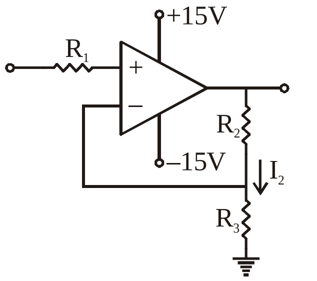
D.U. M.Sc. Entrance - 2014 (Physics) (Code - PTHS-M4)

1. The non-inverting amplifier shown in the following circuit uses a 741 Op-Amp with $R_1 = 1K\Omega, R_2 = 39K\Omega, R_3 = 1K\Omega$. The typical parameter values for the 741 Op-Amp are: Open loop gain $A_v = 2 \times 10^5$, Input resistance $R_i = 2M\Omega$ and Output resistance $R_o = 75\Omega$. The Input resistance and Output resistance for the non-inverting amplifier respectively will be about:



(a) $400G\Omega, 0.015\Omega$
(b) $10G\Omega, 0.015\Omega$
(c) $400G\Omega, 0.00037\Omega$
(d) $10G\Omega, 0.00037\Omega$

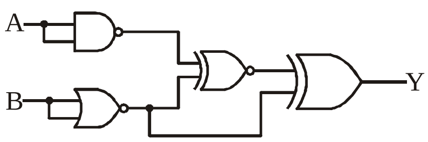
2. The maximum efficiency of an npn BJT amplifier is about $\pi/4$ under the:
(a) Class A configuration
(b) Class B push-pull configuration
(c) Class C tuned configuration
(d) Class AB configuration

3. The *n*-channel JFET having pinch off voltage of –5V shows a transconductance of 1mA/V when the applied gate to source voltage (V_{GS}) is –3V. The maximum value of transconductance (in mA/V) for JFET will be:
(a) 1.5 (b) 2.0 (c) 2.5 (d) 3.0

4. The minimum number of storage elements needed for the designing of a bi-stable multivibrator is:
(a) 0 (b) 1 (c) 2 (d) 3

5. The simplified Boolean expression for $Y = \Sigma_m(0,2,4,5,8,10) + \Sigma_d(6,12,13)$, is:
(a) $\bar{B}\bar{D} + B\bar{C}$ (b) $\bar{B}\bar{D} + B\bar{C} + \bar{A}\bar{B}$ (c) $\bar{D} + B\bar{C}$ (d) $\bar{C}\bar{D} + B\bar{C} + \bar{B}C\bar{D}$

6. The output for the following logic circuit with the given inputs is:



A	B	Y
0	1	Y1
1	1	Y2

(a) $Y1 = 0; Y2 = 0$
(b) $Y1 = 0; Y2 = 1$
(c) $Y1 = 1; Y2 = 0$
(d) $Y1 = 1; Y2 = 1$

7. The resolution of an *n*-bit D to A converter (DAC) using resistive ladder network is:
(a) $1/2^n$ (b) $1/2^{n-1}$ (c) $1/2^n - 1$ (d) $1/2^{n+1}$

8. In a 4-bit serial-in-parallel-out shift register, the outputs Q_D, Q_C, Q_B and Q_A of respective D Flip-Flops are initially in the state 1010. A binary sequence 0101 is applied to the input of the first D-flip-flop (having output Q_D). After two clock pulses, the values of output $Q_D\ Q_C\ Q_B\ Q_A$ of the shift register will be:
(a) 1001 (b) 0100 (c) 0110 (d) 1010

9. The T-states required for the opcode fetch in a 8085 microprocessor and the execution time required for opcode fetch if the clock frequency is 2MHz are:
(a) 4T, 2μs (b) 8T, 4μs (c) 2T, 2μs (d) 8T, 2μs

10. Assume the accumulator content in 8085 microprocessor is AAH and flag CY = 0. The content of the accumulator and CY flag after the execution of RAL instruction twice are respectively:
(a) A = A9H, CY = 0 (b) A = 54H, CY = 1
(c) A = A9H, CY = 1 (d) A = 54H, CY = 0

