PSC Assistant Project Engineer - KLDC Ltd Examination Previous Year Question Paper

Exam Name: ***Assistant Project Engineer - KLDC Ltd***

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Medium of Questions: English

142/2015

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Black cotton soils have :
   (A) High Plasticity
   (B) Low plasticity
   (C) Good shear strength
   (D) Highly incompressible

2. The term 'Drift' in soil formation relates to :
   (A) Deposits made by glaciers
   (B) Deposits formed by melting of glaciers
   (C) Lateral movement of soil
   (D) Fissures formed in lateritic rocks

3. Degree of saturation of soil refers to :
   (A) Ratio of the volume of voids to the volume of soil
   (B) Ratio of the volume of water to the volume of voids
   (C) Ratio of the volume of water to the volume of soil
   (D) Ratio of weight of water to the weight of solids

4. For a soil with specific gravity 2.6 and dry unit weight of 20 KN/m^3 (unit weight of water = 10 KN/m^3) the void ratio will be :
   (A) 0.7
   (B) 0.52
   (C) 0.769
   (D) 0.3

5. If 60% of a soil sample is finer than 0.06 mm and 10% of it is finer than 0.004 mm, its uniformity coefficient will be :
   (A) 0.0667
   (B) 1.5
   (C) 15
   (D) 0.00024

6. A soil with a consistency index of zero indicates that :
   (A) Soil is at the liquid limit
   (B) Soil attained its plastic limit
   (C) Soil is hard
   (D) Soil has good shear strength

7. If the effective grain size of a soil is 0.2 mm and Allen Hazen's C is 15, its coefficient of permeability is :
   (A) 0.30 mm/sec
   (B) 0.60 mm/sec
   (C) 0.3 cm/sec
   (D) 0.6 cm/sec

8. The normal stress and shear stress on a failure plane in a drained test on a cohesion less soil are 1.0 kg/cm^2 each, the angle that the failure plane makes with the major principal plane will be :

(A) 90° (B) 45°

(C) 22.5° (D) 67.5°

9. Which of the following statement is wrong?

(A) In cantilever retaining walls, the stem acts as a vertical cantilever; whereas in counterfort retaining walls it act as a continuous slab

(B) Weep holes are provided in the retaining walls to reduce the development of excessive lateral pressure on the walls

(C) Fine graded soils are usually recommended as a backfill material as it reduces the earth pressure against retaining walls

(D) The basic difference between counterfort and cantilever retaining walls is in the calculation of bending moment and shear force

10. Which of the following statements is TRUE?

(A) The depth of exploration required at a particular site is mainly governed by the depth of the influencing zone

(B) Auger bring is recommended where depth of sampling is high

(C) Wash boring is suitable for obtaining undisturbed samples above water table level

(D) Undisturbed soil samples are used to determine the index properties of soil like grain size, plasticity characteristics etc

11. 'The maximum rate at which a soil in any given condition is capable of absorbing water' is termed as :

(A) Infiltration rate (B) Infiltration capacity

(C) Absorption capacity (D) Sorption rate

12. 'Capillary fringe' refers to :

(A) Zone just above the water table where moisture content is maintained by capillarity

(B) Zone just below the water table where moisture content is maintained by percolation

(C) Zone below the soil moisture zone

(D) Zone just below the sub-surface where moisture content is maintained by infiltration

13. The plotting of linear form of standard infiltration capacity curve represents a straight line with a slope equal to :

(A) $-1/[K \log_{10} e]$ (B) $1/[K \log_{10} e]$

(C) $K/[\log_{10} e]$ (D) $-K/[\log_{10} e]$

14. Most of the heavy rains in India are due to :
(A) Thunderstorms
(B) Orographic precipitation
(C) Convective precipitation
(D) Cyclonic precipitation

15. The relation between the optimum number of rain-guage stations (N), Allowable percentage error in the calculation of mean rainfall (E) and the coefficient of variation of rainfall is :
(A) $N^2 = C^2E^2$
(B) $N^2E^2 = C^2$
(C) $N = CE$
(D) $NE^2 = C^2$

