ISRO

Previous Year Paper
Scientist Civil 2017

	INDIAN SPACE RESEARCH ORGANISATION	SET A
इसरो isro	Recruitment Entrance Test for Scientist/Engineer 'SC' 2017	

1. The resultant of two forces each equal to P and acting at right angles is

(a) $P/\sqrt{2}$ (b) $P/2$ (c) $P/2\sqrt{2}$ (d) $\sqrt{2}P$

2. Non coplanar concurrent forces are those forces which

(a) Meet at one point, but their lines of action do not lie on the same plane

(b) Do not meet at one point and their lines of action do not lie on the same plane

(c) Meet at one point and their lines of action also lie on the same plane

(d) Do not meet at one point, but their lines of action lie on the same plane

3. The point through which the whole weight of the body acts, irrespective of its position, is known as

(a) Moment of inertia (b) Centre of mass

(c) Centre of percussion (d) Centre of gravity

4. The moment of inertia of a rectangular section 3 cm wide and 4 cm deep about an axis passing through its centre of gravity and parallel to width is

(a) 9 cm^4 (b) 12 cm^4

(c) 16 cm^4 (d) 20 cm^4

5. Modulus of rigidity is the ratio of

(a) Linear stress to lateral strain (b) Lateral strain to linear strain

(c) Linear stress to linear strain (d) Shear stress to shear strain

6. Two bars of different materials and same size are subjected to the same tensile force. If the bars have unit elongation in the ratio of 3:5, then the ratio of modulus of elasticity of the two materials will be

(a) 2:5 (b) 3:5 (c) 5:3 (d) 3:4

7. Modular ratio of the two materials is the ratio of

(a) Linear stress to linear strain

(b) Shear stress to shear strain

(c) Their modulus of elasticity's

(d) Their modulus of rigidities

8. The young's modulus of a material is 150 GPa and Poisson's ratio is 0.25, the modulus of rigidity of the material is

(a) 30 GPa (b) 50 GPa (c) 60 GPa (d) 100 GPa

9. A body is subjected to a direct tensile stress of 300 MPa in one plane accompanied by a simple shear stress of 200 MPa. The maximum normal stress will be

(a) – 100 MPa (b) 250 MPa (c) 300 MPa (d) 400 MPa

10. A vessel of 4 m^3 contains oil which weighs 30 kN. The specific weight of the oil is

(a) 4.5 kN / m^3 (b) 6 kN / m^3 (c) 7.5 kN / m^3 (d) 10 kN / m^3

11. The variation in the volume of a liquid with the variation of pressure is called its

(a) Surface tension (b) Compressibility

(c) Capillarity (d) Viscosity

12. The pressure of a liquid measured with the help of piezometer tube is

(a) Vacuum pressure (b) Atmospheric pressure

(c) Absolute pressure (d) Gauge pressure

13. A body floating in a liquid is said to be in a neutral equilibrium, if its metacentre

(a) Coincides with its centre of gravity

(b) Lies above its centre of gravity

(c) Lies below its centre of gravity

(d) Lies between the centre of buoyancy and centre of gravity

14. A Pitot tube is used to measure the

(a) Velocity of flow at the required point in a pipe

(b) Pressure difference between two points in a pipe

(c) Total pressure of liquid flowing in a pipe

(d) Discharge through a pipe

15. When the water level on the downstream side of a weir is above the top surface of a weir, the weir is known as

(a) Narrow crested weir (b) Broadcrested weir

(c) Ogee weir (d) Submerged weir

16. In open channels, the specific energy is the

(a) Total energy per unit discharge

(b) Total energy measured with respect to the datum passing through the bottom of the channel

(c) Total energy measured above the horizontal datum

(d) Kinetic energy plotted above the free surface of water

17. Newton's law of viscosity is a relationship between

(a) Pressure, velocity and temperature

(b) Shear stress and rate of shear strain

(c) Shear stress and velocity

(d) Rate of shear strain and temperature

18. The velocity at which the flow changes from laminar flow to turbulent flow is called

(a) Critical velocity (b) Velocity of approach

(c) Subsonic velocity (d) Supersonic velocity

19. When the length of chain used in measuring distance is longer than the standard length, the error in measured distance will be

