PUNJAB PUBLIC SERVICE COMMISSION

Competitive Examination (November-2016) for Recruitment of Lecturer Chemical Engineering in the Department of Technical Education and Industrial Training, Government of Punjab

READ INSTRUCTIONS BEFORE FILLING ANY DETAILS OR ATTEMPTING TO ANSWER THE QUESTIONS.

Candidate's Name _____

Father's Name _____

Date of Birth ☐☐ ☐☐ ☐☐☐☐ **Category Code*** ☐☐

DD **MM** **YYYY** **(*as given in the admit card)**

OMR Response Sheet No. _____

Roll No. _____

Candidate's Signature **(Please sign in the box)**

Booklet No.

INSTRUCTIONS

1. The candidate shall NOT open this booklet till the time told to do so by the Invigilation Staff. However, in the meantime, the candidate can read these instructions carefully and subsequently fill the appropriate columns given above in CAPITAL letters. The candidate may also fill the relevant columns (other than the columns related to marking responses to the questions) of the Optical Mark Reader(OMR) response sheet, supplied separately

2. **Use only blue or black ball point pen** to fill the relevant columns on this page. Use of fountain pen may leave smudges which may make the information given by the candidate illegible.

3. The candidate shall be liable for any adverse effect if the information given above is wrong or illegible.

4. The candidate must fill all the columns given above on this page and sign at the appropriate place.

5. **Each candidate is required to attempt 100 questions in 120 minutes**, except for visually impaired candidates, who would be given 40 minutes extra, by marking correct responses on the OMR sheet which would be supplied separately to the candidates

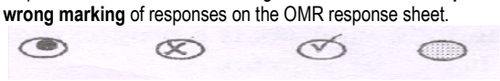
6. **The candidate must write the following on the OMRs sheet:**
   (a)Serial number of OMR sheet supplied to him/her for marking the responses to the questions.
   (b)Serial number of the question booklet
   Failure to do so may lead to cancellation of candidature or any other action which the Commission may deem fit.

7. **The candidate should darken the most appropriate response to the question by completely darkening the relevant circle/oval** according to his/her choice of response i.e. a, b, c or d in the manner shown in the example below.

   a b c d

8. Partly darkening the circle/oval on the OMR response sheet or using other symbols such as tick mark or cross would not result in evaluation of the response as the OMR scanner can only interpret the answers by reading the darkened responses in the manner explained in preceding paragraph. Darkening more than one circle/oval as response to a question shall also be considered as wrong answer.

9. The candidates shall be responsible to ensure that the responses are marked in correct manner and any adverse impact due to wrong marking of responses would be the responsibility of the respective candidate. The following are some of **the examples of wrong marking** of responses on the OMR response sheet.



10. The candidates, when allowed to open the question paper booklet, are advised to check the booklet to confirm that the booklet has complete number of pages, the pages are printed correctly and there are no blank pages. In case there is any such error in the question paper booklet the candidate should immediately bring this fact to the notice of the invigilation Staff and obtain a booklet of the same series.

11. The serial number of the new booklet should be entered in the relevant column of the OMR. The candidate should request the Invigilation Staff to authenticate the change in serial number of question booklet by obtaining the initials of the Staff on the corrected serial number of the question booklet

12. The question paper booklet has **16** pages.

13. **Each question carries three marks.**

14. **There are four options for each question and the candidate has to mark the most appropriate answer on the OMR response sheet using blue or black ball point pen.**

15. **There is no negative marking** for wrong answers or questions not attempted by the candidate.

1. The normal stress is the same in all directions at a point in a fluid, when the fluid is:
   (a) Non-viscous
   (b) Incompressible
   (c) Both (a) and (b)
   (d) Having no motion of one fluid layer relative to the other

2. For a given fluid flow rate, which of the following incurs maximum head loss?
   (a) Flow nozzle
   (b) Venturimeter
   (c) Orifice meter
   (d) All of them incur the same head loss

3. Match List-I with List-II and select the correct answer using the codes given below the Lists (Notations have their usual meanings):