16. The rates of rainfall for a successive 20 min period of a 60 minute rain are 2.5, 5, and 10 cm/hr respectively. If the rainfall volume equals runoff volume above 2.5 cm/hr, the runoff will be :
(A) 10/3 cm
(B) 20/3 cm
(C) 10/6 cm
(D) None of the above

17. The recession limb of a hydrograph indicates :
(A) Greater possibility for infiltration/runoff
(B) Surface detention and interception during a rain
(C) Uniformity of the rain
(D) Withdrawal of water from the storage within the basin

18. A unit hydrograph of a basin is defined as a hydrograph of direct runoff resulting from a rainfall excess of :
(A) 1 mm
(B) 1 cm
(C) $1 cm^3$
(D) $1 mm^3$

19. If a 6 h unit hydrograph is added to the same 6 h unit hydrograph beginning 6 h later, this can be reduced to a 12 h unit hydrograph by dividing the ordinates by :
(A) 6
(B) 12
(C) 2
(D) 3

20. In stream routing, the peak outflow discharge occurs :
(A) Later than the time when two hydrographs cross
(B) Earlier than the time when two hydrographs cross
(C) At the time when two hydrographs cross
(D) None of the above

21. The distance between two points measured with a 30 m chain was recorded as 100 m. It was afterwards found that the chain was 10 cm too short. So, the true distance between the points will be :
(A) 99.666 m
(B) 100.333 m
(C) 100 ± 0.333 m
(D) None of the above

22. Which of the following statement is FALSE?
(A) Correction for sag is always negative
(B) Correction for slope is always negative
(C) Correction for pull can be positive or negative
(D) Correction for temperature is positive if the temperature during measurement is less than the standard temperature

23. A survey line is 100 m long and has a bearing of 210°. The departure of this survey line is :
(A) + 50.000 m (B) – 50.000 m
(C) + 86.602 m (D) – 86.602 m

24. If AB is at S 30° W and AC is N 30° W, the included angle BAC will be :
(A) 120° (B) 60°
(C) 240° (D) None of the above

25. 'Orientation' of a plane table refers to the process of :
(A) Keeping the plane table at successive stations facing the first station
(B) Keeping the plane table along NS direction
(C) Keeping the plane table parallel to the position it occupied at previous station
(D) Keeping the plane table parallel to the base survey line

26. A person 1.684 m tall stands on a beach. The maximum distance visible to him towards the sea will be :
(A) 5 m (B) 25 km
(C) 5 km (D) 25 m

27. The least reading that can be taken with the help of a leveling staff is :
(A) 0.005 m (B) 0.005 cm
(C) 0.05 m (D) None

28. If A1, A2, A3, A4 and A5 represent the areas of cross-sections of an embankment at a distance of D between them, the Prismoidal formula for calculating its volume will be :
(A) $D/3[A1+2A2+4A3+2A4+A5]$ (B) $D/3[A1+4A2+2A3+4A4+A5]$
(C) $D/2[A1+2A2+4A3+2A4+A5]$ (D) $D/2[A1+4A2+2A3+4A4+A5]$

29. The prismoidal correction for a level section with depths of cutting 'h' and 'H' at a distance of 'D' apart with side slopes 's' and will be :
(A) $Ds/3\,[h-H]^2$ (B) $Ds/3\,[h-H]$
(C) $Ds/6\,[h-H]^2$ (D) $Ds/6\,[h+H]^2$

30. If the area included within 450 m, 453 m and 456 m contour lines of a reservoir are respectively 250 sq.m and 750 sq.m, the volume of water (by trapezoidal formula) will be :

(A) 450000 cu.m (B) 225000 cu.m
(C) 1000 cu.m (D) 1500 cu.m

31. A jet of water strikes a flat plate with a velocity of 20 m/s inclined at 30° with the axis of the jet. If the cross-sectional area of the jet is $50\,cm^2$ and density of water is 1000 kg/cu.m, the force exerted by the jet on the plane will be :

