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JE(Civil) Spl. Drive(Main) – 2015 – Set – 1

Technical Paper

: INSTRUCTIONS TO CANDIDATES :

0916

THIS SET CONTAINS 100 QUESTIONS OF 1 MARK EACH IN 19 PAGES.

BEFORE THE QUESTION-SET BEFORE USE. IF ANY DEFECTS ARE FOUND, PLEASE BRING IT TO THE NOTICE OF THE INVIGILATOR.

1. Read all questions carefully before using the OMR answer sheet provided.
2. Fill in the OMR answer sheet first, mentioning the Roll No., Set Code and the place(s) indicated therein and darken the appropriate circle. The wear of the ball point pen only.
3. While filling among the circles in Part – B of the OMR answer sheet, use blue or black ball point pen. The use of fluid, eraser, any correction or use of pencil is not allowed in the OMR answer sheet. More than one circle/option shall not be taken for evaluation.
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10. Candidates may take with them the respective question-sets after the examination is over.
11. Mobile Phone or any Communication Devices is not allowed inside the Examination Hall. The candidates are strictly advised **not to carry** any Mobile Phone or Communication Devices with them into the Examination Hall. Any candidate who is in **possession of Mobile Phone/Communication Devices** inside the Examination Hall is liable to be debarred from the valuation of his/her answer paper and will entail rejection of his/her candidature.
12. Violation of these instructions shall **entail disqualification of the candidate**.
13. There is negative marking of 0.25 mark for each wrong answer.

JE(Civil) Spl. Drive(Main) – 2015 – Set – 1 Technical Paper

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

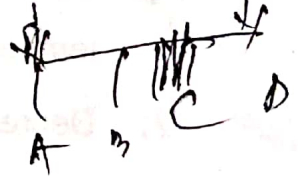
Full Marks : 100

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. The wear of stone pieces by constant rubbing among themselves is due to :
 - (1) Abrasion
 - ☒ (2) Crushing
 - (3) Attrition
 - (4) Impact
 - (5) Toughness
2. Role of Gypsum during manufacturing of cement is to :
 - (1) Decrease the burning temperature
 - (2) Decrease the grinding time
 - (3) Decrease the setting time
 - ☒ (4) Increase the setting time
 - (5) Increase the grinding time
3. The compound responsible for early strength of cement is :
 - ☒ (1) Dicalcium silicate
 - (2) Tricalcium silicate
 - (3) Tricalcium aluminate
 - (4) Tetra-calcium aluminoferrite
 - (5) Calcium oxide
4. The volatile diluent added to a paint is called :
 - (1) Pigment
 - ☒ (2) Drier
 - (3) Extender
 - (4) Thinner
 - (5) None of these
5. Jumper is a tool used for :
 - (1) Testing of stones
 - ☒ (2) Quarrying of stones
 - (3) Dressing of stones
 - (4) Polishing of stones
 - (5) Processing of stones

6. Number of bricks required for one cubic meter of brick masonry is :
 (1) 400
 (2) 450
 (3) 500
 (4) 550
 (5) 600
7. The separation of water or water-cement mixture from the freshly mixed concrete is known as :
 (1) Bleeding
 (2) Segregation
 (3) Isolation
 (4) Flow
 (5) Sampling
8. Footing used in load bearing masonry construction is :
 (1) Isolated
 (2) Strap
 (3) Strip
 (4) Pile
 (5) Mat
9. The under surface of an arch of a stair is called :
 (1) Soffit
 (2) Ceiling
 (3) Roof
 (4) Ridge
 (5) Stringer
10. The sides of an opening like doors and windows are called :
 (1) Lintels
 (2) Heads
 (3) Jambs
 (4) Reveals
 (5) Hinges
11. Filling of cavities with cement slurry is called :
 (1) Filing
 (2) Coping
 (3) Grouting
 (4) Strengthening
 (5) Guniting
12. Before testing for setting time of cement, one should test for :
 (1) Soundness
 (2) Strength
 (3) Consistency
 (4) Fineness
 (5) Heat of hydration
13. A continuous beam ABCD of three spans of length ' ℓ ' each and simply supported at A and D, is loaded uniformly throughout with ' w ' per unit length. The moments at A and D will be :
 (1) $\frac{w\ell^2}{4}$
 (2) $\frac{w\ell^2}{8}$
 (3) $\frac{w\ell^2}{12}$
 (4) $\frac{w\ell^2}{16}$
 (5) 0
- 

