PUMEET – 2021

Important: *Please consult your Admit Card/Roll No. slip before filling your Roll Number on the Test Booklet and Answer Sheet.*

Roll No.   **(In Figure)**   **(In Words)**

O.M.R. Answer Sheet Serial No.

Signature of Candidate: _____   *Signature of Invigilator:* _____

Time: 100 Minutes   **Number of Questions: 100**   **Maximum Marks: 100**

DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO.

INSTRUCTIONS:

1. Write your Roll No. on the Questions Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Question Booklet Serial No. on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point/Black Gel Pen**.
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. Please check that this Question Booklet contains **100** Questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of Test.
5. Each question has four alternative answer (A,B,C,D) of which only one is correct. For each question, darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point/Black Gel Pen. There shall be negative marking for wrong answer, ¼ of the marks of the question will be deducted for every wrong answer.**
6. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Booklet. No marks will be deducted in such cases.
7. **30 minutes extra sould be given to the visually handicapped/PwD Candidates.**
8. **Darken** the bubbles in the OMR Answer Sheet according to the Serial No. of the question given in the Question Booklet.
9. If you want to change an already marked answer, erase the shade in the darkened bubble completely.
10. For rough work only the blank sheet at the end of the Question Booklet be used.
11. The University will provide Logarithmic table. Borrowing of log table or other material is not allowed.
12. The Answer Sheet is designed for computer evaluation. Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e. not following the instructions completely, shall be of the candidate only.**
13. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
14. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so would be expelled from the examination.
15. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistant or found giving or receiving assistant or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
16. **Communication equipment such as mobile phones, pager, wireless set, scanner, camera or any electronic/digital gadget etc., is not permitted inside the examination hall. Use of calculators is not allowed.**
17. The candidates will not be allowed to leave the Examination Hall/Room before the expiry of the allotted time.

1. The infinite series $\sum\limits_{x=1}^{\infty} x\, e^{-x^2}$ converges to

   (A) 0   (B) $\dfrac{1}{2}$ (C) $\dfrac{1}{e}$ (D) $\dfrac{1}{2e}$

2. The alternating series: $1 - \dfrac{1}{3} + \dfrac{1}{2} - \dfrac{1}{3^3} + \dfrac{1}{2^2} - \dfrac{1}{3^5} + \dfrac{1}{2^3} - \dfrac{1}{3^7} + ----$ is

   (A) Oscillatory
   (B) Divergent
   (C) Conditionally convergent
   (D) Convergent as well as absolutely convergent

3. The interval of convergence for the power series: $x - \dfrac{x^2}{2^2} + \dfrac{x^3}{3^2} - \dfrac{x^4}{4^2} + ----- \infty$ is

   (A) $0 \le x \le 1$ (B) $-1 < x < 1$ (C) $-1 \le x \le 1$ (D) $-1 \le x < 1$

4. The radius of convergence of the series: $\sum\limits_{n=1}^{\infty} \dfrac{x^n}{2^n} \dfrac{n^n}{n!}$ is

   (A) 0   (B) 2   (C) $\dfrac{2}{e}$ (D) $\dfrac{e}{2}$

5. Taylor series expansion of the function : $f(x) = 2x^3 + 7x^2 + x - 1$ in powers of $(x-2)$ is

   (A) $45 + 53(x-2) + 19(x-2)^2 + 2(x-2)^3$ (B) $55 + 63(x-2) + 30(x-2)^2 + 8(x-2)^3$

   (C) $45 + 19(x-2)^2 + 8(x-2)^3$ (D) $15 + 35(x-2) + 91(x-2)^2 + 2(x-2)^3$

6. If $f(x,y) = xe^y$, where $x = t^2$ and $y = \dfrac{1}{t^2}$, then $\dfrac{df}{dt}$ is

   (A) $e^{\frac{1}{t^2}} \left(2t + \dfrac{2}{t} \right)$ (B) $e^{\frac{1}{t^2}} \left(2t - \dfrac{2}{t} \right)$ (C) $e^{t^2} \left(2t + \dfrac{2}{t} \right)$ (D) $e^{t^2} \left(2t - \dfrac{2}{t} \right)$

