RAJASTHAN P.E.T.
PHYSICS – 1996

1. **The amplification factors of two triode values are 40 and their plate resistances are 2 kΩ2esp. If both are used of 4 kΩ2n the outer circuit, the ratio of voltage gain will be :**
   (1) 10 (2) 4/9 (3) 4/3 (4) 16/3

2. **Fundamental frequency of an open pipe is :**
   (1) 15 Hz (2) 20 Hz (3) 30 Hz (4) 10 Hz

3. **If the capacity of Tarapore atomic power station is 200 MωωThe energy produced by this reactor in one day will be :**
   (1) 200 mega watt (2) 200 J (3) 1729 x 10^{10}J (4) None

4. **The half life of a radioactive sample is 3.8, the time after which 1/20th part of the sample will left will be:**
   (1) 66 days (2) 16.5 days (3) 18 days (4) 13.5 days

5. **A hollow sphere filled with water and hole in the bottom when oscillates the time period will:**
   (1) decrease (2) increase (3) first increase then decrease (4) remains constant

6. **In AC circuit at the time of resonance :**
   (1) voltage at C and R not in same phase
   (2) voltage at L and C in same phase
   (3) impedance is $\left(\omega L - \frac{1}{C\omega}\right)$
   (4) impedance is R

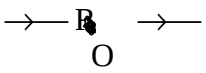
7. **A wave enters from air into water then what is unchanged :**
   (1) wavelength (2) velocity (3) amplitude (4) frequency

8. **In wattles current phase difference between current and voltage is :**
   (1) π/4 (2) π/2 (3) π (4) zero

9. **When the light of wavelength 2537 Å is made to incident over the surface of copper slab, the stopping voltage is 0.24 volt obtained. The there shold frequency for copper will be :**
   (1) 1.414 x 10^{14} Hz (2) 2.248 x 10^{15} Hz
   (3) 1.124 x 10^{15} Hz (4) None

10. **The magnetic field produced at point 0 of the wire shown in figure will be :**

i 



(1) zero (2) $\frac{\mu_0 i}{4r}$ (3) $\frac{\mu_0 i}{2r}$ (4) $\frac{\mu_0 i}{4\pi r}$

11. The V_{rms} of gas molecules is 300 m/sec. If its absolute temperature is reduced to half and molecular weight is doubled the V_{rms} will become:
(1) 75 m/sec. (2) 150 m/sec. (3) 300 m/sec. (4) 600 m/sec.

12. The density of a rubber pipe is 1.5 x 103 kg/m3 and Young coefficient of elasticity is 5 x 106 N/m2 when it is suspend from earth surface the length is 8 m., the increase in its length due to its own weight will be :
(1) 9.6×10^{-5}m (2) 9.6×10^{3}m
(3) 19.2×10^{-2}m. (4) 9.6 m.

13. Surface tension is due to :
(1) cohesive molecular forces
(2) gravitational forces
(3) nuclear forces
(4) electrical forces

14. The time period of a pendulum in stationary lift is T, if lift starts moving in the downward direction the time period will :
(1) decrease (2) increase (3) unchanged (4) uncertain

15. An engine of a car can produce an acceleration of 4 m/sec.2. If this car is dragging another car of same mass than the acceleration produced by the engine of the car will be:
(1) $\frac{1}{2}$ m/sec.^{2} (2) 2 m/sec.^{2} (3) 8 m/sec.^{2} (4) 4 m/sec.^{2}

16. If a stone of mass m is rotated in a vertical circular path of radius 1 meter, the critical velocity will be :
(1) 12.64 m/sec. (2) 3.16 m/sec. (3) 6.32 m/sec. (4) 9.48 m/sec.

