



ENTRY TEST ASSIGNMENTS



BOOK I

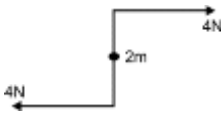
SCIENTIA VISIO

NUST (Med/Engg.) + GIKI + FMDC

Ch # 1+2

(PHYSICS)

- (1) The minimum number of unequal vectors whose vector sum can be zero is
 (a) 3 (b) 2
 (c) 4 (d) 5
- (2) If $\vec{L} = \vec{r} \times \vec{P}$ then $\vec{r} \cdot \vec{L}$ is
 (a) $rL \cos\theta$ (b) zero
 (c) rL (d) $rL \sin\theta$
- (3) Which of the following is a scalar
 (a) torque (b) pressure
 (c) momentum (d) impulse
- (4) The resultant of vectors of 8N and 10 N can never be
 (a) 20 N (b) 15 N
 (c) 12 N (d) 6 N
- (5) The reverse process for vectors addition is called
 (a) multiplication of vectors (b) resolution of vectors
 (c) subtraction of vectors (d) none of these
- (6) Area of parallelogram is equal to magnitude of
 (a) dot product (b) both a or b
 (c) cross product (d) none of these
- (7) Angular acceleration is produced by
 (a) momentum (b) angular momentum
 (c) torque (d) none of these
- (8) For rotational equilibrium
 (a) $\sum F = 0$ (b) $\sum F = 0, \sum \tau = 0$
 (c) $\sum \tau = 0$ (d) none of these
- (9) The scalar product of two vectors 5N and 2N is 5N Angle between them is
 (a) 60° (b) 90°
 (c) 30° (d) none of these
- (10) The angle between $\hat{i} - \hat{j}$ and $\hat{i} + \hat{j}$ is
 (a) 30° (b) 90°
 (c) 60° (d) 0°
- (11) Three vectors \vec{A}, \vec{B} and \vec{C} satisfy the relation $\vec{A} \cdot \vec{B} = 0$ and $\vec{A} \cdot \vec{C} = 0$ then \vec{A} is parallel to
 (a) $\vec{B} \times \vec{C}$ (b) \vec{C}
 (c) \vec{B} (d) $\vec{B} \cdot \vec{C}$
- (12) A force of 20 N is making angle 30° with y-axis its x- component is
 (a) 20 N (b) 5 N
 (c) 10 N (d) zero

- (13) Two vectors \vec{A} and \vec{B} are such that $\vec{C} = \vec{A} + \vec{B} = 0$ and $C^2 = A^2 + B^2$ Angle between \vec{A} and \vec{B} is
- (a) 0° (b) 60°
(c) 90° (d) 45°
- (14) One of the rectangular component of a force is 10 N and makes 60° with force. The force is
- (a) 7 N (b) 20 N
(c) 14 N (d) 17 N
- (15) In the above problem other component is
- (a) 14 N (b) 17.3 N
(c) 6 N (d) 20 N
- (16) Two vectors are at right angle then
- (a) $\vec{A} + \vec{B} = 0$ (b) $\vec{A} \cdot \vec{B} = 0$
(c) $\vec{A} - \vec{B} = 0$ (d) $\vec{A} \times \vec{B} = 0$
- (17) Angle between $r \times F$ and $-F \times r$ is
- (a) 0° (b) 180°
(c) 45° (d) none
- (18) Angle subtended by $-a - b$ with X - axis is
- (a) 45° (b) 225°
(c) 125° (d) 315°
- (19) If $|\vec{A} \times \vec{B}| = \sqrt{3} \vec{A} \cdot \vec{B}$ then angle b/w \vec{A} and \vec{B} is
- (a) 0° (b) 45°
(c) 30° (d) 60°
- (20) In the above problem $|\vec{A} + \vec{B}|$ is
- (a) $A+B$ (b) $(A^2 + B^2 + AB)^{\frac{1}{2}}$
(c) $(A^2 + B^2)$ (d) None of these
- (21) Number of rectangular components of a vector in plane are
- (a) 1 (b) 3
(c) 2 (d) 4
- (22) What is the net torque acting on the rod
- 
- (a) 6 Nm (b) 12 Nm
(c) 8 Nm (d) 18 Nm
- (23) Scalar product is
- (a) associative (b) distributive
(c) commutative (d) all of these
- (24) $\hat{i} \cdot (\hat{k} \times \hat{j})$ is
- (a) 0 (b) -1
(c) 1 (d) \hat{j}

- (25) Component of vector $4\hat{i} + 3\hat{j}$ along Z-axis
 (a) 4 (b) 5
 (c) 3 (d) 0
- (26) SI unit of amount of substance is
 (a) Ampere (b) kg
 (c) mole (d) watt
- (27) Significant figures in 0.2001 are
 (a) 2 (b) 1
 (c) 4 (d) 3
- (28) The least count is called
 (a) percentage uncertainty (b) fractional uncertainty
 (c) absolute uncertainty (d) all of these
- (29) Least count of meter rod is
 (a) 1cm (b) 0.1 cm
 (c) 0.01 mm (d) none
- (30) SI unit is built-up from
 (a) base unit (b) derived unit
 (c) supplementary unit (d) all of these
- (31) When the dimensions of both sides in an equation is equal then the equation is _____?
 A) Simultaneous C) Homogenous
 B) Instantaneous D) Quadratic
- (32) The principle of homogeneity of dimensions determines?
 A) Only variable in the equation C) Constant and variable in the equation
 B) Only constant in the equation D) Correctness of an equation
- (33) A ruler of length of 0.6m is pivoted at the centre, Equal and opposite forces of 2N are applied at the ends of the ruler, creating a couple Torque acting on it is :-
 A) 0.6 Nm C) 0.3 Nm
 B) 1.2 Nm D) 0 Nm
- (34) Which of the following is not a base unit:
 A) kg C) Cd
 B) Ampere D) Dyne
- (35) Physics based on Newtonian mechanics is:
 A) Quantum physics C) Classical physics
 B) Modern physics D) Light
- (36) Centre of gravity of a body lies:
 A) Inside a body C) May be inside or outside a body
 B) Outside a body D) None of the above
- (37) Dimension of plank's constant is
 (a) MLT^{-1} (b) ML^2T^{-1} (c) $M^{-1}L^2T$ (d) ML^2TK^{-1}
- (38) Which of the following have dimensions of frequency
 (1) RC (2) $\frac{1}{RC}$ (3) \sqrt{LC} (4) $1/\sqrt{LC}$ (5) R/L
 (a) 1 & 5 (b) 2 & 4 (c) 2 & 3 (d) 3 & 5

