074/2016

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. The Constituent Assembly firstly summoned in Constitution Hall. Which is recently known as :
   (A) Constituent Assembly Hall
   (B) Central Hall of Parliament
   (C) Assembly Hall of Lok Sabha
   (D) Assembly Hall of Rajya Sabha

2. Which articles of Indian Constitution deals about citizenship?
   (A) Article 14–18
   (B) Article 36–51
   (C) Article 5–11
   (D) Article 6–12

3. The Untouchability Offence Act passed by Indian parliament in :
   (A) 1955
   (B) 1956
   (C) 1961
   (D) 1972

4. The Right to Information Act came to exist on :
   (A) 2005 – Sept. 16
   (B) 2005 – Aug. 18
   (C) 2005 – Nov. 13
   (D) 2005 – Oct. 12

5. The first Echo Tourism Centre in India :
   (A) Thattekkad
   (B) Thenmala
   (C) Pampadumpara
   (D) Odakkali

6. 'Veenapoov' of Kumaranasan firstly published in :
   (A) Vivekodayam
   (B) Swaraj
   (C) Malayalee
   (D) Mithavadi

7. The Newspaper Al-Ameen was started by :
   (A) Muhammed Abdul Rahman
   (B) Vakkam Abdul Khader Moulavi
   (C) Moulana Abdul Kalam Azad
   (D) Moulana Shoukathali

8. The headquarter of Kerala Sahitya Akkadami transferred from Thiruvananthapuram to Thrissur in :
   (A) 1958
   (B) 1956
   (C) 1957
   (D) 1961

9. Who was inaugurated Kerala Sangeetha Nadaka Akkadami in 1958?
   (A) Chithira Thirunal Bala Rama Varma
   (B) Pattam Thanu Pilla
   (C) Jawaharlal Nehru
   (D) E.M.S. Namboothiripad

10. Who is regarded as 'John of Arch' of Kerala?
(A) Akkamma Cheriyan
(B) Anna Chandi
(C) Parvathi Nenmenimangalam
(D) A.V. Kuttimalu Amma

11. The real name of Brahmananda Siva Yogi :
(A) Karatt Achutha Menon
(B) Karatt Govinda Menon
(C) Krishnan Nambiadiri
(D) Kunchi Kannan

12. Who got the 'Njanapita Award' of 2014?
(A) O.N.V. Kurup
(B) Thara Sankar Bandopadyaya
(C) Balachandra Nomade
(D) Amritha Preetham

13. Who wrote the first biography of Sree Narayana Guru?
(A) Moorkoth Ramanunni
(B) Kumaranasan
(C) Moorkoth Kumaran
(D) Dr. Palppu

14. The Association formed by Poykayil Yohannan :
(A) PRCS
(B) PRDA
(C) PADS
(D) PRDS

15. Who was the first Non-Brahmin man who ring the temple bell of Guruvayoor Temple?
(A) P. Krishna Pillai
(B) T.K. Madhavan
(C) K. Kelappan
(D) Mannathu Padmanabhan

16. 'Atmanutapam' written by :
(A) Chattambi Swamikal
(B) Vakbadananda
(C) Markuriakose Elias Chavara
(D) Vaikunda Swamikal

17. Who is regarded as 'Kerala Hemingway'?
(A) M.T. Vasudevan Nair
(B) Thakazhi Sivasankara Pillai
(C) C.V. Raman Pillai
(D) Kurisseri Gopala Pillai

18. Who is called the Legal Adviser of Indian Government?
(A) Attorni General
(B) Advocate General
(C) Controller and Auditor General
(D) Planning Commission

19. The first women speaker of Lok Sabha, Meerakumar was elected from which constituency?
(A) Thoothukudi
(B) Sasaram
(C) Amaravati
(D) Indore

20. The aim of 'Rajiv Awaz Yojana' :
(A) Rural housing
(B) Urban housing
(C) Slum free India
(D) Housing for SC, ST

21. The expression which indicates the units of a physical quantity in terms of fundamental units is :

(A) homogenous equation
(B) dimensional equation
(C) analysis equation
(D) none of these

22. The maximum permissible error in a difference $z = x - y$ is :

(A) $\Delta z = \Delta x + \Delta y$ and $\Delta z / z = (\Delta x + \Delta y)/(x - y)$
(B) $\Delta z = \Delta x - \Delta y$ and $\Delta z / z = (\Delta x - \Delta y)/(x - y)$
(C) $\Delta z = \Delta x + \Delta y$ and $\Delta z / z = (\Delta x - \Delta y)/(x - y)$
(D) $\Delta z = \Delta x + \Delta y$ and $\Delta z / z = (\Delta x + \Delta y)/(x + y)$

