395

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

TEST BOOKLET SERIES

TEST BOOKLET

LECT.(C) POL. TECH./2015

C

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. **Encode clearly the test booklet series A, B, C or D as the case may be in the appropriate place in the answer sheet.**
3. Write your Roll Number only in the box provided alongside. Do not write anything else on the Test Booklet.
4. 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.
5. 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)

6. 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.
7. 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.*
8. 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.
9. 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.
10. After you have completed the test, hand over the Answer Sheet only, to the Invigilator.

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

P.T.O.

Time Allowed : 2 Hours] [Maximum Marks : 100

1. If a cantilever beam of span L and flexural rigidity EI carries a moment M concentrated at the free end, the deflection at the end will be :

(A) $\frac{ML}{24EI}$ (B) $\frac{ML}{12EI}$

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

2. A simply supported beam of span L and flexural rigidity EI is subjected to a moment M at one support. The strain energy due to bending is :

(A) $\frac{M^2L}{6EI}$ (B) $\frac{M^2L}{3EI}$

(C) $\frac{M^2L}{2EI}$ (D) $\frac{M^2L}{EI}$

3. Clockwise moments are applied to both the ends of a uniform simply supported beam. If the ratio of the rotation of two ends is 2, then the ratio of the applied moments will be :

(A) $\frac{3}{2}$ (B) $\frac{5}{3}$

(C) $\frac{7}{5}$ (D) $\frac{5}{4}$

4. The moment distribution method is best suited for :

(A) indeterminate pin jointed truss

(B) rigid frames

(C) space frames

(D) trussed beam

5. The moment of inertia of analogous column of a fixed beam of length L and constant EI is equal to :

(A) $\frac{L^3}{3EI}$ (B) $\frac{L^3}{4EI}$

(C) $\frac{L^3}{12EI}$ (D) $\frac{L^3}{48EI}$

6. The moment capacity of a section at plastic hinge is :

(A) Zero

(B) Yield moment

(C) Twice of yield moment

(D) Fully plastic moment

7. A symmetric three-hinged parabolic arch has span L and rise h. The horizontal thrust in the arch due to uniformly distributed load W is :

(A) $\frac{WL^2}{3h}$

(B) $\frac{WL^2}{8h}$

(C) $\frac{WL^2}{12h}$

(D) $\frac{WL^2}{16h}$

8. The effective length of a circular electric pole of length L and constant diameter erected on ground is :

(A) 0.80 L (B) 1.20 L

(C) 1.50 L (D) 2.00 L

9. As compared to field rivets, the shop rivets have :

(A) Less strength (B) More strength

(C) Equal strength (D) No effects

10. The pressure within a soap bubble is :

(A) the same as that of the surrounding atmosphere

(B) greater than the external pressure

(C) equal to the vapour pressure

(D) none of the above

11. The point through which the resultant hydrostatic free act is called :

(A) Metacentre

(B) Centre of pressure

(C) Centre of buoyancy

(D) None of the above

12. The continuity equation in fluid mechanics is a mathematical statement embodying the principle of :

(A) conservation of energy (B) conservation of mass

(C) conservation of momentum (D) none of these

13. A stagnation point is a point :

(A) where the pressure is zero

(B) where the total energy is zero

(C) where the velocity of flow reduces to zero

(D) where the total energy is maximum

14. Kinematic similarity between model and prototype is :

(A) similarity of shape

(B) the similarity of streamline pattern

(C) the similarity of discharge

(D) none of the above

15. The lower limit of the critical Reynolds' number below which all disturbances (or sources of turbulence) in pipe flow are damped out by viscous action has a value approximately equal to :

(A) 1 (B) 500

(C) 1000 (D) 2000

16. For turbulent flow in smooth pipes, the entrance length is taken as :

(A) 114 (B) 75

(C) 50 (D) 100

17. The maximum velocity in open channels occurs :

(A) at the mid depth

(B) at the free surface

(C) a little below the free surface

(D) near the channel bottom

18. A sewer which receives the discharge from a number of independent houses is called :

(A) house sewer (B) intercepting sewer

(C) lateral sewer (D) none of these

19. The wastewater coming from kitchens and bathrooms is popularly known as :

(A) domestic sewage discharge

(B) sludge discharge

(C) drainage discharge

(D) none of the above

20. Sewage treatment works are normally designed for a design period of :

(A) 40-50 years
(B) 30-40 years
(C) 15-20 years
(D) 5-10 years

21. Laying of sewers is usually done with the help of :

(A) a theodolite
(B) a compass
(C) a plane table
(D) sight rails and boning rods

22. The most suitable section of a sewer in a separate sewerage system is :

(A) rectangular
(B) circular
(C) new egg-shape
(D) parabolic

23. The most prominent force, acting on the underground sewer pipes would be :

(A) compressive force
(B) tensile force
(C) bending force
(D) all of these

24. The best sewer material to resist hydrogen sulphide corrosion is :

(A) R.C.C.