7. If $x = r\cos\theta$ and $y = r\sin\theta$, then $\dfrac{\partial(x, y)}{\partial(r, \theta)}$ is

   (A) $-\dfrac{1}{r}$ (B) $\dfrac{1}{r}$ (C) r (D) $-r$

8. The absolute maximum value of the function $f(x,y) = 2 + 2x - 2y - x^2 - y^2$ on triangular plane in the first quadrant bounded by the lines $x = 0,\ y = 0$ and $y = 9 - x$ is

   (A) 1   (B) 2   (C) 3   (D) 4

9. The direction in which the directional derivative of $f(x,y,z) = x^2 - y^2 + 2z^2$ is maximum at the point $(1, 2, 1)$ is

   (A) $\hat{i} - 2\hat{j} + 2\hat{k}$ (B) $\hat{i} - 2\hat{j} + 4\hat{k}$ (C) $\hat{i} + \hat{j} + 2\hat{k}$ (D) $\hat{i} - \hat{j} + 2\hat{k}$

10. If vectors P and Q are irrotational, then

    (A) $P \times Q$ is irrotational   (B) $P - Q$ is solenoidal
    (C) $P \times Q$ is solenoidal   (D) None of these

11. If $\vec{V}$ is the velocity of a fluid particle, then $\int_C \vec{V} \cdot d\vec{r}$ represents

(A) Work done   (B) Circulation   (C) Flux   (D) Conservative field

12. The value of $\iiint_V \vec{\nabla} \cdot \vec{F} \, dv$ if $\vec{F} = 4xy\,\hat{i} + yz\,\hat{j} - xy\,\hat{k}$ and V is bounded by

$x = 0, \ x = 2, \ y = 0, \ y = 2, \ z = 0 \ $ and $\ z = 2 \ $ is

(A) 20   (B) 40   (C) 60   (D) 80

13. The volume of a solid generated by revolving the ellipse $\dfrac{x^2}{4} + \dfrac{y^2}{4} = 1$ about the major axis is

(A) $\dfrac{4}{3}\pi$ (B) $\dfrac{16}{3}\pi$ (C) $\dfrac{32}{3}\pi$ (D) $\dfrac{64}{3}\pi$

14. The value of the integral $\displaystyle\int_0^1 \int_x^{\sqrt{x}} (x^2 + y^2) \, dy \, dx$ is

(A) $\dfrac{4}{35}$ (B) $\dfrac{3}{35}$ (C) $\dfrac{13}{35}$ (D) $\dfrac{11}{35}$

15. The value of triple integral $\displaystyle\iiint_B e^x \, y z^2 \, dV$, where B is the rectangular box

$\{(x, y, z) : 0 \le x \le 1, \ 1 \le y \le 2, \ -1 \le z \le 1\}$ is

(A) e (B) $e - 1$ (C) $e + 1$ (D) $e^2 - 1$

16. Under what condition, the differential equation: $x y^3 \, dx + p x^2 y^2 \, dy = 0$ is exact?

(A) $p = 3$ (B) $p = 2$ (C) $p = \dfrac{2}{3}$ (D) $p = \dfrac{3}{2}$

17. The orthogonal trajectories of the hyperbolas: $x^2 + y^2 = p$ are

(A) $y = kx$ (B) $x^2 - y^2 = k$ (C) $x^2 + y^2 = k$ (D) $xy = k$

18. The solution of the differential equation: $y'' + 2y' + 2y = 0$ is

(A) $(P\cos x + Q\sin x)\, e^{-x}$ (B) $(P\cos x + Q\sin x)\, e^{x}$

(C) $(P\cos x + Q\sin x)\, e^{-2x}$ (D) $(P\cos x - Q\sin x)\, e^{-2x}$

19. The Wronskian of the functions $1, \ \sin x, \ \cos x$ is

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

20. What is Fourier series?

(A) Power series   (B) Finite trigonometric series

(C) Infinite trigonometric series   (D) Infinite GP series

21. The Fourier coefficient a_0 in the Fourier series expansion for $f(x) = 1 - x^2, \ -1 < x < 1$ is

(A) $\dfrac{3}{4}$ (B) $\dfrac{3}{5}$ (C) $\dfrac{4}{3}$ (D) $\dfrac{5}{3}$

22. Half-range Fourier sine series of $f(x) = x$ in $0 < x < 2$ is

(A) $\dfrac{5}{\pi} \sum\limits_{n=1}^{\infty} \dfrac{(-1)^{n+1}}{n} \sin\dfrac{n\pi x}{2}$