(a) Positive error (b) Mean error

(c) Compensating error (d) Negative error

20. In a whole circle bearing system N 20^0 15' *W corresponds to*

(a) 69^0 45' (b) 290^0 15'

(c) 200^0 15' (d) 339^0 45'

21. The horizontal angle between the true meridian and a survey line is called

(a) Magnetic bearing (b) Azimuth

(c) Dip (d) Magnetic declination

22. The lines passing through points at which the magnetic declination is equal at a given time are called

(a) Isogonic lines (b) Agonic lines

(c) Isoclinic lines (d) Isochrite lines

23. When the whole circle bearing of a traverse line is between 90^0 to 180^0, then

(a) The latitude is positive and departure is negative

(b) The departure is positive and latitude is negative

(c) Both latitude and departure are positive

(d) Both latitude and departure are negative

24. The method of plane tabling commonly used for establishing the instrument stations only, is a

(a) Method of radiation (b) Method of intersection

(c) Method of traversing (d) Method of resection

25. The ratio between the area of a crop irrigated and the quantity of water required during its entire period of the growth, is known as

(a) Delta (b) Duty

(c) Base period (d) Crop period

26. Irrigation canals are generally aligned along

(a) Contour line (b) Valley line

(c) Straight line (d) Water shed

27. The vertical wells provided along the banks of a river to draw ground water in dry season are called

(a) Open wells (b) Tube wells

(c) Artesian wells (d) Infiltration wells

28. The desirable limit of chloride content as per BIS standards in water for domestic supplies should not exceed

(a) 250 ppm (b) 350 ppm (c) 450 ppm (d) 550 ppm

29. B-coli or E-coli are generally harmless organisms and their presence in water indicates the

(a) Presence of pathogenic bacteria

(b) Absence of pathogenic bacteria

(c) Presence of non pathogenic bacteria

(d) Absence of non pathogenic bacteria

30. The most common coagulant used in water treatment plants is

(a) Magnesium sulphate (b) Alum

(c) Chlorine (d) Bleaching powder

31. The permanent hardness of water can be removed by

(a) Adding alum (b) Adding chlorine

(c) Boiling (d) Zeolite process

32. Laterite is chemically classified as

(a) Calcareous rock (b) Metamorphic rock

(c) Siliceous rock (d) Argillaceous rock

33. Excess of alumina in the clay

(a) Makes the brick brittle and weak

(b) Makes the brick crack and warp on drying

(c) Changes colour of the brick from red to yellow

(d) Improves impermeability and durability of the brick

34. The central part of a tree is called

(a) Heart wood (b) Cambium

(c) Sap wood (d) Pith

35. Fender piles are

(a) Used to function as retaining walls

(b) Used to protect concrete deck or other water front structures from the abrasion or impact

(c) Driven at an inclination to resist large horizontal inclined forces

(d) Driven in granular soil with the aim of increasing the bearing capacity of the soil