(B) Brick masonry

(C) Glazed stoneware

(D) Asbestos cement

25. Ventilation columns are placed along a sewer line at intervals of about :

(A) 30 to 50 m

(B) 75 to 100 m

(C) 150 to 300 m

(D) 500 to 750 m

26. Minimum D.O. prescribed for a river stream to avoid fish kills is :

(A) 2 p.p.m.

(B) 4 p.p.m.

(C) 8 p.p.m.

(D) 10 p.p.m.

27. The flow of water in a wash hand basin when it is being emptied through a central opening is an example of :

(A) Free vortex

(B) Forced vortex

(C) Rotational vortex

(D) None of these

28. Grain size analysis of fine grained soil is done by the method of :

(A) Sieve analysis

(B) Hydrometer analysis

(C) Both (A) and (B) above

(D) None of the above

29. The wet analysis to find whether the soil is clay or silt is based on :

(A) Stokes' law

(B) Hazen's law

(C) Pascal's law

(D) Blasius law

30. The pressure in capillary water as compared to atmospheric pressure is always :

(A) more

(B) less

(C) equal

(D) none of these

31. Wedge theory of soil was propagated by :

(A) Coulomb

(B) Rankine

(C) Terzaghi

(D) Tait and Kelvin

32. State of stress is known at all stages in :

(A) Direct shear test

(B) Triaxial compression test

(C) Vane shear test

(D) All of the above

33. The alignment of highway means layout of its :

(A) Centre line on ground

(B) Width

(C) Superelevation

(D) None of the above

34. The impervious pavement surface is of :

(A) WBM

(B) Earthen

(C) Bituminous concrete

(D) None of these

35. The road erosion due to water may be reduced by :

(A) turfing
(B) soil stabilization
(C) soil treatment
(D) none of these

36. Bearing pile transfers superimposed load to :

(A) hard strata
(B) soft soil
(C) sandy soil
(D) none of these

37. When hard strata is not available at sufficient depth the use is made of :

(A) sheet pile
(B) friction pile
(C) bearing pile
(D) battered pile

38. Well foundation is the name given to :

(A) Box caisson
(B) Open caisson
(C) Floating caisson
(D) None of these

39. The method of growing crops on ridges, running on the sides of water ditches is called :

(A) Flood irrigation
(B) Furrow irrigation
(C) Check irrigation
(D) None of these

40. The crop among the following, which is expected to have the maximum duty, is :

(A) Wheat
(B) Rice
(C) Sugarcane
(D) Cotton

41. The first important watering of crops is usually called :

(A) Paleo-watering
(B) Kor-watering
(C) Crop-watering
(D) None of these

42. The water which can be utilised by the crops from the soil is called :

(A) Field capacity water
(B) Capillary water
(C) Hygroscopic water
(D) None of these

43. Unlined irrigation canals, when aligned on curvilinear routes in plan, will have to be pitched on :

(A) both sides

(B) concave side only

(C) convex side only

(D) none of these

44. The critical shear stress τ, at which incipient motion of sediment takes place is proportional to :

(A) $\sqrt{d}$

(B) d

(C) d^2

(D) none of the above

where 'd' is grain size

45. The force exerted by the flowing water on the sediment particles to cause their motion, is called :

(A) buoyant force

(B) tractive force

(C) kinematic force

(D) eddy force

46. The Garret's diagram are based on :

(A) Lacey's theory

(B) Khosla's theory

(C) Bligh's theory

(D) Kennedy's theory

47. The wetted perimeter P of a stable channel is proportional to :

(A) Q (B) $\sqrt{Q}$

(C) Q^2 (D) None of these

where Q = discharge in the channel.