List -I	**List II**
A. Fin	1. $\frac{UA}{C_{\min}}$
B. Heat exchanger	2. $\frac{x}{2\sqrt{a\tau}}$
C. Transient conduction	3. $\sqrt{\frac{h\rho}{kA}}$
D. Heisler Chart	4. $\frac{hl}{k}$

Codes:	A	B	C	D
(a)	3	1	4	2
(b)	2	1	3	4
(c)	3	1	2	4
(d)	2	4	3	1

4. Consider the following phenomena:
   1. Boiling
   2. Free convection in air
   3. Forced convection
   4. Conduction in air

   Their correct sequence in increasing order of heat transfer coefficient is:
   (a) 4, 3, 2, 1
   (b) 4, 1, 3, 2
   (c) 4, 2, 3, 1
   (d) 3, 4, 1, 2

5. A cross-flow type air-heater has an area of 50 m^2. The overall heat transfer coefficient is 100 W/m^2K and heat capacity of both hot and cold stream is 1000 W/K. The value of NTU is:
   (a) 1000
   (b) 500
   (c) 0.2
   (d) 5

6. Fluid flows in an annulus of inner diameter 0.8 m and outer diameter 1 m. Heat is transferred to the fluid from, inner tube surface of the annulus. What is the equivalent diameter for heat transfer in m?
   (a) 0.45
   (b) 0.20
   (c) 1.64
   (d) 9.69

7. Vetrocoke solution is:
   (a) a mixture of K_2CO_3 and As_2O_3
   (b) K_2SO_4
   (c) A mixture of Na_2CO_3 and As_2O_3
   (d) Na_2SO_4

8. A nitrogenous fertiliser contains 20% N2. It could be:
   (a) ammonium nitrate
   (b) calcium ammonium nitrate (CAN)
   (c) urea
   (d) ammonium chloride

9. In the manufacture of $H_3\ PO_4$ (ortho); strong $H_2\ SO_4$ leaching wet process as compared to electric furnace process:
   (a) uses lower grade phosphate rock
   (b) requires lower capital investment in the plant
   (c) produces lower purity acid
   (d) is very costly

10. As reflux ratio increases, operating cost _ _ _ _ _ _ _ and fixed cost _ _ _ _ _ _
   (a) Passes through a minimum, increases
   (b) Increases, passes through a minimum
   (c) Increases, decreases
   (d) Decreases, passes through a minimum

11. At standard temperature and pressure the diffusivity of a gas in air is $1x10^{-5}m^2/s$. If the temperature is increased to four times the previous value and pressure is decreased to half the previous value, all else being constant, the value of diffusivity will be:
   (a) Increased 8 times
   (b) Decreased 16 times
   (c) Increased 16 times
   (d) Decreased 8 times

12. According to Film theory, Effective film thickness is defined as:
   (a) The thickness in which 99% of the concentration difference resides
   (b) The thickness in which 67% of the concentration difference resides
   (c) The thickness in which 89% of the concentration difference resides
   (d) The thickness in which 100% of the concentration difference resides

13. Rate of leaching increases with increase in:
    (a) Temperature
    (b) Viscosity of solvent
    (c) Pressure
    (d) Size of solid

14. A solid is being dried in the linear drying rate regime from moisture content X_o to X_F. The drying rate is zero at $X = 0$ and the critical moisture content is the same as the initial moisture X_o. The drying time for $M = (L_s/A\ R_c)$ is (where, L = total mass of dry solid, A = total surface area for drying R_c = Constant maximum drying rate per unit area X = moisture content (in mass of water/mass of dry solids):
    (a) $M(X_0-X_F)$
    (b) $M(X_0/X_F)$
    (c) $M \ln(X_0/X_F)$
    (d) $MX_0 \ln(X_0/X_F)$

15. A unit-step input is given to a process described by the transfer function $(s-4)/(s^2+3s+2)$. The initial value (at t = 0 +) of the derivative of the output variable in response to the step input is:
    (a) −2
    (b) 0
    (c) 1
    (d) 2

16. Utilities cost in the operation of chemical process plant comes under the:
    (a) Plant overhead cost
    (b) Fixed charges
    (c) Direct production cost
    (d) General expenses