14. The bending moment in an arch throughout the span will be zero, if :

- (1) The arch is parabolic and carries uniformly distributed load throughout the span
- (2) The arch is parabolic and carries two equal loads symmetrically over the span
- (3) The arch is circular and carries uniformly distributed load throughout the span
- (4) The arch is circular and carries two equal loads symmetrically over the span
- (5) None of these

15. How many slope deflection equations are possible in a beam, if 4 supports are there ?

- (1) 0
- (2) 3
- (3) 4
- (4) 6
- (5) 5

16. Which of the following methods of structural analysis is a displacement method ?

- (1) Moment distribution method
- (2) Three moment method

(3) Column analogy method

(4) Kani's method

(5) Strain energy method

17. For the hinged-hinged beam of length 'l' with a unit rotation, the bending stiffness for a hinged end is :

(1) $\frac{3EI}{l}$

(2) $\frac{4EI}{l}$

(3) $\frac{2EI}{l}$

(4) $\frac{EI}{l}$

(5) Nil

18. For a cantilever beam of length 'l' loaded with a udl of 'w' per unit length throughout the length, the maximum deflection at free end is :

(1) $\frac{wl^4}{8EI}$

(2) $\frac{wl^3}{8EI}$

(3) $\frac{wl^4}{3EI}$

(4) $\frac{wl^3}{3EI}$

(5) $\frac{wl^4}{12EI}$

19. Net shear area of a 20 mm bolt at thread (in mm^2) is approximately equal to :
- ☒ 400
 - ☐ 314
 - ☐ 245
 - ☐ 157
 - ☐ 145
20. According to IS specifications, the effective length of a column of actual length, 'L' effectively held in position at both the ends and restrained in direction at one end is taken as :
- ☒ 0.67L
 - ☐ 0.8L
 - ☐ L
 - ☐ 1.5L
 - ☐ 0.5L
21. In a RCC beam, side face reinforcement is provided if its depth exceeds :
- ☐ 300 mm
 - ☐ 500 mm
 - ☐ 700 mm
 - ☐ 750 mm
 - ☒ 1000 mm
22. A reinforced concrete slab is 80 mm thick. The maximum diameter of reinforcement bar that can be used is :
- ☐ 6 mm
 - ☐ 8 mm
 - ☐ 10 mm
 - ☒ 12 mm
 - ☐ 16 mm
23. Modulus of elasticity of M_{20} grade concrete in N/mm^2 is approximately :
- ☐ 22360
 - ☒ 25000
 - ☐ 36000
 - ☐ 20000
 - ☐ 24000
24. The maximum limit of water absorption for aggregates for road construction is :
- ☐ 0.4%
 - ☐ 0.6%
 - ☐ 0.8%
 - ☐ 1.0%
 - ☐ 1.2%
25. The full width of land acquired before finalizing a highway alignment is known as :
- ☐ Width of formation
 - ☒ Right of way
 - ☐ Carriage way
 - ☐ Road way
 - ☐ Lane width

26. A traffic rotary is justified where :
- (1) The number of intersecting roads between 4 and 7
 - (2) The space is limited and costly
 - (3) When traffic volume is less than 500 vehicles per hour
 - (4) When traffic volume is more than 500 vehicles per hour
 - (5) When traffic volume is more than 1000 vehicles per hour
27. In case of a multi lane road, overtaking is generally permitted :
- (1) From right
 - (2) From left
 - (3) From both sides right and left
 - (4) From any side
 - (5) Not at all
28. Along a hill road, a side drain is provided on :
- (1) Outer side of a spur curve
 - (2) Outer side of a re-entrant curve
 - (3) Outer side of both (1) and (2)
 - (4) Inner side of both (1) and (2)
 - (5) Inner side of a spur curve
29. The main function of a fish plate is :
- (1) To join the two rails together
 - (2) To join rails with sleeper
 - (3) To allow the rails to expand and contract freely
 - (4) To improve functional performance of rails
 - (5) None of these
30. If 'n' is the length of rail in meters, the number of sleepers per rail length generally varies from :
- (1) n to $n + 2$
 - (2) $n + 2$ to $n + 4$
 - (3) $n + 3$ to $n + 6$
 - (4) $n + 5$ to $n + 7$
 - (5) $n + 6$ to $n + 8$
31. The minimum gradient in station yards is generally limited to :
- (1) 1 in 500
 - (2) 1 in 750
 - (3) 1 in 1000
 - (4) Zero
 - (5) 1 in 250
32. A ship is berthed in a chamber, and lifted by principle of buoyancy, such a chamber is called :
- (1) Dry dock
 - (2) Wet dock
 - (3) Floating dock
 - (4) Refuge dock
 - (5) None of these
33. The runway orientation is made so that landing and takeoff are :
- (1) Against the wind direction
 - (2) Along the wind direction
 - (3) Perpendicular to wind direction
 - (4) None of these
 - (5) Transverse to wind direction