(A) 1732.05 N (B) 866.002 N
(C) 500 N (D) 1000 N

32. For maximum efficiency of the vanes, the peripheral speed should be :

(A) $1/4^{th}$ of the velocity of jet (B) Half of the velocity of jet
(C) Equal to the jet speed (D) 0.6 times jet speed

33. A jet propelled boat moves at 20 m/s with water being drawn from inlet openings facing the direction of motion. If the relative velocity of the jet is found to be 30 m/s, its propulsion efficiency will be :

(A) 80% (B) 57.14%
(C) 40% (D) 4%

34. Which of the following statement is INCORRECT?

(A) Modern Francis turbines are inward mixed flow reaction turbines
(B) Francis turbines operates under medium heads and requires medium quantity of water
(C) The head acting on the Francis turbine is fully transformed into kinetic energy leaving no pressure head
(D) In Francis turbine, the difference of pressure between the guide vanes and the runner creates the reaction pressure

35. A turbine is to operate under a head of 16 m at 128 rpm. If the power generated is 625 kW, the specific speed of the turbine will be :

(A) 400 rpm (B) 2500 rpm
(C) 100 rpm (D) None of the above

36. The impeller of a centrifugal pump has an internal diameter of 400 mm and it runs at 720 rpm. If the constant radial flow through impeller is 1.51m/s, the inlet vane angle will be :

(A) 185° 42' (B) 95° 42'
(C) 45° (D) 5° 42'

37. The phenomenon of cavitation in centrifugal pumps can be reduced by :

(A) Reducing the suction head (B) Increasing the suction head
(C) Altering the flow velocity (D) Changing the discharge

38. In the case of a centrifugal pump, the kinetic energy per unit weight of water is found to be 8 Nm and the work done per unit weight of water was 24 Nm. So the percentage of work converted into kinetic energy will be :

(A) 66.67% (B) 33.33%
(C) 30% (D) 3%

39. Cavitation begins to appear in centrifugal pumps when :

(A) suction head equals delivery head
(B) vapour pressure of liquid is less than suction pressure
(C) the pressure at suction equals vapour pressure of liquid
(D) the pressure at suction falls below the vapour pressure of liquid

40. The difference between the net inlet head and the head corresponding to the vapour pressure of the liquid in centrifugal pumps is called :

(A) Net Primary Suction Head (B) Negative Suction Head
(C) Suction Head (D) Net Positive Suction Head

41. The knocking tendency in CI engines increase with :

(A) Increase of compression ratio
(B) Decrease of compression ratio
(C) Increasing the temperature of inlet air
(D) None of the above

42. The phenomenon of evaporation from water surface, from the soil an from plant is generally known as :

(A) Vaporization (B) Boiling
(C) Transpiration (D) Hydration

43. Sprinkler irrigation is not suitable for :

(A) rice (B) wheat
(C) plantation crops (D) none of them

44. Subsurface drains are :

(A) underground artificial channels (B) free water drained from open well
(C) artificial drains made over the earth (D) none of these

45. The main function of distributor of ignition of system of engine is to :

(A) Open the primary circuit (B) Close the primary circuit
(C) Both (D) None of the above

46. A current meter measure, the velocity of flow, if it is held :
(A) At the bottom surface of the channel (B) At the surface of the channel
(C) At the centroid of the channel section (D) At any position with in the section

47. Selection and design of soil and water conservation measures mainly depend upon :
(A) soil type (B) land slope
(C) rain fall (D) all of them

48. Ditch cross section is usually :
(A) rectangular (B) square
(C) round (D) none of these

49. In air cooled engines fins are the components of :
(A) Cooling system (B) Ignition system
(C) Fuel system (D) None of the above

50. Infiltration occurs at capacity rate :
(A) due to watershed leakage
(B) if there had been antecedent rain fall
(C) if the intensity of rain fall is lower than the capacity rate
(D) during a first flash storm following summer

51. When a small irrigation canal has to cross over a median drain we construct :
(A) pipe aqueduct (B) box culvert
(C) irrigation culvert (D) aqueduct

