DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

TEST BOOKLET

AP(CE)(TE) 2014

Time Allowed : 2 Hours]   [Maximum Marks : 100

All questions carry equal marks.

INSTRUCTIONS

1. Immediately after the commencement of the examination, you should check that test booklet does not have any unprinted or torn or missing pages or items, etc. If so, get it replaced by a complete test booklet.

2. Write your Roll Number only in the box provided alongside. Do not write anything else on the Test Booklet.

3. This Test Booklet contains **100** items (questions). Each item comprises four responses (answers). Choose only one response for each item which you consider the best.

4. After the candidate has read each item in the Test Booklet and decided which of the given responses is correct or the best, he has to mark the circle containing the letter of the selected response by blackening it completely with Black or Blue ball pen. In the following example, response "C" is so marked :

(A)   (B)   ●   (D)

5. Do the encoding carefully as given in the illustrations. While encoding your particulars or marking the answers on answer sheet, you should blacken the circle corresponding to the choice in full and no part of the circle should be left unfilled.

6. You have to mark all your responses ONLY on the ANSWER SHEET separately given according to 'INSTRUCTIONS FOR CANDIDATES' already supplied to you. *Responses marked on the Test Booklet or in any paper other than the answer sheet shall not be examined.*

7. All items carry equal marks. Attempt all items. Your total marks will depend only on the number of correct responses marked by you in the Answer Sheet. There will be no negative marking.

8. Before you proceed to mark responses in the Answer Sheet fill in the particulars in the front portion of the Answer Sheet as per the instructions sent to you.

9. After you have completed the test, hand over the Answer Sheet to the Invigilator.

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1. The process of determining the elevations of stations from vertical angles and geodetic lengths at mean sea level is called :

