SSC - JEn 2011 (Objective Paper)

1. Presence of oils in water for concreting **[SSC-2011]**

(a) gives smooth surface (b) gives more slump

(c) improves strength (d) reduces strength

2. The volatile diluent added to a paint is known as **[SSC-2011]**

(a) drier (b) pigment

(c) thinner (d) distemper

3. Hardness of rock can be tested in situ using **[SSC-2011]**

(a) Smith's test (b) Schmidt Hammer test

(c) Acid test (d) Crystallization test

4. Unit weight of brick work is about **[SSC-2011]**

(a) 17 – 18 kN/m^3 (b) 18 – 19 kN/m^3

(c) 19 – 20 kN/m^3 (d) 20 – 21 kN/m^3

5. Which one of the following is the purest form of iron? **[SSC-2011]**

(a) Cast iron (b) Wrought iron

(c) Mild steel (d) High carbon steel

6. For R.C.C. construction, the maximum size of coarse aggregate is limited to **[SSC-2011]**

(a) 10 mm (b) 15 mm

(c) 20 mm (d) 25 mm

7. The unit of measurement is per quintal for **[SSC-2011]**

(a) Collapsible gates with rails

(b) Rolling shutters

(c) Expanded metal-wire

(d) Reinforcement of R.C.C. workds

8. Floor Area Ratio (F.A.R.) means **[SSC-2011]**

(a) $\dfrac{\text{Total floor area of all floors} - \text{Area of ground floor}}{\text{Area of plot}}$

(b) $\dfrac{\text{Total floor area of all floors} - \text{Area of ground floor}}{\text{Area of plinth}}$

(c) $\dfrac{\text{Total floor area of all floors}}{\text{Area of plot}}$

(d) $\dfrac{\text{Total floor area of all floors}}{\text{Area of plinth}}$

9. The damp proof course is measured in **[SSC-2011]**

(a) length (b) area

(c) volume (d) weight

10. The most reliable estimate is **[SSC-2011]**

(a) Plinth area estimate

(b) Detailed estimate

(c) Preliminary estimate

(d) Cube rate estimate

11. The multiplying constant of a theodolite is **[SSC-2011]**

(a) f + d (b) f/d + i

(c) f/i + d (d) f/i

12. A building is an obstacle to **[SSC-2011]**

(a) both chaining and ranging

(b) chaining but not ranging

(c) ranging but not chaining

(d) neither chaining nor ranging

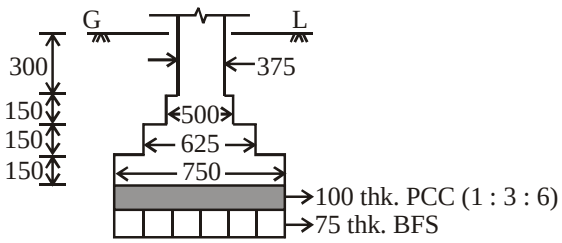
13. The following bearings were observed while traversing with a compass. Which stations are affected by local attraction? **[SSC-2011]**

Line	F.B.	B.B
AB	104°30'	284°30'
BC	48° 15'	226°0'
CD	290°30'	115° 15'
DA	180° 15'	357° 15'

(a) A and D (b) C and D

(c) B and C (d) A and B

14. The cross-section of a strip footing is shown below. **[SSC-2011]**



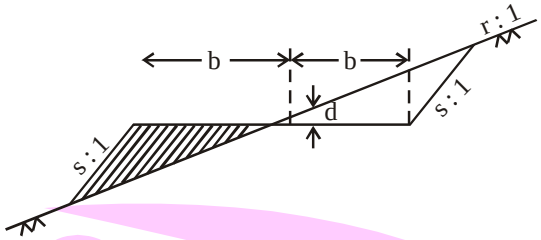
All dimensions are in mm

The quantity of BFS under the footing per metre length is

(a) 0.750 cu. m (b) 0.750 sq. m

(c) 0.056 cu. m (d) 0.056 sq. m

15. The cross-section of a road partly in banking and partly in cutting is shown in the following figure. The area of the shaded portion is **[SSC-2011]**



(a) $\frac{1}{2}\times\frac{(b-rd)^2}{r-s}$ (b) $\frac{1}{3}\times\frac{(b-rd)^2}{r-s}$