52. Drainage coefficient is expressed as depth in _____ water drained off from a given area in 24 hrs. :
(A) Metres (B) Inch
(C) Foot (D) Centimetres

53. Lubrication causes the effects :
(A) cooling effect
(B) cleaning effect
(C) reduced friction effect
(D) sealing effect

54. Unit hydrograph method for flood estimation is usually applied to :
(A) Large basins (B) Hilly areas
(C) Small and medium sized basins (D) All of the above

55. Hydraulic structures constructed across a canal are called :

(A) cross drainage works (B) cross communication works
(C) regulatory works (D) none of the above

56. Vegetative water ways are designed to carry the maximum runoff from a storm of ———— years recurrence interval.

(A) 5 (B) 10
(C) 15 (D) 20

57. Specific heat at constant pressure (Cp) :

(A) increases with increase in moisture content in air
(B) decreases with increase in moisture content in air
(C) remain same irrespective of the moisture content in air
(D) none of the above

58. The shape of the hydrograph of run off is affected by :

(A) the duration of the storm (B) a real distribution of the storm
(C) the intensity of the storm (D) all of the above

59. Coefficient of permeability indicates canal with which water can flow through a soil mass. The soil type which has least permeability is :

(A) gravelly soil (B) clayey soil
(C) sandy soil (D) none of the above

60. In drop spillway the water flow through a ———— and falls over an apron in which energy of water dissipated.

(A) Notch (B) Conduit
(C) Weir (D) Outlet

61. The ratio of brake power to indicated power is called :

(A) Mechanical efficiency (B) Volumetric efficiency
(C) Thermal efficiency (D) None of the above

62. An aquifer that is confined at the bottom but not at the top is known as :

(A) Partially confined aquifer (B) Unconfined aquifer
(C) Semi confined aquifer (D) Aquiclude

63. A lysimeter is used to measure :

(A) infiltration (B) evaporation
(C) evapotranspiration (D) radiation

64. Flow in a chute spillway is at :
(A) about 2 metres / sec
(B) 5.5 metres/sec
(C) supercritical velocities
(D) none of these

65. The volume displaced by one stroke of the piston is known as :
(A) Piston displacement
(B) Piston speed
(C) Both
(D) None of the above

66. Soil is called saline when the pH value is :
(A) less than 4
(B) 7
(C) more than 7
(D) below 0

67. A channel designed by Lacey's theory has a mean velocity of one meter per second. The silt factor is unity. The hydraulic mean radius will be :
(A) 1.5 meters
(B) 2 .0 meters
(C) 2.5 meters
(D) 1.00 meter

68. Soil plant water relations relates to the ———— properties of soil, plant that affects the movement, retention and use of water.
(A) chemical
(B) physical
(C) agronomic
(D) plant nutrient

69. For getting maximum power from petrol engine ,the air fuel ratio should be about :
(A) 15:1
(B) 1:10
(C) 1:15
(D) 1:13

70. Delta of a crop means :
(A) area under the crop
(B) crop period
(C) depth of water required by the crop
(D) crop production

71. Bunds are constructed for the purpose of :
(A) retaining water
(B) controlling soil erosion
(C) diverting runoff
(D) all of them

72. In surface method of irrigation water is applied directly from a :
(A) pipe
(B) channel
(C) drip head
(D) sprinkler

73. A heat engine is defined as a device which converts :
(A) one form of energy into useful work
(B) heat energy into useful work
(C) both
(D) none of the above.

