

# **APSC PWD JE**

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(Civil Engineering)  
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1. The benchmark fixed at the end of day's work is known as

- (A) GTS benchmark
- (B) permanent benchmark
- (C) temporary benchmark
- (D) arbitrary benchmark

2. The main cause(s) of acid rain is/are

- (A) industrial burning of coal and other fossil fuels
- (B) deforestation
- (C) use of fertilizers in cultivation
- (D) All of the above

3. What is the quantity of cement (in kg) and dry sand (in cubic meter) respectively for preparing 1 cubic meter of wet cement mortar of 1:1.5 proportion?

- (A) 270 and 1.00
- (B) 290 and 1.04
- (C) 290 and 1.00
- (D) 312 and 1.04

4. The carpet area of a residential building is generally

- (A) 80%-95% of its plinth area
- (B) 50%-65% of its plinth area
- (C) 65%-80% of its plinth area
- (D) 35%-50% of its plinth area

5. Brick walls are measured in square meter if the thickness of wall is

- (A) 10 cm
- (B) 20 cm
- (C) 30 cm
- (D) None of the above

6. The damp-proof course (DPC) is measured in

- (A) cubic meter
- (B) square meter
- (C) running meter
- (D) All of the above

7. The approximate weight of one cubic meter of mild steel is

- (A) 2400 kg
- (B) 7850 kg
- (C) 1000 kg
- (D) 1400 kg

8. The minimum floor area required for water closet as per NBC is

- (A) 1.2 m<sup>2</sup>
- (B) 1 m<sup>2</sup>
- (C) 1.1 m<sup>2</sup>
- (D) 1.5 m<sup>2</sup>



9. In analysis of rate of a particular item, contractor's profit is taken at the rate of

- (A) 1%
- (B) 10% ✓
- (C) 20%
- (D) 5%

10. When two or more individual column footings are joined by a beam, it is called

- (A) strip footing
- (B) stepped footing
- (C) combined footing ✓
- (D) strap footing

11. A temporary structure which is constructed so as to remove water and/or soil from an area and make it possible to carry on the construction work under reasonably dry condition is called

- (A) cofferdam ✓
- (B) foundation
- (C) caisson
- (D) spillway

12. The most suitable material used for the construction of caisson is

- (A) timber ✓
- (B) cast iron
- (C) steel
- (D) RCC

13. The arrangement of supporting an existing structure by providing support underneath is known as

- (A) shoring
- (B) underpinning ✓
- (C) scaffolding
- (D) jacking

14. Which of the following is used as escape element in building for fire safety?

- (A) Lobby
- (B) Strong room
- (C) Floor
- (D) Outer wall

15. Which of the following standards should be considered in planning?

- (A) IS codes for planning ✓
- (B) ISI
- (C) NBS 2005
- (D) Local building bye-laws

16. The earthquake which occurs within the tectonic plate itself away from the plate boundaries is known as

- (A) internal earthquake ✓
- (B) external earthquake
- (C) intra-plate earthquake
- (D) inter-plate earthquake



17. Which of the following instruments is used to measure the magnitude of an earthquake?

- (A) Seismograph
- (B) Speedometer
- (C) Ammeter
- (D) Richter scale ✓

18. The first formal seismic code in India is

- (A) IS 1893 ✓
- (B) IS 1920
- (C) IS 1937
- (D) IS 1993

19. While considering the design of RCC buildings for providing ductility, the minimum grade of concrete recommended by the Indian Code is

- (A) M10
- (B) M20 ✓
- (C) M15
- (D) M25

20. Mortar or concrete conveyed through pressure hose and applied pneumatically at high velocity onto a surface is called

- (A) guniting ✓
- (B) grouting
- (C) sealing
- (D) spraying

21. In PERT, the critical path represents the

- (A) shortest path for the earliest completion of the project
- (B) longest path of the network from initial to final event ✓
- (C) ideal path by proceeding along, which the project can be completed as per schedule
- (D) path which takes into account the completion of parallel activities

22. While submitting a tender, the contractor is required to deposit some amount with the department as a guarantee of the tender is known as

- (A) earnest money
- (B) bank guarantee
- (C) security deposit ✓
- (D) caution money