(c) $\frac{1}{2}\times\frac{(b+rd)^2}{r-s}$ (d) $\frac{1}{3}\times\frac{(b+rd)^2}{r-s}$

16. If fore bearing of a line is N 30° E, the back bearing of the line is **[SSC-2011]**

(a) N 30° W (b) N 30° E

(c) S 30° W (d) S 30° E

17. An anallatic lens is provided in a **[SSC-2011]**

(a) Theodolite (b) Tacheometer

(c) Dumpy level (d) Prismatic compass

18. Which of the following methods of plane table surveying is used to locate the position of an inaccessible point? **[SSC-2011]**

(a) Radiation (b) Intersection

(c) Traversing (d) Resection

19. The expression for the discharge (Q) through a flow net for isotropic soils is given by **[SSC-2011]**

(a) $Q = KH\times\frac{N_F}{N_D}$ (b) $Q = KH\sqrt{N_F/N_D}$

(c) $Q = KH\left(\frac{N_F}{N_D}\right)^2$ (d) $Q = KH\left(\frac{N_F}{N_D}\right)^3$

20. The dimensions of surface tension are **[SSC-2011]**

(a) $M^1\ L^0\ T^{-2}$ (b) $M^1\ L^{-1}$

(c) $M^1\ L^1\ T^{-2}$ (d) $F^1\ T^{-2}$

21. The height of hydraullic jump is equal to **[SSC-2011]**

(a) sequent depth

(b) difference of conjugate depths

(c) difference in alternate depths

(d) initial depth

22. In a Newtonian fluid **[SSC-2011]**

(a) the shear stress is directly proportional to the rate of fluid deformation

(b) dynamic viscosity is directly proportional to the rate of fluid deformation

(c) kinematic viscosity is directly proportional to the rate of fluid deformation

(d) dynamic viscosity is zero

23. Valid range for S the degree of saturation of soil, in percentage is **[SSC-2011]**

(a) $S > 0$ (b) $S \le 0$

(c) $0 < S < 100$ (d) $0 \le S \le 100$

24. A soil has a bulk density of 22 kN/m^3 and water content 10%. The dry density of soil in kN/m^3 is **[SSC-2011]**

(a) 18.6 (b) 20.0

(c) 22.0 (d) 23.2

25. A pycnometer is used to determine **[SSC-2011]**

(a) water content and void ratio

(b) specific gravity and dry density

(c) water content and specific gravity

(d) void ratio and dry density

26. Toughness index is defined as the ratio of **[SSC-2011]**

(a) Plasticity index to Consistency index

(b) Plasticity index to Flow index

(c) Liquidity index to Flow index

(d) Consistency index to Liquidity index

27. The unit weight of a completely saturated soil is given by **[SSC-2011]**

(a) $\frac{(G+e)\gamma_w}{1+e}$ (b) $\frac{(G+e)\gamma_w}{G+e}$

(c) $\frac{(G-1)\gamma_w}{1+e}$ (d) $\frac{(1-e)\gamma_w}{G+e}$

where, G = Specific gravity of solids

e = Void ratio

γ_w = Unit weight of water

28. A soil has an average particle size of 0.2 mm. It is predominantly **[SSC-2011]**

(a) gravel (b) sand

(c) silt (d) clay

29. Continuity equation is based on the principle of conservation of **[SSC-2011]**

(a) energy (b) mass

(c) momentum (d) both (a) and (b)

30. The discharge over a broad-crested weir is maximum when the depth of flow is **[SSC-2011]**

(a) $\frac{H}{3}$ (b) $\frac{2H}{3}$

(c) $\frac{H}{2}$ (d) $\frac{2H}{5}$

31. A floating body will remain in stable equilibrium if the metacentre is **[SSC-2011]**

(a) above the centre of buoyancy

(b) above the centre of gravity

(c) below the centre of gravity

(d) below the centre of buoyancy

32. The pressure of a liquid measured with the help of a piezometer tube is **[SSC-2011]**

(a) atmospheric pressure (b) gauge pressure

(c) absolute pressure (d) vacuum pressure

33. A hydrometer is used to measure **[SSC-2011]**

(a) velocity of fluids (b) velocity of gases

(c) flow of fluids (d) specific gravity of liquids

34. In designing hydraulic structures in alluvial rivers, the equation that is used to calculate the normal depth of scour R for a discharge intensity of q $m^3/s/m$ is **[SSC-2011]**