- (39) How many significant figures are there in the following values?
71 mg (2) 0.071 g (3) 0.000071 kg
(a) 1,2 and 6 (b) 2,3 and 6 (c) 2,2 and 2 (d) none of these
- (40) Given $C = A \times B$ and $D = B \times A$. The angle between C & D is
(a) 0° (b) 60° (c) 90° (d) 180°
- (41) Resultant of two vectors a & b is given as $\sqrt{a^2 + b^2 + \sqrt{2} ab \cos \theta}$. The angle between a & b is
(a) 0° (b) 30° (c) 45° (d) 60°
- (42) The magnitude of the resultant of $(\vec{A} + \vec{B})$ and $\vec{A} - \vec{B}$ is
(a) A (b) $2A$ (c) $2B$ (d) $\sqrt{A^2 + B^2}$
- (43) The resultant of two vectors of magnitude 4 & 6 is 10. The value of their dot product is
(a) 10 (b) 24 (c) -10 (d) -24
- (44) The cross product of vector $\hat{i} + \hat{j}$ and $\hat{i} + \hat{k}$ is
(a) $\hat{i} + \hat{j} + \hat{k}$ (b) $\hat{i} - \hat{j} + \hat{k}$ (c) $\hat{i} + \hat{j} - \hat{k}$ (d) $\hat{i} - \hat{j} - \hat{k}$
- (45) The angle subtended by vectors $\hat{i} + \hat{j}$ with x-axis is
(a) 30° (b) 45° (c) 60° (d) 90°
- (46) \rightarrow What is the torque of force $F = \hat{i} - 2\hat{j}$ acting at a point whose position vector is $r = -\hat{i} - \hat{j}$
(a) $\hat{i} + 3\hat{k}$ (b) $-2\hat{i} - 3\hat{j}$ (c) $-3\hat{j}$ (d) $3\hat{k}$
- (47) The magnitude of the resultant of two vectors of magnitudes 3 units and 4 units is 5 units. What is the angle between two vectors?
(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{2}$ (c) $\frac{3\pi}{4}$ (d) π
- (48) Given $\mathbf{P} = \mathbf{A} + \mathbf{B}$ and $\mathbf{Q} = \mathbf{A} - \mathbf{B}$. If the magnitudes of vectors \mathbf{P} and \mathbf{Q} are equal, what is the angle between the two vectors \mathbf{A} and \mathbf{B} ?
(a) Zero (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{2}$ (d) π
- (49) The magnitudes of four pairs of displacement vectors are given which pairs of displacement vectors cannot be added to give a resultant vector of magnitude 4cm?
(a) 2 cm, 3cm (b) 1 cm, 3cm (c) 1cm, 5cm (d) 1cm, 7cm
- (50) Given $A \cdot B = 0$ and $A \times C = 0$ what is the angle between B and C ?
(a) 45° (b) 90° (c) 135° (d) 180°
- (51) While measuring acceleration due to gravity by a simple pendulum, a student makes a positive error of 1% in the length of pendulum and a negative error of 3% in the value of time period. The percentage error in the measurement of g is
(a) 2% (b) 4% (c) 7% (d) 10%

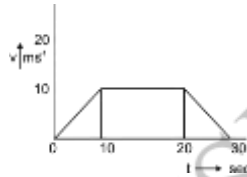
- (52) A particle is moving east with a velocity of 5m/s. In 10 seconds the velocity changes to 5m/s north. The average acceleration in this time is
- (a) $\frac{1}{\sqrt{2}} \text{ms}^{-2}$ towards north-west (b) $\frac{1}{2} \text{ms}^{-2}$ towards north-west
(c) $\frac{1}{\sqrt{2}} \text{ms}^{-2}$ towards north-east (d) $\frac{1}{2} \text{ms}^{-2}$ towards north-east.
- (53) A particle is moving on a circular path with a constant speed v . The magnitude of the change in its velocity after it has described an angle of 60° is
- (a) v (b) $\sqrt{2}v$ (c) $\sqrt{3}v$ (d) $\frac{\sqrt{3}}{2}v$
- (54) Which of the following vector is/are perpendicular to the vector $4\hat{i} - 3\hat{j}$
- (a) $4\hat{i} + 3\hat{j}$ (b) $6\hat{i}$ (c) $7\hat{k}$ (d) $3\hat{i} - 4\hat{j}$
- (55) Lesser the relative error
- (a) Less accurate a measurement
(b) More accurate is the measurement
(c) More precise a measurement (d) Less precise a measurement.
- (56) Dimension of resistance
- (a) $M^1L^2T^{-3}A^{-2}$ (b) $M^1L^{-2}T^3A^{-2}$
(c) $M^{-1}L^2T^{-3}A^{-2}$ (d) MT^{-2}
- (57) Which of following pairs has same dimensions
- (a) pressure, stress (b) momentum, impulse
(c) energy, torque (d) all of these
- (58) If error in the measurement of mass is 1 % and radius is 2%. Then maximum error in moment of inertia is
- (a) 3% (b) 5%
(c) % (d) none
- (59) Random error can be minimized by
- (a) taking mean of large number of observations
(b) reducing zero error in device
(c) both
(d) none
- (60) When 400.1 is added to 20.54 we get
- (a) 420 (b) 420.1
(c) 420.65 (d) 420.6

NUST (Med/Engg.) + GIKI + FMDC

CH # 3+4

(PHYSICS)

1. The displacement time graph of a particle moving with uniform velocity is
 - (a) parabola
 - (b) straight line
 - (c) circle
 - (d) hyperbda
2. The ratio of distance to displacement along a semi circle of radius r is
 - (a) 2π
 - (b) π
 - (c) $\pi/2$
 - (d) none of these
3. Which of following changes when particle is moving with uniform velocity?
 - (a) speed
 - (b) acceleration
 - (c) velocity
 - (d) position vector
4. The displacement time graph for two bodies A and B are straight these inclined at 60° and 30° to time axis. Find ratio of their speed is
 - (a) 3 : 1
 - (b) $\sqrt{3} : 1$
 - (c) 1 : 3
 - (d) $1 : \sqrt{3}$
5. In the given graph distance traveled is



- (a) 200m
 - (b) 300 m
 - (c) 250 m
 - (d) 400m
6. In above problem height is
 - (a) 2 m
 - (b) 4 m
 - (c) 3m
 - (d) 2.5 m
7. If $R = \frac{R_{\max}}{2}$ then angle of projection is
 - (a) 30°
 - (b) 60°
 - (c) 15°
 - (d) none
8. Rocket works on the principle of conservation of
 - (a) mass
 - (b) energy
 - (c) momentum
 - (d) angular momentum
9. If momentum is increased by two times K.E increases by
 - (a) two times
 - (b) 3 times
 - (c) four times
 - (d) remains
10. The velocity time graph are inclined at 30° 45° with time axis. The ratio of their acceleration
 - (a) $\sqrt{3}:2$
 - (b) $\sqrt{3} \quad 1$
 - (c) $1 : \sqrt{3}$
 - (d) none
11. Definition of force comes from
 - (a) 1st law
 - (b) 3rd law
 - (c) 2nd law
 - (d) all of these

12. At maximum height in projectile motion \vec{v} and \vec{a} are
(a) parallel (b) perpendicular
(c) anti parallel (d) none
13. The ratio of range and height at 45° is
(a) 1 : 4 (b) 1 : 2
(c) 4 : 1 (d) 2 : 1
14. The speed of projectile at maximum height is half of its initial speed v its angle of projection is
(a) 30° (b) 60°
(c) 45° (d) 90°
15. A body of momentum mv collides a wall elastically its change in momentum is
(a) $-2mV$ (b) $-mv$
(c) mV (d) 0
16. If $H = R$ then angle of projection is
(a) 45° (b) 76°
(c) 60° (d) 90°
17. A force of $3\hat{i} + 2\hat{j} + 4\hat{k}$ N gives displacement of $10\hat{j}$ m. The work done is
(a) 20 J (b) 26 J
(c) 32J (d) zero
18. The escape velocity for a body projected from earth is 11 kms^{-1} If projected at 45° it will be
(a) 11 kms^{-1} (b) 44 kms^{-1}
(c) 22 kms^{-1} (d) 11 ms^{-1}
19. If a power of 1KW is maintained for 1 sec then work done is
(a) 10^5 J (b) 10^{-6} J
(c) 10^3 J (d) $3.6 \times 10^5 \text{ J}$
20. A ballistic flight is the motion under
(a) gravity (b) both a and b
(c) inertia (d) none of these
21. At which angle work done equal to half of its maximum value
(a) 30° (b) 60°
(c) 45° (d) 90°
22. Which one of the following is non-conservative
(a) friction (b) tension string
(c) air resistance (d) all of these
23. The food which we eat in 3 days produce energy equal to energy from _____
litter of petrol
(a) 1 (b) 3
(c) 1/3 (d) 9
24. The range of projectile at 30° is R , at the angle of 60° the range will be
(a) R (b) $R/2$
(c) $2R$ (d) none of these
25. A long spring when stretched by a distance x has P.E. v . On increasing the extension to nx , the P.E of spring will be
(a) v/n (b) nv (c) n^2v (d) V/n^2

26. A body is subjected to a constant force $F = -\hat{i} + 2\hat{j} + 3\hat{k}$. What is the work done by this force in moving the body through a distance of 4m along z-axis and 3m along y-axis

- (a) 6 J (b) 12 J (c) 18 J (d) 24 J

27. When a constant force acts on a body of 'm' initially at rest the velocity acquired is proportional to

- (a) \sqrt{m} (b) $\frac{1}{\sqrt{m}}$ (c) m (d) $\frac{1}{m}$

28. A ball is projected horizontally from the top of a cliff on the surface of the earth with a speed of 40m/s, assuming there is no air resistance. What will be its speed three second later.