23. The artificial activity which indicates that an activity following it, cannot be started unless the preceeding activity is completed, is known as

- (A) event
- (B) free float
- (C) dummy ✓
- (D) constraint

24. In which direction the inertia force in building acts with respect to the earthquake force?

- (A) Opposite
- (B) Parallel
- (C) Diagonal
- (D) None of the above



25. The horizontal angle between the true meridian and magnetic meridian at a place is known as

- (A) azimuth
- (B) magnetic declination ✓
- (C) local attraction
- (D) bearing of a line

26. When a curve consists of two arcs with different radii lies on the opposite sides of common tangent and centres lie on the opposite sides is known as

- (A) simple circular curve ✓
- (B) compound curve
- (C) transition curve
- (D) reverse curve

27. Which of the following types of foundation is suitable in black cotton soil?

- (A) Strip foundation
- (B) Pier foundation
- (C) Under-reamed pile foundation ✓
- (D) All of the above

28. As per Indian Road Congress recommendations, the camber on cement concrete road should be

- (A) 1 in 50 to 60 ✓
- (B) 1 in 45 to 60
- (C) 1 in 20 to 24
- (D) 1 in 12 to 16

29. A good building stone should not absorb water more than

- (A) 1%
- (B) 5% ✓
- (C) 10%
- (D) 15%

30. The number of bricks required for one cubic meter of brick masonry is

- (A) 400
- (B) 450
- (C) 500 ✓
- (D) 550



31. The nominal size of brick as per Indian Standard is

- (A) 20 cm × 10 cm × 10 cm
- (B) 23 cm × 12 cm × 8 cm
- (C) 19 cm × 9 cm × 9 cm ✓
- (D) 21 cm × 11 cm × 8 cm

32. A thin sheet of wood sliced from a log of wood is called

- (A) plywood ✓
- (B) lamin board
- (C) veneer
- (D) None of the above

33. The ingredient which gives the desired colour to a paint is called

- (A) base
- (B) pigment ✓
- (C) vehicle
- (D) solvent

34. Los Angeles testing machine is used to conduct

- (A) attrition test
- (B) impact test
- (C) abrasion test ✓
- (D) crushing strength test

35. The maximum superelevation for plain and rolling terrain road should not be greater than

- (A) 2%
- (B) 3%
- (C) 5%
- (D) 7% ✓

36. Traffic rotary is ideally suited

- (A) when traffic is more than four streams join at junction ✓
- (B) when traffic is very heavy
- (C) when the pedestrian traffic is heavy
- (D) for congested areas

37. Sheep foot roller is generally used for compacting

- (A) granular soil
- (B) non-plastic silts
- (C) fine sand
- (D) clay soil ✓

38. In case of sleepers of railway, which is incorrect?

- (A) Sleepers are laid transverse to the rails ✓
- (B) Sleepers are laid parallel to the rails
- (C) Sleepers help in maintaining proper gauge
- (D) Sleepers distribute the load from rail to ballast



39. While writing a measurement book (MB), which of the following points may be accepted?

- (A) Entries made in pencil but later ink over
- (B) Index of MB not kept up to date
- (C) Blank spaces left between paragraphs
- (D) For large work, separate MB may be used ✓

40. Identify the correct statement from the following.

- (A) Administrative approval is accorded on detailed estimate of the project.
- (B) Contract agreement is made after acceptance of the tender. ✓
- (C) Security money has to be deposited by all intending tenderers.
- (D) Drawings and specifications are not necessary in contract document.

41. If the depth of actual neutral axis is more than the depth of critical neutral axis, the section will be known as

- (A) balanced section
- (B) transformed section
- (C) over-reinforced section ✓
- (D) under-reinforced section

42. The error eliminated by taking face left and face right observations is known as

- (A) closing error
- (B) parallax error
- (C) eccentricity error ✓
- (D) relative error

43. If the RL of BM is 200.00 m, the back sight reading is 2.215 m and foresight reading is 1.870 m, then the RL of forward station will be

