

JEEDEC-2017
Sub-Civil Engineering

Time Allowed : 2 Hours

Maximum Marks : 100

70100270

Booklet No.

INSTRUCTIONS

Candidates should read the following instructions carefully before answering the questions:

1. This question Paper contains 50 MCQ type objective questions. Each question has four answer options given, viz. A, B, C and D.
2. Only one answer is correct. Correct answer will fetch full marks 2. Incorrect answer or any combination of more than one answer will fetch $-\frac{1}{2}$ marks. No answer will fetch 0 marks.
3. Questions must be answered on OMR sheet by darkening the appropriate bubble marked A, B, C, or D.
4. Use only **Black/Blue ball point pen** to mark the answer by complete filling up of the respective bubbles.
5. Mark the answers only in the space provided. Do not make any stray mark on the OMR.
6. Write question booklet number and your roll number carefully in the specified locations of the OMR. Also fill appropriate bubbles.
7. Write your name (in block letter), name of the examination centre and put your full signature in appropriate boxes in the OMR.
8. The OMRs will be processed by electronic means. Hence it is liable to become invalid if there is any mistake in the question booklet number or roll number entered or if there is any mistake in filling corresponding bubbles. Also it may become invalid if there is any discrepancy in the name of the candidate, name of the examination centre or signature of the candidate vis-a-vis what is given in the candidate's admit card. The OMR may also become invalid due to folding or putting stray marks on it or any damage to it. The consequence of such invalidation due to incorrect marking or careless handling by the candidate will be sole responsibility of candidate.
9. Rough work must be done on the question paper itself. Additional blank pages are given in the question paper for rough work.
10. Handover the OMR to the invigilator before leaving the Examination Hall.

Space for Rough Work

07500111

Civil Engineering

1. The instantaneous stress induced in a bar of length L , cross sectional area A , modulus of elasticity E , due to a freely falling weight W from a height h is approximately equal to
- (A) $(2EhW/AL)^{\frac{1}{2}}$ (B) $2EhW/AL$
(C) $(EhW/AL)^{\frac{1}{2}}$ (D) EhW/AL
2. A portion of beam between two sections is said to be in pure bending, when there is
- (A) constant bending moment and constant shear force. (B) constant bending moment and zero shear force.
(C) zero bending moment and constant shear force. (D) zero bending moment and zero shear force.
3. The slow setting cement will have higher percentage of
- (A) tricalcium aluminate (B) tricalcium silicate
(C) gypsum (D) di-calcium silicate
4. Minimum value of superelevation at any curve in a road is
- (A) Zero (B) 1.0%
(C) equal to camber (D) not specified
5. Killing of pathogenic organisms is called
- (A) endogenous oxidation (B) liquidification
(C) pasteurization (D) disinfection
6. Runoff denotes
- (A) amount of evaporation (B) surplus rainfall flowing through the streams
(C) canal discharge wasted after irrigation (D) depth of ground water level below ground surface
7. Uniformly distributed load ' w ' per unit length is suspended from a cable between point A and point B. If the points A and B are at same level at distance ' l ' and central sag of the cable is ' h ' the horizontal thrust developed at supports is
- (A) $wl/2h$ (B) $wl^2/4h$
(C) $wl/4h$ (D) $wl^2/8h$
8. A system co-planer forces acting on a rigid body can be reduced to
- (A) one force only. (B) one couple only.
(C) one force and one couple only. (D) either one force or one couple.

9. A wall constructed to retain the earth from slippage on the hill side of a roadway is called
(A) breast wall (B) retaining wall
(C) parapet wall (D) guard wall
10. Water Bound Macadam derives stability primarily from
(A) cohesion alone. (B) the binding power of bituminous material.
(C) aggregate interlocking, particle friction and cohesion. (D) flexural strength of the surface course.
11. Concrete Mixtures are specified by
(A) number of cement bags required in a batch. (B) volume of coarse aggregates used.
(C) nominal volume of concrete mixed in a batch. (D) diameter of the drum.
12. As per the assumption made in moment distribution method, all joints in a frame are
(A) Hinged (B) Rigidly clamped
(C) Rigidly fixed (D) Flexible
13. The critical section for bending moment of a concrete footing under a masonry wall is a section at
(A) the face of the wall.
(B) a distance of effective depth of footing from the face of the wall.
(C) a distance of twice the width of the wall from the face of the wall.
(D) a distance of half the effective depth of footing from the face of the wall.
14. Annual ring of Timber represents
(A) Life (B) Strength
(C) Density (D) Type
15. A steel bar is rigidly held at two ends. The temperature of the bar is allowed to rise by 80°C . The stress produced in the bar will be
(A) compressive (B) tensile
(C) torsional (D) thermal
16. A point subjected to a number of forces will be in equilibrium, if
(A) algebraic sum of forces is zero.
(B) algebraic sum of moment of the forces about the point is zero.
(C) two resolved parts in any two directions at right angles are equal.
(D) sum of resolved parts in any two directions at right angles are both zero.