74. Hydrology deals with :
(A) all aspects of water available on the earth
(B) irrigation water requirements of crops
(C) mechanics of motion of water
(D) non available water for plants

75. Removal of a fairly uniform layer of soil from the field due to rainfall and runoff is known as :
(A) splash erosion (B) sheet erosion
(C) rill erosion (D) gully erosion

76. In well system, the vertical distance to which the water column is lowered is referred to as :
(A) depression (B) cone
(C) radius of influence (D) none of these

77. Fly wheel mainly works as :
(A) To start the engine (B) Energy reservoir
(C) To serve uniform running (D) None of the above

78. The purpose of canal lining is to :
(A) control seepage (B) strengthen canal section
(C) increase capacity of the canal (D) to serve all these

79. A plot of accumulated precipitation verse time in a chronological order is called :
(A) Hyetograph (B) Unit hydrograph
(C) Mass curve (D) Hydrograph

80. Drain tiles are made of :
(A) mild steel (B) aluminium
(C) concrete (D) none of these

81. Name the social reformer associated with an agitation connected to the Tali temple in Kozhikode in 1917 :
(A) Narayana Guru (B) T.K. Madhavan
(C) C. Krishnan (D) K. Kelappan

82. Which was the social reform organisation of the Nairs founded in 1905?
(A) Keraleeya Nair Samajam (B) Nair Service Society
(C) Malayali Sabha (D) None of the above

83. Who founded the organisation known as Kerala Muslim Aikya Sangham?
(A) E. Moidu Moulavi (B) Vakkom Abdul Khader Moulavi
(C) Muhammad Abdur Rahiman (D) Moideen Koya

84. Name the ruler of Travancore at the time of the beginning of the Vaikom Satyagraha :
(A) Srimulam Thirunal (B) Sethu Lakshmi Bai
(C) Rani Gouri Parvatibai (D) None of the above

85. Who among the following was manhandled during the Guruvayur satyagraha?
(A) A.K. Gopalan (B) Mannath Padmanabhan
(C) N.P. Damodaran (D) K. Kelappan

86. Name the leader who was punished for a speech at Kozhenchery in 1935 :
(A) George Joseph (B) P. Krishna Pilla
(C) E.V. Ramaswami Nair (D) C. Kesavan

87. Who was the editor of the periodical Aikyam?
(A) Hassan Koya Mulla (B) Seethi sahib
(C) Muhammed Abdur Rahiman (D) None of the above

88. Who was the editor of Kerala patrika?
(A) Chengalath Kunjirama Menon (B) G.P. Pilla
(C) K. Ramakrishna Pilla (D) K.G. Sankar

89. Who wrote the poem 'Chitrasala' ?
(A) Kumaran Asan (B) Ulloor Parameswara Iyer
(C) Vallattol Narayana Menon (D) G. Sanakara Kurup

90. Who wrote the novel 'Sundarikalum Sundaranmarum'?
(A) P.C. Kutti Krishnan (B) Vaikom Muhammed Basheer
(C) Thakazhi Sivasankara Pilla (D) S.K. Pottekkat

91. The well known writer Indira Goswami belonged to :
(A) Haryana (B) Uttar pradesh
(C) Assam (D) West Bengal

92. Name the capital of Kenya :
(A) Cairo (B) Amman
(C) Nairobi (D) Accra

93. India shares ———— per cent of the total geographical area in the world.
(A) 4.5% (B) 2.5%
(C) 3.4% (D) 2.4%

94. Name the historic personality who was known as Fuhrer :
(A) Mussolini (B) Churchill
(C) Hitler (D) Stalin

95. When is World Environment celebrated?
(A) April 22 (B) March 23
(C) June 5 (D) December 10

96. When is world wetland day celebrated?
(A) January 9 (B) February 2
(C) March 5 (D) May 8

97. Who is the foreign secretary of India?
(A) Sujatha Singh (B) Sanjaya Baru
(C) S. Jayashankar (D) T.P. Sreenivasan

98. Who is the defence minister of India?
(A) Sushama Swaraj (B) Manohar Parrikar
(C) Rajnath Singh (D) Nitin Gadkari

99. The terms socialist and secular were inserted to the Preamble of the Indian Constitution as per the 42nd Amendment in :
(A) 1975 (B) 1976
(C) 1977 (D) 1979

100. Who is the President of Sri Lanka?
(A) Rajapakse (B) Sirisena
(C) Chandrika Kumaratunga (D) Sirimao Bandaranayake