(a) $R = 1.35(q/f)^{2/3}$ (b) $R = 1.2(q^2/g)^{1/3}$

(c) $R = 1.35(q^2/f)^{1/3}$ (d) $R = 4.75(q)^{1/2}$

35. A earthen channel has been designed on Lacey formulae to carry a full supply charge of 30 m^3/s. The median size of the soil is 0.3 mm. The mean velocity of flow at this discharge is **[SSC-2011]**

(a) 0.98 m/s (b) 0.76 m/s

(c) 2.2 m/s (d) 1.36 m/s

36. Which of the following spillways is least suitable for an earthern dam? **[SSC-2011]**

(a) Chute spillway (b) Side channel spillway

(c) Shaft spillway (d) Ogee spillway

37. For the irrigation of a crop, the base period B (in days), dpeth of water Δ (in metres) are related to theduty D (in ha/cumex) at the field as **[SSC-2011]**

(a) $D = \frac{0.864B}{\Delta}$ (b) $D = \frac{0.864\Delta}{B}$

(c) $D = \frac{8.64B}{\Delta}$ (d) $D = \frac{1.98B}{\Delta}$

38. Camber is the road is provided for **[SSC-2011]**

(a) effective drainage

(b) counteracting the centrifugal force

(c) having proper sight distance

(d) all the above

39. The alum added as coagulant in water treatment functions better when the raw water is **[SSC-2011]**

(a) acidic with high turbidity

(b) alkaline with high turbidity

(c) neutral with low turbidity

(d) acidic with low turbidity

40. The 'safe water' does not contain any **[SSC-2011]**

(a) taste (b) colour

(c) pathogen (d) odour

41. Which of the following gases is responsible for acid rain? **[SSC-2011]**

(a) VOC (b) NO_X

(c) CO (d) CH_4

42. The ratio between peak hourly water demand and maximum daily demand (per hour of course) is **[SSC-2011]**

(a) 1.5 (b) 1.8

(c) 2.0 (d) 2.7

43. The ozonation in drinking water helps to remove **[SSC-2011]**

(a) colloidal particles (b) hardness

(c) flocs (d) microorganisms

44. The total water consumption including domestic, commercial and industrial demands for average Indian people is **[SSC-2011]**

(a) 135 lpcd (b) 210 lpcd

(c) 240 lpcd (d) 270 lpcd

45. The curve provided at the change of gradient is called **[SSC-2011]**

(a) Horizontal curve (b) Transition curve
(c) Reverse curve (d) Vertical curve

46. To provide a cant in rails, wooden sleepers are cut to a slope at rail seat, which is known as **[SSC-2011]**

(a) coning (b) cutting
(c) boxing (d) adzing

47. If α is the angle of crossing, then nthe number of crossing 'N' according to centre line method is giving by **[SSC-2011]**

(a) $\frac{1}{2}\cot\frac{\alpha}{2}$ (b) $\cot\frac{\alpha}{2}$
(c) cot α (d) $\frac{1}{2}\text{cosec}\frac{\alpha}{2}$

48. The recommended camber for water bound Mecadam road is **[SSC-2011]**

(a) 1 in 40 to 1 in 50 (b) 1 in 33 to 1 in 40
(c) 1 in 25 to 1 in 33 (d) 1 in 20 to 1 in 25

49. Identify which of the following items is not considered while designing rigid pavements. **[SSC-2011]**

(a) Centre of a panel (b) Edge of a panel
(c) Corner of a panel (d) Dowel bars between edges

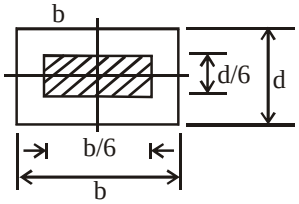
50. The ideal form of the curve for the summit curve is **[SSC-2011]**

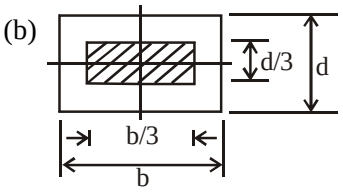
(a) spiral (b) parabola
(c) circle (d) lemniscate

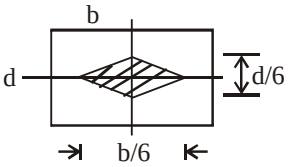
51. The maximum numerical value of Poisson's ratio is **[SSC-2011]**