11. Which statement will you add in the following program to make it work correctly?

```
#include <stdio.h>
int main ()
{
printf("%f\n", log (36.0));
    return 0;
    }
```

(a) #include <conio.h> (b) #include <math.h>
(c) #include <stdlib.h> (d) #include <dos.h>

12. Each fusion reaction in the Sun liberates about 26.7 MeV of energy. About 1.4×10^3W of solar power is incident on each square metre of the Earth that is at a distance of about 1.5×10^{11} m from the Sun. The number of fusion reactions occurring per second in the core of the Sun is about:
(a) 10^{37} (b) 10^{39} (c) 10^{41} (d) 10^{43}

13. A nucleus consists of Z protons and N neutrons. If the mass of proton is m_p and the mass of neutron is m_n, the mass of the nucleus, M, is given as:
(a) $M = Zm_p + Nm_n$ (b) $M < Zm_p + Nm_n$
(c) $M > Zm_p + Nm_n$ (d) M is independent of m_p and m_n

14. Consider the following reactions:
(I) $p + p \to p + p + p + \overline{p}$ (II) $p + p \to p + n + \pi^+$
(III) $p + p \to p + n + \pi^0 + \pi^+$ (IV) $p + p \to p + p + \pi^- + \pi^+$
Which of these reactions can occur?
(a) Only I (b) Only IV
(c) Both I and IV (d) All I, II, III and IV

15. In the absence of the neutrino emission, which conservation laws will be violated in beta decay?
(a) Energy conservation only
(b) Energy and momentum conservation only
(c) Energy, momentum and angular momentum conservation
(d) No conservation law is violated

16. A mixture contains 2 mole of He $(C_p = 2R,\ C_v = 1R)$ and 1 mole of H $(C_p = 3R,\ C_v = 2R)$. The approximate values of C_v and γ for the mixture are, respectively:
(a) $1.33R, 1.75$ (b) $2R, 1.5$ (c) $1.63R, 1.67$ (d) $2.5R, 1.4$

17. A steam engine takes 50g of steam at 100ºC per minute and cools it down to 20ºC. The heat rejected by the steam engine per minute is about (Latent heat of vaporization of steam = 540 cal/g):
(a) 0.4×10^4 cal (b) 2.1×10^4 cal (c) 3.1×10^4 cal (d) 6.2×10^4 cal

18. Choose the wrong statement from the following:
(a) Entropy remains constant in all adiabatic processes
(b) Gibbs function increases in all natural processes
(c) Change in enthalpy during an isobaric process is equal to the heat transferred
(d) In a throttling process, the initial and final enthalpies are equal

19. In an adiabatic process involving an ideal gas, if the volume *V* is related to the absolute temperature *T*, by $V \sim 1/T^2$, the adiabatic index $\gamma(=C_P/C_V)$ is:
(a) 1.4 (b) 1.5 (c) 0.5 (d) 0.75

20. In superconductors, Cooper pairs are formed due to electron-electron interactions mediated by:
(a) Phonons (b) Photons (c) Excitons (d) Polarons

21. Dielectric polarizability is a proportionality constant in the relation between:
(a) Electric dipole moment and local electric field (b) Displacement vector and local electric field
(c) Electric dipole moment and charge density (d) Displacement vector and charge density

22. If the molecular weight and density of rock salt (NaCl) with fcc structure are 60 and 2160 kg/m^3, respectively, the lattice constant in Å is about:
(a) 6.78 (b) 5.69 (c) 4.51 (d) 3.10

23. Debye temperatures of copper and gold are 340K and 170K, respectively. At room temperature, if the specific heat for copper is 1.5 kJmol^{-1}K^{-1}, the specific heat for gold is about:
(a) 0.19 kJmol^{-1}K^{-1} (b) 1.2 kJmol^{-1}K^{-1} (c) 1.9 kJmol^{-1}K^{-1} (d) 12 kJmol^{-1}K^{-1}