- (A) 200.345 m ✓
- (B) 199.345 m
- (C) 199.655 m
- (D) 200.655 m

$$\begin{aligned} \text{RL of BM} &= 200.00 \text{ m} \\ \text{BS} &= 2.215 \\ \text{FS} &= 1.870 \\ \text{RL of FS} &= 200.00 - 2.215 + 1.870 \\ &= 199.655 \end{aligned}$$

44. For contour interval of a contour map, which of the following statements is correct?

- (A) Contour interval is inversely proportional to the scale of the map.
- (B) Contour interval is directly proportional to the flatness of the ground.
- (C) Contour interval is directly proportional to availability of time.
- (D) All of the above ✓

45. The point above which a floating body starts oscillating when the body is tilted, is known as

- (A) centre of pressure
- (B) centre of gravity
- (C) metacentre ✓
- (D) centre of buoyancy



46. If the bearing of  $OA = 20^\circ$  and bearing of  $OB = 120^\circ$ , then  $\angle AOB$  is

- (A)  $100^\circ$
- (B)  $140^\circ$
- (C)  $180^\circ$
- (D)  $80^\circ$

47. Object situated on opposite sides of a river inaccessible from plane table can be located by

- (A) resection
- (B) traversing
- (C) radiation
- (D) intersection ✓

48. Two distances of 20 meters and 100 meters were accurately measured out and the intercepts on the staff between the outer stadia webs were 0.196 at the former distance and 0.996 at the later. The tacheometric constants are

- (A)  $k = 100, c = 0.4$
- (B)  $k = 120, c = 0.3$
- (C)  $k = 50, c = 0.2$
- (D)  $k = 200, c = 0.6$

49. What is the degree of curve for a radius of 573 m using chain of 20 m length?

- (A)  $1^\circ$
- (B)  $2^\circ$  ✓
- (C)  $3^\circ$
- (D)  $5^\circ$

JEC/PWRD/I/23/115-B

50. Which railheads are mostly used in railway track?

- (A) Double-headed rail
- (B) Bull-headed rail
- (C) Flat-footed rail
- (D) None of the above

51. The minimum compressive strength of 43 grade OPC is

- (A)  $43 \text{ N/m}^2$  ✓
- (B)  $43 \text{ N/mm}^2$
- (C)  $43 \text{ kg/m}^2$
- (D)  $43 \text{ kg/mm}^2$

52. The soil which is transported by running water is known as

- (A) Alluvial soil ✓
- (B) Marine soil
- (C) Aeolian soil
- (D) Colluvial soil



53. The functional equation for specific gravity ( $G$ ), water content ( $w$ ), void ratio ( $e$ ) and degree of saturation ( $S$ ) is

(A)  $S = \frac{wG}{e}$  ✓

(B)  $G = \frac{Sw}{e}$  ✗

(C)  $e = \frac{G}{Sw}$  ✗

(D)  $w = \frac{SG}{e}$  ✗

54. The uniformity coefficient of a soil is

(A)  $D_{30} / D_{10}$

(B)  $D_{30} / (D_{10} \times D_{60})$

(C)  $D_{60} / D_{10}$  ✓

(D)  $D_{60} / (D_{30} \times D_{10})$

55. The liquid limit exists in case of

(A) sandy soil ✓

(B) silty soil

(C) clay ✗

(D) None of the above

56. The critical hydraulic gradient ( $i_c$ ) is related to the specific gravity ( $G$ ) and void ratio ( $e$ ) by the relation

(A)  $i_c = \frac{1+G}{1+e}$

(B)  $i_c = \frac{1-G}{1+e}$  ✓

(C)  $i_c = \frac{G-1}{1+e}$

(D)  $i_c = \frac{G-1}{1-e}$

57. Permeability of soil is not affected by

(A) grain size

(B) void ratio of soil

(C) atmospheric pressure ✓

(D) structural arrangement of soil particles

58. The angle of internal friction  $\phi$  for cohesive soil is equal to

(A)  $0^\circ$  ✓

(B)  $30^\circ$

(C)  $15^\circ$

(D)  $45^\circ$



59. Quick sand is

- (A) pure silica sand
- (B) a condition in which cohesion is decreased quickly
- (C) a sand which can act as a quick filter
- (D) a condition in which cohesionless soil loses its shear strength due to the upward flow of water ✓