23. The threshold frequency corresponds to the wavelength of radiation incident on certain metal with work function 3.31×10^{-19} J is : ($h = 6.62 \times 10^{-34}$ Js)

(A) $\Lambda = 6500$ Å
(B) $\Lambda = 6200$ Å
(C) $\Lambda = 6000$ Å
(D) $\Lambda = 7000$ Å

24. Which of the following schemes does not produce lasing action?

(A) Two level
(B) Three level
(C) Four level
(D) Five level

25. A person sitting inside a car is safe because :

(A) The electric field inside the car is equal to the field outside
(B) The electric field inside the car is zero
(C) The electric field inside the car will be cancelled by lightning
(D) The electric field inside the car is infinity

26. The differential form of Gauss's theorem is :

(A) $V.E = \rho / \mu_0$
(B) $V^2 E = 0$
(C) $V.E = \rho / \varepsilon_0$
(D) $V.V = \rho / \varepsilon_0$

27. Change in entropy when 0.2 kg water falls in temperature from 360 K to 340 K is :

(A) 0.482 J/K
(B) 0.0482 J/K
(C) –0.482 J/K
(D) –0.428 J/K

28. The Mayer's relation is :

(A) $C_P - C_V = R$
(B) $C_P / C_V = r$
(C) $PV = nRT$
(D) None of these

29. At terminal velocity, the acceleration of the body is :

(A) maximum
(B) same as that of the velocity
(C) square of the velocity
(D) zero

30. The velocity of the particle is given by the relation $v = at^2 + bt + c$. The dimension of a, b and c are :

(A) $(LT^{-3}, LT^{-2}, LT^{-1})$
(B) $(LT^{-1}, L^{-1}T^2, LT^{-1})$
(C) (LT^3, LT^{-2}, LT^2)
(D) (LT^{-3}, LT^2, LT^{-1})

31. The Young's modulus $Y = MgL/\pi r^2 l$, it is given that $L = 2.890$ m, $M = 3.00$ kg, $g = 9.81$ m/s^2, $r = 0.041$ cm, $l = 0.087$ m. The possible percentage of error is :

(A) 6.036%
(B) 6.306%
(C) 6.360%
(D) 6.630%

32. Of the five spectrum series of hydrogen, which one lies in ultraviolet region?

(A) Balmer series
(B) Lyman series
(C) Pfund series
(D) Bracket series

33. A quarter wave plate produces a path difference of :

(A) $\lambda/4$
(B) $2\lambda/4$
(C) $3\lambda/4$
(D) $4\lambda/4$

34. The force F experienced by a moving charge with speed v in electric and magnetic field is :

(A) $F = [qE + (v \times B)]$
(B) $F = [E + q(v \times B)]$
(C) $F = [q(E \times B) + v]$
(D) $F = q[E + (v \times B)]$

35. The frequency of oscillation of charging LCR circuit is :

(A) $f = 2\pi\sqrt{1/LC - R^2/4L^2}$
(B) $f = 1/2\pi\sqrt{1/LC - R^2/4L^2}$
(C) $f = 2\pi\sqrt{1/LC^2 - R^2/4L^2}$
(D) $f = 1/2\pi\sqrt{1/LC - R/4L}$

36. The dimension of scattering cross section is that of :

(A) velocity
(B) volume
(C) area
(D) none of these

37. The work done in blowing a bubble of surface tension T, having radius r is :

(A) $4\pi r^2 T$
(B) $4\pi T/r^2$
(C) $8\pi r^2 T$
(D) $8/\pi r^2 T$

38. If l is the moment of inertia, ω is the angular velocity and m is the mass of a rotating body then kinetic energy is

(A) $K = \frac{1}{2} m\omega^2$ (B) $K = \frac{1}{2} l\omega^2$

(C) $K = \frac{1}{2} lm\omega^2$ (D) $\frac{1}{2} l^2 m\omega^2$

39. In CE amplifier emitter current = 6 mA, base current = 0.1 mA, then current gain is :

(A) 59 (B) 65

(C) 60 (D) 50

40. A galvanometer having 30 divisions and a current sensitivity of 20 μA/div and it has a resistance of 25 Ω. To convert it into an ammeter up to 1 amp, the shunt required is :

(A) 1.050 Ω (B) 1.0050 Ω

(C) 1.510 Ω (D) 0.1050 Ω

41. The additional term introduced by Maxwell to remove the inconsistency of Ampere' law is :

(A) $\mu_0 \partial B/\partial t$ (B) $\varepsilon_0 \partial^2 E/\partial t^2$

(C) $\varepsilon_0 \partial E/\partial t$ (D) $\mu_0\varepsilon_0 \partial^2 E/\partial t^2$

