OSSC
JE
Previous Year Paper
(Civil) 2014

JE(Main) – 2014 – Set – 3
CE

7048

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2. Fill in Part – A of the OMR answer sheet first, mentioning the Roll No. and other data as applicable in the place(s) indicated therein and darken the appropriate circles in blue **or** black ball point pen only.
3. While darkening the circle in Part – B of the OMR answer sheet, use blue **or** black ball point pen only. Do not use any whitener or eraser or pencil in the OMR answer sheet.
4. Do not write any name/surname **or** put any symbol, sign, slogan, prayer **or** any mark of identification in Part – B of the OMR answer sheet. **Any such act is liable to render the answer sheet unfit for evaluation.**
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12. Violation of these instructions shall **entail disqualification of the candidate.**
13. There is negative marking of 0.25 mark for each wrong answer.

SEAL

JE(Main) – 2014 – Set – 3
CE

Time : 1 $\frac{1}{2}$ Hours

Full Marks : 100

*Each question carries **1** mark.*

*There is negative marking of **0.25** mark for each wrong answer.*

*Answer **all** questions, choosing the correct **one** from the alternatives suggested and darken the appropriate circle using BLUE **or** BLACK BALL POINT PEN.*

1. A member carrying an axial load can be best observed in case of a :
   (1) Beam
   Column
   (3) Truss — Correct
   (4) Truss or column
   (5) Truss and column

2. For a bar in tension, a standard hook has an anchorage equivalent to a straight length of :
   (1) 8 ϕ
   (2) 12 ϕ
   (3) 16 ϕ — Correct
   (4) 20 ϕ
   (5) 24 ϕ

3. The purpose of provision of lateral ties in columns is to :
   (1) Avoid buckling of longitudinal bars — Correct
   (2) Facilitate construction
   (3) Facilitate compaction of concrete
   (4) Increase the load carrying capacity of column
   (5) None of these

4. In case of two way slab, the limiting deflection of the slab is :
   (1) Primarily a function of the long span
   (2) Primarily a function of the short span
   (3) Independent of long or short span
   (4) Dependent on both long and short span
   (5) None of these

5. For a beam, if d = effective depth, b = width and D = overall depth, then the maximum area of compression reinforcement in a beam is :
   (1) 0.04bd — Correct
   (2) 0.04bD
   (3) 0.12bd
   (4) 0.12bD
   (5) 0.08bd

6. Half of the main steel in a simply supported slab of span L is bent up near the support at a distance of x from the centre of the bearing, where x is equal to

(1) L/3
(2) L/5
(3) L/7
(4) L/9
(5) L/10

7. The minimum and maximum values of the longitudinal reinforcement in a column as percent of the sectional area of the column are :

(1) 0.6 and 6
(2) 0.6 and 8
(3) 0.8 and 6
(4) 0.8 and 8
(5) None of these

8. The most efficient steel section for a beam is :

(1) Angle section
(2) Rectangular section
(3) Channel section
(4) T section
(5) I section

9. The slenderness ratio of a tension member subjected to reversal of stresses shall not exceed :

(1) 60
(2) 120
(3) 150
(4) 180
(5) 350

10. As per IS : 800, the outstand of flange plates for a compression flange should not exceed (t = thickness of the thinnest plate) :

(1) 12 t
(2) 16 t
(3) 20 t
(4) 25 t
(5) 30 t

11. For a cantilever beam of span L and flexural rigidity EI applied with a point load W at free end, the magnitude of maximum deflection occurring is :

(1) $WL^2/2EI$
(2) $WL^3/3EI$
(3) $WL^4/4EI$
(4) $WL^4/5EI$
(5) None of these

12. A two span continuous beam with both ends fixed have :

(1) 6 points of contraflexure
(2) 5 points of contraflexure
(3) 4 points of contraflexure
(4) 3 points of contraflexure
(5) 2 points of contraflexure

13. The maximum negative bending moment in case of a fixed beam carrying uniformly distributed load is at :

(1) Mid span
(2) 1 / 3 of the span
(3) 1 / 4 of the span
(4) Supports
(5) 1 / 5 of span

14. The moment required to rotate the near end of a prismatic beam through unit angle without translation (the far end is fixed, EI = flexural rigidity and L is the span of the beam), is given by :