- (a) 30m/s (b) 40m/s (c) 50 m/s (d) 70 m/s

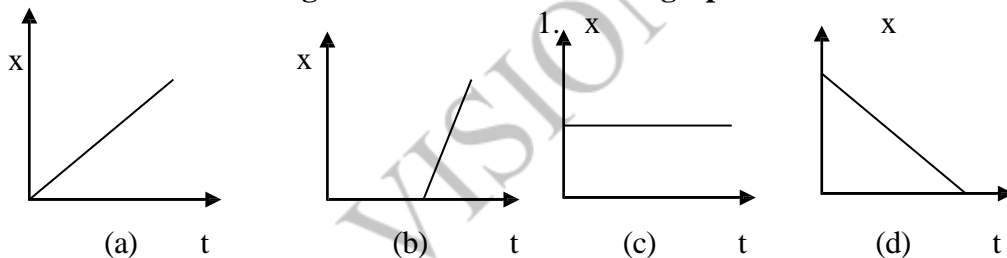
29. Energy released from burning 1 ton coal is

- (a) 5×10^7 J (b) 1×10^6 J (c) 30×10^9 J (d) 1.8×10^{-11} J

30. 1 h. P is equal to

- (a) 746 watt (b) 647 watt (c) 500 watt (d) 250 watt

31. Which of the following can not be distance time graph



32. For the motion on a straight line with constant acceleration, the ratio of the magnitude of displacement to the distance covered is,

- (a) <1 (b) ≤ 1 (c) =1 (d) >1

33. An aero plane is moving with velocity 'v'. It drops a packet from a height 'h'. The time taken by the packet in reaching the ground will be,

- (a) $\sqrt{\frac{2v}{g}}$ (b) $\sqrt{\frac{2g}{h}}$ (c) $\sqrt{\frac{h}{2g}}$ (d) $\sqrt{\frac{2h}{g}}$

34. The ratio of distance to displacement along a semi circle of radius r is

- (a) 2π (b) $\pi/2$
(c) π (d) None of these

35. A car is moving with uniform velocity 40 km hr⁻¹. Force of friction on car is

- (a) 400 N (b) Less than engine force
(c) Greater than engine force (d) Remains constant

36. Motion of a projectile is

- (a) One dimensional (b) Two dimensional
(c) Three dimension (d) Four dimensional

37. Power of colour TV is (approximate)
- (a) 130watts (b) 120watts
(c) 110watts (d) 150watts
38. Energy released from burning 1 ton coal is (approximate)
- (a) $5 \times 10^7 \text{J}$ (b) $1 \times 10^6 \text{J}$
(c) $30 \times 10^9 \text{J}$ (d) $1.8 \times 10^{-11} \text{J}$
39. The tidal energy is due to gravitational pull of
- (a) Sun (b) Moon
(c) Mass (d) Earth
40. The semiconductor device which converts sunlight into electrical energy is called
- (a) Solar cell (b) Photo voltaic cell
(c) Thermocouple (d) Solar panel
41. If $R=H$ the angle of projection is
- (a) $\tan^{-1}(1)$ (b) $\tan^{-1}(2)$
(c) $\tan^{-1}(3)$ (d) $\tan^{-1}(4)$
42. Two masses of 1gm and 4gm are moving with equal K.E the ratio of their moments is
- (a) 4:1 (b) 1:2
(c) $\sqrt{2}:1$ (d) 1:9
43. Which of the following is non conservative force
- (a) Nuclear (b) Elastic force
(c) Electrostatic (d) Viscous
44. A projectile has a range R and time of flight T. If the range is doubled (by increasing the speed of projection without changing the angle of projection), the time of flight will become
- (a) $\frac{T}{\sqrt{2}}$ (b) $\sqrt{2}T$ (c) $\frac{T}{2}$ (d) 2T
45. A ball is projected vertically upwards with a certain initial speed. Another ball of the same mass is projected at an angle of 60° with the vertical with the same initial speed. At the highest point, the ratio of their potential energies will be
- (a) 4:1 (b) 3:2 (c) 2:3 (d) 2:1
46. A moving body need not have
- (a) velocity (b) momentum (c) potential energy (d) kinetic energy.
47. A car weighing 1 tone is moving twice as fast as another car weighing 2 tons. The K.E of the one ton car is
- (a) less than that of the two-ton car
(b) same as that of the two-ton car
(c) more than that of the two-ton car
(d) impossible to compare
48. If K.E of a body increases by 300% its momentum will increase by
- (a) 100% (b) 200% (c) 300% (d) 400%
49. If $R=4H$ the angle of projection is
- (a) 30° (b) 45°
(c) 60° (d) 76°

NUST (Med/Engg.) + GIKI + FMDC
(PHYSICS) CH. 5+6 (I)

- The torque acting upon a system is zero which of following will be conserved?
(a) momentum (b) moment of inertia
(c) angular momentum (d) angular velocity
- The ratio of total to rotational energy associated with hoop is
(a) $\frac{2}{1}$ (b) $\frac{1}{4}$
(c) $\frac{1}{3}$ (d) $\frac{2}{3}$
- What will be duration of day and night if earth shrinks to half the present radius
(a) 24 hrs (b) 6 hrs
(c) 12 hrs (d) 3 hrs
- The spinning ballet dancer draws her arms close to her chest She will now
(a) spin faster (b) spin at same rate
(c) spin slow (d) stop spinning
- If gymnast sitting on rotating stole with his arms outstretched suddenly lowers his arms then
(a) ω decreases (b) ω remains constant
(c) I decreases (d) angular momentum increases
- Two circular rings have masses in the ratio 1 : 2 and diameters 2 : 1 the ratio of their moment of inertia is
(a) 1 : 4 (b) 4 : 1
(c) 2 : 1 (d) $\sqrt{2} : 1$
- The angular speed of hour's hand of mechanical watch is-----radian per second
(a) $\pi/6$ (b) $\pi/4$
(c) $\pi/12$ (d) $\pi/8$
- INTELSAT has capacity of
(a) 3 channels (b) both a & b
(c) 30,00 two way telephone (d) none
- The ratio of moment of inertia of disc and hoop is
(a) 1/2 (b) 1/4
(c) 2 : 1 (d) none
- The ratio of rotational to translational K.E of hoop is
(a) 1 : 2 (b) 1 : 1
(c) 2 : 1 (d) none
- $2\pi r$ subtends an angle of
(a) 1 radian (b) 2 radian
(c) 4 radian (d) 2π rad
- Height of closest orbit of earth is
(a) 400m (b) 40 km
(c) 400 km (d) 36000 km
- As the speed of falling drop increases its dragging force
(a) Decreases (b) Increases
(c) Remains same (d) Cannot predicted