(B) $\dfrac{4}{\pi} \sum\limits_{n=1}^{\infty} \dfrac{(-1)^{n+1}}{n} \sin\dfrac{n\pi x}{2}$

(C) $\dfrac{5}{\pi} \sum\limits_{n=1}^{\infty} \dfrac{(-1)^{n}}{n} \sin\dfrac{n\pi x}{4}$

(D) $\dfrac{4}{\pi} \sum\limits_{n=1}^{\infty} \dfrac{(-1)^{n}}{n} \sin\dfrac{n\pi x}{4}$

23. The partial differential equation obtained by eliminating the arbitrary constants from the relation: $z = a x^2 + b y^2$ is

(A) $2z = x p + y q$ (B) $z = y p + x q$ (C) $2z = x p - y q$ (D) $z = y p - x q$

24. The solution of the PDE: $x p + y q = 3z$ is

(A) $x^3 = f\left(\dfrac{x}{y}\right)$ (B) $x^3 = f\left(\dfrac{y}{x}\right)$ (C) $x^3 = z\, f\left(\dfrac{x}{y}\right)$ (D) $x^3 = f\left(\dfrac{x z}{y}\right)$

25. The solution of a PDE: $p^2 + q^2 = 1$ is

(A) $z = x + \sqrt{10 + a^2}\, y + c$

(B) $z = a x - \sqrt{2 + a^2}\, y + c$

(C) $z = a x + \sqrt{1 - a^2}\, y + c$

(D) $z = x + \sqrt{3 - a^2}\, y + c$

26. The popularly used PDEs in engineering or physics are
(A) First-order and linear equations
(B) Second-order and linear equations
(C) First-order and non-linear equations
(D) More than second-order and nonlinear equations

27. The Laplace transformation of $f(t) = k$, where k is a constant and $t \geq 0$ is

(A) $k s$ (B) $k - s$ (C) $\dfrac{k}{s}$ (D) $k + s$

28. Inverse Laplace transform of the function $f(s) = \dfrac{1}{s^2 (s^2 + 1)}$ is

(A) $\sin t$ (B) $t \sin t$ (C) $t + \sin t$ (D) $t - \sin t$

29. If $f(s) = L\{f(t)\}$, then $L\{f(\lambda t)\}$ is

(A) $\lambda f(s)$ (B) $\dfrac{1}{\lambda} f\left(\dfrac{s}{\lambda}\right)$ (C) $\dfrac{1}{\lambda} f\left(\dfrac{\lambda}{s}\right)$ (D) $f(\lambda s)$

30. If $f(s) = L\{f(t)\}$, then $\dfrac{d f(s)}{ds}$ is equal to

(A) $L\{f(t)\}$ (B) $L\{t\, f(t)\}$ (C) $L\{-t\, f(t)\}$ (D) $L\left\{\dfrac{f(t)}{t}\right\}$

31. Miller indices of a plane which cut intercepts of 2, 3 and 4 units along the three axes are
(A) (2,3,2) (B) (2,3,4) (C) (6,4,3) (D) (4,3,2)

32. In He-Ne laser, pumping method used is
(A) Optical pumping
(B) Electrical excitation
(C) Chemical pumping
(D) Direct conversion

(3)

33. Fresnel biprism is a variant of
    (A) Refraction
    (B) Polarisation
    (C) Diffraction
    (D) Young's double slit experiment

34. Damped oscillator is represented by the equation of the form
    (A) $\alpha x^2 + \beta x + k\ 0$
    (B) $\dfrac{d^2x}{dt^2} + \beta \dfrac{dx}{dt} + kx = 0$
    (C) $\dfrac{dx}{dt} + kx = 0$
    (D) $\dfrac{d^2x}{dt^2} + kx = 0$

35. In case of the photo-electron emission,
    (A) Both holes and electrons are produced.
    (B) Maximum velocity of photoelectron increases with decreasing wave length.
    (C) Velocity of emitted electrons depends on light intensity.
    (D) Rate of photoelectron emission is inversely proportional to light intensity.