42. The efficiency of a network when it transfer maximum power to the load is :

(A) 25% (B) 50%

(C) 75% (D) 100%

43. Skieter, the dog weighs exactly 36.5 kg. When weighed on a defective scale he weighed 38 kg. The percentage of error in measurement of defective scale to the nearest tenth is :

(A) 4.1% (B) 4.3%

(C) 4.2% (D) 4.0%

44. When a plane polarised light incident on a rotating analyser, in one complete rotation one finds :

(A) one complete extinction

(B) one brightness and two complete extinction

(C) two brightness and one complete extinction

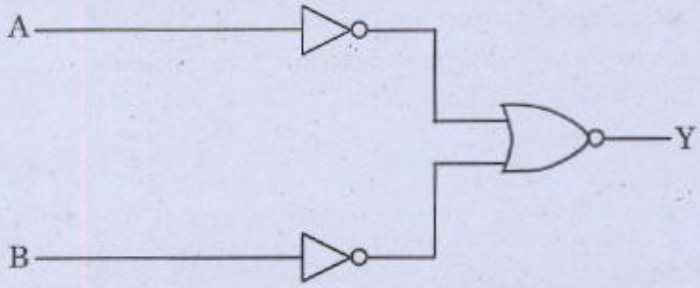
(D) two brightness and two complete extinction

45. Sky is blue because of :

(A) Raman scattering (B) Rayleigh scattering

(C) Brillouin scattering (D) Meiser scattering

46. Which of the logic gate is represented by the following combination?



(A) OR
(B) NAND
(C) AND
(D) NOR

47. A uniform electric field pointing in positive y direction exists in a region. Let A be the origin, B be the point on x axis at $x = 2$ cm and C be the point on y axis at $y = 2$ cm, the potential at the points A, B and C satisfy :

(A) $V_A < V_B$
(B) $V_A > V_B$
(C) $V_A < V_C$
(D) $V_A > V_C$

48. A cricket ball is thrown at a speed of 28 m/s in a direction 30° above the horizontal, the distance from the thrower to the point where the ball returns to the same level is :

(A) 72 m
(B) 69 m
(C) 70 m
(D) 58 m

49. The escape velocity of a body depends on :

(A) mass of the body
(B) the direction of projection
(C) the location from where it is projected
(D) the height of the location from where it is projected

50. The unit of power of lens is :

(A) dioptre
(B) square metre
(C) N/m^2
(D) decibel

51. The dimension of gravitational field intensity is :

(A) LT^{-2}
(B) MLT^2
(C) L^2MT
(D) None of these

52. The wavelength of light, when the angle of minimum deviation is 30° for the second order and the number of lines per cm of the grating is 5000, is :

(A) 5.107×10^{-7} m
(B) 51.07×10^{-7} m
(C) 5.176×10^{-7} m
(D) 5.106×10^{-7} m

53. The spherical aberration of the lens can be minimised :
(A) by using a crossed lens
(B) by using two lenses separated by a distance
(C) by using a planable lens
(D) all of these

54. A bullet of mass 0.04 kg moving with a speed of 90 m/s enters a heavy wooden block and stopped after distance of 60 cm. The retardation of the bullet is :
(A) $-6750\ m/s^2$ (B) $-6570\ m/s^2$
(C) $-7650\ m/s^2$ (D) $-6705\ m/s^2$

55. The percentage in the measurement of mass and velocity is 1% and 2% respectively. Then the percentage error in kinetic energy is :
(A) 4% (B) 5%
(C) 6% (D) 8%

56. The measured value of a quantity is 75.5 and the expected value is 80.0. Then the relative error is :
(A) 0.05% (B) –5.6%
(C) –6.5% (D) 6.5%

57. Which property of zener diode is used to regulate supply voltage?
(A) At break down voltage there is a large in the reverse current
(B) The large reverse current will change the reverse voltage
(C) The zener voltage is independent of the current through the diode
(D) None of these

58. The density of atmosphere at sea level is $1.29\ kg/m^3$. Assume that it does not change with altitude, the atmosphere extended up to :
(A) 8 km (B) 9.5 km
(C) 12.5 km (D) 18 km

59. The least count of screw gauge is given by :
(A) pitch / number of division on main scale
(B) magnitude of one main scale division / number of division on vernier scale
(C) pitch / number of division on head scale
(D) magnitude of one pitch scale division / number of division on vernier scale