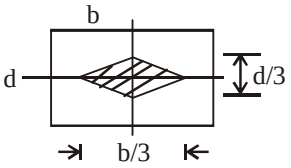
(a) 0.0 (b) 0.25
(c) 0.50 (d) 1.00

52. Which ecentric load, if placed within the central core shown in figure below, does not produce tension in the column cross-section? **[SSC-2011]**

(a)


(b)


(c)


(d)


53. The bending stress on a prismatic beam is given by **[SSC-2011]**

(a) My/Z (b) My/I
(c) MZ/y (d) MI/y

54. If the column ends are effectively held in position and restrained against rotation at both ends, then the effective length is **[SSC-2011]**

(a) 2 L (b) L/2
(c) 0.707 L (d) L

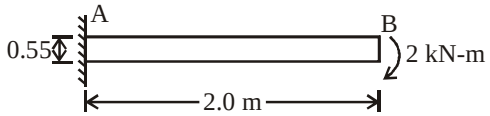
55. The modulus of elasticity of steel is **[SSC-2011]**

(a) 2×10^4 MPa (b) 1.2×10^5 MPa
(c) 2×10^5 MPa (d) 2×10^5 MPa

56. Identify the erroneous statement **[SSC-2011]**

Mild steel

(a) has two yield points
(b) is a ductile material
(c) has small percent elongation at failure
(d) shows strain hardening

57.


For the above cantilever beam, the absolute value of shear force at A is **[SSC-2011]**

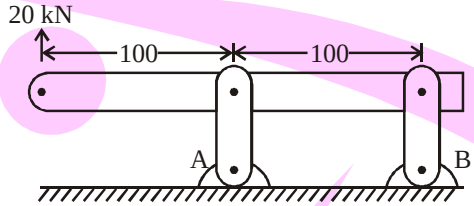
(a) 1.0 kN (b) 4.0 kN
(c) 0 kN (d) 2.0 kN

58. The relationship between Young's modulus E, shear modulus, G and Poisson's ratio, ν, is given by **[SSC-2011]**

(a) $G = \frac{E}{2(1+\nu)}$ (b) $E = \frac{G}{2(1+\nu)}$

(c) $G = \frac{E}{2(1-\nu)}$ (d) $E = \frac{G}{2(1+\nu)}$

59. Reaction at support A is **[SSC-2011]**



(a) 40 kN downward (b) 40 kN upward

(c) 20 kN upward (d) 20 kN downward

60. The modulus of elasticity of steel is more than that of concrete. It indicates that steel is **[SSC-2011]**

(a) less elastic (b) more elastic

(c) more plastic (d) less plastic

61. Maximum shear stress produced on a solid circular shaft under torque is **[SSC-2011]**

(a) $\frac{16T}{\pi D^4}$ (b) $\frac{16T}{\pi D^3}$

(c) $\frac{32T}{\pi D^4}$ (d) $\frac{32T}{\pi D^3}$

62. The working stress of a material is expected to be **[SSC-2011]**

(a) equal to ultimate stress (b) equal to yield stress

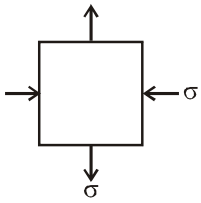
(c) less than yield stress (d) more than yield stress

63. The angle between the principal plane and the plane of maximum shear is **[SSC-2011]**

(a) 45° (b) 90°

(c) 135° (d) 60°

64.



For such element only under normal stresses, the radius of Mohr circle is **[SSC-2011]**

(a) σ (b) σ/2

(c) 2σ (d) 0.6 σ

65. To estimate 28 day crushing strength of concrete cubes from 7 day cube strength, we multiply the 7 day cube stength by **[SSC-2011]**

(a) 3 (b) 2.5

(c) 1.5 (d) 1.2

66. The maximum deflection of tip of cantilever beam with concentrated load P at the free end is **[SSC-2011]**

(a) $\frac{Pl^3}{3EI}$ (b) $\frac{Pl^3}{8EI}$

(c) $\frac{Pl^3}{12EI}$ (d) $\frac{Pl^3}{24EI}$

67. To obtain high compressive strength of cement at **[SSC-2011]**

(a) very slow rate [1200°C $\xrightarrow{30\text{ minutes}}$ 500°C $\xrightarrow{20\text{ minutes}}$ Ambient temperature]