17. Annual depreciation cost are not constant when, the _____ method of depreciation calculation is used:
    (a) Straight line
    (b) Sinking fund
    (c) Present worth
    (d) Declining balance

18. Pick out the wrong statement:
    (a) Net worth means paid up share capital and reserve & surplus
    (b) Return on equity = profit after tax/net worth
    (c) Working capital turn over ratio = sales/net working capital
    (d) Total cost of production is more than net sales realisation (NSR) at break even point

19. Which of the following is not a component of working capital?
    (a) Raw materials in stock.
    (b) Finished products in stock.
    (c) Transportation facilities.
    (d) Semi-finished products in the process

20. Smoke density of flue gas is measured by:
    (a) Photo electric cell
    (b) Thermal conductivity meter
    (c) Chromatograph
    (d) Polarography

21. The net positive suction head (NPSH) of a centrifugal pump is defined as the sum of the velocity head and the pressure head at the:
    (a) Discharge
    (b) Suction
    (c) Suction minus vapor pressure of the liquid at suction temperature
    (d) Discharge minus vapor pressure of the liquid at the discharge temperature

22. Boundary layer separation is characterized by one of the conditions given below, where 'Re' is the Reynolds number for the flow. Select the appropriate conditions:
    (a) Re << 1, accelerating flow
    (b) Re >> 1, accelerating flow
    (c) Re << 1, decelerating flow
    (d) Re >>1, decelerating flow

23. In a consecutive reaction system $A \xrightarrow{E_1} B \xrightarrow{E_2} C$ when E_1 is much more greater than E_2, the yield of B increases with the:
    (a) Increases of temperature
    (b) Decrease of temperature
    (c) Increase in initial concentration of A
    (d) Decrease in initial concentration of A

24. The heat flow equation through a cylinder of inner radius "r_1" and outer radius "r_2" is desired in the same form as that for heat flow through a plane wall. The equivalent area A_m is given by:

(a) $\dfrac{A_1 + A_2}{\log_e\left(\dfrac{A_2}{A_1}\right)}$

(b) $\dfrac{A_1 + A_2}{2\log_e\left(\dfrac{A_2}{A_1}\right)}$

(c) $\dfrac{A_2 - A_1}{2\log_e\left(\dfrac{A_2}{A_1}\right)}$

(d) $\dfrac{A_2 - A_1}{\log_e\left(\dfrac{A_2}{A_1}\right)}$

25. Given the following data,
Inside heat transfer coefficient = 25 W/m^2K.
Outside heat transfer coefficient = 25 W/m^2K
Thermal conductivity of bricks (15 cm thick) = 0.15 W/mK,
The overall heat transfer coefficient (in W/m^2K) will be closer to the:
(a) Inverse of heat transfer coefficient
(b) Heat transfer coefficient
(c) Thermal conductivity of bricks
(d) Heat transfer coefficient based on the thermal conductivity of the bricks alone

26. Two spheres A and B of same material have radii 1 m and 4 m and temperature 4000 K and 2000 K respectively.
Which of the following statement is correct?
The energy radiated by sphere A is:
(a) Greater than that of sphere B
(b) Less than that of sphere B
(c) Equal to that of sphere B
(d) Equal to double of sphere B

27. The Graetz number is concerned with the:
(a) mass transfer between a gas and a liquid
(b) absorption with chemical reaction
(c) heat transfer in turbulent flow
(d) heat transfer in laminar flow

28. The overall heat transfer co-efficient for a shell and tube heat exchanger for clean surfaces is U_0 = 400 $W/m^2.K$. The fouling factor after one year of operation is found to be h_{d0} = 2000 $W/m^2.K$. The overall heat transfer co-efficient at this time is:
(a) 1200 $W/m^2.K$
(b) 894 $W/m^2.K$
(c) 333 $W/m^2.K$
(d) 287 $W/m^2.K$

29. Hydrogenation of edible oils is done to:
(a) Decrease the number of unsaturated bond
(b) Lower the melting point of oil
(c) Increase the thermal conductivity of oil
(d) Enable the oil to be packed in tin containers