(1) EI / L
(2) 2EI / L
(3) 3EI / L
(4) 4EI / L
(5) 5EI / L

15. If a 3 hinged semi-circular arch of span L and radius R is loaded uniformly with w per unit run throughout the span, the horizontal thrust is :

(1) wL
(2) wR
(3) wR / 2
(4) wL / 2
(5) None of these

16. The slope deflection method falls in the category of :

(1) Matrix analysis
(2) Fictitious analysis
(3) Indeterminate analysis
(4) Determinate analysis
(5) Force analysis

17. The bending moment diagram of a cantilever beam subjected to a couple at the free end would be :

(1) Triangle
(2) Parabola
(3) Cubic parabola
(4) Rectangle
(5) Trapezium

18. The carry over factor in a prismatic member, whose far end is fixed, is :

(1) 0
(2) 1 / 2
(3) 3 / 4
(4) 1
(5) None of these

19. In a riveted joint of rivet dia, d, the minimum pitch of the rivets shall not be less than :

(1) 1.5 d
(2) 2.0 d
(3) 2.5 d
(4) 3.0 d
(5) 3.5 d

20. The heaviest I section for same depth is :
(1) ISMB
(2) ISLB
(3) ISHB
(4) ISWB
(5) None of these

21. The accuracy of measurement in chain surveying does not depend on :
(1) Importance of features
(2) General layout of the chain lines
(3) Length of the offset
(4) Scale of the plotting
(5) Topography of the site

22. If R is the radius of the main curve, θ is the angle of deflection, S is the shift and L is the length of the transition curve, then total tangent length of the curve is :
(1) $(R + S) \tan \theta/2 - L/2$
(2) $(R + S) \tan \theta/2 + L/2$
(3) $(R - S) \tan \theta/2 - L/2$
(4) $(R - S) \tan \theta/2 + L/2$
(5) None of these

23. The angle of intersection of a contour and ridge line is :
(1) 120°
(2) 90°
(3) 60°
(4) 45°
(5) 30°

24. The 'fix' of a plane table station with three known points, is bad if the plane table station lies :
(1) In the great triangle
(2) Outside the great triangle
(3) On the circumference of the circumscribing circle
(4) Inside the circumference of the circumscribing circle
(5) None of these

25. ABCD is a rectangular plot of land. If the bearing of the side AB is 105°, the bearing of CD is :
(1) 345°
(2) 75°
(3) 105°
(4) 180°
(5) 255°

26. For true difference in elevations between two points A and B, the level must be set up :
(1) Near the point B
(2) Near the point A
(3) At any point between A and B
(4) Either at A or at B
(5) Exactly at the midpoint between A and B

27. The slope correction for a length of 30 m along a gradient of 1 in 20 is :
(1) 0.375 cm
(2) 37.5 cm
(3) 3.75 cm
(4) 1.75 cm
(5) 2.75 cm

28. For the construction of highway (or railway) :
(1) Longitudinal sections are required
(2) Both longitudinal and cross sections are required
(3) Cross sections are required
(4) Either (1) or (3)
(5) None of these

29. Transition curves are introduced at either end of a circular curve, to obtain :
(1) Gradual increase of super-elevation from zero at the tangent point to the specified amount at the junction of the transition curve with main curve
(2) Gradually decrease of curvature from zero at the tangent point to the specified quantity at the junction of the transition curve with main curve
(3) Gradual change of gradient from zero at the tangent point to the specified amount at the junction of the transition curve with main curve
(4) All of these
(5) None of these

30. Pick up the correct statement from the following :
(1) For thin structures subjected to wetting and drying, the water-cement ratio should be 0.45
(2) For mass concrete structures subjected to wetting and drying, the water-cement ratio should be 0.55
(3) For thin structures which remain continuously under water, the water-cement ratio by weight should be 0.55
(4) For massive concrete structures which remain continuously under water, the water-cement ratio by weight should be 0.65
(5) All of these

31. Portland Pozzolana Cement possesses :
(1) Higher resistance to chemical attack
(2) Lower heat of hydration
(3) Lower shrinkage on drying
(4) Water tightness
(5) All of these