    (A) Levelling

    (B) Trigonometric levelling

    (C) Triangulation

    (D) None of the above

2. Trigonometric levelling by reciprocal observations :

    (A) eliminates error due to uncertain refraction

    (B) is essentially done in the early morning

    (C) proves to be more accurate than spirit levelling

    (D) all of the above

3. Which one of the following is a correction to be applied in trigonometric levelling ?

    (A) Correction for dip

    (B) Correction for semi-diameter of sun

    (C) Axis signal correction

    (D) Parallax correction

4. Station marks are used in triangulation to provide :

(A) A surface mark

(B) a good target point

(C) complete description to enable the station to be recovered even after years

(D) all of the above

5. Residual error of a measurement is the difference of :

(A) True and observed values

(B) Most probable and observed values

(C) Standard and probable values

(D) None of the above

6. Ground control points are established in aerial photogrammetry to control :

(A) Height distortion

(B) Tilt displacement

(C) Scale

(D) None of the above

7.   Remote sensing can be defined as collecting information about a target

      (A)   Without seeing it

      (B)   by touching it

      (C)   without a physical contact with it

      (D)   None of the above

8.   Which of the following cannot be achieved by remote sensing ?

      (A)   Detection of forest fires

      (B)   Detection of pollutants

      (C)   Prevention of earthquakes

      (D)   Land use pattern

9.   A passive sensor uses which of the following sources of energy ?

      (A)   Sun   (B)   Flash light

      (C)   Its own source   (D)   Moon

10. Elasticity of soil is the property by which it regains the original position when the load is :

   (A) Applied　　　　　　　　(B) Extended

   (C) Pressed　　　　　　　　(D) Removed

11. Specific gravity of soils is the ratio of their density to that of :

   (A) Standard Material

   (B) Specified Material

   (C) Water

   (D) None of the above

12. The property of soil by virtue of which it deforms rapidly without rupture or volume change rebound is known as :

   (A) Ductility　　　　　　　　(B) Plasticity

   (C) Permeability　　　　　　(D) Porosity

13. Soil between soil and clay is known as :

   (A) Shale　　　　　　　　　(B) Hard pan

   (C) Loam　　　　　　　　　(D) Silt

14. Saturated clay tests for shear strength can be performed by :

(A) Tri-axial compression test

(B) Direct shear test

(C) Unconfined compression test

(D) None of the above

15. The lateral earth pressure in a retaining wall is :

(A) Proportional to square of depth

(B) Proportional to internal friction of the soil

(C) Proportional to depth

(D) None of the above

16. Failure of stability of slopes takes place amongst the following when the slopes are limited :

(A) Horizontal layer

(B) A curved surface

(C) Slip plane

(D) None of the above

17. One of the reasons for failure of foundations is due to the following distribution of weight :

(A) Unbalanced

(B) Heavy

(C) Unequal

(D) Non-uniform

18. Grillage foundation is provided when :

(A) Heavy isolated loads exists

(B) Soil is hard

(C) Piles are not possible

(D) None of the above

19. Under-reamed piles are normally the following :

(A) Precast

(B) Bored

(C) Driven

(D) Sunken

20. Under certain condition the disadvantage of timber pile is the following :

(A) less strength

(B) penetration

(C) less durability

(D) none of these

21. Balanced T-beam is economical, comment :

(A) Always

(B) Never

(C) By change

(D) none of these

22. Domes are used on :

(A) Bunkers

(B) Bins

(C) Top of water tank

(D) All of these

23. A circular bunker and conical dome have a ring beam at their junctions. The ring beam is designed for :

(A) hoop tension

(B) hoop compression

(C) meridional tension

(D) None of the above

24. Where bearing capacity of soil is poor, conveyance of water is done through :

(A) Aqueduct

(B) box culvert

(C) both (A) and (B)

(D) None of the above

25. The load which does not change its magnitude and position will time is called :

(A) dead load

(B) live load

(C) creep load

(D) dynamic load

26. In ultimate strength design, the internal load is increased by :

(A) load factor

(B) factor of safety

(C) limiting factor

(D) all of these

27. Two tension members are connected by :

(A) splices

(B) filler plates

(C) gusset plate

(D) all of these

28. Aerated concrete is suitable for application such as :

(A) Filler wall

(B) Wall insulation

(C) Fire protection

(D) All of the above

29. The rotation of the free end of a cantilever beam due to a 5 kN load is 0.001 rad. Then the deflection of the free end due to a moment of 120 kN.m is :

(A) 1.2 mm

(B) 2.4 mm

(C) 3.6 mm

(D) 4.8 mm

30. The mid-point of a simply supported beam undergoes a displacement of δ. If the span of the beam is L, then the rotation at the ends will be :

(A) $\dfrac{\delta}{L}$

(B) $\dfrac{2\delta}{L}$

(C) $\dfrac{3\delta}{L}$

(D) $\dfrac{4\delta}{L}$

31. The carry-over factor for a prismatic beam element is :

(A) 1

(B) $\frac{1}{2}$

(C) $\frac{1}{3}$

(D) $\frac{1}{4}$

32. The moment required to rotate the near end of a prismatic beam through

unit angle, with translation; the far end being fixed is :

(A) $\frac{EI}{L}$

(B) $\frac{2EI}{L}$

(C) $\frac{3EI}{L}$

(D) $\frac{4EI}{L}$

33. The moment of inertia of a fixed beam of span L varies linearly from I at

end A to 2I at B. The area of the analogous column will be :

(A) $L \log_e \frac{2}{EI}$

(B) $L \log_e \frac{3}{EI}$

(C) $L \log_e \frac{4}{EI}$

(D) $L \log_e \frac{5}{EI}$

34. In a statically indeterminate structure, the formation of first plastic hinge will reduce the number of redundancy by :

(A) 0

(B) 1

(C) 2

(D) 3

35. Which of the following sections will have maximum shape factor :

(A) square

(B) circular

(C) diamond

(D) triangle

36. The variation of influence line for the stress function in a statically determinate structure is :

(A) linear

(B) parabolic

(C) circular

(D) none of these

37. The area of the influence line diagram for the fixed end moment of a fixed beam of span L is :

(A) $\dfrac{L^2}{8}$

(B) $\dfrac{L^2}{12}$

(C) $\dfrac{L^2}{16}$

(D) $\dfrac{L^2}{24}$

38. In highway pavements, emulsions are mainly used in :

(A) surface dressing

(B) patching and maintenance operations

(C) bitumen macadam

(D) asphaltic concrete

39. The binder normally used in flexible pavement construction is :

(A) organic soil

(B) bitumen

(C) cement-lime mixture

(D) none of the above

40. A hill road is one which passes through a terrain having a cross slope of :

(A) 10% — 25%

(B) 25% — 60%

(C) 60% — 70%

(D) 70% — 80%

41. Reinforcement in concrete pavement is provided :

(A) 7 cm below the top level

(B) 5 cm above the bottom level

(C) in the centre of the slab

(D) none of the above

42. The portion of a road surface which is used normally by high speed vehicular traffic is called :

(A) expressway

(B) highway

(C) carriageway

(D) right of way

43. Highway meeting the rail track should be straight from the centre of a rail track for at least a length of :

(A) 30 metres

(B) 20 metres

(C) 10 metres

(D) 40 metres

44. Purpose of the seal coat is to provide :

(A) an even surface

(B) required grade

(C) camber

(D) an impervious layer

45. Limiting gradient in plain is :

(A) 1 in 15   (B) 1 in 20

(C) 1 in 25   (D) 1 in 30

46. Permissible tolerance in grade, camber and alignment of a cement concrete road is :

(A) 0.01%   (B) 0.1%

(C) 1%   (D) 2%

47. While designing for superelevation, design value of lateral friction coefficient is taken as :

(A) 0.015   (B) 0.051

(C) 0.15   (D) 0.5

48. In the design of highways, expansion and contraction joints should respectively by provided at :

(A) 50 m and 32 m

(B) 50 m and 10 m

(C) 25 m and 10 m

(D) 25 m and 32 m

49. Shear centre of a semi-circular arc strip of radius 'r' will be at a distance of 'X' from the centre of the arc, where 'X' is equal to :