48. Lining of irrigation channels :

(A) increases waterlogging

(B) increases channel cross-section

(C) increases command area

(D) increases chances of breaching

49. The minimum recommended free-board for lined canals carrying discharge of more than 10 cumecs is :

(A) 0.3 m

(B) 0.6 m

(C) 0.75 m

(D) 1.2 m

50. Aggrading rivers are :

(A) silting rivers

(B) scouring rivers

(C) rivers in regime

(D) meandering rivers

51. In which district of H.P. is Ghadasru lake ?

(A) Lahaul-Spiti

(B) Kullu

(C) Kinnaur

(D) Chamba

52. From where does river Giri Ganga rise ?

(A) Chaushal peak

(B) Kupar peak

(C) Dharathi range

(D) Chirgaon

53. In which district of H.P. is Choordhar peak ?

(A) Kinnaur

(B) Chamba

(C) Solan

(D) Shimla

54. Who was the first European to visit Kullu on his way to Ladakh in 1820 ?

(A) Moorcraft

(B) Vigne

(C) Major Hay

(D) Captain R.C. Lee

55. During the reign of which raja of Chamba was the image of Marikula Devi set up at Markul-Udaipur ?

(A) Partap Singh Varman

(B) Ganesh Varman

(C) Vir Varman

(D) Anand Varman

56. Which scion of Kangra princely state was given the rank of honorary Major in the British Army in 1888 ?

(A) Ludar Chand

(B) Jai Chand

(C) Kirat Chand

(D) Uday Chand

57. During 2012-13 what was the contribution of agriculture sector to the state income in Himachal Pradesh ?

(A) 8.32 percent

(B) 10.87 percent

(C) 12.25 percent

(D) 14.42 percent

58. Which two districts of H.P. are covered under the scheme Backward Region Grant Fund ?

(A) Sirmaur and Kinnaur

(B) Chamba and Lahaul-Spiti

(C) Lahaul-Spiti and Sirmaur

(D) Sirmaur and Chamba

59. According to 2011 census, what is the percentage of urban population in Himachal Pradesh ?

(A) 8 percent

(B) 9 percent

(C) 10 percent

(D) 11 percent

60. On which day (according to Vikrami Samvat) are bugs, flees and lice etc. burnt with cow-dung balls in H.P. ?

(A) first Ashad

(B) first Sawan

(C) first Bhadon

(D) first Asauj

61. Who is the Chairman of Indian Space Research Organisation (ISRO) ?

(A) Shailesh Nayak

(B) C.N. Rao

(C) R. Radhakrishnan

(D) Vikram Sarabhai

62. Who gave the title दिल वाले दुल्हनियाँ ले जायेंगे to Aditya Chopra's film whose working title was 'the brave heart will take the bride' ?