60. In Newton's ring experiment the diameter of m^{th} ring changes from 1.2 cm to 1 cm when the air space between the lens and the plate is replaced by some transparent liquid. The refractive index of the liquid is :
(A) 1.45 (B) 1.44
(C) 1.33 (D) 1.35

61. How one can prepare a p-type conducting polymer from polyacetylene?

(A) Doping with Na^+ (B) Doping with Ca^{2+}

(C) Doping with Naphthalene (D) Doping with I^-

62. The fact that differentiate a conducting polymer from a conventional metallic conductor is :

(A) conducting polymer exhibits metallic lustre

(B) conducting polymer possesses a valance band and conduction band

(C) the charge carriers in conducting polymers are electrons

(D) in conducting polymers the conductance increases with increase in temperature

63. Monomer unit of Neoprene is :

(A) Chloroprene (B) Isoprene

(C) Acetylene (D) Caprolactum

64. Find out the odd one among the following polymers :
Polyethylene, Polystyrene, Teflon, Nylon 6,6

(A) Polyethylene (B) Polystyrene

(C) Teflon (D) Nylon 6,6

65. Which one of the following is a method for the preparation of carbon nanotubes?

(A) High pressure carbon monoxide process

(B) Chemical vapour deposition method

(C) Arc discharge method

(D) All the above

66. What is the hybridisation of carbon in carbon nanotube?

(A) sp (B) dsp^2

(C) sp^2 (D) sp^3

67. Which of the following is related with carbon nanotubes?

(A) Single walled (B) Chiral

(C) Arm chair (D) All the above

68. Which one of the following is an example for a thermosetting plastic?

(A) Polypropylene (B) Polystyrene

(C) PVC (D) Bakelite

69. The parameter which is measured experimentally in a bomb calorimeter is :

(A) ΔC_V (B) ΔH_C

(C) ΔG_C (D) ΔT

70. The process inside a bomb calorimeter is assumed to be :

(A) isenthalpic
(B) isobaric
(C) adiabatic
(D) isothermal

71. Beer-Lambert law shows deviation of higher concentrations because :

(A) wavelength of incoming radiation experiences a variation at higher concentrations
(B) intermolecular interactions becomes significant at higher concentrations
(C) path length measurements errs at higher concentrations
(D) none of the above

72. A substance which absorbs the wavelengths at the red end of the visible spectrum appears :

(A) white
(B) blue
(C) black
(D) red

73. The internal standard used in proton NMR spectroscopy to calibrate chemical shift is :

(A) D_2O
(B) $COCl_3$
(C) Tetramethyl silane
(D) DMSO-D_6

74. Unit of chemical shift is :

(A) nm
(B) ns
(C) MHz
(D) ppm

75. Paper chromatography is an example for :

(A) Adsorption chromatography
(B) Ion exchange chromatography
(C) Partition chromatography
(D) None of the above

76. In a chromatography experiment the distance travelled by the solvent measured is 10 cm. If the distance travelled by the sample is 5 cm, what is the R_f -value of the sample?

(A) $\frac{10}{5}$
(B) $\frac{5}{10}$
(C) 5×10
(D) None of these

77. An X-ray diffraction pattern is a plot of :

(A) λ against d
(B) θ against λ
(C) 2θ against intensity
(D) none of these

78. Which one of the following is correct about TGA (Thermogravimetric analysis)?

(A) Used to find out the melting point
(B) Used to find out the enthalpy of phase transitions
(C) It is a plot of heat flow Vs temperature
(D) It is a plot of percentage weight loss against temperature and helps to find out decomposition temperature of a sample

79. Which one of the following is correct about DTA (Differential thermal analysis)?
(A) It provides information about the weight loss of a compound upon heating
(B) Helps to find out the dissociation temperature of a compound
(C) It is a plot of ΔT against temperature and provides information about the exothermic and endothermic events happening in a sample
(D) None of the above

80. Which one of the following is correct about TEM (Transmission electron microscopy)?
(A) Used to find out the morphology of hard objects
(B) Used to find out the morphology of hollow objects
(C) Used to find out the structure of nano objects
(D) Options (B) and (C) are correct

81. *A* and *B* can do a piece of work in 12 days; *B* and *C* can do it in 20 days while *C* and *A* can do it in 15 days. In how many days will they all working together can finish the work?
(A) 8 days
(B) 10 days
(C) 9 days
(D) 6 days

82. In a certain code BADE is coded as 12 and BYE is coded as 32. Then how will GOOD be coded in the same language?:
(A) 41
(B) 16
(C) 28
(D) 56

83. The angle between the hour hand and the minute hand of a clock when the time is 30 minutes past 4'O clock :
(A) 60 degree
(B) 50 degree
(C) 45 degree
(D) 40 degree