17. If the MI of a disc about the tangent in its plane is I, its MI about the tangent perpendicular to the plane will be :
(1) $\frac{5}{4}$ I (2) $\frac{3}{2}$ I (3) $\frac{3}{4}$ I (4) $\frac{6}{5}$ I

18. Photo electric effect is based on :
(1) Davisson-Germer experiment
(2) Maxwell,s theory
(3) Einstein theory
(4) Plank's constant

19. In a electrical circuit a cell, a variable resistance R and ammeter are connected in series. A voltmeter connected with the variable resistance to measure the voltage across the wire R and at one instant the reading of ammeter and voltmeter are 0.3 A and 0.9 V resp. At other instant the values of ammeter and voltmeter are 0.25 amp. and 1.0 volt for other value of R. The internal resistance of the cell is :

(1) 4.6 Ω (2) 4.3 (3) 3.4 Ω (4) 2.0 Ω

20. To electroplate a spoon with silver, one has to place it on :

(1) any where in electro lyticsolution
(2) between anode and cathode
(3) cathode
(4) anode

21. Dimensional formula for magnetic induction is :

(1) $M^1L^1T^{-3}A^{-1}$ (2) $M^1L^2T^{-2}A^{-1}$
(3) $M^1L^0T^{-2}A^{-1}$ (4) $M^1L^2T^{-2}A^{-1}$

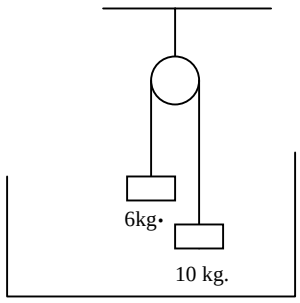
22. Two charges of 20 μc and 80 μc charge are placed at 10 cm. distance from each other at which point the electrical field intensity is zero :

(1) 0.033 M (2) – 0.04M (3) 0.003 M (4) – 0.01 M

23. An electron is moving in a circular orbit of radius 5.1 x 10^{-11} m in a hydrogen atom with 6.8 x 10^{15} c/s frequency. The equivalent magnetic moment of the atom will be :

(1) 9.56 x 10^{-25} A x m^2
(2) 4.4 x 10^{-24} A x m^2
(3) 9.58 x 10^{-35} A x m^2
(4) 8.9 x 10^{-24} A x m^2

24. A weightless string is suspend on a frictionless pulley, a mass of 6 kg. is suspend at one end and mass of 10 kg. is suspended on the other end of the string, the tension in the string will be :



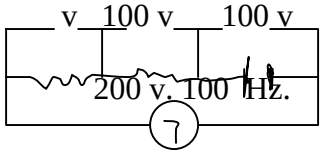
(1) 73.5 N (2) 79 N (3) 2.45 N (4) 24.5 N

25. The wavelength for Lyman series is 912 Å, the wave no. will be :

(1) 912 (2) $\frac{10^{10}}{}$ (3) 912 x 3 (4) 912 x 9

26. In the following circuit the reading of voltmeter will be :

(1) 300 V
(2) 900 V
(3) 200 V
(4) 400 V



27. To purchase 1 kg. sugar will be beneficial at :

(1) at attitude 40^0 (2) equators (3) poles (4) at 45^0 attitude

28. The period of laser is 10-8 sec. The uncertainty in energy will be:

(1) 1.5×10^{-26} J (2) 6.62×10^{-26} J (3) 1.05×10^{-26}J (4) zero

29. An electric cattle works at 220 volt and 4A current. To boil a 1 kg. water at room temperature 20^0 C will take time:

(1) 12.8 minute (2) 6.3 minute (3) 6.4 minute (4) 12.6 minute

30. The cross sectional area of an aluminum square rod is 5×10^{-3} m^2 and length is 1 m. If the resistivity of the aluminum is 2.8×10^{-8} Ωm, resistance will be :

(1) 11.2×10^{-3} Ω (2) 1.12×10^{-3}Ω
(3) 2.42×10^{-3}Ω (4) 1.24×10^{-4}Ω

31. An electron is moving around infinite linear positive charge in the orbit of 0.1 m. If the liearcharge density is 1 μC, velocity of electron will be:

(1) 0.0562×10^7 m/s. (2) 5.62×10^{-7} m/s.
(3) 562×10^5 m/s. (4) 5.62×10^7 m/s.