32. The timber having maximum resistance against white ants, is obtained from :
(1) Teak
(2) Sal
(3) Shisam
(4) Chur
(5) All of these

33. For one cubic meter of brick masonry, number of bricks of IS size required is about :
(1) 600
(2) 525
(3) 550
(4) 500
(5) 650

34. Cement paints usually :
(1) Contain 5% sodium chloride
(2) Are prepared with white cement
(3) Contain 5% to 10% colour pigments
(4) Contain hydrated lime
(5) All of these

35. To give a brilliant finish, the type of varnish used, is :
(1) Turpentine varnish
(2) Oil varnish
(3) Water varnish
(4) Spirit varnish
(5) None of these

36. Sea sand used in structures, causes :
(1) Dampness
(2) Efflorescence
(3) Distintegration
(4) All of these
(5) None of these

37. Which of the following has more fire resisting characteristics :
(1) Marble
(2) Lime stone
(3) Compact sand stone
(4) Granite
(5) Wood

38. Which of the following bricks are used for lining of furnaces ?
(1) Overburnt bricks
(2) Underburnt bricks
(3) Refractory bricks
(4) First class bricks
(5) None of these

39. A piezometer opening in pipes measures :
(1) Negative static pressure
(2) Velocity head
(3) Static pressure
(4) Total pressure
(5) None of these

40. Maximum efficiency of transmission of power through a pipe is :
(1) 76.67%
(2) 25%
(3) 50%
(4) 33.33%
(5) 66.67%

41. The momentum correction factor (β) for the viscous flow through a circular pipe is :
(1) 1.33
(2) 1.5
(3) 1.67
(4) 0.67
(5) 0.33

42. The maximum vacuum created at the summit of a syphon is :
(1) 2.6 m of water
(2) 3.14 m of water
(3) 7.4 m of water
(4) 9.81 m of water
(5) None of these

43. A pitot tube is used to measure :
(1) Pressure
(2) Difference in pressure
(3) Velocity of flow
(4) Discharge
(5) Thrust

44. Most economical section of a triangular channel, is :
(1) Right angled triangle
(2) Equilateral triangle
(3) Isosceles triangle with 45° vertex angle
(4) Right angled triangle with equal sides
(5) Any isosceles triangle

45. Mach number is the ratio of intertia force to :
(1) Viscosity
(2) Elasticity
(3) Gravitational force
(4) Surface tension
(5) Shear force

46. To avoid the force of surface tension in an incline manometer, the minimum angle of inclination is :
(1) 2°
(2) 3°
(3) 4°
(4) 5°
(5) 6°

47. The velocity of the fluid particle at the center of the pipe section is :
(1) Minimum
(2) Maximum
(3) Equal throughout
(4) Zero
(5) None of these

48. If the average daily demand of a city of 50,000 population, is 20 m. l. d., the maximum daily demand is :
(1) 36 mld
(2) 30 mld
(3) 24 mld
(4) 18 mld
(5) 12 mld

49. The dilution ratio at which the odour is hardly detectable is generally called threshold odour number and for public supplies it should not exceed :
(1) 10
(2) 7
(3) 5
(4) 3
(5) 1

50. The chloride content of treated water for public supplies should not exceed :
(1) 100 ppm
(2) 200 ppm
(3) 250 ppm
(4) 300 ppm
(5) 150 ppm

51. The yield of a rapid gravity filter as compared to that of slow sand filter is :
(1) 30 times
(2) 25 times
(3) 20 times
(4) 15 times
(5) 10 times

52. The algae dies out in the zone of :

(1) Active decomposition

(2) Degradation — correct

(3) Recovery

(4) Cleaner water

(5) None of these

53. Self-cleansing velocity is :

(1) Velocity of water at flushing

(2) Velocity at dry weather flow

(3) Velocity at which no accumulation remains in the drains

(4) Velocity of water in a pressure filter

(5) None of these

54. If 2% solution of a sewage sample is incubated for 5 days at 20°C and depletion of oxygen was found to be 5 ppm, B. O. D. of the sewage is :