24. If a charged particle of charge *q* and mass *m* moving with speed *v* enters a magnetic field $\boldsymbol{B}$ perpendicular to its direction of motion, it will move in a circular orbit of radius *R*. Then,
(a) *R* is directly proportional to q/m and $|\boldsymbol{B}|$
(b) *R* is inversely proportional to q/m and $|\boldsymbol{B}|$
(c) *R* is directly proportional to q/m and inversely proportional to $|\boldsymbol{B}|$
(d) *R* is inversely proportional to q/m and directly proportional to $|\boldsymbol{B}|$

25. A current I flows in a cylindrical wire of length L and radius *a*, placed in a uniform electric field, E = VL, parallel to the wire (V is the potential difference between the two ends of the wire). Which of the following statements is correct?
(a) The Poynting vector is zero for this system
(b) The magnitude of Poynting vector is $\frac{VI}{2\pi aL}$ and it is directed parallel to the wire
(c) The magnitude of Poynting vector is $\frac{VI}{2\pi aL}$ and it points radially inward
(d) The magnitude of Poynting vector is $\frac{VI}{2\pi aL}$ and it points radially outward

26. Sunlight is incident on the surface of the sea at an angle θ. A sailor viewing through a rotating polaroid can almost block the reflected light by adjusting the angle of the polaroid. The value of θ is about (Refractive index of water is 1.33):
(a) 57° (b) 53° (c) 49° (d) 41°

27. The skin depth of the electromagnetic waves in a poor conductor is:

(a) $\omega\sqrt{\frac{\varepsilon\mu}{2}}[\sqrt{1+(\frac{\sigma}{\varepsilon\omega})^2}-1]^{1/2}$ (b) $\omega\sqrt{\frac{\varepsilon\mu}{2}}$

(c) $\frac{2}{\sigma}\sqrt{\frac{\varepsilon}{\mu}}$ (d) $\frac{\lambda}{2\pi}$

28. The ensemble average of the product of two functions *f* and *g* is equal to:
(a) Product of the ensemble average of *f* and the ensemble average of *g*
(b) Sum of the ensemble average of *f* and the ensemble average of *g*
(c) Difference between the ensemble average of *f* and the ensemble average of *g*
(d) Ratio of the ensemble average of *f* and the ensemble average of *g*

29. The wave-function for identical fermions is anti-symmetric under interchange of particle positions. This is a consequence of:
(a) Dirac quantization condition (b) Bose-Einstein condensation
(c) Bohr correspondence principle (d) Pauli exclusion principle

30. Consider a Maxwell-Boltzmann system with two states of energies *E* and 2*E*. If each state is two-fold degenerate, then the partition function would be (in terms of *E*, *k*, and *T*, where *k* is the Boltzmann constant and *T* is the absolute temperature):

(a) $Z = 2e^{-3E/(kT)}$ (b) $Z = e^{-E/(kT)}[1+2e^{-E/(kT)}]$

(c) $Z = 2e^{-E/(kT)}[1+e^{-2E/(kT)}]$ (d) $Z = 2e^{-E/(kT)}[1+e^{-E/(kT)}]$

31. The surface of the Sun has a temperature close to 6000 K and it emits a blackbody (Planck) spectrum that reaches a maximum near a wavelength of 5×10^{-7} m. For a body with a surface temperature of 300K, the thermal spectrum would reach a maximum at a wavelength:
(a) 10^{-5} m (b) 2×10^{-6} m (c) 5×10^{-6} m (d) 10^{-6} m

32. If the monochromatic source of light in Young's double-slit experiment is replaced by a white-light source, then:
(a) No fringes will be formed
(b) There will be white fringes only
(c) There will be a coloured central fringe only
(d) There will be a central white fringe flanked on either side by a few coloured fringes

33. Interference and diffraction of light supports its:
(a) Wave nature (b) Quantum nature
(c) Transverse nature (d) Electromagnetic character