84. If the new year day (1st January) of the year 2013 was a Tuesday then which year immediately after 2013 will have new year day Tuesday itself?
(A) 2015
(B) 2017
(C) 2019
(D) 2020

85. The area of a triangle is 216 cm^2 and its sides are in the ratio 3:4:5. The perimeter of the triangle is :
(A) 60 cm
(B) 100 cm
(C) 56 cm
(D) 72 cm

86. A person incurs a loss of 5% by selling a watch for Rs. 1,140. At what price should the watch be sold to earn a profit of 5%?
(A) 1260
(B) 1280
(C) 1300
(D) 1320

87. The next term in the series 1, 3, 7, 15, 31, ... is :

(A) 52
(B) 63
(C) 56
(D) 66

88. If a man travels at the rate of 40 Km/hr he misses the flight by 11 minutes and if he travels at the rate of 50 Km/hr he reaches the airport 4 minutes earlier. The distance travelled by him to reach the airport is :

(A) 35 Km
(B) 50 Km
(C) 70 Km
(D) 40 Km

89. When simplified the expression $\frac{10}{1.2}+\frac{10}{2.3}+\frac{10}{3.4}+\cdots+\frac{10}{n(n+1)}$, for any natural number is :

(A) $\frac{10n}{n+1}$
(B) $\frac{10n^2}{n+1}$
(C) $\frac{10(n-1)}{n+1}$
(D) $\frac{10(n+1)}{n(n+1)}$

90. If a certain sum of money amounts to Rs. 1,008 in 2 years and to Rs. 1,164 in $3\frac{1}{2}$ years at a certain simple interest rate the amount deposited (Principal) is Rs. :

(A) 1,000
(B) 900
(C) 800
(D) 850

91. If $x^2+2xy+2y^2=1$, then $\frac{dy}{dx}$ at the point where $y=1$ is equal to :

(A) 1
(B) 2
(C) -1
(D) 0

92. The value of $\int_0^6 |x-3|\,dx$ is equal to :

(A) 6
(B) 9
(C) 12
(D) 18

93. How many four digit numbers 'abcd' exist such that a is odd, b is divisible by 3, c is even and d is prime?

(A) 380
(B) 360
(C) 400
(D) 620

94. The system of linear equations $3x+y-z=2$, $x-z=1$, $2x+2y+\alpha z=5$ has a unique solution when :

(A) $\alpha \neq 3$
(B) $\alpha \neq 4$
(C) $\alpha \neq 5$
(D) $\alpha \neq 2$

95. If $\begin{vmatrix} 2a & x_1 & y_1 \\ 2b & x_2 & y_2 \\ 2c & x_3 & y_3 \end{vmatrix} = \frac{abc}{2} \neq 0$, then area of the triangle whose vertices are $\left(\frac{x_1}{a}, \frac{y_1}{a}\right)$, $\left(\frac{x_2}{b}, \frac{y_2}{b}\right)$ and $\left(\frac{x_3}{c}, \frac{y_3}{c}\right)$ is :

(A) $\frac{abc}{4}$

(B) $\frac{abc}{8}$

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

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

96. $\int \frac{\sqrt{5+x^2}}{x^4} dx$ is equal to :

(A) $\frac{1}{15}\left(1+\frac{5}{x^2}\right)^{3/2}$

(B) $\frac{-1}{15}\left(1+\frac{1}{x^2}\right)^{3/2}$

(C) $\frac{-1}{15}\left(1+\frac{5}{x^2}\right)^{3/2}$

(D) $\frac{1}{15}\left(1+\frac{1}{x^2}\right)^{3/2}$

97. The radius of a cylinder increasing at the rate 5 cm/sec in such a way that the volume remains as a constant. When radius is 5 cm and height is 3 cm, the rate of change of height with respect to time is :

(A) 9 cm/sec

(B) –6 cm/sec

(C) –3 cm/sec

(D) 5 cm/sec

98. The area of the curve $y = \sin x$ between $x = 0$ and $x = \pi$ is :

(A) 4

(B) 0

(C) –2

(D) –4

99. A ball is thrown vertically upwards with an initial velocity of 128 ft/sec and the ball's height after t seconds is given by $S(t) = 128t - 16t^2$. At what time the velocity is 48 ft/sec?

(A) 2 sec

(B) 2.5 sec

(C) 3 sec

(D) 1.5 sec

100. If sum of two numbers is k, then the minimum value of the sum of their cubes is :

(A) k^3

(B) $2k^3$

(C) $\frac{1}{4}k^3$

(D) $\frac{1}{2}k^3$