60. The angle made by the failure envelope with horizontal in the Mohr's circle gives

- (A) cohesion
- (B) angle of internal friction ✓
- (C) angle of wall friction
- (D) surcharge angle

61. For the same soil, increase in compactive effort

- (A) does not affect OMC
- (B) increases OMC
- (C) decreases OMC
- (D) decreases dry density

62. Using a plate load test, we can determine

- (A) the allowable bearing pressure
- (B) the ultimate bearing capacity
- (C) the settlements for a given intensity of loading
- (D) All of the above ✓

63. California bearing ratio test is used

- (A) to find the bearing capacity of soil
- (B) to find the thickness of flexible pavement ✓
- (C) to find the ratio of ultimate bearing capacity to net bearing capacity
- (D) All of the above ✓

64. If alternate courses of headers and stretchers are laid with queen closers, the bond of brick will be known as

- (A) Dutch bond
- (B) header-stretcher bond
- (C) flemish bond
- (D) English bond ✓

65. In case of Pozzolana cement, which of the following statements is incorrect?

- (A) The percentage of Pozzolana material should be between 10 to 30. ✓
- (B) It offers great resistance to expansion.
- (C) It possesses high tensile strength.
- (D) It possesses more resistance to erosion and weathering action. ✓

66. The process of turning a telescope about the horizontal axis in a vertical plane is known as

- (A) swinging
- (B) transiting ✓
- (C) reversing
- (D) plunging



67. The ratio of area of jet of water at vena contracta to the area of orifice is known as

- (A) coefficient of discharge
- (B) coefficient of contraction
- (C) coefficient of velocity
- (D) coefficient of viscosity

68. The cracks occur in the centre of cross-section of tree are known as

- (A) cup shakes
- (B) heart shakes
- (C) ring shakes
- (D) star shakes

69. The desirable pH value for domestic water is.

- (A) 7
- (B) 6 to 8 ✓
- (C) 5 to 9
- (D) 7 to 8.5

70. Backwashing is highly effective in case of

- (A) slow sand filter
- (B) rapid sand filter ✓
- (C) pressure filter
- (D) both rapid and slow sand filters

71. The only disinfectant available in the three states (i.e., solid, liquid and gas) is

- (A) chlorine ✓
- (B) bromine
- (C) iodine
- (D) fluorine

72. Iron and manganese can be removed from water by

- (A) sedimentation
- (B) sedimentation added by coagulation ✓
- (C) filtration
- (D) oxidation

73. Zero hardness of water is achieved by

- (A) lime-soda process
- (B) excess lime treatment
- (C) zeolite process ✓
- (D) excess alum and lime treatment

74. As per recommendation of Indian Railway Board, the minimum formation width of embankment in single track broad gauge should be

- (A) 5.5 m
- (B) 6.1 m
- (C) 10.1 m
- (D) 10.7 m



75. When piles are driven in granular soil with the aim of increasing bearing capacity of soil, the pile is known as

- (A) friction pile
- (B) composite pile
- (C) compaction pile ✓
- (D) sheet pile

76. By adopting reciprocal levelling, which of the following errors is **not** eliminated?

- (A) Error due to curvature of earth
- (B) Error due to atmospheric refraction
- (C) Error due to wrong staff reading
- (D) Error due to line of collimation

77. A 30 m chain is found to be 10 cm too short throughout the measurement. If the distance measured is 300 m, what will be the actual distance?

- (A) 299.00 m
- (B) 301.00 m
- (C) 300.10 m ✓
- (D) 310.00 m

78. Which part of Muster Roll is used for keeping record of all unpaid wages?

- (A) Part-I
- (B) Part-II
- (C) Part-III
- (D) Part-IV

79. Plain chlorination is done after

- (A) aeration ✓
- (B) sedimentation
- (C) filtration
- (D) softening

80. A coagulant aid is one which

- (A) promotes coagulation
- (B) stimulates floc formation
- (C) increases doses of coagulant
- (D) narrows down the pH range