34. Longitudinal waves will not show:
(a) Interference (b) Diffraction (c) Polarisation (d) Total internal reflection

35. The Fourier transform of $\sin(\omega_0 t)$ is proportional to:

(a) $\delta(\omega+\omega_0)$ (b) $\delta(\omega-\omega_0)$

(c) $\delta(\omega+\omega_0)-\delta(\omega-\omega_0)$ (d) $\delta(\omega+\omega_0)+\delta(\omega-\omega_0)$

36. The Fourier transform of a function $f(t)$ is denoted by $\tilde{F}(\omega)$. Let the complex conjugate of $\tilde{F}(\omega)$ be denoted by $\tilde{F}^{'*'}(\omega)$. If $f(t)$ is real, then:

(a) $\tilde{F}(\omega)=\tilde{F}^{'*'}(-\omega)$ (b) $\tilde{F}(\omega)=\tilde{F}^{'*'}(\omega)$

(c) $\tilde{F}(\omega)=\tilde{F}^{'*'}\left(\frac{1}{\omega}\right)$ (d) $\tilde{F}(\omega)=\tilde{F}^{'*'}\left(\frac{-1}{\omega}\right)$

37. A periodic function can be expressed in the form

$$f(x)=\sum_{n=0}^{\infty}\left[a_{2n}\cos(x)+a_{2n+1}\sin(x)\right]$$

If this function is given to be $f(x)=|\sin(x)|$, which of the following statement is correct?

(a) $a_{2n}=0$ for all n (b) $a_{2n+1}=0$ for all n

(c) $a_n=0$ for all n (d) $a_n=0$ for all n other than n = 1

38. The first and second order Legendre polynomials are given by

$$P_1(\mu)=\cos(\theta),\ P_2(\mu)=\frac{3}{2}\cos^2(\theta)-\frac{1}{2},\ \text{where } \mu=\cos(\theta).$$

The integral $\int P_1(\mu)P_2(\mu)\sin(\theta)d\theta$ with limits of integral from $\theta=0$ to $\theta=\pi$ will be:

(a) 3π (b) $-\pi$ (c) 0 (d) π

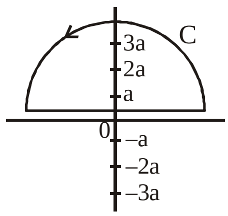
39. If an electron of mass m_e and a proton of mass m_p have the same kinetic energy, then the ratio of their de Broglie wavelengths λ_e/λ_p is:

(a) 1 (b) m_p/m_e (c) $(m_p/m_e)^{1/2}$ (d) $(m_p/m_e)^2$

40. The value of the integral $2\int x^4 e^{-x^2}dx$ with limits $-\infty$ to $+\infty$ is:

(a) $\Gamma(5/2)$ (b) $\Gamma(5)$ (c) $\Gamma(4)$ (d) $\Gamma(3/2)$

41. Consider the integral of the function f(z) in the complex plane along the contour C as shown in the figure. For $f=[z^2+a^2]^{-1}$, the value of the integral is:



(a) $\frac{\pi}{a}$ (b) $\frac{2\pi}{a}$

(c) $\frac{i\pi}{2a}$ (d) $\frac{i\pi}{a}$

42. The function $f(z)=\frac{(z-2)}{(z^2-4)(z+3)}$

(a) Has a simple pole at z = 2 and a simple pole at z = 3
(b) Has a simple pole at z = –2 and a simple pole at z = –3
(c) Has a pole of order 2 at z = 2 and a simple pole at z = –3
(d) Has a pole of order 2 at z = –2 and a simple pole at z = 3

43. The complex function $f(z)=z^{1/2}$

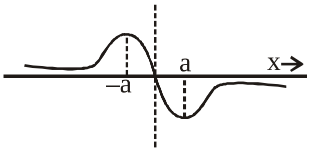
(a) Has a simple pole at z = 0 (b) Has a pole of order 2 at z = 0

(c) Has a branch point (d) Is analytic in the entire complex plane

44. A particle moves along a circle of unit radius with uniform angular velocity ω. The probability of finding the particle at a position between x and x + dx(x < 1) to the right of the centre, is:

(a) $\frac{dx}{\pi\sqrt{1-x^2}}$ (b) $\frac{dx(1-x^2)}{2\pi}$ (c) $\frac{dx}{2\pi(1-x^2)}$ (d) $\frac{dx\sqrt{1-x^2}}{2\pi}$

45. The wave function of the first excited state of a particle in a simple harmonic oscillator potential may be represented as shown in the figure below:



The probability of finding the particle at a particular position is maximum for:

(a) only x = a (b) only x = –a

(c) Both x = a and x = –a (d) x tending to $\pm\infty$

46. Which of the following is an admissible wave function in three dimensions? (Here N_1, N_2, N_3, N_4 and r_0 are constants and r is the radial coordinate):

(a) $\psi = \frac{N_1}{(r^2 + r_0^2)^{1/4}}$ (b) $\psi = \frac{N_2}{(r^2 + r_0^2)^{1/2}}$

(c) $\psi = \frac{N_3}{(r^2 + r_0^2)^{3/2}}$ (d) $\psi = \frac{N_4}{(r^2 + r_0^2)^{2}}$

47. The wave function of a particle is given by $\psi = \frac{1}{\sqrt{2}}e^{-|x|/2}$ with $-\infty < x < +\infty$. The minimum uncertainty in the momentum is:

(a) $10h/(2\pi)$ (b) $h/(2\pi\sqrt{2})$ (c) 2/h (d) $\sqrt{h}$

48. The general solution of the differential equation $\frac{d^3y}{dx^3} + \frac{1}{x}\frac{d^2y}{dx^2} + \frac{1}{x^2}\frac{dy}{dx} = 0$ can be expressed as (C_1, C_2 and C_3 are constants):

(a) $C_1 + C_2x^{1+i} + C_3x^{1-i}$ (b) $C_1 + C_2x + C_3x^i$

(c) $C_1x + C_2x^2 + C_3x^3$ (d) $C_1x + C_2x^{1+i} + C_3x^{1-i}$

49. A system is described by a Lagrangian $[dx/dt]^3 + x^3$ where x is the degree of freedom and t is the time. The Euler equation of motion for this system is,

(a) $\frac{d^2x}{dt^2} = -3x^2$ (b) $\frac{d^2x}{dt^2} = 3x^2$

(c) $\frac{d^2x}{dt^2} = \frac{1}{2}\frac{x^2}{dx/dt}$ (d) $\frac{d^2x}{dt^2} = -\frac{1}{2}\frac{x^2}{dx/dt}$

50. The most general solution for the one dimensional wave equation $\frac{\partial^2 F}{\partial x^2} = \frac{\partial^2 F}{\partial t^2}$ is:

(a) F = h(x + t) + g(x – t) (b) F = h(x – t)

(c) F = g(x – t) (d) F = h(x + t) × g(x – t)

51. Consider a partial differential equation given by $\frac{\partial^2 F}{\partial x^2} = \frac{\partial F}{2\partial t}$. An admissible solution will be:

(a) $e^{kx+2\sqrt{k}t} + e^{kx-2\sqrt{k}t}$ (b) $e^{\sqrt{k}x+2kt} + e^{-\sqrt{k}x+2kt}$

(c) $e^{kx-2\sqrt{k}t}$ (d) $e^{kx+2\sqrt{k}t}$

52. If the trace and the determinant of a 2 × 2 matrix are both zero; then,

(a) Only one of eigenvalues needs to be zero (b) Both the eigenvalues need to be zero

(c) Both the eigenvalues are non-zero but finite (d) At least one of the eigenvalues should be infinite

53. The matrix given by:

$$\begin{pmatrix} 3 & 2i & 1 \\ -2i & 4 & 1+2i \\ 1 & 1-2i & 5 \end{pmatrix}$$

(a) Has one real and one complex eigenvalues (b) Has two real and one complex eigenvalues

(c) Has three real eigenvalues (d) Has three complex eigenvalues

54. The trace of a 4 × 4 matrix is 8 and its determinant is –24. If two of its eigenvalues are 3 and 4, the other two eigenvalues are:

(a) –2 and 1 (b) 2 and –1 (c) 2 and 1 (d) –2 and –1

55. A vector field is given by $\vec{A} = y\hat{i} + z\hat{j} + x\hat{k}$. The curl of the vector is:

(a) $\hat{i} + \hat{j} - \hat{k}$ (b) $-\hat{i} - \hat{j} - \hat{k}$ (c) $-\hat{i} - \hat{j} + \hat{k}$ (d) $\hat{i} + \hat{j} + \hat{k}$

56. The magnitude of the cross product of two vectors $\overline{AB}$ and $\overline{AC}$ is equal to:

(a) The area of the triangle

(b) The area of the parallelogram with adjacent sides AB and AC

(c) Twice the area of the rectangle with adjacent sides AB and AC

(d) The area of the circle passing through A, B and C

57. Consider a set of surfaces $f(x, y, z) = c$. Different values of *c* will generate different surfaces. The gradient of *f* at a point P has a direction:

(a) Tangential to the surface at point P

(b) At 45 degrees to the surface at point P

(c) Normal to the surface at the point P in the direction of increasing value of *f*

(d) Normal to the surface at the point P in the direction of decreasing value of *f*

58. A wire is in the form of a curve given by $2y = x^2$ with $-1 < x < 1$. This is rotated by an angle π about the line x = 0. The area swept by the wire is:

(a) $\frac{2\pi}{3}$ (b) $(2^{3/2})\frac{2\pi}{3}$ (c) $(2^{3/2}-1)\frac{2\pi}{3}$ (d) $(2^{3/2}+1)\frac{2\pi}{3}$

59. Apply Newton-Raphson method to solve the equation (1/x) – a = 0. The resulting iterative formula for the root of this equation is:

(a) $x_{n+1} = 2x_n + ax_n^2$ (b) $x_{n+1} = 2x_n - ax_n^2$ (c) $x_{n+1} = ax_n^2$ (d) $x_{n+1} = -ax_n^2$

60. Which of the following is not an iterative method for solving equations?

(a) Fixed point method (b) Newton - Raphson method

(c) Gauss elimination method (d) Gauss - Seidel method

61. It is known that the root of the function $f(x)$ lies between 0 and 1. After 10 iterations of the bisection method, the approximate accuracy of the root will be:

(a) Correct up to 2 places of decimal (b) Correct up to 3 places of decimal

(c) Correct up to 4 places of decimal (d) Correct up to 5 places of decimal

62. The electric field of a travelling wave is given by $100\cos(10^9 t - 4x)$, where t is in seconds and x in metres. The speed of the wave is:
(a) 3.0×10^8 m/s (b) 2.5×10^8 m/s (c) 3.0×10^7 m/s (d) 5.0×10^7 m/s

63. Electric susceptibility χ of a linear, isotropic and non-dispersive medium is related to the electric displacement vector ***D*** and the applied electric field ***E*** via the relation:
(a) $\chi = |\mathbf{D} - 4\pi\mathbf{E}|$ (b) $\chi = |\mathbf{D} - \mathbf{E}|/4\pi$
(c) $\chi\mathbf{E} = \mathbf{D} - 4\pi\mathbf{E}$ (d) $\chi\mathbf{E} = (\mathbf{D} - \mathbf{E})/4\pi$

64. The Poynting vector has the dimension of:
(a) Energy / Area (b) Power / Area
(c) Energy / (Charge × Volume) (d) Power / (Charge × Volume)

65. The phase difference between two points, which are 0.5 cm apart in a wave of wavelength 1.0 metre, is:
(a) 2.8° (b) 5.0° (c) 3.6° (d) 1.8°

66. The motion of a simple pendulum executing oscillations with large amplitude is:
(a) Periodic and simple harmonic (b) Periodic but not simple harmonic
(c) Aperiodic (d) Rectilinear