14. Density of water is
(a) Greater than blood (b) Nearly equal to blood
(c) Less than blood (d) Zero
15. Viscosity of gas with increase in temperature
(a) Increases (b) Decreases
(c) Remains same (d) Zero
16. One torr is equal to
(a) 133.3 Nm^{-2} (b) 133.3 Nm^2
(c) $133.3 \text{ N}^{-1}\text{m}^2$ (d) None
17. If radius of droplet is doubled terminal velocity will
(a) Increase twice (b) Increase thrice
(c) Increase 4 times (d) Same
18. Flow rate is measured in
(a) m^3s^{-1} (b) ms^{-1}
(c) ms (d) ms^{-2}
19. The maximum dragging force on a sphere of 9.8 N is
(a) 9.8 N (b) 4.9 N
(c) 19.6 N (d) None
20. A man of weight w is standing on a lift which is moving up-wards with an acceleration, the apparent weight of man will be.
(a) $W(1-a/g)$ (b) $2W(1-2a/g)$ (c) $W(1+a/g)$ (d) W
21. Ball pen functions on the principle of
(a) viscosity (b) Boyle's law (c) gravitational force (d) surface tension
22. Angular speed of minutes hand of mechanical watch is
(a) $\frac{\pi}{30} \text{ rad/min}$ (b) $\pi \text{ rad/min}$ (c) $\frac{\pi}{2} \text{ rad/min}$
(d) none of these
23. If the distance between the earth and the sun is reduce to one fourth then the number of days in one year approximately
(a) 183 (b) 129 (c) 46 (d) 365
24. If the radius of the earth suddenly contracts to $1/n$ of its present value without any change in its mass, the duration of one day will become approximately.
(a) $\frac{24}{n}$ hours (b) $\frac{24}{n^2}$ hours (c) $24n$ hours (d) $24n^2$ hours.
25. Water strands at a height H in a large tank whose sides are vertical. A hole is made in one of the walls of the tank at a depth h below the surface of water. The distance R from the foot of the wall where the emerging stream of water strikes the floor is
(a) $\sqrt{h(H-h)}$ (b) \sqrt{hH} (c) $2\sqrt{h(H-h)}$ (d) $2\sqrt{hH}$
26. When the terminal velocity is reached, the acceleration of a body moving through a viscous medium is,
(a) zero (b) positive
(c) negative (d) depends upon other factors
27. If temperature rises, the coefficient of viscosity of a liquid
(a) decreases (b) increases
(c) remains unchanged (d) increases for some liquids and decreases for others

28. A small and a large rain drops are falling through air.
- the large drop moves faster
 - the small drop moves faster
 - both move with the same speed
 - no conclusion can be drawn unless the exact sizes of the drops are known.
29. A car moves at a speed of 36 kmh^{-1} on a level road the coefficient of friction between the tyres and the road is 0.8. The car negotiates a curve of radius R . If $g = 10 \text{ ms}^{-2}$, the car will skid or slip while negotiating the curve if the value of R is
- 20m
 - 12m
 - 14m
 - 16m
30. A stone of mass 250 g is tied to the end of a string of length 1.0 m. It is whirled in a horizontal circle with a frequency of 30 rev/min. What is the tension in a string?
- $\frac{\pi^2}{4} \text{ N}$
 - $\frac{\pi^2}{2} \text{ N}$
 - $\pi^2 \text{ N}$
 - $2\pi^2 \text{ N}$
31. A large open tank has two holes in the wall one is a square hole of side L at a depth y from the top and the other is a circular hole of radius R at a depth $4y$ from the top. When the tank is completely filled with water, quantities of water flowing out per second from the holes are the same. Then R is equal to
- $\frac{L}{\sqrt{2\pi}}$
 - $2\pi L$
 - L
 - $\frac{L}{2\pi}$
32. The torque of 100Nm acting on a wheel at rest, rotates it through 200 radians in 10s. The angular acceleration of wheel in rads^{-2} is
- 4
 - 2
 - 6
 - 8
33. The centripetal force required to keep the body in circular path is F_1 . What would be centripetal force if radius becomes two times
- $2F_1$
 - $\frac{F_1}{2}$
 - $4F_1$
 - $\frac{F_1}{4}$
34. Dimensions of angular displacement is
- $[T]$
 - $[T^{-1}]$
 - $[MT^{-1}]$
 - none
35. In order to produce the artificial gravity that would be twice than that of earth, the frequency of space-craft would be ($f_e = \text{freq of rotation to produce gravity equal to the earth}$)
- $f_s = 2f_e$
 - $f_s = \frac{f_e}{2}$
 - $\sqrt{2}f_e$
 - zero
36. For same mass and velocity, which one is greater for a disc.
- $K.E_{\text{rot}}$
 - $K.E_{\text{tran}}$
 - both are same
 - none
37. 1 torr is equal to
- 133.3 N/m^3
 - 13.33 Nm^2
 - 133.3 N/m^2
 - none
38. The dimension of Torr is
- $[ML^{-1}T^2]$
 - $[ML^{-1}T^{-2}]$
 - $[ML^2T^{-1}]$
 - $[M^2LT^{-1}]$
39. If different streamlines do not cross each other then flow is
- irregular
 - regular
 - steady
 - unsteady
40. Bernoulli equation is applicable on
- ideal fluid
 - laminar flow only
 - steady flow only
 - none

41. If the distance between the earth and the sun is reduce to one fourth then the number of days in one year approximately
(a) 183 (b) 129 (c) 46 (d) 365
42. A wheel rotates about an axis passing through the center and perpendicular to the plane with slowly increasing angular speed. Then it has
(a) radial velocity and radial acceleration
(b) tangential velocity and radial acceleration
(c) tangential velocity and tangential acceleration
(d) tangential velocity but acceleration having both components
43. When a fluid passes through the constricted part of a pipe, its
(a) velocity and pressure decreases (b) velocity and pressure increases
(c) velocity decreases and pressure increases (d) velocity increases and pressure decreases
44. The rate of leak from a hole in a tank is
(a) independent of its height from the bottom
(b) more if situated near the bottom
(c) more if situated near its top
(d) more at midway between top and bottom
45. A stone of mass 250 g is tied to the end of a string of length 1.0 m. It is whirled in a horizontal circle with a frequency of 30 rev/min. What is the tension in a string?
(a) $\frac{\pi^2}{4}$ N (b) $\frac{\pi^2}{2}$ N (c) π^2 N (d) $2\pi^2$ N
46. A car moves at a speed of 36 kmh^{-1} on a level road the coefficient of friction between the tyres and the road is 0.8. The car negotiates a curve of radius R. If $g = 10 \text{ ms}^{-2}$, the car will skid or slip while negotiating the curve if the value of R is
(a) 20m (b) 12m (c) 14m (d) 16m
47. The ratio of escape to orbital velocity
(a) $\sqrt{2}$ (b) $\frac{1}{\sqrt{2}}$
(c) 2 (d) 1
48. Geostationary satellites have period
(a) 1hr (b) 12 hrs
(c) 24 hrs (d) None
49. Height of closest orbit of earth is
(a) 400m (b) 40 km
(c) 400 km (d) 36000 km
50. In the constricted part of a pipe, fluid
(a) Velocity increases pressure decreases (b) Velocity and pressure increases
(c) Velocity and pressure decreases (d) Velocity decreases pressure increases

NUST (Med/Engg.) + GIKI + FMDC**(PHYSICS) CH. 7+8 (I)**

- The frequency of waves produced in microwave oven is
(a) 1450 Hz (b) 2450 Hz
(c) 1650 Hz (d) 1150 Hz
- The process where by energy is dissipated from oscillating system is called
(a) Oscillation (b) Damping
(c) Resonance (d) All
- A physical system under going forced vibrations is called
(a) Driven harmonic oscillator (b) Forced harmonic oscillator
(c) Simple harmonic oscillators (d) both a & b
- Total energy of S.H.M at mean position is
(a) K.E (b) P.E (c) zero (d) None
- Frequency for second's pendulum is
(a) 2 sec (b) 2min (c) 0.5 sec (d) 2.5scc
- Wave form of S.H.M is
(a) Sine wave (b) Square wave
(c) Saw tooth (d) rectangular wave
- The K.E and P.E of S.H.M are equal when displacement is
(a) $\frac{x_o}{\sqrt{2}}$ (b) $\frac{x_o}{2}$ (c) $\sqrt{2}x_o$ (d) x_o
- Time period of simple pendulum is T. If its length is increased by 4 times its period will be
(a) T (b) 2T (c) $\frac{T}{2}$ (d) None
- The displacement of S.H.M of amplitude x_o in one period is
(a) x_o (b) $2x_o$ (c) $4x_o$ (d) Zero
- Total energy of a particle executing S.H.M of amplitude x_o is proportional to
(a) x_o^2 (b) x_o^{-2} (c) x_o (d) x_o^{-1}
- A simple pendulum is oscillating in a lift. If lift starts moving upward with acceleration its period will
(a) Increase (b) Decrease
(c) Remains same (d) Cannot produced
- A S.H.M has amplitude A and time period T its maximum speed is
(a) $\frac{4A}{T}$ (b) $\frac{2\pi A}{T}$ (c) $\frac{2A}{T}$ (d) $\frac{4\pi A}{T}$
- A S.H.M has period of 0.01s an amplitude 0.2m velocity at mean position is
(a) 20π (b) 40π (c) 60π (d) 80π
- A particle executes S.H.M with frequency f the frequency its K.E changes is
(a) $\frac{f}{2}$ (b) f (c) 2f (d) 4f
- A loaded spring vibrates with period T, it then cut into 4 equal parts and the same load is suspended from one part. New period is
(a) $\frac{T}{4}$ (b) $\frac{T}{2}$ (c) 2T (d) 4T