30. If the relative volatility of a binary mixture is very low, separation is not economically feasible by simple distillation. In such cases a third component called “entrainer” is added to the mixture. The purpose of the entrainer is:
(a) To increase the relative volatility by making an azeotrope with one of the constituents
(b) To increase the relative volatility by making a solution with one of the constituents
(c) Both of these
(d) None of the above

31. Fenske's equation for determining the minimum number of theoretical stages in a distillation column is applicable under the assumption that:
    (a) Boiling point of the mixture doesn't change
    (b) Relative volatility is constant
    (c) Mixture shows positive deviations from ideality
    (d) Mixture shows negative deviations from ideality

32. Drying operation under vacuum is done so that:
    (a) Drying temperature can be increased
    (b) Drying temperature can be decreased
    (c) materials having high bound moisture content can be dried
    (d) materials having high unbound moisture content can be dried

33. The unit impulse response of a first-order process is 5exp[−t/4]. The gain and time constant of the process are, respectively:
    (a) 5 and 4
    (b) 10 and 4
    (c) 5 and 0.25
    (d) 20 and 4

34. In the agitators, the power required will be changed with the increase of diameter of agitator (*D*) as:
    (a) D^5
    (b) D^2
    (c) D
    (d) D^9

35. A forced circulation long tube vertical evaporator as compared to the natural circulation evaporator:
    (a) Is economical in operation
    (b) Employs high velocity, high heat transfer rate and less heating surface requirement
    (c) Employs a centrifugal pump placed between external downtake from vapor drum and inlet to tube bundle.
    (d) Both (b) & (c)

36. Hazards associated with the relief valve leakage for extremely hazardous material storage can be taken care of by providing:
    (a) Rupture diaphragm
    (b) Dikes
    (c) Surge chamber
    (d) None of these

37. Thermistor, which has high temperature coefficient of resistivity, is used as the sensing element in resistance thermometer. It is a/an:
    (a) Conductor
    (b) Insulator
    (c) Solid semi-conductor
    (d) Liquid semi-conductor

38. The terminal velocity of a small sphere settling in a viscous fluid varies as the:
    (a) First power of its diameter
    (b) Inverse of the fluid viscosity
    (c) Inverse square of the diameter
    (d) Square of the difference in specific weights of solid & fluid

39. Very small pressure difference (< 5 mm water column) can be most conveniently measured by a/an _____ manometer:
    (a) U-tube water
    (b) U-tube mercury
    (c) Inclined tube mercury
    (d) Inclined tube water

40. With increase in the shear rate, the apparent viscosity of pseudoplastic fluids:
    (a) Increases
    (b) Decreases
    (c) Remains same
    (d) May increase or decrease; depends on the magnitude of shear rate

41. For an autocatalytic reactor, the suitable reactor set up is:
    (a) P.F. reactors in series.
    (b) CSTR in series
    (c) CSTR followed by P.F. reactor
    (d) P.F. reactor followed by CSTR

42. In a condenser, water enters at 30°C and flows at the rate 1500 kg/hr. The condensing steam is at a temperature of 120°C and cooling water leaves the condenser at 80°C. Specific heat of water is 4.187 kJ/kg K. If the overall heat transfer coefficient is 2000 W/m2K, then heat transfer area is:
    (a) 0.707 m^2
    (b) 7.07 m^2
    (c) 70.7 m^2
    (d) 141.4 m^2

43. Hot oil is cooled from 80 to 50°C in an oil cooler which uses air as the coolant. The air temperature rises from 30 to 40°C. The designer uses a LMTD value of 26°C. The type of heat exchanger is:
    (a) Parallel flow
    (b) Double pipe
    (c) Counter Flow
    (d) Cross Flow

44. When α is absorbtivity, ρ is reflectivity and τ is transmissivity, then for diathermanous body, which of the following relation is valid?
    (a) $\alpha = 1, \rho = 0, \tau = 0$
    (b) $\alpha = 0, \rho = 1, \tau = 0$
    (c) $\alpha = 0, \rho = 0, \tau = 1$
    (d) $\alpha + \rho = 1, \tau = 0$

45. Match the unit processes in Group 1 with the industries in Group 2

Group 1	**Group 2**
P. Saponification	1. Petroleum refining
Q. Calcination	2. Synthetic fibres
R. Alkylation	3. Cement
	4. Soaps and Detergents