17. Moment of Inertia of square of side 'a' about an axis through its centre of gravity is
- (A) $a^3/3$ (B) $a^4/3$
(C) $a^4/12$ (D) $a^4/8$
18. If two forces act at an angle of 120° and if the greater force is 500 N and their resultant perpendicular to the smaller force, the smaller force is
- (A) 200 N (B) 250 N
(C) 300 N (D) 350 N
19. A bar of circular cross section varies uniformly from a cross section 2D to D. If extension of the bar is calculated treating it as a bar of average diameter, the error will be
- (A) 10% (B) 25%
(C) 33.33% (D) 50%
20. Portland cement is manufactured by burning
- (A) limestone and alumina (B) limestone and clay
(C) limestone and sand (D) limestone and iron
21. Compensating errors in chaining are
- (A) proportional to the length of the line.
(B) proportional to the square root of the length of the line.
(C) inversely proportional to the square root of the length of the line.
(D) inversely proportional to the length of the line.
22. When it is not possible to set up the level midway between two points, the difference in elevation between them is measured by
- (A) Fly levelling (B) Precise levelling
(C) Differential levelling (D) Simple levelling
23. Contour lines of different elevations can unite to form one line in the case of
- (A) vertical cliff (B) cave
(C) plane ground (D) river bed
24. The horizontal distance between any two consecutive contours is called
- (A) Vertical equivalent (B) Horizontal equivalent
(C) Contour interval (D) Contour gradient
25. The daily variation in magnetic declination is known as
- (A) Diurnal variation (B) Solar variation
(C) Secular variation (D) Irregular variation

26. The method of plane table survey where the object to be plotted is sighted from two plane table stations is known as
(A) Radiation method (B) Intersection method
(C) Resection method (D) Orientation method
27. Regarding plane table survey which of the following does not hold good?
(A) All the plotting work including contouring can be done in the field.
(B) It is quite suitable for small scale survey.
(C) Less number of control points are required.
(D) It can be done in all season.
28. The whole circle bearing of lines AB and BC are $18^{\circ}15'$ and $335^{\circ}45'$ respectively. What is the value of the included angle ABC?
(A) $307^{\circ}30'$ (B) $354^{\circ}00'$
(C) $177^{\circ}30'$ (D) $42^{\circ}30'$
29. A soil having uniformity co-efficient more than 10 is called
(A) uniform (B) fine
(C) coarse (D) well graded soil
30. The bulk density of soil can be defined as
(A) ratio of the weight of the solids to the volume of solids.
(B) ratio of unit weight of soil to that of water.
(C) unit weight of soil.
(D) unit weight of soil under saturated condition.
31. The shrinkage index is equal to
(A) liquid limit - plastic limit (B) liquid limit - shrinkage limit
(C) plastic limit - liquid limit (D) plastic limit - shrinkage limit
32. In a saturated soil deposit having density 22 kN/m^3 , the effective normal stress on horizontal plane at 5m depth is
(A) 22 kN/m^3 (B) 50 kN/m^3
(C) 60 kN/m^3 (D) 110 kN/m^3
33. An aquifer that is confined at the bottom but not at the top is known as
(A) partially confined aquifer (B) aquiclude
(C) semi confined aquifer (D) unconfined aquifer

34. Duty of the canal water is expressed in
(A) cumec (B) centimeter
(C) ha per cumec (D) ha per centimeter
35. The process of removing suspended and colloidal matter from sewage is called
(A) purification (B) clarification
(C) suspension (D) dewatering
36. BOD stands for
(A) Biochemical Oxygen Demand (B) Biological Oxygen Demand
(C) Bacteriological Oxygen Demand (D) Basic Oxygen Demand
37. The best coagulant for removing the colour of water is
(A) alum (B) lime
(C) iron sulphate (D) copper sulphate
38. The advantage of rapid sand filter is
(A) slow but efficient filtration. (B) small space required.
(C) highly efficient in bacteria removal. (D) useful for low turbidity water.
39. Marshall method is used in
(A) arsenic amount determination. (B) moments of a framed structure.
(C) runoff calculation. (D) bituminous mix design.
40. The curve which is having infinite radius at one end and finite radius at other end is known as
(A) compound curve (B) combined curve
(C) valley curve (D) transition curve
41. The point of contra flexure in a beam is the point where
(A) shear force changes its sign. (B) bending moment is maximum.
(C) shear force is maximum. (D) bending moment changes its sign.
42. Which property of aggregate is tested by conducting aggregate impact test?
(A) durability (B) hardness
(C) toughness (D) porosity

43. Service road refers to
(A) road used for movement of service vehicles.
(B) road beside high mobility highway provided for access to the abutting properties.
(C) road in railway yard.
(D) road in urban slum.
44. The steel used for rail contains two important elements
(A) Carbon and Silicon (B) Sulphur and Silicon
(C) Carbon and Manganese (D) Manganese and Phosphorous
45. The Disc signal is provided for
(A) shunting operation (B) passenger trains
(C) goods train (D) marshalling operation
46. High COD to BOD ratio of an organic pollutant represents
(A) high biodegradability of the pollutant. (B) low biodegradability of the pollutant.
(C) presence of free oxygen. (D) presence of toxic material.
47. The ratio between maximum stress intensity due to suddenly applied load and the stress intensity produced by a load of the same magnitude applied gradually is
(A) 1/2 (B) 1
(C) 2 (D) 4
48. The intensity of pressure at any point in a liquid in a vessel is directly proportional to the
(A) area of the vessel containing liquid. (B) depth of liquid from surface.
(C) length of the vessel containing the liquid. (D) volume of the vessel containing liquid.
49. If the depth of a simple supported rectangular beam is doubled, for same load W , the deflection at the centre will be
(A) 1/2 (B) 1/4
(C) 1/6 (D) 1/8
50. Slenderness ratio is the ratio of effective length of column to
(A) its radius of gyration. (B) extreme fibre distance from centroid of the section.
(C) its cross sectional area. (D) its moment of inertia.