(A) $\dfrac{\pi r}{2}$

(B) $\dfrac{2r}{\pi}$

(C) $\dfrac{4r}{\pi}$

(D) $\dfrac{\pi r}{4}$

50. For two plates of equal thickness, full strength of fillet weld can be ensured if its maximum size for square edge is limited to :

(A) 1.5 mm less than the thickness

(B) 75% of the thickness

(C) 80% of the thickness

(D) none of the above

51. The height at which wind force acts on a moving vehicle on a bridge deck is :

   (A) 1.2 m

   (B) 1.5 m

   (C) 1.7 m

   (D) 2.0 m

52. The deflection at the free end of a cantilever subjected to a couple M at its free end and having a uniform rigidity EI throughout its length 'L' is equal to :

   (A) $\dfrac{ML^2}{2EI}$

   (B) $\dfrac{ML^2}{3EI}$

   (C) $\dfrac{ML^2}{6EI}$

   (D) $\dfrac{ML^2}{8EI}$

53. If the stream function is $\psi = 2xy$, then the velocity at a point (1, 2) is equal to :

   (A) 2

   (B) 4

   (C) $\sqrt{20}$

   (D) 16

54. A person of height 1.65 m standing on a cliff of height 20 m above the water level on sea-shore can sight a ship at a distance of about :

   (A) 10 km

   (B) 18 km

   (C) 30 km

   (D) 40 km

55. For design of a simply supported R.C.C. T-beam the ratio of effective span to the overall depth of the beam should not exceed :

(A) 10

(B) 20

(C) 30

(D) 40

56. During seepage through an earth mass, the direction of seepage is :

(A) parallel to the equipotential line

(B) perpendicular to the stream lines

(C) perpendicular to the equipotential lines

(D) none of the above

57. In a particular material, if the modulus of rigidity is equal to the bulk modulus then the Poisson's ratio will be :

(A) $\frac{1}{8}$

(B) $\frac{1}{4}$

(C) $\frac{1}{2}$

(D) 1

58. A short bar element of uniform cross-section is subjected to concentrated axial

forces at its two ends. The longitudinal stress distribution on the cross-section

is uniform at :

(A) all sections

(B) the two ends only

(C) the mid section only

(D) none of the above

59. Which of the following is *not* a heavy vehicle ?

(A) Truck   (B) Jeep

(C) Tractor-trailer   (D) Dragline

60. A lighthouse is visible just above the horizon at a certain station at the sea

level. The distance between the station and the lighthouse is 40 km. The

height of the lighthouse is approximately :

(A) 187 m   (B) 137.7 m

(C) 107.7 m   (D) 87.3 m

61. A trap used for a water closet is called :

(A) gully trap

(B) p-trap

(C) intercepting trap

(D) anti-siphon trap

62. The trap efficiency of a reservoir is a function of :

(A) inflow into the reservoir

(B) ratio of inflow to storage capacity

(C) ratio of reservoir capacity to inflow

(D) reservoir capacity

63. In Sarda type fall, the following crest may be used for discharge upto 20 cumecs :

(A) Ogee

(B) Bellmouth

(C) Trapezoidal

(D) Rectangular

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64. General earthwork of canals is observed by providing :