2.1
4
2
2.5

34. FSL of a canal at its head with respect to parent channel is kept :
- (1) At the same level
 - (2) 15 cm higher
 - ☒ (3) 15 cm lower
 - (4) 10 cm higher
 - (5) 10 cm lower
35. When a canal is carried over a natural drainage, the structure provide is known as :
- (1) Syphon
 - ☒ (2) Aqueduct
 - (3) Super passage
 - (4) Syphon aqueduct
 - (5) Ditches
36. The top soil of a water logged field becomes more alkaline and more infertile, if its pH value is :
- (1) 6
 - (2) 8
 - (3) 9
 - (4) 11
 - ☒ (5) 10
37. The main function of a diversion head work of a canal from a river is :
- (1) To remove silt
 - (2) To control floods
 - (3) To store water
 - ☒ (4) To raise water level
 - (5) To increase discharge
38. A river training work is generally required when the river is :
- (1) Meandering
 - (2) Aggrading
 - (3) Degrading
 - ☒ (4) All of these
 - (5) Perennial
39. In India, which type of the following is adopted as standard recording rain gauge ?
- ☒ (1) Symon's rain gauge
 - (2) Tipping bucket type
 - (3) Natural siphon type
 - (4) Weighing bucket type
 - (5) Optical type
40. As compared to gravity dams, the earthen dams :
- ☒ (1) Are costlier
 - (2) Are susceptible to failure
 - (3) Require less skilled labour
 - (4) Require sound rock foundation
 - (5) Require highly skilled labour

41. The radius of influence is :
- (1) Radius of the main well
 - (2) Distance from the wall of main well to the point of zero draw down
 - (3) Distance from the centre of main well to the point of zero draw down
 - (4) Is calculated by thumb rule
 - (5) Independent of any distance
42. The quantity of water retained by the sub-soil against gravity, is known as :
- (1) Yield
 - (2) Porosity
 - (3) Specific yield
 - (4) Specific retention
 - (5) Potential infiltration
43. Hydrograph is a graphical representation of :
- (1) Surface run off
 - (2) Ground water flow
 - (3) Rain fall
 - (4) Discharge flowing in the river
 - (5) Velocity of flow of water
44. Brick walls are measured in square meter, if the thickness of the wall is :
- (1) 10 cm
 - (2) 15 cm
 - (3) 20 cm
 - (4) 25 cm
 - (5) Not measured in square meter
45. The cross-section of a highway is taken at :
- (1) Right angle to the center line
 - (2) 30 meters apart
 - (3) Intermediate points having abrupt change in gradient
 - (4) All of these
 - (5) None of these
46. Due to change in price level, a revised estimate is prepared if the sanctioned estimate exceeds :
- (1) 1%
 - (2) 3%
 - (3) 5%
 - (4) 7%
 - (5) 6%

(Turn over)

47. According to ISI method of estimate, the order of the sequence is :

- (1) Height, length, breadth
- (2) Length, breadth, height
- (3) Breadth, length, height
- (4) Breadth, height, length
- (5) Length, height, breadth

48. For 100 sq. mt. cement concrete (1 : 2 : 4), 4 cm thick floor, the quantity of cement required is :

- (1) 0.94 m³
- (2) 0.96 m³
- (3) 0.98 m³
- (4) 1.0 m³
- (5) 1.1 m³

$$0.3 \times 0.3 \times 0.35 \times \frac{2.5}{10} = 0.007875$$

49. Relation between water demand and coincident draft, is based on :

- (1) Fire demand
- (2) Maximum daily demand
- (3) Both (1) and (2)
- (4) Neither (1) nor (2)
- (5) Population of the city

50. Water obtained from tube well is known as :

- (1) Surface water

- (2) Sub-surface water
- (3) Run-off
- (4) Wholesome water
- (5) Potable water

51. Water channel supported above the ground over the trestles is generally called :

- (1) Flume
- (2) Tunnel
- (3) Aqueduct
- (4) Canal
- (5) Syphon aqueduct

52. Turbidity of raw water measures :

- (1) Acidity of water
- (2) Dissolved oxygen
- (3) Hardness
- (4) Suspended solids
- (5) Specific conductivity