36. A brick which is cut in such a way that the width of its one end is half that of a full brick, is called

(a) King closer (b) Mitred closer

(c) Beveled closer (d) Queen closer

37. The vertical distance between the springing line and the highest point on the intrados is called ———— of the arch.

(a) Depth (b) Extrados

(c) Haunch (d) Rise

38. The super elevation is

(a) Directly proportional to the velocity of vehicles

(b) Inversely proportional to the velocity of vehicles

(c) Directly proportional to the width of pavement

(d) Inversely proportional to the width of pavement

39. The minimum length of a valley curve should be such that the head light beam sight distance is equal to

(a) Stopping sight distance (b) Passing sight distance

(c) Braking distance (d) Chord distance

40. Junction between the flange and web of a beam is known as

(a) Lap joint (b) Butt joint

(c) Fillet (d) Shear joint

41. Rolled steel equal and unequal sections are designated as ISA followed by

(a) Length and thickness of legs

(b) Width of flange and depth of web

(c) Depth of section

(d) Weight per meter length

42. A strut is a structural member subjected to

(a) Tension in a direction parallel to its longitudinal axis

(b) Tension in a direction perpendicular to its longitudinal axis

(c) Compression in a direction parallel to its longitudinal axis

(d) Compression in a direction perpendicular to its longitudinal axis

43. Which of the following is a best compression member section?

(a) Single angle section (b) Tubular section

(c) Double angle section (d) I section

44. The longitudinal movement of the rails in a track is technically known as

(a) Buckling (b) Hogging

(c) Creeping (d) Cracking

45. When two tracks of same or different gauges cross each other at any angle, the crossing provided is

(a) Diamond crossing (b) Scissors crossing

(c) Level crossing (d) Tongue crossing

46. An activity in a project management network is

(a) The beginning or end of a specified job

(b) An element of work entailed in the project

(c) Represented by a circle in a network with a number in it

(d) The progress of work up to a certain limit

47. A critical activity in a project management network has

(a) Maximum float (b) Minimum float

(c) Zero float (d) Average float

48. The relation between void ratio (e), degree of saturation (s), water content (w) and specific gravity of solids (G) is given by

(a) $e + s = w + G$ (b) $e \times s = w \times G$

(c) $e/s = w/G$ (d) $s + e / w = G + e /s$

49. The difference between maximum void ratio and minimum void ratio of a sand sample is 0.25. If relative density of this sample is 60% at a void ratio of 0.40, then the void ratio of this sample at its loosest state will be

(a) 0.40 (b) 0.75 (c) 0.70 (d) 0.55

50. Which of the following clay mineral gives maximum swelling?

(a) Kaolinite (b) Montmorillonite

(c) Illite (d) Mica

51. Toughness index of the soil is the ratio of

(a) Flow index and plasticity index

(b) Plasticity index and flow index

(c) Liquidity index and flow index

(d) Flow index and liquidity index

52. A flow line in seepage through a soil medium is defined as the

(a) Path of particles of water through saturated soil mass

(b) Line connecting points of equal head of water

(c) Flow of movement of fine particles of soil

(d) Direction of the flow particle

53. The ratio of decrease in voids ratio of soil due to increase in effective stress is called

(a) Coefficient of permeability

(b) Coefficient of curvature

(c) Coefficient of volume compressibility

(d) Coefficient of compressibility

54. A simply supported beam A carries a point load at its mid span. Another identical beam B carries the same load but uniformly distributed over the entire span. The ratio of the maximum deflection of the beams A and B will be,

(a) 8/5 (b) 5/8 (c) 3/5 (d) 5/3

55. A cantilever beam 2.5m long carries a uniformly distributed load 50 KN per meter over length of 1.5m from the free end. The value of maximum shear force and bending moment for the beam will be respectively;

(a) 15 KN & 150 KNm (b) 10 KN & 131.25 KNm

(c) 15 KN & 131.25 KNm (d) 10 KN & 150 KNm

56. When the water table is close to the ground surface, the bearing capacity of a soil is reduced to

(a) One fourth (b) One half

(c) Two third (d) Three fourth

57. Harsh mix of concrete

(a) Lacks plasticity (b) Is cohesive

(c) Has high cement content (d) Can be easily moulded

58. The chemical ingredient of cement which provides quick setting property to the cement is

(a) Lime (b) Silica

(c) Alumina (d) Iron oxide

59. Which of the following cements is expected to have the highest compressive strength after 3 days?

(a) Ordinary Portland cement (b) Rapid hardening cement

(c) High alumina cement (d) Sulphate resisting cement

60. The phenomenon by virtue of which the cement does not undergo large change in volume when mixed with water, in known as

(a) Fineness (b) Soundness

(c) Setting time (d) Efflorescence

61. A compaction factor of 0.88 indicates that the workability of concrete mix is

(a) Very low (b) Low

(c) Medium (d) High

62. Vertical sides of concrete columns shuttering may be stripped after

(a) 1 to 2 days (b) 7 days

(c) 14 days (d) 21 days

63. The section in which concrete is not fully stressed to its permissible value when stress in steel reaches its maximum value, is called

(a) Under reinforced section (b) Over reinforced section

(c) Critical section (d) Balanced section

64. The effective depth of a singly reinforced rectangular beam is 400 mm. The section is over reinforced and the neutral axis is 180 mm below the top. If the maximum stress

attained by concrete is 5 N / mm^2 and the modular ratio is 18, then the stress developed in the steel will be