32. In Young's bislit experiment the intensity at a point when the path difference between the waves is λ is obtained k. If the path difference is changed to λ/4 the intensity at that point will be :

(1) k (2) k/2 (3) k/4 (4) zero

33. A small sphere of radius r is kept inside a hollow sphere of radius R (R > r) concentrically. The large and small sphere are charged by charges Q and q respectively. Both the sphere are separated from each other. The potential difference depends upon:

(1) only on q (2) only on Q (3) both q and Q
(4) does not depend upon both

34. Laser Rays are :

(1) instrument to measure the velocity of aeroplane
(2) instrument to measure the intensity of X-rays
(3) measure of frequency
(4) highly coherent waves

35. On increasing the temperature the frequency of organ pipe will:

(1) decreases (2) increases (3) unchanged (4) uncertain

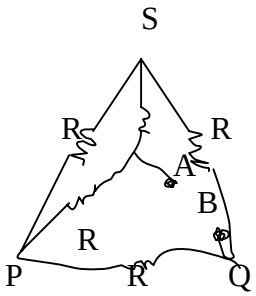
36. In uranium series the initial nucleus is $_{92}U^{238}$ and last nucleus $_{82}Pb^{206}$, the no. of αα and ββ particles will be:

(1) 3,4 (2) 4,3 (3) 8,6 (4) 6, 8

37. The ββ spectrum is :

(1) continuous (2) line (3) continuous and line both (4) none

38. In the circuit the equivalent resistance between A and B is :



(1) RΩ (2) $\frac{R}{2}$ Ω (3) $\frac{R}{4}$ Ω (4) 2 R Ω

39. Two whistles A and B 660 Hz and 596 Hz frequencies. An observes is standing in the middle of the line joining to source. Source B and observer are moving towards right with velocity 30 m/s. and A is standing at left side. If the velocity of sound in air is 330 m/s. the no of beats listen by the observer Is:

(1) 8 (2) 6 (3) 4 (4) 2

40. Two pitch ball of each mass m and charge q are suspended from a point by weightless threads of length ιι If both the threads are separated by an angle θθ with the vertical, If the value of q is negligible, the distance between two pitch balls will be:

(1) $\left(\frac{q^2\iota}{2\pi\varepsilon_0 mg}\right)^{1/3}$ (2) $\left(\frac{q^2\iota}{4\pi\varepsilon_0 mg}\right)^{1/3}$

(3) $\left(\frac{q^2\iota}{2\pi\varepsilon_0 mg}\right)^{1/3}$ (4) $\left(\frac{q\iota^2}{4\pi\varepsilon_0 mg}\right)^{1/3}$

41. In the two parallel wires current is flowing in the same directions, then they will :

(1) slip on each other (2) repells (3) attracts (4) nothing happens

42. A mass moving with a constant velocity wrt. X-axis, its angular momentum wrt.origin :

(1) decreases (2) increases (3) constant (4) zero

43. A one mole monoatomic gas is mixed to one mole of a diatomic gas, the value of r of the mixture will be:

(1) 1.45 (2) 1.4 (3) 1.54 (4) 1.5

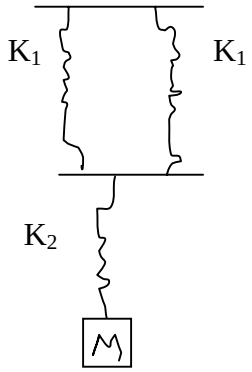
44. The total force constant of the springs shown in the figure will be:

(1) $\left(\frac{2}{k_1} + \frac{1}{k_2}\right)^{-1}$

(2) $\frac{1}{2k_1} + \frac{1}{k_2}$

(3) $\left(\frac{1}{2k_1} + \frac{1}{k_2}\right)^{-1}$

(4) $\frac{k_1}{2} + k_2$



45. Gravitational acceleration of the earth surface is g = 9.8 m/sec.^{2}, value of g at 10 km. height will be (R = 6400 km.)