(b) slow rate [1200°C $\xrightarrow{20\text{ minutes}}$ 500°C $\xrightarrow{15\text{ minutes}}$ Ambient temperature]

(c) moderate rate [1200°C $\xrightarrow{15\text{ minutes}}$ 500°C $\xrightarrow{10\text{ minutes}}$ Ambient temperature]

(d) fast rate [1200°C $\xrightarrow{10\text{ minutes}}$ 500°C $\xrightarrow{5\text{ minutes}}$ Ambient temperature

68. Identify which grade of cement is not available in Indian market **[SSC-2011]**

(a) 23 grade (b) 33 grade

(c) 43 grade (d) 53 grade

69. Rapid setting cement contains relatively higher proportion of **[SSC-2011]**

(a) C_3S (b) C_2S

(c) C_3A (d) C_4AF

70. According to IS : 383, the coarsest sand falls under grading zone **[SSC-2011]**

(a) I (b) II

(c) III (d) IV

71. The initial setting time of fresh concrete should be **[SSC-2011]**

(a) lower than 15 minutes (b) greater than 30 minutes

(c) greater than 1 hour (d) not more than 10 hours

72. Find the wrong statement **[SSC-2011]**
In Le chatelier's apparatus we
(a) estimate expansion potential of cement
(b) estimate presence of magnesia in cement
(c) estimate presence of free lime in cement
(d) adopt 0.78 times the standard consistency of water.

73. Find the odd entry among silica fume, rice husk ash, metakaoline and ground granulated blast furnace slag with respect to cement production **[SSC-2011]**
(a) Silica fume
(b) Rice busk ash
(c) Metakaoline
(d) Ground granulated blast furnace slag

74. The thermal expansion coefficient (α) of steel is **[SSC-2011]**
(a) 13×10^{-6}/°C and closely resembles to α of concrete
(b) 11×10^{-6}/°C and differs widely from α of concrete
(c) 12×10^{-6}/°C and close to α of concrete
(d) 14×10^{-6}/°C but nearly equal to α of concrete

75. Maximum spacing of longitudinal bars measured along the periphery of the RC solumn shall not exceed **[SSC-2011]**
(a) 200 mm
(b) 250 mm
(c) 300 mm
(d) 20 times dia. of longitudinal bar

76. The tensile strength of concrete in flexure as per IS : 456 is **[SSC-2011]**
(a) $0.6\sqrt{f_{ck}}$ (b) $0.7\sqrt{f_{ck}}$
(c) $0.75\sqrt{f_{ck}}$ (d) $0.9\sqrt{f_{ck}}$
where f_{ck} is the characteristic strength of concrete

77. Low workability of concrete conforms to a slump of **[SSC-2011]**
(a) 25 – 75 mm (b) 50 – 100 mm
(c) 75 – 100 mm (d) 100 – 150 mm

78. For mild and moderate exposures, if 20 mm down coarse aggregates are used, minimum cement content per cubic metre of concrete must not be less than **[SSC-2011]**
(a) 280 kg (b) 300 kg
(c) 320 kg (d) 340 kg

79. The bond strength of concrete increase with **[SSC-2011]**
(a) the quantity of steel
(b) the tensile strength of steel
(c) the grade of concrete
(d) the quantity of concrete

80. The increased rate of strength gain of rapid hardening cement is achieved by **[SSC-2011]**
(a) higher content of C_3S
(b) higher content of C_3A
(c) higher content of C_4AF
(d) higher content of C_2S

81. Bulking of sand is maximum if the percentage of moisture content is of the order of **[SSC-2011]**
(a) 5 (b) 8
(c) 10 (d) 15

82. Study the following statements: **[SSC-2011]**
I. For constant w/c ratio, finer sand decreases the workability
II. Creep is the deformation of concrete under sustained loading
The correct statement(s) is/are
(a) only I (b) only II
(c) Both I and II (d) None of I and II is true

83. All R.C. columns must be designed for a minimum eccentricity of **[SSC-2011]**
(a) l/50 + D/3 (b) l/25 + D/30
(c) l/500 + D/30 (d) l/30 + D/500

84. The minimum cover in a slab should neither be less than the diameter of bar nor less than **[SSC-2011]**
(a) 10 mm (b) 13 mm
(c) 20 mm (d) 25 mm