(a) 110 N / mm^2 (b) 135 N / mm^2

(c) 160 N / mm^2 (d) 180 N / mm^2

65. If the bond stress developed in a reinforced concrete beam is more than permissible value, it can be brought down by

(a) Decreasing the depth of the beam

(b) Decreasing the number of bars

(c) Decreasing the diameter of the bars

(d) Increasing the diameter of the bars

66. A T beam behaves like a rectangular beam of width equal to its flange, if neutral axis

(a) Remains outside the flange

(b) Remains within the flange

(c) Remains below the slab

(d) Remains anywhere in the web

67. The analysis of slab spanning in one direction is done by assuming it to be a beam of

(a) 1m length (b) 1m^2 area

(c) 1m width (d) Least thickness

68. A reinforced concrete slab is 75 mm thick. The maximum size of reinforcement bar that can be used is

(a) 6 mm dia (b) 8 mm dia

(c) 10 mm dia (d) 12 mm dia

69. The drops are provided in flat slabs to resist

(a) Torsion (b) Compression

(c) Thrust (d) Shear

70. In a reinforced concrete retaining wall, a shear key is provided if the

(a) Shear stress in the vertical stem is excessive

(b) Shear force in the toe slab is more than that in the heel slab

(c) Retaining wall is not safe against sliding

(d) Retaining wall is not safe against overturning

71. The value of $\underset{x\to 0}{Lt}\,(\tan x \log x)$ is

(a) 1 (b) $\tan x$ (c) $\log x$ (d) 0

72. The general solution of the differential equation $9yy'+4x=0$ is, ($y'=\frac{dy}{dx}$, C = constant)

(a) $9x^2+4y^2=C$ (b) $\frac{x^2}{9}+\frac{y^2}{4}=C$

(c) $4x^2+9y^2=C$ (d) $\frac{x^2}{4}-\frac{y^2}{9}=C$

73. The Laplace transform L(e^{at}) is , [Note:– $L(f(t))=\bar{f}(s)$]

(a) $\frac{1}{s}$ (b) $\frac{a}{s+a}$

(c) $\frac{1}{s-a}$ (d) $\frac{s}{a}$

74. The number of sub matrices (1×2) of a matrix (2×3) is

(a) Three (b) Four

(c) Five (d) Six

75. If $A=\begin{bmatrix}3 & 2 & -1\\ 0 & 4 & 6\end{bmatrix}$ and $B=\begin{bmatrix}1 & 0 & 2\\ 5 & 3 & 1\\ 6 & 4 & 2\end{bmatrix}$ Then the product of the matrices AB is

(a) $\begin{bmatrix}4 & 7 & 5\\ 0 & 12 & 4\end{bmatrix}$ (b) $\begin{bmatrix}7 & 2 & 3\\ 16 & 51 & 36\end{bmatrix}$

(c) $\begin{bmatrix}7 & 2 & 6\\ 56 & 36 & 16\end{bmatrix}$ (d) $\begin{bmatrix}16 & 2 & 7\\ 56 & 6 & 36\end{bmatrix}$

76. If 2 is root of the equation $2X^2+X^2-13X+6=0$, then the equation is exactly divisible by the factor

(a) $X-2$ (b) $2X$ (c) $X+6$ (d) $X+13$

77. A determinant (Δ) of 3 rows (R_1,R_2,R_3) and 3 columns (C_1,C_2,C_3) has a value $\Delta=15$. If two columns C_2 and C_3 of the determinant (Δ) are interchanged, then the value of determinant will be

(a) 15 (b) –15 (c) 45 (d) –45

78. If $u = \sin^{-1}\frac{(x+y)}{\sqrt{x}+\sqrt{y}}$ then by Euler's theorem, $x.\frac{\partial u}{\partial x} + y.\frac{\partial u}{\partial y}$ will be

(a) $\frac{1}{2}\sin u$ (b) $\frac{1}{2}\tan u$

(c) $x + y$ (d) $\sin x + \sin y$

79. While calculating the cost of a pile of bricks measured as 2 m × 15 m × 1.2 m, the tape is stretched 1% beyond the standard length. If the count is 450 bricks per cubic meter and cost of bricks is Rs. 5,000 per 1000 no's, the approximate error in the cost is

(a) Rs. 2,430 (b) Rs. 1,215

(c) Rs. 5,000 (d) Rs. 1,000

80. The series $1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + ...,$ is

(a) Convergent (b) Divergent

(c) Conditionally Convergent (d) Oscillatory

Space for rough work

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