16. A particle executing S.H.M has an acceleration of 64 cm s^{-2} when displacement is 4cm. Its period is
(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) π (d) 2π
17. Period of oscillation of mass m suspended from spring is 1s then period of mass $4m$ will be
(a) $\frac{1}{4} \text{ s}$ (b) $\frac{1}{2} \text{ s}$ (c) 2s (d) 4s
18. If amplitude of S.H.M is doubled then speed of v at mean position will be
(a) 2V (b) 3V
(c) 4V (d) V
19. A boy is swinging on a swing in sitting position. How will period be affected if she stands up
(a) Will decrease (b) Will increase
(c) Unchanged (d) Cannot predicted
20. Due to overlapping of two identical waves the speed of resultant wave
(a) Decrease (b) Increase
(c) Remains same (d) None
21. The ratio $\frac{E_a}{E_i}$ is equal to
(a) γ (b) γ^{-1}
(c) $1/\sqrt{\gamma}$ (d) γ^2
22. The ratio of velocity of sound in H_2 to O_2 is at STP
(a) 4: 1 (b) 1 : 4
(c) 2: 1 (d) 1:2
23. Due to moisture in air speed of sound
(a) Increases (b) Decreases
(c) Remains same (d) May increase or decrease
24. Stars moving away from earth show a
(a) Yellow shift (b) Blue shift
(c) Red shift (d) None
25. The wavelength of fundamental mode of vibration of closed organ pipe is
(a) 2L (b) 4L
(c) L (d) $\frac{L}{2}$
26. Beats can be heard when difference of frequency is not more than
(a) 4 (b) 6
(c) 10 (d) 8
27. Increase in velocity of sound in air for 1°C rise in temperature is
(a) 61ms^{-1} (b) 0.61ms^{-1}
(c) 61cms^{-1} (d) Both b and c
28. The velocity of sound is greatest in
(a) Water (b) Air
(c) Glass (d) Oxygen

29. In SHM the total energy is half at the amplitude of
- (a) $X_0/2$ (b) $X_0/\sqrt{2}$
(c) $X_0/4$ (d) None
30. The speed of sound waves of frequency f is v . The speed of sound waves having frequency $2f$ is
- (a) v (b) $2v$
(c) $\frac{v}{2}$ (d) $\sqrt{2}v$
31. The first resonance length in a closed pipe is 20 cm then second resonance occurs at
- (a) 60 cm (b) 90 cm
(c) 120 cm (d) None
32. The number of antinodes between two successive nodes is
- (a) 1 (b) 2
(c) 3 (d) 4
33. The temperature at which speed of sound in air becomes double its value at 0°C is
- (a) 819°C (b) 819 K
(c) 1092 K (d) None
34. How does speed of sound in air depends on atmospheric pressure P
- (a) $v \propto P^{-1}$ (b) $v \propto P^{\frac{1}{2}}$
(c) $v \propto P^{\frac{1}{2}}$ (d) $v \propto P^0$
35. A spring of force constant K is cut into three equal pieces. If these three pieces are connected in parallel, the force constant of the combination will be
- (a) $\frac{K}{3}$ (b) $\frac{K}{9}$ (c) $3K$ (d) $9K$
36. A particle is executing simple harmonic motion of amplitude A . What fraction of the total energy is kinetic when the displacement is half the amplitude?
- (a) $\frac{1}{4}$ (b) $\frac{1}{2\sqrt{2}}$ (c) $\frac{1}{2}$ (d) $\frac{3}{4}$
37. When a mass m is hung from the lower end of a spring of negligible mass, an extension x is produced in the spring. The mass is set into vertical oscillations. The time period of oscillation is
- (a) $T = 2\pi\sqrt{\frac{x}{mg}}$ (b) $T = 2\pi\sqrt{\frac{gx}{m}}$
(c) $T = 2\pi\sqrt{\frac{x}{g}}$ (d) $T = 2\pi\sqrt{\frac{x}{2g}}$
38. The potential energy of a particle executing simple harmonic motion at a distance x from the equilibrium position is proportional to
- (a) \sqrt{x} (b) x (c) x^2 (d) x^3
39. A simple harmonic oscillator has time period T . The time taken by it to travel from extreme position to half the amplitude is
- (a) $\frac{T}{6}$ (b) $\frac{T}{12}$ (c) $\frac{T}{4}$ (d) $\frac{T}{2}$

40. Two sound waves of equal intensity I produce beats. The maximum intensity of sound produced in beats will be
 (a) I (b) $4I$ (c) $2I$ (d) $I/2$
41. The ratio of the speed of sound in nitrogen gas to that in helium gas at S.T.P is
 (a) $\sqrt{\frac{2}{7}}$ (b) $\sqrt{\frac{7}{2}}$ (c) $\sqrt{\frac{3}{5}}$ (d) $\sqrt{\frac{6}{5}}$
42. The time period of a simple pendulum measured inside a stationary lift is T . If the lift starts accelerating upwards with an acceleration $g/3$, the time period will be
 (a) $\sqrt{3}T$ (b) $\frac{\sqrt{3}}{2}T$ (c) $\frac{T}{\sqrt{3}}$ (d) $\frac{T}{3}$
43. If the intensity of sound increases by a factor of 10^5 the increase in intensity level is
 (a) 5db (b) 10db (c) 25db (d) 50db
44. Equation of a particle vibrating in SHM is $2y = 8 \sin 4\pi t$. Its amplitude and angular frequency is
 (a) 6 cm & 2π rad (b) 4cm & 4π rad (c) 16cm & 4Hz
 (d) 32m & 2Hz
45. A particles executing S.H.M has an acceleration as a function of displacement of 64 cm/s^2 when its displacement is 4 cm. Its time period in second is
 (a) $\pi/2$ (b) $\pi/4$ (c) π (d) 2π
46. If the given spring of spring constant K is cut in to three identical segments. The spring constant of each is
 (a) $K/3$ (b) $K/2$ (c) $3K$ (d) $6K$
47. If $K = .04N$ and $x = 4\text{cm}$ then $K =$
 (a) 1Nm^{-1} (b) 2Nm^{-1} (c) 3Nm^{-1} (d) 4Nm^{-1}
48. The time period of a simple pendulum inside a stationary lift is $\sqrt{3}$ sec . What will be the time period when lift moves upward with acceleration $\frac{g}{4}$
 (a) $2\sqrt{3}$ sec (b) $2\sqrt{2}$ sec (c) 2 sec (d) $\sqrt{3} 2$
49. When K.E of a particle executing SHM is one half of its maximum value, the displacement of the particle from mean position in terns of amplitude x_0 is
 a. (a) $\frac{x_0}{2}$ (b) $\frac{x_0}{\sqrt{2}}$ (c) $\frac{x_0}{3}$ (d) $\frac{x_0}{4}$
50. A particle executing SHM with frequency $\frac{2}{\pi} \text{Hz}$ and an amplitude of 6cm. Its speed at mean position is
 (a) 12 cm / sec (b) 6 cm / sec
 (c) 24 cm / sec (d) 3 cm / sec