85. Total pressure on the vertical face of a retaining wall of height h, per unit run exerted by the retained earth weighing w per unit volume and angle of repose ϕ is given by **[SSC-2011]**
(a) $wh\frac{1-\sin\phi}{1+\sin\phi}$ (b) $wh^2\frac{1-\sin\phi}{1+\sin\phi}$
(c) $\frac{wh^2}{2}\frac{1-\sin\phi}{1+\sin\phi}$ (d) $\frac{wh^2}{3}\frac{1-\sin\phi}{1+\sin\phi}$

86. Maximum spacing of side face reinforcement of beams having depth of web more than 750 mm is **[SSC-2011]**

(a) 300 mm (b) width of web of the beam

(c) smaller of A & B (d) greater of A & B

87. The modulus of rupture of concrete gives: **[SSC-2011]**

(a) the direct tensile strength of the concrete

(b) the direct compressive strength of the concrete

(c) the tensile strength of concrete under bending

(d) the characteristic strength of concrete

88. A flat slab is supported on **[SSC-2011]**

(a) beams

(b) columns

(c) walls

(d) columns monolithically built with slab

89. According to IS : 456 – 2000, side face reinforcement should be provided when depth of web of a beam exceeds **[SSC-2011]**

(a) 650 mm (b) 700 mm

(c) 725 mm (d) 750 mm

90. If a beam fails in bond then its bond strength can be increased most economically by **[SSC-2011]**

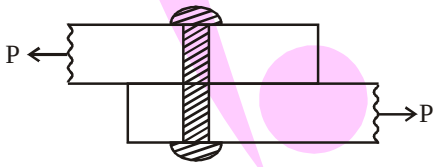
(a) increasing the depth of beam

(b) using thinner bars but more in number

(c) using thicker bars but less in number

(d) providing vertical stirrups

91. If a 2 cm diameter rivet connects two plates as shown below and safe shear stress for rivet is 1000 kg/cm^2 the value of maximum permissible pull will be **[SSC-2011]**



(a) 1100 kg (b) 1140 kg

(c) 2140 kg (d) 3140 kg

92. According to IS : 400 – 1984, the permissible stress in axial tension in steel is **[SSC-2011]**

[f_y = minimum yield stress of steel

(a) 0.56 f_y (b) 0.66 f_y

(c) 0.70 f_y (d) 0.6 f_y

93. The gross diameter of rivet (hole) for a rivet with nominal diameter of 27 mm is **[SSC-2011]**

(a) 28 mm (b) 28.6 mm

(c) 29 mm (d) 29.5

94. The maximum permissible stress in shear for power driven ship rivet is **[SSC-2011]**

(a) 80 N/mm^2 (b) 90 N/mm^2

(c) 100 N/mm^2 (d) 250 N/mm^2

95. As per IS : 800 – 1984, the lacings of compression member shall be proportioned to resist a total transverse shear 'S' equal to at least **[SSC-2011]**

(a) 1.0% of axial load (b) 2.0% of axial load

(c) 2.5% of axial load (d) 3.0% of axial load

96. The outstand of web stiffeners in terms of the thickness of flat 't' should be **[SSC-2011]**

(a) 6 t (b) 8 t

(c) 10 t (d) 12 t

97. When two plates are placed end-to-end and are joined by two cover plates, the joint is known as **[SSC-2011]**

(a) lap joint (b) butt joint

(c) chain rivetted lap joint (d) double cover butt joint

98. As per codal provisions, the effective buckling length of a cantilever steel column of length L is given by **[SSC-2011]**

(a) 0.5 L (b) 1.3 L

(c) 2 L (d) 3 L

99. Diameter of a rivet hold should be greater than the nominal diameter of rivet by about **[SSC-2011]**

(a) 4 to 5 mm (b) 2.5 to 4 mm

(c) 1.5 to 2 mm (d) 0 to 1.5 mm

100. Bearing stiffeners in plate girders are provided at **[SSC-2011]**

(a) mid span (b) equal interval

(c) supports (d) neutral axis

Answer Key									
1		2		3		4		5	
6		7		8		9		10	
11		12		13		14		15	
16		17		18		19		20	
21		22		23		24		25	
26		27		28		29		30	
31		32		33		34		35	
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