81. The most commonly used pump for lifting water in water supply mains is  
(A) reciprocating pump ✓  
(B) centrifugal pump  
(C) axial flow pump  
(D) rotary type pump
82. Calculate the area of a pipe, if flow rate is 20 liters/min and flow velocity is 5 cm/sec.  
(A) 66.67 cm<sup>2</sup>  
(B) 60 cm<sup>2</sup>  
(C) 62 cm<sup>2</sup>  
(D) 64 cm<sup>2</sup>
83. The detention period for plain sedimentation water tank is  
(A) 4 to 8 hours ✓  
(B) 8 to 16 hours  
(C) 16 to 24 hours  
(D) 24 to 36 hours
84. To control the growth of algae in reservoirs, the compound which is used, is  
(A) bleaching powder ✓  
(B) copper sulphate  
(C) lime solution  
(D) alum solution
85. The population of a city in 2010 was 50000. The average increase in population over last 8 decades is 7500 and average incremental increase during 8 decades is 750. The population based on incremental method in 2030 will be  
(A) 55000  
(B) 60500  
(C) 66500  
(D) 72500
86. The bacteria which require free oxygen for their survival, are called  
(A) aerobic bacteria ✓  
(B) anaerobic bacteria  
(C) facultative bacteria  
(D) None of the above
87. What is the minimum diameter of pipes used for drainage of wastewater?  
(A) 105 mm  
(B) 50 mm  
(C) 75 mm  
(D) 100 mm
88. What are the product gases of anaerobic digestion?  
(A) Carbon dioxide and methane ✓  
(B) Methane and oxygen  
(C) Oxygen and carbon dioxide  
(D) Nitrogen and methane



89. The first step in the sludge treatment process is

- (A) thickening
- (B) dewatering
- (C) digestion ✓
- (D) phosphorus recovery

90. An opening fitted with suitable cover, provided for inspection, cleaning and maintenance of the sewer line is called

- (A) cleaning eye
- (B) cover
- (C) manhole ✓
- (D) sewerage

91. If 2% solution of a sewage sample is incubated for 5-days at  $20^{\circ}\text{C}$  and depletion of oxygen was found to be 5 ppm, BOD of sewage is

- (A) 200 ppm
- (B) 225 ppm
- (C) 250 ppm
- (D) None of the above

92. The pure bending equation to express relation among bending stress, moment of resistance, moment of inertia, radius of curvature, elasticity modulus with usual notations is

- (A)  $M/I = f/y = E/R$  ✓
- (B)  $M/I = f/R = E/y$
- (C)  $M/f = y/R = E/I$
- (D)  $M/y = f/E = I/R$

93. Which of the following is not a greenhouse gas?

- (A) Carbon dioxide
- (B) Methane ✓
- (C) Hydrofluorocarbon
- (D) Carbon monoxide

94. The coefficient of curvature of a well-graded soil will be

- (A) less than 1
- (B) between 1 and 3 ✓
- (C) between 3 and 6
- (D) greater than 6



95. The optimum moisture content (OMC) is the moisture content of the soil when the

- (A) settlement is maximum
- (B) permeability is maximum
- (C) dry density is maximum ✓
- (D) shear strength is maximum

96. The magnetic bearing of a line is  $N 25^{\circ} W$  and declination of that area is  $5^{\circ} W$ . The true bearing of the line will be

- (A)  $N 30^{\circ} W$
- (B)  $N 20^{\circ} W$  ✓
- (C)  $N 5^{\circ} W$
- (D)  $N 30^{\circ} E$

97. In arid season with uneven land surface, the most suitable method of irrigation is

- (A) basin method
- (B) check method
- (C) sprinkler irrigation method ✓
- (D) furrow irrigation method

98. Retrofitting technique involves

- (A) dismantling the entire structure to rebuilt
- (B) strengthening the structure by grouting, jacking, etc. ✓
- (C) repairing minor damage periodically
- (D) None of the above

99. Which of the following tests is conducted to determine the optimum dose of coagulant?

- (A) Deflector plate mixer
- (B) Jar test
- (C) Jackson's turbidity meter ✓
- (D) Mechanical flocculator

100. If the porosity of a soil sample is 50%, the void ratio of that soil will be

- (A) 0.50
- (B) 1.00 ✓
- (C) 1.50
- (D) 2.00