) Detailed estimate
62. The expenses of item which do not come under any regular head of item and the cost of unforeseen items are called
- (A) Lump-sum
 - (B) Extras
 - (C) Customary charges
 - (D) Contingencies
63. The quantity of Damp Proof Course (D.P.C) is worked out in :
- (A) m^2
 - (B) m^3
 - (C) m
 - (D) limp-sum
64. The technique of finding the fair price of an existing building or property is known as :
- (A) Estimation
 - (B) valuation
 - (C) Pricing
 - (D) Costing
65. The annual periodic payments made for the payment of the capital invested is known as :
- (A) Depreciation
 - (B) Sinking fund
 - (C) Annuity
 - (D) Solatium