Codes:

(a) P-4, Q-3, R-2
(b) P-4, Q-2, R-1
(c) P-4, Q-1, R-2
(d) P-4, Q-3, R-1

46. Oxidation of SO_2 to SO_3 is favoured by:

(a) low temperature and low pressure
(b) low temperature and high pressure
(c) high temperature and low pressure
(d) high temperature and high pressure

47. In a distillation column, weeping can be prevented by:

(a) Increase liquid flow rate
(b) Increase vapor flow rate
(c) Decrease liquid flow rate
(d) Decrease vapor flow rate

48. In extraction, as the temperature increases, the area covered by the bimodal curve:

(a) Decreases
(b) Increases
(c) Remains unchanged
(d) Passes through a maximum

49. In gas absorption, the operating line is straight only when plotted in terms of _ _ _ _ _ _ units:

(a) Mole fraction
(b) Molarity
(c) Partial pressure
(d) Mole ratio

50. An ideal binary mixture of n - heptane (A) and n - octane (B) at 110 °C temperature and atmospheric pressure is at equilibrium in a cylindrical vessel. If the saturation vapor pressure of pure A and B is 1050 and 484 mm Hg, the liquid mole fraction of A is:

(a) 0.55
(b) 0.40
(c) 0.20
(d) 0.48

51. In extraction, solvent should be chosen such that it should have:

(a) High distribution coefficient
(b) Low distribution coefficient
(c) Low recoverability
(d) High chemical reactivity

52. For a first-order lead system with transfer function $g(s) = K(\zeta s + 1)$, the corner frequency is given by:
    (a) $1/\zeta$
    (b) π/ζ
    (c) $2\pi/\zeta$
    (d) $2/\zeta$

53. Optimum economic pipe diameter for fluid is determined by the:
    (a) Viscosity of the fluid
    (b) Density of the fluid
    (c) Total cost considerations (pumping cost plus fixed cost of the pipe)
    (d) None of the above

54. Which of the following is not a current asset of a chemical company?
    (a) Inventories
    (b) Chemical equipments
    (c) Marketable securities
    (d) None of the above

55. The value of fouling factor depends upon the:
    (a) Characteristic of process fluid.
    (b) Velocity of process fluid containing suspended solids
    (c) Suspended solids in the fluid
    (d) All (a), (b) and (c)

56. In a heat exchanger, shell side fluid velocity can be changed by changing the tube:
    (a) Layout
    (b) Pitch
    (c) Both (a) and (b)
    (d) Neither (a) nor (b)

57. Match the following:

Group 1	**Group 2**
(P) Viscosity	(1) Pyrometer
(Q) Pressure	(2) Hot wire anemometer
(R) Velocity	(3) Rheometer
(S) Temperature	(4) Piezoelectric element

    (a) P-4, Q-3, R-1, S-2
    (b) P-3, Q-4, R-2, S-1
    (c) P-3, Q-4, R-1, S-2
    (d) P-4, Q-3, R-2, S-1

58. A binary distillation column is operating with a mixed feed containing 20 mol% vapour. If the feed quality is changed to 80 mol% vapour, the change in the slope of the q-line is:
    (a) 1.75
    (b) 2.75
    (c) 3.75
    (d) 4.75

59. In case of a pressure driven laminar flow of a Newtonian fluid of viscosity (μ) through a horizontal circular pipe, the velocity of the fluid is proportional to:
    (a) μ
    (b) $\mu^{0.5}$
    (c) μ^{-1}
    (d) $\mu^{-0.5}$

60. In a steady and incompressible flow of a fluid (density = 1.25 kg m^{-3}), the difference between stagnation and static pressures at the same location in the flow is 30 mm of mercury (density = 13600 kg m^{-3}). Considering gravitational acceleration as 10 m s^{-2}, the fluid speed (in m s^{-1}) is:
    (a) 49-52
    (b) 59-62
    (c) 69-72
    (d) 79-82

61. Black liquor generated during paper manufacture is concentrated in a:
    (a) single effect evaporator
    (b) single effect evaporator followed by a crystalliser
    (c) multiple effect evaporator
    (d) multiple effect evaporators followed by a crystalliser