53. The process of passing water through beds of granular materials, is called :

- (1) Screening
- (2) Disinfection
- (3) Filtration
- (4) Coagulation
- (5) Sedimentation

54. Distribution main for any water supply is normally designed as _____ for its average daily requirement.

- (1) 100%
- (2) 125% ✓
- (3) 150%
- (4) 225%
- (5) 180%

55. The valve that allows the water to flow in one direction is a :

- ✓ (1) Sluice valve
- (2) Reflux valve
- (3) Scour valve
- (4) Air valve
- (5) Plug valve

56. A sewer which receives discharge of a number of house sewers is known as :

- (1) Common Sewer
- (2) Trunk Sewer
- (3) Lateral Sewer
- ✓ (4) Branch Sewer
- (5) Public Sewer

57. The cross-section recommended for separate system of sewerage is :

- (1) Circular
- ✓ (2) Egg-shaped
- (3) Rectangular
- (4) Parabolic
- (5) Trapezoidal

58. The natural process in which the oxygen of water of streams is consumed by the sewage and at the same time, it is replenished (filled again) by the atmosphere, is known as :

- ✓ (1) Oxidation
- (2) De-oxidation
- (3) Self-purification
- (4) Sedimentation
- (5) Activate sludge process

59. In CBR test, the value of CBR is calculated at :

- (1) 2.5 mm penetration only
- (2) 5.0 mm penetration only
- (3) 7.5 mm penetration only
- ✓ (4) Both (1) and (2)
- (5) 10 mm penetration only

(Turn over)

60. The maximum width of a vehicle as recommended by IRC is :
- (1) 2.44 m
 - (2) 1.88 m
 - (3) 3.80 m
 - (4) 4.70 m
 - (5) 5.0 m
61. Enoscope is used to find :
- (1) Average speed
 - (2) Spot speed
 - (3) Time mean speed
 - (4) Space mean speed
 - (5) Root mean square speed
62. Gauge is the distance between :
- (1) Centre to centre of rails
 - (2) Running faces of rails
 - (3) Outer faces of rails
 - (4) None of these
 - (5) Two railway tracks
63. The compensation for curvature on gradient for Metre Gauge is given by :
- (1) $70/R$
 - (2) $35/R$
 - (3) $105/R$
 - (4) $53/R$
 - (5) $95/R$
64. In 80/100 grade bitumen, 80/100 represents :
- (1) Unit weight
 - (2) Kinematic viscosity
 - (3) Dynamic viscosity
 - (4) Penetration
 - (5) Consistency
65. Ductility of bitumen is expressed in :
- (1) mm
 - (2) Degree centigrade
 - (3) Per degree centigrade
 - (4) Kg per degree centigrade
 - (5) Pulling speed
66. Water released by trees into the atmosphere is called :
- (1) Infiltration
 - (2) Run off
 - (3) Transpiration
 - (4) Evaporation
 - (5) Evapotranspiration
67. The crops that need a lot of water are :
- (1) Rice and maize
 - (2) Wheat and maize
 - (3) Rice and wheat
 - (4) Maize and other grains
 - (5) Shrubs

68. Earthquake of 7.0 magnitude can cause :

- (1) Severe damage
- (2) Mild jolts
- (3) Medium damage
- (4) Less damage
- (5) No damage

69. The infertility of soil in water-logged areas is due to :

- (1) Death of bacteria causing nutrification
- (2) Increase of salinity
- (3) Growth of weeds
- (4) Toxic material
- (5) All of these

70. According to Khosla's theory, the exit gradient in the absence of a downstream cutoff is :

- (1) Zero
- (2) Unity
- (3) Infinity
- (4) Very large
- (5) Large

71. Which of the below is not an instrument used to set right angles ?

- (1) Cross staff

(2) Site square

(3) Optical staff

(4) Prism square

(5) Compass

72. The process of location of intermediate points on a survey line is :

- (1) Aligning
- (2) Extending
- (3) Ranging
- (4) Offsetting
- (5) Chaining

73. Prevention of the needle from pointing to the magnetic north in a given locality is termed as :

- (1) Local attraction
- (2) Declination
- (3) Deviation
- (4) Local distraction
- (5) Magnetic meridian

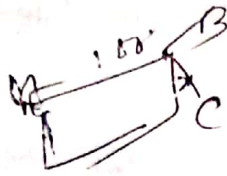
74. Which of the below is used for levelling a plane table ?