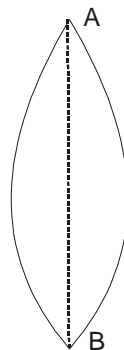
51. Transverse wave can propagate
- (a) both in gas and in metal (b) in gas but not in meta
(c) not in gas but in metal (d) neither in gas nor in a metal
52. A source of sound emitting sound waves of frequency 500Hz is moving towards a stationary observer with speed 100m/sec. The Doppler's shift is given by
- (a) 5 m (b) 50 m (c) $\frac{1}{5}m$ (d) none
53. Two tuning forks A and B are sounded together. 2 beats are per sec are produced. A has frequency 256 Hz. When A is slightly loaded 1 beats /sec are produced. The original frequency of B is.
- (a) 258 Hz (b) 254 Hz (c) 259 Hz (d) data is not sufficient
54. Velocity of the wave in a stretched string is
- (a) $v = \sqrt{T \times m/l}$ (b) $v = \sqrt{T \times l/m}$
(c) $v = \sqrt{T/m \times l}$ (d) $v = \sqrt{Tml}$
55. Doppler shift in frequency does not depend upon
- (a) the actual frequency of the wave (b) the distance of these
(c) apparent frequency of these (d) none of these

NUST (Med/Engg.) + GIKI + FMDC**(PHYSICS) CH. 9+10 (I)**

- Which one of the following proves transverse nature of light waves
(a) interference (b) polarization
(c) diffraction (d) all
- According to Huygen's theory light travels in the form of
(a) proton (b) corpuscles
(c) wave front (d) none
- The phase change of 180° is equal to path difference of
(a) λ (b) 3λ
(c) $\lambda/2$ (d) 2λ
- Fringe width can be increased by decreasing
(a) slits separation (b) λ
(c) distance of screen from slits (d) none
- A grating has 500 lines per mm. its grating element is
(a) $2 \times 10^{-2}\text{m}$ (b) $2 \times 10^{-2}\text{cm}$
(c) $2 \times 10^{-6}\text{m}$ (d) none
- The blue colour of sky is due to
(a) reflection (b) polarization
(c) diffraction (d) scattering
- The speed of light in vacuum depends upon
(a) amplitude (b) λ
(c) frequency (d) none of these
- The diffraction of light was discovered by
(a) Newton (b) Young
(c) Grimaldi (d) Hertz
- Electromagnetic waves transport
(a) energy (b) both
(c) momentum (d) none
- The electromagnetic wave theory was proposed by
(a) Young (b) Maxwell
(c) Hertz (d) Huygen
- Huygen's principle used to
(a) locate wave front (b) explain diffraction
(c) determine speed of light (d) all
- Corpuscular nature of light was given by
(a) Newton (b) Maxwell
(c) Hertz (d) Huygen
- In Young's experiment, fringe spacing is
(a) $\frac{\lambda}{Ld}$ (b) $\frac{d}{\lambda L}$
(c) $\frac{\lambda L}{d}$ (d) $\frac{L}{\lambda d}$
- Which one is optically active substance?
(a) sodium chlorate (b) sugar solution
(c) quartz (d) all

15. The plane polarized light can be achieved by
(a) selective absorption (b) scattering by small particles
(c) reflection from surfaces (d) all of these
16. An ordinary incandescent light emits
(a) polarized light (b) monochromatic light
(c) unpolarized light (d) ultraviolet light
17. X-rays can be used for observing
(a) diffraction (b) polarization
(c) interference (d) all
18. A typical diffraction grating has about
(a) 400 to 500 lines/cm (b) 400 to 5000 lines/cm
(c) 400-500 lines/cm (d) 40 to 5000 lines/cm
19. Fringe spacing is minimum for
(a) red light (b) green light
(c) blue light (d) yellow
20. The material used to obtain plane polarized light are called
(a) dichroic substance (b) solids
(c) semiconductor (d) all
21. Resolving power of diffraction grating is
(a) $N \times m$ (b) $\frac{\lambda L}{d}$
(c) N / m (d) $\frac{\Delta \lambda}{\lambda}$
22. Light from sun reaches the earth in the form of
(a) circular wave front (b) plane wave front
(c) cylindrical wave front (d) all of these
23. Standard meter was defined by Michelson using light emitted from
(a) cesium (b) cadmium
(c) platinum (d) Gold
24. If moveable mirror in interferometer moved through λ the number of fringes are observe
(a) 1 (b) 3
(c) 2 (d) 4
25. For large magnification of a telescope
(a) f_o increases (b) both a and b
(c) f_e decreases (d) one of these
26. The image obtained in case of simple microscope is
(a) virtual (b) magnified
(c) erect (d) all
27. Cladding is used to
(a) produce total internal reflection (b) both a and b
(c) continuous refraction (d) none
28. The light signal must be regenerated by
(a) transmitter (b) receivers
(c) repeaters (d) all
29. The minimum distance between object and its real image in convex lens is
(a) f (b) $3f$
(c) $2f$ (d) $4f$

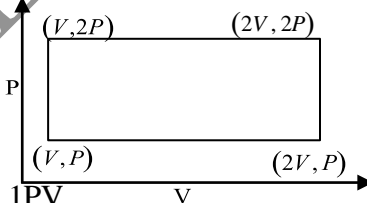
30. Single mode step index fiber has capacity of _____ T.V channel
 (a) 10 (b) 14
 (c) 12 (d) 16
31. Power of lens of focal length 20cm is
 (a) 20 diopters (b) 5 diopters
 (c) $\frac{1}{20}$ diopters (d) none
32. The light emitted from LED has wavelength in fiber optic system is
 (a) 1.3 μm (b) 1.5 μm
 (c) 1.4 μm (d) 1.2 μm
33. If a convex lens of focal length f is cut into two halves along diameter of lens focal length of each half is
 (a) f (b) $f/2$
 (c) $2f$ (d) $4f$
34. For large magnification of telescope f_e should be
 (a) small (b) infinity
 (c) large (d) none
35. Power is lost in optical fiber is due to
 (a) diffraction (b) refraction
 (c) reflection (d) scattering and absorption
36. For total internal reflection the angle of incidence is
 (a) equal to critical angle (b) less than critical
 (c) greater than critical only (d) both a and b
37. How is the interference pattern affected if the Young's experiment was performed in still water than in air?
 (a) Fewer fringes will be visible (b) Fringes will be broader
 (c) Fringes will be narrower (d) no fringes will be observed.
38. What will be the colour of the sky as seen from the earth if there were no atmosphere?
 (a) black (b) blue (c) orange (d) red
39. Light travels with a speed of $2 \times 10^8 \text{ ms}^{-1}$ in crown glass of refractive index 1.5. What is the speed of light in dense flint glass of refractive index 1.8?
 (a) $1.33 \times 10^8 \text{ ms}^{-1}$ (b) $1.67 \times 10^8 \text{ ms}^{-1}$
 (c) $2.0 \times 10^8 \text{ ms}^{-1}$ (d) $3.0 \times 10^8 \text{ ms}^{-1}$
40. Two interfering beams have intensities in the ratio 9:4. Then the ratio of maximum to minimum intensity in the interference pattern is
 (a) 25 : 1 (b) 13 : 5 (c) 5 : 1 (d) 3 : 2
41. The equi-convex lens, shown in the figure, has a focal length f . What will be the focal length of each half if the lens is cut along AB?



