

130/2015

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Stainless steel is an alloy of which among the following?
(A) chromium, nickel and iron (B) manganese, copper and iron
(C) copper, carbon and iron (D) copper, tin and zinc
2. What is determined by conducting an abrasion test?
(A) aggregate crushing value (B) toughness
(C) hardness (D) soundness
3. On which of the following, the support for flat slab is provide?
(A) beams built monolithically above walls
(B) columns built monolithically with slab
(C) beams
(D) walls
4. What is the width of Broad Gauge?
(A) 1.575 m (B) 1.565 m
(C) 1.576 m (D) 1.676 m
5. Among which of the following conditions a T-beam becomes identical to a rectangular beam with width equal to that of flange?
(A) neutral axis remains within web
(B) neutral axis remains within flange
(C) neutral axis coincides with geometrical centre of beam
(D) none of these
6. Which among the following is a step used for changing the direction of a stair?
(A) flight (B) nosing
(C) landing (D) winder
7. By which of the following tests, fineness of cement can be determined?
(A) permeability test (B) soundness test
(C) vicat apparatus test (D) compression test
8. Among the following, in which type of canal, flow occurs only when there is a rise of flow in river?
(A) inundation canal (B) contour canal
(C) ridge canal (D) side slope canal

9. What is defined as the ratio of volume of air voids to the total volume of soil mass and is expressed as percentage?
 (A) void ratio (B) porosity
 (C) percentage air voids (D) air content
10. What is the side slope of a Cipoletti weir?
 (A) 1 horizontal to 2 vertical (B) 2 horizontal to 1 vertical
 (C) 4 horizontal to 1 vertical (D) 1 horizontal to 4 vertical
11. How the temporary hardness of water is removed?
 (A) by boiling (B) by lime soda process
 (C) by zeolite process (D) by aeration
12. In which of the following types of concrete beam section, failure will occur all on a sudden?
 (A) singly reinforced beam (B) under reinforced section
 (C) balanced section (D) over reinforced section
13. In which condition a doubly reinforced beam is used?
 (A) when extra safety is needed
 (B) when depth and breadth of beam have to be restricted in size
 (C) when large moment is expected
 (D) when depth is more than 1 m
14. In a water supply scheme, for what purpose aeration is carried out?
 (A) to remove taste and odour
 (B) for complete elimination of colloidal matter
 (C) for killing pathogenic bacteria
 (D) for coagulation
15. What is the disadvantage of centrifugal pump compared with reciprocating pump?
 (A) priming required (B) pulsatory flow
 (C) low speed (D) difficult to handle viscous fluid
16. What is known as the force per unit area required to penetrate into a soil mass with a circular plunger of 50 mm diameter at a rate of 1.25 mm/minute?
 (A) bearing capacity (B) modulus of rupture
 (C) CBR (D) aggregate crushing value
17. What is floor area ratio?
 (A) ratio of total floor area on all floors to plinth area
 (B) ratio of plinth area to plot area
 (C) ratio of ground floor area to plot area
 (D) ratio of total floor area on all floors to plot area

18. What is azimuth?
 (A) arbitrary meridian (B) true meridian
 (C) magnetic meridian (D) none of these
19. What will be the hydraulic mean depth for a most economical rectangular section of an open channel, of width B and depth D?
 (A) $D/2$ (B) $2D$
 (C) $\frac{BD^2}{6}$ (D) $\frac{BD^3}{12}$
20. At any point on the magnetic equator what will be the angle of dip?
 (A) 100° (B) 0°
 (C) 90° (D) 180°
21. What is the area of building, excluding the area occupied by walls?
 (A) net area (B) plinth area
 (C) carpet area (D) floor area
22. In the case of open channel flow if the flow is laminar, which of the following is correct?
 (A) Reynolds number < 500 (B) Reynolds number > 500
 (C) Reynolds number < 2000 (D) Reynolds number > 4000
23. Name the ratio of power available at the shaft of a turbine to the power delivered by water to the runner.
 (A) volumetric efficiency (B) overall efficiency
 (C) mechanical efficiency (D) hydraulic efficiency
24. What is meant by cambium layer of an exogeneous tree?
 (A) layer between inner bark and sap wood
 (B) outermost layer of the tree
 (C) zone of inner rings surround the pith
 (D) layer between pith and heart wood
25. What is the difference between two measured values of same quantity in surveying?
 (A) variation (B) discrepancy
 (C) intentional error (D) balancing error
26. A wooden pile is being driven with a drop hammer weighing 18 kN and having a free fall of 1 m. The penetration in the last blow is 5 mm. Determine the load carrying capacity of pile according to the Engineering News formula :
 (A) 100 kN (B) 90 kN
 (C) 110 kN (D) 180 kN

27. A jet of water, of cross sectional area 0.005 m^2 strikes a flat plate normally with a velocity of 15 m/s . If the plate is moving with a velocity of 5 m/s in the direction of jet and away from the jet, what is the force exerted by the jet on the plate?
- (A) 250 N (B) 0.50 N
(C) 500 N (D) 0.25 N
28. Dry density of which sample is expected to be high?
- (A) organic clay (B) dense sand
(C) bentonite (D) stiff clay
29. Which among the following is the great circle, formed by a plane through the observer's position that is perpendicular to the direction of gravity at that point intercepts the celestial sphere?
- (A) observer's meridian (B) ecliptic
(C) hour circle (D) horizon
30. What is known as a watertight enclosure made up of sheet pile walls, usually temporary, built around a working area for the purpose of excluding water during construction?
- (A) cofferdam (B) bulkhead
(C) penstock (D) box caisson
31. What is meant by Froude's number?
- (A) ratio of inertia force and viscous force
(B) ratio of square root of inertia force and pressure force
(C) ratio of square root of inertia force and gravity force
(D) ratio of inertia force and pressure force
32. Among which of the following conditions, Darcy's Law is not applicable to seepage of soils?
- (A) soil is homogeneous
(B) the flow conditions are turbulent in soil
(C) the soil is incompressible under stress
(D) the soil is isotropic
33. Which of the following is a field test?
- (A) vane shear test (B) direct shear test
(C) triaxial compression test (D) unconfined compression test
34. For what type of soil unconfined compression test is generally applicable?
- (A) saturated clay (B) sand
(C) silt (D) poorly graded sandy silt