62. Claude process of gas liquefaction employs:
    (a) Merely compression of gas beyond its critical pressure
    (b) Joule-Thomson expansion cooling
    (c) Heat exchange with colder stream
    (d) Adiabatic expansion against a piston or in a turbine

63. Which of the following is not an intensive property?
    (a) Chemical potential
    (b) Surface tension
    (c) Heat capacity
    (d) None of these

64. The theoretical minimum work required to separate one mole of a liquid mixture at 1 atm, containing 50 mole % each of n- heptane and n- octane into pure compounds each at 1 atm is:
    (a) -2 *RT* ln 0.5
    (b) -*RT* ln 0.5
    (c) 0.5 *RT*
    (d) 2 *RT*

65. If the vapour pressure at two temperatures of a solid phase in equilibrium with its liquid phase are known, then the latent heat of fusion can be calculated by the:
    (a) Maxwell's equation
    (b) Clayperon-Claussius equation
    (c) Van Laar equation
    (d) Nernst Heat Theorem

66. Carbon monoxide (CO) is burnt in presence of 200% excess pure oxygen and the flame temperature achieved is 2298 K. The inlet streams are at 25 °C. The standard heat of formation (at 25 °C) of CO and CO_2 are -110kJ $mol^{-1}$and -390 kJ mol^{-1}, respectively. The heat capacities (in J $mol^{-1}K^{-1}$) of the components are
    $C_{PO2} = 25+14x10^{-3}$ T
    $C_{PCO2} = 25+42x10^{-3}$ T
    Where, *T* is the temperature in K. The heat loss (in kJ) per mole of CO burnt is:
    (a) 32.0 to 38.0
    (b) 39.0 to 45.0
    (c) 46.0 to 52.0
    (d) 53.0 to 59.0

67. Which of the following is an undesirable dynamic characteristic of an instrument?
    (a) Reproducibility
    (b) Dead zone
    (c) Time lag
    (d) Static error

68. Which of the following is the dynamic characteristics of an instrument?
    (a) Reproducibility
    (b) Sensitivity
    (c) Dead zone
    (d) Fidelity

69. Which of the following relates the emf generated in a single homogeneous wire to the temperature difference?
    (a) Peltier effect
    (b) Thomson effect
    (c) Seebeck effect
    (d) None of the above

70. A metal oxide is reduced by heating it in a stream of hydrogen. After complete reduction, it is found that 3.15 gm of the oxide has yielded 1.05 gm of the metal. It may be inferred that the:
    (a) atomic weight of the metal is 4
    (b) equivalent weight of the metal is 4
    (c) atomic weight of the metal is 2
    (d) equivalent weight of the metal is 8

71. Which one among the following was successfully tested in Germany recently as World's first green helicopter which is environment friendly and emission free?
    (a) Volocopter
    (b) Sikorsky
    (c) Eurocopter
    (d) Bell

72. Recently Iran had clinched a deal with six world powers to curb nuclear activities. Which one among the following is not a party to it?
    (a) USA
    (b) France
    (c) Russia
    (d) Japan

73. Which one among the following systems contains the oldest rock formation of India?
    (a) Aravalli System
    (b) Archean System
    (c) Cuddapah System
    (d) Vindhyan System

74. How much approximately is the total area of Punjab?
    (a) 10,992 Square Kilometer
    (b) 21,231 Square Kilometer
    (c) 50,362 Square Kilometer
    (d) 8,756 Square Kilometer

75. Virasat-e-Khalsa is situated in which city?
    (a) Ludhiana
    (b) Amritsar
    (c) Anandpur Sahib
    (d) Patiala

76. Who is the Punjabi Poetess to get Jananpith Award?
    (a) Ms Amrita Shergill
    (b) Ms Amrita Pritam
    (c) Ms Dilip Kaur Tiwana
    (d) Ms Sharmila Panday

77. Which town of Punjab has the largest grain market of Asia?
    (a) Ludhiana
    (b) Samrala
    (c) Bathinda
    (d) Khanna