- (a) $\frac{f}{2}$ (b) f (c) $\frac{3f}{2}$ (d) $2f$
42. A plane mirror is approaching you at 10 cm/s. Your image will approach you with a speed of
 (a) 25 cm/s (b) 10 cm/s (c) 15 cm/s (d) 20 cm/s
43. A converging lens is used to form an image on a screen. When the upper half of the lens is covered by an opaque screen,
 (a) half the image will disappear (b) complete image will be formed
 (c) intensity of the image will increase (d) none of these.
44. A man of height 1.6m wishes to see his full image in a plane mirror placed at a distance of 2m. the minimum height of mirror should be
 (a) 0.4 m (b) 0.8 m (c) 1.6 m (d) 2.4 m
45. Spherical aberration in a thin lens can be reduced by
 (a) using a monochromatic light (b) using a doublet combination
 (c) using a circular annular mask over the lens (d) increasing the size of the lens.
46. The focal length of a convex lens is 50 cm. Its power is
 (a) + 50D (b) -50D (c) +2D (d) -2D
47. An optical fiber with its protective case may be typically
 (a) 6m (b) 6mm (c) 6cm (d) 0.6mm
48. A concave lens of focal length „ f “ forms an image which is „ n “ times the size of the object. The distance of object from the lens is
 (a) $\left(\frac{1-n}{n}\right)f$ (b) $\left(\frac{1+n}{n}\right)f$ (c) $(1-n)f$ (d) $(1+n)f$
49. Huygen’s proposed 1st time that light from a luminous source travels in space as waves in
 (a) 1978 (b) 1878
 (c) 1778 (d) 1678
50. A surface on which all the points have the same state of vibration is known as
 (a) wave-length (b) wave-packet
 (c) wave-let (d) wave-front

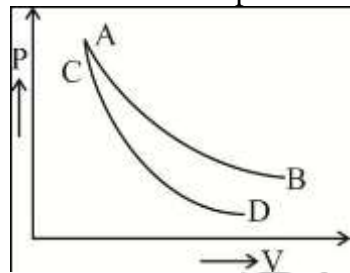
NUST (Med/Engg.) + GIKI + FMDC**(PHYSICS) CH. 11 (I)**

1. Pressure of a gas is written
 - (a) $\frac{1}{3} \rho < v^2 >$
 - (b) $\frac{3}{2} \rho (v)$
 - (c) $\frac{1}{3} \rho (v)$
 - (d) None
2. The value of Boltzman constant is
 - (a) $1.38 \times 10^{23} \text{ JK}$
 - (b) $1.38 \times 10^{-23} \text{ JK}^{-1}$
 - (c) $1.38 \times 10^{-23} \text{ JK}$
 - (d) $1.38 \times 10^{26} \text{ JK}^{-1}$
3. First law of thermodynamics is a statement of law of conservation of
 - (a) Mass
 - (b) Heat
 - (c) Energy
 - (d) All
4. The process in which no heat can enter or leave the system is
 - (a) Isobaric
 - (b) Adiabatic
 - (c) Isothermal
 - (d) Isochoric
5. Work done is maximum in
 - (a) Isothermal expansion
 - (b) Adiabatic expansion
 - (c) Isobaric process
 - (d) Isochoric process
6. The value of universal gas constant is
 - (a) 8.314 J mole k
 - (b) $8.314 \text{ Jmol}^{-1} \text{ k}^{-1}$
 - (c) $8.314 \text{ j mole k}^{-1}$
 - (d) $3.148 \text{ J mole}^{-1} \text{ k}^{-1}$
7. An ideal heat engine can have efficiency 100% if exhaust temperature is
 - (a) 0°C
 - (b) 0°F
 - (c) OK
 - (d) 273K
8. Fahrenheit and centigrade have same reading at
 - (a) 46°
 - (b) -40°
 - (c) 32°
 - (d) None
9. The Carnot cycle consist of
 - (a) Two processes
 - (b) 3 – processes
 - (c) Four processes
 - (d) None of these
10. In Carnot cycle internal energy in one cycle
 - (a) Increases
 - (b) Decreases
 - (c) Zero
 - (d) Remains constant
11. The third stroke of petrol engine is
 - (a) Input stroke
 - (b) Exhaust stroke
 - (c) Power stroke
 - (d) None of these
12. The efficiency of diesel engine is
 - (a) 25 % to 30%
 - (b) 30% to 35%
 - (c) 35% to 40%
 - (d) 30% to 40%

13. If $C_v = \frac{5}{2}R$ then C_p in
- (a) $\frac{2}{5}R$ (b) $\frac{7}{2}R$
 (c) $\frac{2R}{7}$ (d) $\frac{5}{2}R$
14. No entropy change is associated with
- (a) Adiabatic process (b) Isobaric process
 (c) Isothermal process (d) Isochoric process
15. During adiabatic expansion temperature of system
- (a) Decreases (b) Increases
 (c) Remains same (d) 0
16. Which one is correct
- (a) $C_p - C_v = R$ (b) $\frac{C_p}{C_v} = \gamma$
 (c) $C_v - C_p = R$ (d) Both a and b
17. Diatomic molecules of a gas have _____ K.E.
- (a) Translational (b) Vibrational
 (c) rotational (d) all of these
18. Triple point of water is
- (a) 273. 16 K (b) 273. 16°F
 (c) 273.16°C (d) 270°C
19. Which of the following is not a state function of a system
- (a) Temperature (b) Internal energy
 (c) Heat (d) Pressure
20. Efficiency of Carnot engine is
- (a) 100% (b) 60%
 (c) 80% (d) Maximum
21. During adiabatic compression change in internal energy 1 mole of a gas is 100J the work done is
- (a) 100 J (b) - 100J
 (c) 200 J (d) $\frac{1}{100} J$
22. The work done on ideal gas during the cycle is
- 
- (a) $\frac{1}{2}PV$ (b) 2PV
 (c) $\frac{PV}{2}$ (d) 0
23. A Carnot engine takes 300 cal at 500k and rejects 150 cal of heat sink. temperature of sink
- (a) 250 K (b) 250°C
 (c) 250 F (d) 100 K

SCIENTIA VISION SYSTEM

24. Which one is not in diesel engine
 (a) Piston (b) Inlet valve
 (c) Outlet valve (d) Spark plug
25. If the temperature of the patient is 40°C , his temp. on Fahrenheit scale will be
 (a) 104°F (b) 72°F
 (c) 96°F (d) 100°F
26. A carnot engine take 300 cal of heat at 500 K and rejects 150 cal of heat to the sink. The temperature of the sink is
 (a) 100 K (b) 250 K
 (c) 125 K (d) 700 K
27. During isobaric process
 (a) $\Delta P=0$ (b) $\Delta V=0$
 (c) $\Delta T=0$ (d) $\Delta W=0$
28. A girl has 240 grams of water at 50°C . How many grams of ice, at 0°C , are needed to cool the water to 0°C
 (a) 100 grams (b) 140 grams
 (c) 58 grams (d) 150 grams
29. When a solid metallic sphere is heated, the largest percentage increase occurs in its.
 (a) diameter (b) surface area (c) volume (d) density
30. In the figure curves AB and CD represent the relation between pressure P and volume V of an ideal gas. One of the curves represents on isothermal expansion and the other represents an adiabatic expansion. Which curve represents an adiabatic expansion?



- (a) curve AB (b) curve CD (c) both "a" and "b" (d) none of these
31. The ratio of adiabatic bulk modulus to isothermal bulk modulus of a gas is
 (a) 1 (b) γ (c) $\frac{\gamma}{(\gamma-1)}$ (d) $\frac{(\gamma-1)}{\gamma}$
32. During an adiabatic compression of 5 moles of a gas, 250 J of work was done. The change in the internal energy will be
 (a) 50 J (b) -150 J (c) 250 J (d) -250 J
33. Four molecules of a gas have speeds 1, 2, 3 and 4 kms^{-1} . The value of the root mean square speed of the gas molecule is
 (a) $\frac{1}{2\sqrt{15}} \text{kms}^{-1}$ (b) $\frac{1}{2\sqrt{10}} \text{kms}^{-1}$ (c) 2.5kms^{-1} (d) $\frac{\sqrt{15}}{2} \text{kms}^{-1}$
34. What is the value of absolute zero in Fahrenheit scale
 (a) 0°F (b) 22°F
 (c) -350°F (d) -459.4°F
35. The average translational K.E of the system determine its
 (a) Internal energy (b) entropy
 (c) temperature (d) volume

36. The energy transforming processes that occur within an organism are named as
(a) metabolism (b) catabolism
(c) food chain (d) mitochondria
37. In all real processes where heat transfer occurs, the energy available for doing work
(a) increases (b) decreases
(c) remains constant (d) none of these
38. All Carnot engines working between the same two temperatures have the same efficiency irrespective of
(a) temperature (b) working substance
(c) internal energy (d) all of these
39. A Carnot engine absorbs a quantity of heat 1000 J from a source and does useful work of 300 J. The heat rejected is
(a) 300 J (b) 1000 J
(c) 700 J (d) 500 J
40. In which of the following expansions the work done is more when same heat is supplied
(a) isochoric (b) isothermal
(c) isobaric (d) same in all the three cases