67. A vertical spring, loaded with a mass, executes simple harmonic motion with a period of 4s. The difference in the kinetic energy and potential energy of this system changes with a period of:
(a) 4s (b) 2s (c) 8s (d) 16s

68. Consider an air column having one end closed. The ratio of lengths of columns having the other end either open or closed, which emit the same fundamental note, is:
(a) 4:1 (b) 3:2 (c) 8:1 (d) 2:1

69. Splitting of spectral lines in the Stark effect depends on:
(a) Magnetic quantum number (b) Spin quantum number
(c) Azimuthal quantum number (d) Principal quantum number

70. A three-level system of atoms has N_1 atoms in level E_1, N_2 in level E_2 and N_3 in level E_3(N_2>N_1>N_3 and E_1<E_2<E_3). Laser emission is possible for the transitions:
(a) $E_2 \rightarrow E_1$ (b) $E_3 \rightarrow E_2$ (c) $E_2 \rightarrow E_3$ (d) $E_3 \rightarrow E_1$

71. The ratio of intensities of spectral lines in hydrogen spectrum for the transitions $2^2 p_{1/2} \rightarrow 1^2 s_{1/2}$ is:
(a) 1/4 (b) 1/6 (c) 1/3 (d) 1/2

72. A satellite of mass *m* is moving round a planet of mass *M* in a circular orbit of radius *R*. The time taken for one complete revolution is:
(a) Linear in *R* (b) Proportional to $m^{1/2}$
(c) Proportional to $R^{3/2}$ (d) Independent of *M*

73. If the sum of all external forces on a system of interacting particles is zero, then:
(a) The total mechanical energy of the system is necessarily constant
(b) The total potential energy of the system is necessarily constant
(c) The total linear momentum of the system is necessarily constant
(d) The total kinetic energy of the system is necessarily constant

74. A horizontally mounted disk with moment of inertia ***I*** spins about a frictionless axle. At time $t = 0$, the initial angular speed of the disk is ω. A constant torque τ is applied to the disk, causing it to come to a halt in time *t*. The power required to dissipate the wheel's energy during this time is:
(a) $(I\omega^2)/(2t)$ (b) $(I\omega^2)/(2\tau)$ (c) $(I\omega)/t$ (d) $(I\omega^2)/2$

75. Relative to a stationary observer, a rod of length 1.0 metre is moving at 0.8 times the speed of light in vacuum. It would appear to the observer that the rod's length is:
(a) 0.8 m (b) 0.6 m (c) 1.0 m (d) 1.25 m

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ANSWER KEY

1. (b)	**2.** (b)	**3.** (c)	**4.** (a)	**5.** (a)
6. (b)	**7.** (a)	**8.** (c)	**9.** (a)	**10.** (a)
11. (b)	**12.** (a), (b)	**13.** (b)	**14.** (d)	**15.** (c)
16. (a)	**17.** (c)	**18.** (b)	**19.** (b)	**20.** (a)
21. (a)	**22.** (b)	**23.** (d)	**24.** (b)	**25.** (c)
26. (b)	**27.** (c)	**28.** (e)	**29.** (d)	**30.** (d)
31. (a)	**32.** (d)	**33.** (a)	**34.** (c)	**35.** (c)
36. (a)	**37.** (b)	**38.** (c)	**39.** (c)	**40.** (e)
41. (a)	**42.** (b)	**43.** (c)	**44.** (a)	**45.** (c)
46. (c), (d)	**47.** (b)	**48.** (a)	**49.** (c)	**50.** (a)
51. (b)	**52.** (b)	**53.** (c)	**54.** (b)	**55.** (b)
56. (b)	**57.** (c)	**58.** (c)	**59.** (b)	**60.** (c)
61. (b)	**62.** (b)	**63.** (d)	**64.** (b)	**65.** (d)
66. (b)	**67.** (b)	**68.** (d)	**69.** (a)	**70.** (a)
71. (e)	**72.** (c)	**73.** (c)	**74.** (a)	**75.** (b)

The **e** represents error / ambiguity in the respective questions and full (4) marks will be given to the candidates for these questions.