(1) 10 m/sec.^{2} (2) 9.77 m/sec.^{2}
(3) 17.6 m/sec.^{2} (4) zero

46. Intra molecular forces are found in :

(1) solids, liquids and gases
(2) solids and gases
(3) only solids
(4) only gases

47. In the circular motion in a vertical plane the minimum velocity at the lowest point is:

(1) $\sqrt{6\,rg}$ (2) $\sqrt{3\,rg}$ (3) zero (4) $\sqrt{5\,rg}$

48. Energy of a photon of 6 x 10-8 m wavelength is :

(1) 41.4 eV (2) 40.2 eV (3) 20.6 eV (4) 51.4 eV

49. A car is moving with 30 m/s. velocity in 500 m radius path. If the velocity is increasing by 2m/sec.^{2} then the resultant acceleration will be :

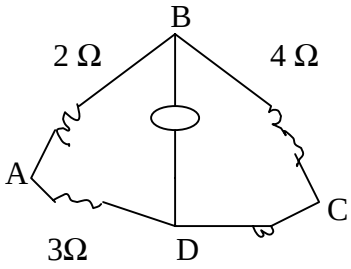
(1) 4.5 m/sec.^{2} (2) 2.7 m/sec.^{2} (3) 2.5 m/sec.^{2} (4) 2m/sec.^{2}

50. A bullet moving with V velocity collides to a wall and stops, its 50% energy converts into heat then the increase in temp. is :

(1) $\frac{V^2S}{2J}$ (2) $\frac{V^2}{4JS}$ (3) $\frac{2V^2}{JS}$ (4) $\frac{V^2S}{J}$

51. In the following circuit if deflection in the glav. Is zero then the value of resistance will be :

(1) 8 Ω
(2) 6 Ω
(3) 4 Ω
(4) 2 Ω



52. Isotopes have :

(1) equal no. of neutrons
(2) equal no. of protons
(3) equal no. of neutrons but unequal no. of protons
(4) none

53. The radius of first orbit of hydrogen atom is 0.5 Å and an electron is moving in this orbit with 2 x 106 m/s. velocity, the current due to motion of electron in the orbit will be :

(1) 1.5×10^{-2} (2) 1.5 mA (3) 1 mA (4) 2.5 mA

54. The redness in atmosphere at sunrise and sun-set is due to :

(1) scattering of light (2) dispersion of light
(3) refraction of light (4) reflection of light

55. X-rays was discovered by :

(1) Plank (2) Curie (3) Thomson (4) Rontgen

56. The distance between centres of earth and moon are D and the mass of earth is 81 times that of mass of moon, the distance from the centre of the earth at which gravitational force on a body will be zero is :

(1) $\frac{D}{2}$ (2) $\frac{2D}{3}$ (3) $\frac{4D}{3}$ (4) $\frac{9D}{10}$

57. Value of gravitational acceleration is maximum is :

(1) inside of the earth (2) at a hill
(3) at poles (4) at the equator

58. Intra molecular forces are of :

(1) some time of low range and sometimes of height range
(2) low range
(3) infinite range
(4) uncertain

59. The time period of a pendulum of infinite length is :

(1) infinity (2) 84.6 mt (3) zero (4) uncertain

60. The law of action reaction is based upon the which law of Newton :

(1) first law (2) second law (3) third law (4) none

61. Emission of energy from sun is :

(1) by chemical reactions
(2) by radio activity
(3) by fusion
(4) by fission

62. Which quantity remains conserved as external torque is zero :

(1) linear momentum
(2) angular momentum
(3) kinetic energy
(4) potential energy

63. The electric field at distance r from a uniformly charged infinite sheet of charge density σσwill be :

(1) σ^2 (2) σ (3) σ (4) σ^2

64. In Young experiment the sodium lamp of wavelength λλ= 5898 Å produces 92 fringes in visible region, if the source of light is changed by green light of wavelength 5461 Å the no. of fringes obtained in the visible region will be :

(1) 99 (2) 85 (3) 67 (4) 62

65. A standard cell is balanced at 150 cm. height of a potentiometer wire. If this cell is shunted by a resistance of 2 ΩΩthe balanced position is obtained at 100 cm. length. The internal resistance of the cell will be :

(1) 2 Ω (2) 1 Ω (3) 0.66 Ω (4) 0.1 Ω

66. A wire tension 225 N produces 6 beats per second when it tuked with a fork, when the tension changed to 256 N, it again tuned with the same tuning fork to no. of beats remained unchanged, the frequency of tuning fork will be :