(1) 150 ppm

(2) 200 ppm

(3) 250 ppm

(4) 300 ppm

(5) 350 ppm

55. Ventilating shafts are provided to a sewer line at every :

(1) 100 m

(2) 150 m

(3) 200 m

(4) 250 m

(5) 300 m

56. The digested sludge from septic tanks, is removed after a maximum period of :

(1) 2 years

(2) 3 years — Correct

(3) 4 years

(4) 5 years

(5) 6 years

57. The duty is largest :

(1) At the head of water course

(2) At the head of a main canal

(3) On the field

(4) At the head of the distributaries

(5) Same at all places

58. When a canal and a drainage approach each other at the same level, the structure so provided is :

(1) A siphon aqueduct

(2) A siphon

(3) A level crossing

(4) A super passage

(5) An aqueduct

59. In a barrage, the crest level is kept :

(1) High with no gates

(2) High with large gates

(3) Low with large gates

(4) Low with no gates

(5) None of these

60. Canals constructed for draining off water from water logged areas are known as :

(1) Drains
(2) Inundation canals
(3) Contour canals
(4) Valley canals
(5) Ridge canals

61. Consumptive use of a crop during growth is the amount of :

(1) Interception
(2) Evaporation
(3) Transpiration
(4) Both (1) and (2)
(5) All of (1), (2) and (3)

62. The best unit period of a unit hydrograph, is equal to the basin lag divided by :

(1) 2
(2) 3
(3) 4
(4) 5
(5) 6

63. The earthen embankments constructed parallel to the river banks at some suitable distance for flood control, are known as :

(1) Levees
(2) Dykes
(3) River walls
(4) Both dykes and levees
(5) None of these

64. If the grain size of soil increases :

(1) Water supply in well increases
(2) Specific retention decreases
(3) Specific yield increases
(4) All of (1), (2) and (3)
(5) None of these

65. Isohytes are the imaginary lines joining the points of equal :

(1) Rainfall
(2) Pressure
(3) Height
(4) Humidity
(5) Reduced level

66. The foundations are placed below ground level to increase :

(1) Structural stability
(2) Workability
(3) Strength
(4) Stiffness of structures
(5) All of these

67. If the height of the first storey of a building is 3.2 m and riser is 13 cm, the number of treads required is :

(1) 12
(2) 18
(3) 24
(4) 30
(5) 36

68. The piece of a brick cut with its one corner equivalent of half the length and half the width of a full brick is known as :

(1) King closer
(2) Queen closer
(3) Beveled closer
(4) Half king closer
(5) Half queen closer

69. In horizontal D. P. C., thickness of cement concrete (1 : 2 : 4) is :

(1) 3 cm
(2) 4 cm
(3) 5 cm
(4) 6 cm
(5) 8 cm

70. The voussoir placed at crown of an arch, is known as a :

(1) Soffit
(2) Key
(3) Haunch
(4) Gauged brick arch
(5) Springer

71. The constuction joints in buildings are provided after :

(1) 10 m
(2) 20 m
(3) 30 m
(4) 40 m
(5) 50 m

72. Open test pit is only suitable up to a depth of :

(1) 3 m
(2) 4 m
(3) 5 m
(4) 6 m
(5) 1 m

73. The projections of head or sill of a door or window frame are known as :

(1) Chocks
(2) Stops
(3) Horns
(4) Transoms
(5) Lintels

74. For effective drainage, the finished surface of flat roof should have a minimum slope of :

(1) 1 in 5
(2) 1 in 10
(3) 1 in 15
(4) 1 in 20
(5) 1 in 40

75. Which of the following earth moving machineries has the shortest cycle time ?

(1) Dipper shovel
(2) Drag line
(3) Hoe
(4) Clam shell
(5) Bulldozer

Contd.