36. When two waves of same amplitude add constructively, the intensity becomes
    (A) Double   (B) Half   (C) Four times   (D) One-fourth

37. In the Newton's rings experimental set up, if a few drops of a transparent liquid are introduced between the lens and the plate at the bottom
    (A) The fringe diameter will increase by a factor of $\mu^{1/2}$.
    (B) The fringe diameter will remain the same.
    (C) The fringe diameter will increase by a factor of μ.
    (D) The fringes will contract with diameter reduced by a factor of $\mu^{1/2}$.

38. In the Michelson interferometer, the compensating plate is used for
    (A) Replacing bright central fringe with dark one
    (B) Getting circular shape of interference fringes. (to compensate for the effect of speed of earth)
    (C) Equating the effective path length traversed by reflected waves subsequent to splitting of the incident beam
    (D) Inducing symmetry in the optical elements

39. When 100 keV electron beam is made incident on Pb-target (Given K -shell binding energy of Pb element is 90.0 keV), the emission spectrum will consist of
    (A) Characteristic K X-rays of Pb
    (B) Characteristic K X-rays of Pb and bremmstrahlung photons ranging 90-100 keV
    (C) Characteristic X-rays of Pb and bremmstrahlung photons ranging 0-90 keV
    (D) Various characteristic X-rays of Pb and bremmstrahlung photons ranging 0-100 keV

40. The observed length of the meter stick (100 cm) moving parallel to its length when its mass is 1.25 times its rest mass will be:
    (A) 100 cm   (B) 80 cm   (C) 49 cm   (D) 64 cm

(4)

41. Bragg's law of diffraction is used in the process of
    (A) X-ray production   (B) Gamma-ray production
    (C) X-ray scan   (D) X-ray crystallography

42. A particle is incident on a potential step with its kinetic energy just greater than height of the step. Which of the following shall hold true for incident particle:
    (A) It will be solely transmitted
    (B) It will be solely reflected
    (C) There will be reflection as well as transmission
    (D) It will be absorbed by the potential step

43. The correct form of expression for the time-dependent Schodinger wave equation is
    (A) $-\dfrac{\hbar^2}{2m}\dfrac{\partial^2 \psi}{\partial x^2}+V\psi = i\hbar\dfrac{\partial^2 \psi}{\partial t^2}$

    (B) $-\dfrac{\hbar^2}{2m}\dfrac{\partial \psi}{\partial x}+V\psi = i\hbar\dfrac{\partial \psi}{\partial t}$

    (C) $-\dfrac{\hbar^2}{2m}\dfrac{\partial^2 \psi}{\partial t^2}+V\psi = i\hbar\dfrac{\partial \psi}{\partial x}$

    (D) $-\dfrac{\hbar^2}{2m}\dfrac{\partial^2 \psi}{\partial x^2}+V\psi = i\hbar\dfrac{\partial \psi}{\partial t}$

44. Unit cell of an orthorhombic crystal system is characterized by cell axes and angles between them as
    (A) $a \neq b \neq c;\ \alpha = \beta = 90^o, \gamma = 120^o$
    (B) $a = b = c;\ \alpha = \beta = 90^o, \gamma = 120^o$
    (C) $a \neq b \neq c;\ \alpha = \beta = \gamma = 90^o$
    (D) $a = b = c;\ \alpha = \beta = \gamma = 90^o$

45. In case of the Compton scattering of photon from free electron, the possible directions for the struck electron and the photon w.r.t. the incident photon are
    (A) Forward hemisphere and any direction, respectively.
    (B) Backward hemisphere and forward hemisphere, respectively.
    (C) Forward hemisphere and backward hemisphere, respectively.
    (D) Any direction and forward hemisphere, respectively.