78. SAPTA is related to:
    (a) Communication
    (b) Infrastructure
    (c) Trade
    (d) Transport

79. In which of the following National Congress sessions was the "Quit India" resolution passed?
    (a) Lahore Session of 1926
    (b) Madras Session of 1927
    (c) Bombay Session of 1942
    (d) Ramgarh Session of 1940

80. The Government of India has established NITI Aayog to replace the:
    (a) Human Rights Commission
    (b) Finance Commission
    (c) Law Commission
    (d) Planning Commission

81. The concept of Public Interest Litigation originated in:
    (a) United Kingdom
    (b) Australia
    (c) The United States
    (d) Canada

82. The Government of India Act, 1919 was based on:
    (a) Morley – Minto Reforms
    (b) Montagu – Chelmford Report
    (c) Ramsay Mac-Donald Award
    (d) None of the above

83. Which one of the following Bills must be passed by each house of the Indian Parliament separately, by special majority?
    (a) Ordinary Bill
    (b) Money Bill
    (c) Finance Bill
    (d) Constitution Amendment Bill

84. The resolution for removing the Vice President of India can be moved in the:
    (a) Lok Sabha alone
    (b) Either House of Parliament
    (c) Joint sitting of Parliament
    (d) Rajya Sabha alone

85. In order to provide pensions to the workers of the unorganised sector, which one among the following schemes has been launched by the Govt?
    (a) Swabhiman
    (b) Swavalamban
    (c) Swadhar
    (d) Aadhaar

86. Which one among the following is the latest nation to join the WTO?
    (a) North Korea
    (b) China
    (c) Russia
    (d) Afghanistan

87. India's rank in Human Capital Index 2016 is:
    (a) 110^{th}
    (b) 150^{th}
    (c) 105^{th}
    (d) 85^{th}

88. The condition of Aphelian occurs on_____
    (a) 4^{th} June
    (b) 4^{th} July
    (c) 21^{st} June
    (d) 21^{st} July

89. Sunda Trench (Java Trench) is located in:
    (a) Indian Ocean
    (b) Pacific Ocean
    (c) Atlantic Ocean
    (d) None of the above

90. In a Presidential system, the legislature can remove the President by:
    (a) Impeachment only
    (b) Token out
    (c) A vote of no-confidence
    (d) None of the above

91. The Rowlett Act stood for :
    (a) Compulsory economic support to war efforts
    (b) Imprisonment without trial and summary Procedures for trial
    (c) Suppression of the khilafat Movement
    (d) Imposition of Restrictions on freedom of the press

92. Which one of the following rights was described by Dr. Ambedkar as “the heart and soul” of the Constitution?
    (a) Right to Equality
    (b) Right against Exploitation
    (c) Right to constitutional remedies
    (d) Right to freedom of religion

93. Step well Rani-ki-vav which was approved as a world Heritage site by the UNESCO in 2014, is located in:
    (a) Gujarat
    (b) Rajasthan
    (c) Punjab
    (d) Tamil Nadu

94. What is the full form of NCC?
    (a) National Cadet Council
    (b) National Cadet Corps
    (c) National Corps Committee
    (d) National Cadet Committee

95. Arrange the following cities of Punjab from West to East:

1. Bathinda 2. Muktsar 3. Barnala 4. Fatehgarh Sahib

(a) 2 1 3 4
(b) 1 2 4 3
(c) 1 2 3 4
(d) 3 2 1 4

96. Guru Gobind Singh fought his first battle at:

(a) Bhangani
(b) Anandpur
(c) Chamkaur
(d) Muktsar

97. The concept of Miri and Piri was enunciated by :

(a) Guru Angad Dev
(b) Guru Arjan Dev
(c) Guru Hargobind
(d) Guru Gobind Singh

98. The last battle of Anglo-Sikh wars was fought at:

(a) Sabraon
(b) Ramnagar
(c) Gujarat
(d) Chillian wala

99. The compositions of which one of the following Gurus are not contained in the Adi Granth?

(a) Guru Arjan Dev
(b) Guru Hargobind
(c) Guru Angad Dev
(d) Guru Amar Dass

100. Chandi-di-war is contained in:

(a) Adi Granth
(b) Dasam Granth
(c) Sau Sakhis
(d) Sar Kathavali

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