(1) 186 (2) 280 (3) 225 (4) 256

67. Ratio of De-Broglie wavelengths of a proton and an alpha particle of the same energy is :

(1) 1 : 4 (2) 4: 1 (3) 1: 2 (4) 2 : 1

68. Neutron was discovered by :

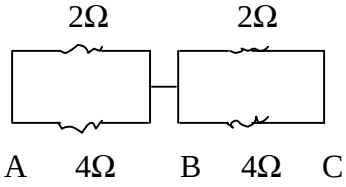
(1) Goldstein (2) Rutherford (3) Chadwick (4) Thomson

69. The cause of great shine in a diamond is :

(1) diffusion
(2) total internal reflection

(3) diffraction
(4) reflection

70. In the circuit the equivalent resistance is :



(1) $\frac{8}{3}\ \Omega$ (2) $\frac{10}{3}\ \Omega$ (3) $\frac{6}{3}\ \Omega$ (4) $\frac{4}{3}\ \Omega$

71. Ratio of voltages in a step up transformer is 8. If voltage at primary is 120 volt then the voltage at the secondary will be:
(1) 960 Volt (2) 180 Volt (3) 120 Volt (4) 150 Volt

72. In a triode amplifier phase between input and output voltages is :
(1) zero (2) π (3) 2π (4) $\pi/2$

73. If R_p= 7 kΩ and g_m = 2.5 mili mho, how much the grid voltage must be changed when plate voltage is changed by 50 Volt, in order to keep plate current constant:
(1) + 2 Volt (2) – 4 Volt (3) + 4 Volt (4) – 3 Volt

74. The equation $I_p = KV_p^{3/2}$ is called :

(1) Gelusec law (2) Newton's law (3) Charles law (4) None

75. X-rays are :
(1) sound waves (2) em eaves (3) radio waves (4) all above

76. In space charge limited region the plate voltage is 50 Volt and plate current is 100 mA. If the plate voltage is changed to 20 Volt, the plate current will become :
(1) 10 mA (2) 19 mA (3) 25 mA (4) 40 mA

77. The pressure inside a tyre of a car is four times of atmospheric pressure and temp. 300 k. If the tyre is bursted all of sudden the new temperature will be (r = 7/5) :
(1) $300\ (4)^{-27}$ (2) $300\ (4)^{2/7}$ (3) $300\ (4)^{7/2}$ (4) $300\ (2)^{7/2}$

78. Mutual inductance of a coil is 5H, if current changes to 0 amp. from 5 amp. in 10^{-3} sec. then the induced emf. in secondary :

79. If solar temp. is doubled then :
(1) it will emit infra red rays mainly
(2) it will emit ultra vilet rays mainly
(3) emission will be doubled
(4) emission will be four times

80. A capillary tube is dipped in water up to length ι the level of water reaches upto height h. Now the end which is inside the water is closed and capillary tube is put outside the water and that closed end is opend if ι> h; the height of remaining water column in the capillary will be :

(1) h (2) 2 h (3) ι + h (4) 0

81. Two loops of different wire are placed concentrically in a plane. If the current in the outer loop is made to pass clock wise and current increases with time, the induced current in the inner loop will be :

(1) will depend upon radius of loop.
(2) zero
(3) anticlock wise
(4) clock wise

82. Distance between earth and moon is reduced to half then the time period will be :

(1) nothing can be said (2) unchanged
(3) decreases (4) increases

83. Energy of a photon of 5890 Å wavelength is :

(1) 3×10^{-19} J (2) 3.6×10^{-24} J
(3) 3.347×10^{-19} J (4) 3.364×10^{-19} J

84. Range of a ball which is projected at 30^0 angle with 80 m/s. velocity is :

(1) 565 m. (2) 108 m. (3) 632 m. (4) 433 m.