46. Which of the following travels with velocity of light?
    (A) Alpha particles   (B) Neutrons   (C) Beta particles   (D) Gamma rays

47. The quantum nature of light is not used in explain the phenomenon of
    (A) Compton effect   (B) Photoelectric effect
    (C) Interference of light   (D) Emission or absorption spectrum

48. If a charged particle of mass 'm' is accelerated to non-relativistic velocity through a potential difference of V volts, the de-Broglie wavelength is proportional to
    (A) $V^{-1/2}$ (B) V   (C) V^2 (D) $V^{1/2}$

(5)

49. Heisenberg uncertainty principle places
   (A) An upper limit on the product of uncertainties in simultaneous measurement of position and momentum.
   (B) An upper limit on the product of uncertainties in simultaneous measurement of energy and momentum.
   (C) An upper limit on the product of uncertainties in simultaneous measurement of energy and time.
   (D) A lower limit on the product of uncertainties in simultaneous measurement of position and momentum.

50. In case of damped oscillator, logarithmic decrement measures
   (A) The rate at which the amplitude of the oscillatory motion dies away.
   (B) The time in which the total mechanical energy becomes ($1/e$) of the initial value.
   (C) The ratio of the energy stored in the system to the energy lost per period.
   (D) The rate at which the time period of the oscillatory motion dies away.

51. Predict the geometry of $Ni(CO)_4$ and $[Ni(CN)_4]^{2-}$ ion, respectively.
   (A) Square planar and tetrahedral
   (B) Both are square planar
   (C) Tetrahedral and square planar
   (D) Both are tetrahedral

52. Which of the following molecular orbital receives electron when NO^+ is reduced to NO?
   (A) $\sigma 2p_y$ orbital
   (B) $\pi 2p_y$ orbital
   (C) $\sigma^* 2p_z$ orbital
   (D) $\pi^* 2p_y$ orbital

53. Name the phenomenon when crystals produce electric signals on applying pressure.
   (A) Pyroelectricity
   (B) Ferroelectricity
   (C) Piezoelectricity
   (D) Ferrielectricity

54. In which of the following, three O atoms of SiO_4^{4-} unit are shared?
   (A) Pyrosilicate
   (B) Sheet silicate
   (C) Linear chain silicate
   (D) 3D sheet silicate

55. Which of the following statements is true?
   (A) $[FeF_6]^{3-}$ and $[CuCl_4]^{2-}$ are diamagnetic, $[Fe(CN)_6]^{3-}$ is paramagnetic
   (B) $[Ni(CN)_4]^{2-}$ and $[FeF_6]^{4-}$ are diamagnetic, $[Ag(CN)_2]^-$ is paramagnetic
   (C) $[Fe(CN)_6]^{4-}$ and $[Cu(NH_3)_6]^+$ are diamagnetic, $[NiCl_4]^{2-}$ is paramagnetic
   (D) $Ni(CO)_4$ is diamagnetic, $[Cu(NH_3)_6]^+$ and $[Ni(CN)_4]^{2-}$ are paramagnetic

56. Calculate CFSE for Mn^{2+} ion in weak octahedral field.
   (A) -20Dq + 2P
   (B) 0 Dq
   (C) -24 Dq
   (D) +8 Dq

57. Which of the following techniques is based upon deposition of vapours on the surface of iron to prevent corrosion ?
   (A) Electroplating
   (B) Electroless metal coating
   (C) Hot dipping
   (D) CVD

58. The oxide of which of the following metals decomposes reversibly to the metal and oxygen.
   (A) Au
   (B) Sn
   (C) Pb
   (D) Cu

(6)

59. Which of the following is a halon ?
    (A) $CBrClF_2$ (B) C_6H_5Cl (C) Propylene oxide (D) Pyrene

60. Choose a metalloid from the following which is highly toxic to the environment.
    (A) Silicon   (B) Cadmium   (C) Mercury   (D) Arsenic