- (1) Plumb bob
- (2) Spirit level
- (3) Compass
- (4) U-frame
- (5) Alidade

75 60

75. If the fore bearing of a line AB is 50° and that of line BC is 20° , then the included angle between the lines is :

- (1) 20°
- (2) 50°
- (3) 150°
- (4) 230°
- (5) 250°



76. The multiplying constant of theodolite is :

- (1) f/i
- (2) $(f + d)$
- (3) $(f/i) + d$
- (4) $(f/d) + i$
- (5) f/d

77. For tachometer the additive and multiplying constants are respectively :

- (1) 0 and 100
- (2) 100 and 0
- (3) 0 and 0
- (4) 100 and 100
- (5) 0 and 50

78. In levelling, error due to earth's curvature is to be corrected using :

- (1) $C_c = 0.0673D^2$
- (2) $C_c = 0.012D^2$
- (3) $C_c = 0.0136D^2$
- (4) $C_c = 0.0785D^2$
- (5) $C_c = 0.0587D^2$

79. The true length of a line is 200 m. When this is measured with a 20 m tape, the length is 200.80 m. The correct length of the 20 m tape is :

- (1) 19.92 m
- (2) 19.98 m
- (3) 20.08 m
- (4) 20.04 m
- (5) 20.06 m

$$\frac{200}{200.80} \times 20 = 19.92$$

80. The rate of an item of work depends on :

- (1) Specifications of works
- (2) Specifications of materials
- (3) Proportion of mortar
- (4) All of these
- (5) None of these

81. The brick work is measured in :

- (1) Cu m
- (2) Square m
- (3) m
- (4) None of these
- (5) Number

82. Pick up the correct statement regarding the centre line method of estimating a building :

- (1) Product of the centre line of the walls and area of cross-section of any item, gives total quantity of the item
- (2) The centre line is worked out separately for different sections of the walls of a building
- (3) The centre line length is reduced by half the layer of the main wall joining the partition wall
- (4) All of these
- (5) None of these

83. For the construction of buildings, the subheads of the estimate are :

- (1) Earth work, Concrete work, Brick work
- (2) Brick work, Stone work, Roofing
- (3) Brick work, Flooring, Wood work, Steel work
- (4) All of these
- (5) None of these

84. Cement paints usually :

- (1) Contain 5% sodium chloride
- (2) Are prepared with white cement
- (3) Contain 5% to 10% colour pigments
- (4) All of these
- (5) None of these

85. 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) Second class bricks

86. A pitot tube is used to measure :
- (1) Pressure
 - (2) Difference in pressure
 - (3) Velocity of flow
 - (4) Discharge
 - (5) Variation in discharge
87. 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 type of triangle
88. The digested sludge from septic tanks, is removed after a maximum period of :
- (1) 2 years
 - (2) 3 years
 - (3) 4 years
 - (4) 5 years
 - (5) 10 years
89. In case of laying gullies, siphons and intercepting traps, the cost includes :
- (1) Setting and laying
 - (2) Bed concreting
 - (3) Connection to drains
 - (4) Both (2) and (3)
 - (5) All of these
90. Consumptive use of a crop during growth is the amount of :
- (1) Interception
 - (2) Evaporation
 - (3) Transpiration
 - (4) All of these
 - (5) None of these
91. The piece of a brick cut with its one corner equivalent to 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

92. The construction joints in buildings are provided after :
- (1) 10 m
 - (2) 20 m
 - (3) 30 m
 - (4) 40 m
 - (5) 50 m
93. The projections of head or sill of a door or window frame are known as :
- (1) Chocks
 - (2) Stops
 - (3) Horns
 - (4) Lintels
 - (5) Transoms
94. 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) Approval of estimate
95. Bar Charts are suitable for :
- (1) Minor works
 - (2) Major works
 - (3) Large projects
 - (4) All of these
 - (5) Only (1) and (2)
96. Separation of water or water sand cement from a freshly mixed concrete, is known as :
- (1) Flooding
 - (2) Bleeding
 - (3) Segregation
 - (4) Creeping
 - (5) Screening
97. Workability of concrete is increased due to an excess of :
- (1) Cement
 - (2) Water
 - (3) Rounded aggregates
 - (4) All of these
 - (5) Fine aggregate
98. 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



99. The bottom most layer of a flexible pavement is :

- (1) Base
- (2) Sub-base
- (3) Subgrade
- (4) Base course
- (5) Surface course

100. A member carrying an axial load can be best observed in case of a :

- (1) Beam
- (2) Column
- (3) Truss
- (4) Truss or column
- (5) Foundation