(A) Groynes   (B) Spurs

(C) Regulator   (D) Bed bank

65. A protective and training bank is called the following :

(A) Protective   (B) Training

(C) Regime   (D) Level

66. A structure for dropping the flow into the conduit to a lower level for
dissipating surplus energy is called :

(A) Drift   (B) Barrage

(C) Drop   (D) Sluice

67. A small branch of a canal meant for direct irrigation is called :

(A) Common   (B) Delta

(C) Supply   (D) None of these

68. In canal excess excavation is deposited by providing the following on the side of the canal :

(A) Dowla

(B) Berm

(C) Spoil

(D) None of these

69. A structure through which discharge can be regulated is called :

(A) Notch

(B) Orifice

(C) Regulator

(D) Weir

70. If the roots of the crops are saturated, the land is called :

(A) Marshy

(B) Humid

(C) Waterlogged

(D) None of these

71. A module in which the discharge is not influenced by level of water is called the following module :

(A) Flexible

(B) Semi-rigid

(C) Rigid

(D) None of these

72. The theory which gives equal weightage to horizontal and vertical creep is known as the following :

   (A) Kennedy's

   (B) Lacey's

   (C) Bligh's

   (D) None of the above

73. A core wall is provided in :

   (A) An earth dam

   (B) A canal regulator

   (C) An aqueduct

   (D) A gravity dam

74. A level crossing is a cross-drainage work where :

   (A) Canal flows under pressure

   (B) Canal flows under a specified level above the drain

   (C) Canal has a free flow

   (D) None of the above

75. Evaporation is maximum :

    (A) When the temperature is very low

    (B) When it is raining

    (C) When the temperature is high

    (D) During night

76. Waterlogging is eliminated by :

    (A) Deep ploughing

    (B) Shallow ploughing

    (C) Irrigation

    (D) Providing tile drains

77. Irrigation canals are generally aligned along :

    (A) ridge line

    (B) contour line

    (C) valley line

    (D) straight line

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78. The meandering of river is due to :

(A) Sediment load of streams

(B) discharge and hydraulic properties of stream

(C) Erodibility of the bed and banks of streams

(D) All of the above

79. The nose of the divide wall of a barrage is founded on :

(A) Firm rock which may be at any depth

(B) Well foundation

(C) Pile foundation

(D) None of the above

80. A hyetograph is a plot against time of :

(A) Cumulative rainfall

(B) Rainfall intensity

(C) Discharge

(D) Stage

81. The British designated those princely hill states which were on the right bank of the Satluj as Punjab Hill States and those on the left bank as Shimla Hill States. Which of the following did not fall neatly into either of these two categories because the Satluj bisects it into two almost equal halves ?

(A) Suket

(B) Handoor

(C) Kutlchar

(D) Kehlur

82. In which district of H.P. is Kumarwaha lake ?

(A) Kullu

(B) Mandi

(C) Shimla

(D) Sirmaur

83. On which river is Sataun bridge ?

(A) Yamuna

(B) Pabbar

(C) Tons

(D) Giri

84. At which place is fertilizer factory in Solan District ?

   (A) Chambaghat   (B) Darlaghat

   (C) Majholi   (D) Parwanoo

85. In which year did first passenger train run between Kalka and Shimla ?

   (A) 1901   (B) 1903

   (C) 1905   (D) 1907

86. With which district of H.P. is Mohna folk song associated ?

   (A) Mandi   (B) Kangra

   (C) Una   (D) Bilaspur

87. Which of the following temples is dome shaped ?

   (A) Shakti Devi, Chhatrari, Chamba District

   (B) Hidimba Devi in Kullu District

   (C) Hateshwari Devi in Shimla District

   (D) Shri Naina Devi in Bilaspur District

88. Which one of the following blocks of Sirmaur District has been identified for setting up Model Schools ?

(A) Rajgarh

(B) Shillai

(C) Pachhad

(D) Sangrah

89. At which place is Bal/Balika Ashram in Shimla District ?

(A) Theog

(B) Kotkhai

(C) Sarahan

(D) Jharag

90. Where has H.P. State civil supplies corporation opened a wholesale godown in Mandi District ?

(A) Talyar

(B) Bhambhla

(C) Bhangrotu

(D) Drang

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91. To which country does Zalim Khan Usupave whom Yogeshwar Dutt defeated at the 2014 Asian Games Wrestling final belong ?

   (A) Pakistan   (B) Iran

   (C) Kazakhstan   (D) Tajikistan

92. With which NGO is Lalitha Kumarmangalam associated ?

   (A) Smridhi

   (B) Swabhiman

   (C) Prakruti

   (D) Paryas

93. To which country does Patrick Modiana, who got 2014 Nobel prize for literature belong ?

   (A) Italy

   (B) France

   (C) Brazil

   (D) Spain

94. What is Hudhud ?

   (A) Cyclonic storm

   (B) Boundary line between India and China

   (C) Cricket Stadium in Odisha

   (D) Terrorist outfit in Pakistan

95. Who is the author of *The Accidental Prime Minister : The Making and Unmaking of Manmohan Singh* ?

   (A) Vinod Rai   (B) Sajnay Baru

   (C) Daman Singh   (D) Natwar Singh

96. Which of the following categories of cloth is non-biodegradable ?

   (A) Nylon   (B) Cotton

   (C) Wool   (D) Silk

97. Which one of the following rivers emanates from Sihawa mountain of Chhattisgarh ?

   (A) Krishna   (B) Cauvery

   (C) Mahanadi   (D) Tapti

98. In which month in 2014 did India and China sign an agreement to open new route for pilgrims to Kailash Mansarovar ?

(A) July

(B) August

(C) September

(D) October

99. In which one of the following countries Ebola virus was detected initially ?

(A) Sierra Leone

(B) Austria

(C) Peru

(D) Thailand

100. In which country is border town Kobani which has been under attack by the ISIS terrorists ?

(A) Turkey

(B) Syria

(C) Liberia

(D) Iraq