(A) Kirron Kher
(B) Gul Panang
(C) Yash Chopra
(D) Mahesh Bhatt

63. How many Indian cities are included in WHO's list of 20 most polluted cities of the world released in early 2015 ?

(A) 11
(B) 12
(C) 13
(D) 14

64. How many Indian villages are proposed to be developed under the Pradhan Mantri Adarsh Gram Yojna ?

(A) 500
(B) 1000
(C) 1500
(D) 2000

65. When was Teen Murti Memorial (New Delhi) built ?

(A) 1918

(B) 1919

(C) 1922

(D) 1945

66. What does Alrosa of Russia with which several Indian companies have signed contracts deal with ?

(A) Petroleum

(B) Natural gas

(C) Diamonds

(D) Steel

67. Who led the pro-democracy protests in Hong Kong during 2014 ?

(A) Martin Lee

(B) Nathan Law

(C) Jimi Lai

(D) All of the above

68. Who is the President of Sri Lanka ?

(A) Ranil Wickremesinghe

(B) Maithripala Sirisena

(C) Mahindra Rajapaksha

(D) Chandrika Kumartunga

69. For which offence was Eric Garner, a black American choked to death by a white policeman in the United States ?

(A) for carrying a toy pistol

(B) for putting his hands in his trousers pockets

(C) for selling loose untaxed cigarettes

(D) for shop lifting

70. Which country's construction company held nearly 160 workers hostage recently ?

(A) Iran

(B) Iraq

(C) Kenya

(D) Sudan

71. Which of the following is *not* a method of survey ?

(A) astronomic

(B) reconnaissance

(C) telescopy

(D) plain table

72. Knowledge of surveying is significant for laying :

(A) underground pipelines

(B) town planning

(C) laying of canals

(D) all of these

73. The smaller angle made by a survey line with the true meridian is known as :

(A) True bearing

(B) Azimuth

(C) Grid meridian

(D) Magnetic meridian

74. The 3-point problem of plane table survey may be solved by rules of :

(A) Lehmann

(B) Taher

(C) Gravatt

(D) Dumpy

75. When the purpose of levelling is to obtain difference in elevation of two points, the levelling is called :

(A) compound
(B) differential
(C) fly levelling
(D) all of these

76. Simpson's 1/3rd rule to compute the plane area is applicable when number of ordinates is :

(A) Even
(B) Odd
(C) Both (A) and (B) above
(D) None of the above

77. The zero circle of a planimeter is also known as :

(A) Circle of correction
(B) Zero error
(C) Initial error
(D) All of these

78. A theodolite may be used to measure :

(A) Deflection angles
(B) Direct angles
(C) Magnetic bearings of lines
(D) All of these

79. Prismatic compass indicates :

(A) Reduced bearing

(B) Whole circle bearing

(C) Both (A) and (B) above

(D) None of the above

80. Which method is more accurate for surveying of deep ravines ?

(A) Chain surveying

(B) Tacheometric surveying

(C) Both are equally accurate

(D) None of these

81. Refractories are used in chimney and fire places for :

(A) Insulation against heat

(B) Sound proofing

(C) D.P.C.

(D) Acoustical proofing

82. Surkhi as building material is used in :

(A) floor covering

(B) Brick masonry

(C) Pointing old work

(D) All of these

83. Marble is obtained by transforming from :

(A) Limestone

(B) Sandstone

(C) Slate

(D) Silicate

84. It is difficult to impart polish on :

(A) Sandstone

(B) Limestone

(C) Both (A) and (B) above

(D) None of the above

85. Reinforced-brick-concrete is used in building construction for the elements such as :

(A) Lintels

(B) Roofs

(C) Both (A) and (B) above

(D) None of the above

86. Advantages of using cavity wall is better :

(A) Heat insulation

(B) Sound insulation

(C) Damp-proofing

(D) All of these

87. The term 'guniting' is related to :

(A) damp-proofing

(B) pointing

(C) plastering

(D) none of these

88. The shell roof preferred for industrial roofing is :

(A) East light type

(B) North light type

(C) West light type

(D) South light type

89. The per capita water demand includes :

(A) domestic water demand only

(B) domestic as well as commercial water demand

(C) domestic, commercial and industrial water demand

(D) none of the above

90. For the irrigation of crops, the base period B in days, the duty D in ha/(m^3/s) and delta (Δ) in metres are related as :

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

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

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

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

91. Humidity is measured by :

(A) Hydrometer

(B) Hygrometer

(C) Hyetometer

(D) Anemometer

92. The temperature of air at which it becomes just fully saturated with the available vapour, is called :

(A) dew point

(B) cloud point

(C) front point

(D) none of the above

93. A line joining places of equal rainfall is called :

(A) hyetograph

(B) isobar

(C) isotherm

(D) isohyet

94. Double mass curve technique is followed :

(A) to check the consistency of rain gauge records

(B) to find the average rainfall over a number of years

(C) to find the number of rain gauges required

(D) to estimate the mining precipitation value

95. Infiltration capacity :

(A) is a constant factor

(B) changes with time

(C) changes with location

(D) changes both with time as well as location

96. The evaporation from plants and from the surrounding soils together is called :

(A) vaporisation

(B) transpiration

(C) evapo-transpiration

(D) hydration

97. Drainage density of a basin may be defined as :

(A) Number of drains per unit area of the basin

(B) Length of drains per unit area of the basin

(C) Number of rain gauges installed in the basin

(D) None of the above

98. "Specific Yield" for an unconfined acquifer is :

(A) Greater than porosity

(B) Less than porosity

(C) Equal to porosity

(D) Unrelated to porosity

99. The model of a prototype which is prepared on the principles of similitude is called a :

(A) Scale model

(B) Analog model

(C) Computer model

(D) None of these

100. The maximum number of unknown forces that can be found in a concurrent coplanar force system under equilibrium is :

(A) Zero

(B) 2

(C) 3

(D) 6