85. A loop of thread is placed over a horizontal film of soap. If the threadis peneterated in the mid, it acquires circular shape of radius R. If the surface tension of soap is T, the tension in the thread is :

(1) RT (2) $\frac{2\pi R}{T}$ (3) πRT (4) $\frac{\pi R^2}{T}$

86. A particle executing SHM has total energy E. When the displacement of the particle is half of its amplitude at that point the kinetic energy of the particle will be :

(1) $\frac{E}{3}$ (2) $\frac{E}{4}$ (3) $\frac{E}{2}$ (4) $\frac{3E}{4}$

87. Value of 'g' at the surface of moon is one sixth of that at the earth surface then the time period of a pendulum at moon is how much times to that at earth :

(1) $\frac{1}{6}$ times (2) 6 times (3) $\sqrt{6}$ times (4) $\frac{1}{\sqrt{6}}$ times

88. A car has to cover the distance 60 km. if half of the total time it travels with velocity 80 km./hr. and in rest half time its speed becomes 40 km/hr. the average speed of car will be :

(1) 180 kmph (2) 120 kmph (3) 80 kmph (4) 60 kmph

89. If the kinetic energies of two bodies of 4 k. gm. And 16 k. gm. Is same, the ratio of their momentum is :

(1) 4 : 1 (2) 2 : 1 (3) 1 : 2 (4) 1 : 4

90. Work done to increase a unit length of a wire is :

(1) $\frac{1}{2} Y^2S$ (2) $\frac{1}{2} YS^2$ (3) $\frac{1}{2} YS$ (4) $\frac{1}{2} YS^2$

91. If kinetic energy of a body is increased by 20 % then increase in momentum will be :

(1) 3000 % (2) 10% (3) 11% (4) 22%

92. Current in a circuit will be watt less when the phase difference between voltage and current is :

(1) 60^0 (2) 180^0 (3) 45^0 (4) 90^0

93. The half life of Radium is 1600 yrs. After 4800 yrs. the unitergrated amount of radium will be :

(1) $\frac{8}{7}$ (2) $\frac{7}{8}$ (3) $\frac{1}{8}$ (4) $\frac{1}{16}$

94. The energy of an electron at 0 K temp. can be called :

(1) potential energy (2) work function
(3) emission energy (4) Fermi energy

95. Cooling law is based upon :

(1) Kirchoff's law (2) Stefan's law
(3) Prevost law (4) Plank's law

96. Use of triode is as a :

(1) modulator (2) oscillator (3) amplifier (4) all of these

97. If the colour of a star changes from red to blue, it means :

(1) it is constant
(2) coming towards earth
(3) moving away from earth
(4) none

98. A bomb of 9 kg. blasts into two parts of 3 kg. is 16 m/sec. then the kinetic energy of 6 kg. is 16 m/sec. then the kinetic energy of 6 kg. part is :

(1) 24 J (2) 48 J (3) 96 J (4) 92 J

99. Weight of 1 kg. sugar will be max. at :

(1) poles (2) sea level (3) equator (4) at all places

100. There is a pendulum in a life and the lift is coming down wards frealy then the time period is :

(1) zero (2) infinity (3) 2 second (4) 9.8 sec.

ANSWER SHEET

1.(3)	2.(1)	3.(3)	4.(2)	5.(3)	6.(4)	7.(4)	8.(2)	9.(2)	10.(2)	11.(2)
12.(1)	13.(1)	14.(2)	15.(2)	16.(2)	17.(4)	18.(3)	19.(4)	20.(3)	21.(3)	22.(1)
23.(4)	24.(1)	25.(2)	26.(3)	27.(2)	28.(3)	29.(2)	30.(2)	31.(2)	32.(2)	33.(1)
34.(4)	35.(2)	36.(3)	37.(2)	38.(1)	39.(3)	40.(3)	41.(2)	42.(3)	43.(4)	44.(3)
45.(3)	46.(1)	47.(4)	48.(3)	49.(2)	50.(2)	51.(2)	52.(2)	53.(3)	54.(1)	55.(4)
56.(1)	57.(3)	58.(2)	59.(2)	60.(3)	61.(3)	62.(2)	63.(2)	64.(1)	65.(3)	66.(1)
67.(4)	68.(3)	69.(4)	70.(1)	71.(1)	72.(2)	73.(4)	74.(4)	75.(2)	76.(3)	77.(1)
78.(3)	79.(2)	80.(1)	81.(3)	82.(3)	83.(3)	84.(1)	85.(1)	86.(4)	87.(3)	88.(4)
89.(3)	90.(4)	91.(3)	92.(4)	93.(3)	94.(4)	95.(2)	96.(4)	97.(2)	98.(4)	99.(1)
100.(2)										