76. The first stage of a construction is :
(1) Preparation of estimate
(2) Survey of the site
(3) Initiation of proposal
(4) Preparation of tender
(5) Allotment of funds

77. The critical activity has :
(1) Normal float
(2) Maximum float
(3) Minimum float
(4) Zero float
(5) None of these

78. Bar Charts are suitable for :
(1) Minor works
(2) Major works
(3) Large projects
(4) All of (1), (2) and (3)
(5) None of these

79. Separation of water or water sand cement from a freshly mixed concrete, is known as :
(1) Flooding
(2) Bleeding
(3) Segregation
(4) Creeping
(5) None of these

80. Percentage of pozzolanic material containing clay up to 80%, used for manufacture of Pozzolana cement is :
(1) 70%
(2) 60%
(3) 50%
(4) 40%
(5) 30%

81. Ordinary concrete may not be used for the following grade of concrete :
(1) M 10
(2) M 15
(3) M 20
(4) M 25
(5) M 40

82. For normal RCC works, i. e. slabs, columns, beams, walls etc. the grade of concrete mix used is generally :
(1) 1 : 3 : 6
(2) 1 : 2 : 4
(3) 1 : 1 / 2 : 3
(4) 1 : 1 : 2
(5) 1 : 4 : 8

83. Workability of concrete is increased due to an excess of :
(1) Cement
(2) Water
(3) Rounded aggregates
(4) All of (1), (2) and (3)
(5) None of these

84. Which of the following is a method for estimating the building works ?
(1) Long and short wall method
(2) Out-to-out and in-to-in method
(3) Center line method
(4) Crossing method
(5) All of these

(Turn over)

85. For RCC works, no deduction is made in estimation for openings up to :
(1) 0.1 m^2
(2) 0.2 m^2
(3) 0.3 m^2
(4) 0.4 m^2
(5) 0.5 m^2

86. For paving or floor finishes, dado and skirting deduction for ends of dissimilar materials or other articles embedded shall note be made for areas exceeding :
(1) 0.01 m^2
(2) 0.1 m^2
(3) 0.2 m^2
(4) 0.3 m^2
(5) 0.4 m^2

87. The multiplying factor for painting collapsible gate measured flat (size of opening) all over is :
(1) 1.3
(2) 1.5
(3) 2
(4) 2.5
(5) 3.0

88. For one cubic meter of cement concrete prop with stone chips 1 : 2 : 4, the required number of cement bags is :
(1) 4.54
(2) 5.34
(3) 6.34
(4) 6.5
(5) 7.0

89. For 2.5 cubic meter thick cement concrete (1 : 2 : 4) damp-proof-course, the quantity of stone chips required will be :
(1) 2 m^3
(2) 2.2 m^3
(3) 2.5 m^3
(4) 2.7 m^3
(5) 3 m^3

90. The quantity of brick work in foundation and plinth per day per mason should be :
(1) 0.5 m^3
(2) 0.75 m^3
(3) 1 m^3
(4) 1.25 m^3
(5) 1.5 m^3

91. As per IRC recommendations, the maximum limit of super elevation for mixed traffic in plain terrain is :
(1) 1 in 15
(2) 1 in 12.5
(3) 1 in 10
(4) 1 in 7.5
(5) Equal to camber

92. The bottom most layer of a flexible pavement is :
(1) Base
(2) Sub-base
(3) Subgrade
(4) Base course
(5) None of these

Contd.

93. As per IRC, the width of the pavement of a single lane should be a minimum of :
(1) 3.25 m
(2) 3.50 m
(3) 3.75 m
(4) 4.0 m
(5) 4.5 m

94. The traffic volume N, traffic density T and traffic speed V are interrelated as :
(1) N = VT
(2) V = NT
(3) T = VN
(4) N = square root of VT
(5) V = square root of NT

95. The best material for sleepers is :
(1) Reinforced concrete
(2) Pre stressed concrete
(3) Mild steel
(4) Cast iron
(5) HYSD steel

96. The overall length of a turnout is the distance between the end of the stock rail and :
(1) Heel of crossing
(2) Toe of crossing
(3) Throat of crossing
(4) Nose of crossing
(5) None of these

97. Points are a group of :
(1) Stock rails
(2) Tongue rails
(3) Switches
(4) Stretcher bars
(5) Bearing plate

98. The place used for servicing and repairing of the aircraft is called :
(1) Apron
(2) Hanger
(3) Terminal building
(4) Holding apron
(5) Stock yard

99. The most popular method of construction of wall break water is :
(1) Barge method
(2) Staging method
(3) Low level method
(4) Mooring system method
(5) None of these

100. Drift method of tunneling is used to construct tunnels in :
(1) Rock
(2) Soft ground
(3) Self supporting ground
(4) Broken ground
(5) Granite layer