61. One molal solution of a complex of cobalt chloride with NH_3 in water showed an elevation in boiling point equal to 1.8 K. Assuming that the complex is completely ionized in the solution, the complex is (K_b for water= 0.45 K Kg mol^{-1})
    (A) $[Co(NH_3)_5Cl]Cl_2$ (B) $[Co(NH_3)_6]Cl_3$
    (C) $[Co(NH_3)_4 Cl_2]Cl$ (D) $[CoNH_3)_3Cl]Cl_2$

62. The standard free energies of formation of $H_2S(g)$ and $CdS(s)$ at 1000 °C are -48.0 KJ/mol and -125.2 KJ/mol respectively. Use these data to predict whether $H_2(g)$ will reduce CdS (s) to metallic Cd at this temperature.
    (A) ΔG= -77.2 KJ/mol and H_2 reduces CdS
    (B) ΔG= 0 KJ/mol and the reaction is at equilibrium
    (C) ΔG= 77.2 KJ/mol and the reaction is not feasible
    (D) ΔG= -38.6 KJ/mol and H_2 reduces CdS

63. Nylon 66 is not a:
    (A) Polyamide   (B) Condensation polymer
    (C) Co-polymer   (D) Homopolymer

64. A 10% solution by mass of cane sugar in water has freezing point of 271K and freezing point of pure water is 273.15K. The freezing point of a 10% solution (by mass) of glucose in water is
    (A) 271K   (B) 273.15K   (C) 269.07K   (D) 275.15K

65. Enthalpy is equal to
    (A) $-T^2 [\frac{\partial (G/T)}{\partial T}]_P$ (B) $T^2 [\frac{\partial (G/T)}{\partial T}]_P$
    (C) $T^2 [\frac{\partial (G/T)}{\partial T}]_V$ (D) $-T^2 [\frac{\partial (G/T)}{\partial T}]_V$

66. P_A and P_B are the vapour pressure of the pure liquids components A and B, respectively of an ideal binary solution. If x_A represents the mole fraction of the component (((A), the total pressure of the solution will be:
    (A) $P_A + x_A(P_B- P_{((A)}$ (B) $P_B + x_A(P_B- P_{((A)}$ (C) $P_A + x_A(P_A- P_{(B)}$ (D) $P_B + x_A(P_A- P_{(B)}$

67. Calculate the amount of heat supplied to Carnot's cycle, working between 368K and 298K. If the maximum work obtained is 895 joules.
    (A) 3643.54 joules   (B) 4319.23 joules   (C) 4705.14 joules   (D) 5142.84 joules

68. Which one of the following equations does not correctly represent the first law of thermodynamics for the given process?
    (A) Isochoric process : ΔE=q
    (B) Isothermal process : q= -w
    (C) Adiabatic process : ΔE= -w
    (D) Expansion of a gas into vacuum : ΔE=q

69. Which of the following statement is wrong?
(A) Nylon-6,6 is an example of elastomers
(B) Artificial silk is derived from cellulose
(C) Both starch and cellulose are polymers of glucose
(D) The repeat unit in natural rubber is isoprene

70. Which of the following statements about low density polyethylene is false?
(A) It is a poor conductor of electricity
(B) Its synthesis requires dioxygen
(C) It is a type of thermoplastic polymer
(D) It is used in the manufacture of bucket, dust-bins etc.

71. A 2Ω resistor carrying 2 ampere current will dissipate power equal to
(A) 4 watts   (B) 8 watts   (C) 16 watts   (D) 32 watts

72. Norton's theorem results in
(A) A current source with an impedance in parallel
(B) A voltage source with an impedance in series
(C) A voltage source alone
(D) A current source alone

73. Three delta connected resistors absorb 30 kW, when connected to a 400 V, 3-phase supply. When they are connected in star across the same supply, the power absorb will be
(A) 50 kW   (B) 20 kW   (C) 10 kW   (D) 60 kW

74. In two wattmeter method of measuring power in a balanced 3-phase circuit, if the reading of one wattmeter is zero, then the power factor of the load is
(A) Unity   (B) $\sqrt{3}/2$ (C) $1/2$ (D) Zero

75. A 10 kVA 400/200 V, single-phase transformer with 10% leakage impedance draws a steady short- circuit line current of
(A) 50 A   (B) 150 A   (C) 250 A   (D) 350 A

76. If the applied voltage to a DC machine is 230 V, then the back emf, for maximum power developed is
(A) 115 V   (B) 200 V   (C) 230 V   (D) 460 V

77. Which of the following configuration has the highest current gain?
(A) Common base   (B) Common emitter (C) Common collector (D) Emitter follower

78. If the dc value of rectified output voltage of a rectifier is 300 volts and the rms ripple voltage is 6 volts, the ripple factor is
(A) 1%   (B) 2%   (C) 4%   (D) 0.5%

79. $\bar{A}.\bar{B}.\bar{C}=D$ represents a
(A) NOR gate   (B) NAND gate   (C) EX-OR gate   (D) AND gate

80. Number of flip-flops needed to divide the input frequency by 32 is
(A)   2   (B) 4   (C) 5   (D) 8

81. SHM refers to
    (A) Sinusoidal Hyperbolic Movement
    (B) Simple Harmonic Movement
    (C) Simple Harmonic Motion
    (D) Simplified Harmonic Movement

82. Forces are called concurrent when their lines of action meet at
    (A) One point
    (B) Two points
    (C) One line
    (D) One plane

83. Hooke's law holds good up to
    (A) Yield point
    (B) Limit of proportionality
    (C) Breaking point
    (D) Elastic limit

84. Which of the following is not a type of welding joint
    (A) Tee
    (B) Edge
    (C) Corner
    (D) Line

85. In an isometric drawing, the angle between any two coordinate axes is
    (A) 30°
    (B) 45°
    (C) 90°
    (D) 120°

86. The units of kinematic viscosity are
    (A) $\dfrac{kg}{m.s}$
    (B) $\dfrac{kg.m}{s}$
    (C) $\dfrac{m}{s^2}$
    (D) $\dfrac{m^2}{s}$

87. C_p-C_v, for an ideal gas is equal to
    (A) R/2
    (B) R
    (C) 2R
    (D) 3R

88. In the equation, PV^n=constant, if the value of n=1, then it represents a reversible ....process:
    (A) Isothermal
    (B) Adiabatic
    (C) Isobaric
    (D) Polytropic

89. Assuming that CO_2 obeys perfect gas law, the density of CO_2 (in kg/m^3), at 0^{0}C and 2 atm is
    (A) 1
    (B) 2
    (C) 3
    (D) 4

90. A wet paper pulp contains 75% water. After 100 kg of water removed in a dryer, it is found that the pulp is now containing 30% water. The weight of the original pulp is
    (A) 96.6 Kg
    (B) 95.5 Kg
    (C) 76.8 Kg
    (D) 155.5 Kg

91. 1. raining heavily 2. since they were 3. all the team members 4.very late 5. decided to go home 6. for the awards ceremony 7. and it was
    Select the correct order for the above jumbled sentence.
    (A) 7654321
    (B) 1357642
    (C) 3524671
    (D) 3256417

92. Either my uncle or my aunt _____ coming to the party.
    (A) is
    (B) are
    (C) would
    (D) aren't

93. She loves watching movies, especially if _____ are comedies.
    (A) movie   (B) they   (C) this   (D) that

94. 'Raghav read the novel in one day' means the same as
    (A) One day, Raghav read a novel   (B) Raghav reads the novel.
    (C) The novel was read by Raghav in one day   (D) One day Raghav reads the novel

95. I _____ a new song on the radio.
    (A) heard   (B) hears   (C) hearing   (D) was hear

96. The non-verbal communication of touch is studied by
    (A) kinesics   (B) oculesics   (C) haptics   (D) proxemics

97. The accent of an individual falls under
    (A) linguistic communication   (B) paralinguistic communication
    (C) extralinguistic communication   (D) intralinguistic communication

98. Grapevine refers to communication that is
    (A) informal   (B) formal   (C) nonverbal   (D) impolite

99. Pick the correct sentence:
    (A) A European couple bought an umbrella   (B) An European couple bought a umbrella.
    (C) A European couple bought a umbrella   (D) An European couple bought an umbrella

100. When I visited them, she _____ working for six months.
    (A) had been   (B) was   (C) has been   (D) were now

x-x-x