SCIENTIA VISION SYSTEM

ANSWER KEY BOOK I
CHAPTER 1+2

1	A	13	C	25	D	37	B	49	D
2	B	14	B	26	C	38	B	50	B
3	B	15	B	27	C	39	C	51	C
4	A	16		28	C	40	S	52	A
5	B	17	A	29	B	41	C	53	A
6	C	18	B	30	D	42	B	54	C
7	C	19	D	31	C	43	B	55	B
8		20		32	D	44	D	56	A
9	A	21	C	33	B	45	B	57	D
10	B	22	C	34	D	46	D	58	B
11	A	23	D	35	C	47	B	59	A
12	C	24	B	36	C	48	C	60	D

CHAPTER 3+4

1	B	13	C	25	C	37	B	49	B
2	C	14	B	26		38	C	50	
3	D	15	A	27	D	39	B	51	
4	A	16	B	28		40	B	52	
5	A	17	A	29		41	D	53	
6	D	18	A	30	A	42	B	54	
7	C	19	C	31	D	43	D	55	
8	C	20	B	32	C	44	B	56	
9	C	21	B	33	D	45	A	57	
10	C	22	D	34	B	46	C	58	
11	A	23	A	35	D	47	C	59	
12	B	24	A	36	B	48	A	60	

CHAPTER 5+6

1	C	13	B	25	C	37	C	49	C
2	A	14	B	26	A	38	B	50	A
3	B	15	A	27	A	39	C	51	
4	A	16	A	28	A	40	A	52	
5	C	17	C	29	B	41	C	53	
6	C	18	A	30	A	42	D	54	
7	A	19	A	31	A	43	D	55	
8	B	20	A	32	A	44	B	56	
9	A	21		33	B	45	A	57	
10	B	22	A	34	D	46	B	58	
11	D	23	C	35	C	47	A	59	
12	C	24	B	36	B	48	C	60	

CHAPTER 7+8

1	B	13	B	25	B	37	C	49	B
2	B	14	C	26	C	38	C	50	C
3	A	15	B	27	D	39	B	51	C
4	A	16	A	28	C	40	B	52	C
5	C	17	C	29		41	A	53	
6	A	18	A	30	A	42	B	54	B
7	A	19	A	31	A	43	C	55	B
8	B	20	C	32	A	44	B	56	
9	D	21	D	33	A	45	A	57	
10	A	22	A	34	D	46	C	58	
11	B	23	A	35	D	47	A	59	
12	B	24	C	36	D	48	C	60	

CHAPTER 9+10

1	B	13	C	25	B	37	C	49	D
2	C	14	D	26	D	38	A	50	D
3	C	15	D	27	B	39	B	51	
4	A	16	C	28	C	40	A	52	
5	C	17	D	29	D	41	D	53	
6	D	18	B	30	B	42	D	54	
7	D	19	C	31	B	43	B	55	
8	C	20	A	32	A	44	B	56	
9	B	21	A	33	C	45	C	57	
10	B	22	B	34	A	46	C	58	
11	A	23	B	35	D	47		59	
12	A	24	C	36	C	48	B	60	

CHAPTER 11

1	A	13	B	25	A	37	B	49	
2	B	14	A	26	B	38	B	50	
3	C	15	A	27	A	39	C	51	
4	B	16	D	28	D	40	C	52	
5	C	17	D	29	C	41		53	
6	B	18	A	30	B	42		54	
7	C	19	C	31	B	43		55	
8	B	20	D	32	C	44		56	
9	C	21	B	33	D	45		57	
10	D	22	A	34	D	46		58	
11	C	23	A	35	C	47		59	
12	C	24	D	36	A	48		60	



BOOK II

SCIENTIA VISIO

NUST (Med/Engg.) + GIKI + FMDC

(PHYSICS) CH. 12+13 (II)

1. The magnitude of $\frac{1}{4} \pi \epsilon_0$ is

(a) 9×10^9	(b) 8.85×10^{-12}
(c) 9×10^{-9}	(d) 8.85×10^{12}
2. When a solid body is negatively charged by friction, it means that the body has

(a) acquired excess of electrons
(b) lost some protons
(c) acquired some electron and lost a lesser number of protons
(d) lost some positive ions
3. Four electric charges A,B,C,D are arranged as shown in the figure. The electric force will be least between charges

(a) A and B	(b) B and D
(c) A and D	(d) A and C



5. A and B are two points in an electric field. If the work done in carrying 4.0 coulomb of electric charge from A to B is 16.0 joule the potential difference between A and B is

(a) zero	(b) 4 V
(b) 2.0 v	(d) 16V
6. How many electrons will have a charge of one coulomb?

(a) 6.2×10^{18}	(b) 5.2×10^{18}
(c) 6.2×10^{19}	(d) 5.2×10^{19}
7. Two point charges +2 coulomb and +6 coulomb repel each other with a force of 12 N. If a charge of -2 coulomb is given to each of these charges, the force will now be

(a) zero	(b) 8 N (repulsive)
(c) 8 N (attractive)	(d) None
8. A hollow sphere of copper is positively charged. Then the electric field inside the sphere is

(a) the same as the field at the surface
(b) greater than the field at the surface
(c) less them the field at the surface but not zero
(d) zero
9. A and B are two spherical conductors of the same extent and size. A is solid and B is hollow Both are charged to the same potential. If the charges on A and B are Q_A and Q_B respectively, then

(a) Q_A is less than Q_B	(c) $Q_A = Q_B$
(b) Q_A is greater than Q_B but not double	(d) $Q_A = 2Q_B$

10. A capacitor connected to a 10 V battery collects a charge of 40 micro coulomb with air as dielectric and 100 micro coulomb with oil as dielectric. The dielectric constant of the oil is
- (a) 4 (b) 0.4
(c) 2.5 (d) 1.0
11. Energy of an electric capacitor of capacity C, when subjected to a potential V, is given by
- (a) $1/2CV^2$ (b) CV
(c) $1/2C^2V$ (d) $1C/2V$
12. Two bulbs having the ratings 40W, 220V and 20 W, 110 V. The ratio of their resistance is
- (a) 1: 2 (b) 2 :1
(c) 1 :1 (d) 1 : 4
13. Two charge conducting spheres of radii R_1 and R_2 , separated by a large distance, are connected by a long wire. The ratio of the charges on them is
- (a) $\frac{R_1}{R_2}$ (b) $\frac{R_1^2}{R_2^2}$
(c) $\frac{R_2}{R_1}$ (d) $\frac{R_2^2}{R_1^2}$
14. Two capacitors of capacitances 0.3 μF and 0.6 μF are connected in series across a battery of 6 V. The ratio of energies stored in them is
- (a) 1/4 (b) 2
(c) 1/2 (d) 4
15. Two charges are in vacuum at a distance d apart. The force between them is F. If a medium of dielectric constant 4 is introduced between them, the force will now be
- (a) 4F (b) F/2
(c) 2F (d) F/4
16. Two plates are 2cm apart. If a potential difference of 10 volt s is applied between the plates. The electric field between the plates will be
- (a) 20 N/C (b) 250 N/C
(c) 500 N/C (d) 250 N/C
17. The capacitance of a parallel plate capacitor does not depend on
- (a) area of the plates (b) medium between the plates
(c) nature of metal plates (d) distance between the plates
18. Electric field intensity at a point inside a hollow charged spherical conductor
- (a) is zero
(b) is constant
(c) increase with the distance from the centre of the sphere
(d) none of the above
19. You are given a resistance coil and a battery. In which of the following cases is largest amount of heat generated?
- (a) When the coil is connected to the battery directly
(b) When the coil is divided into two equal parts and both the parts are connected to the battery in parallel
(c) When the coil is divided into four equal parts and all the four parts are connected to the battery in parallel
(d) When only half the coil is connected to the battery

20. If the potential difference across a conductor is doubled the rate of heat production will become
- (a) double (b) $\sqrt{2}$ times
(c) half (d) four times
21. There are two electric bulbs of 40 W and 100.W They are first connected in series and then in parallel across a source
- (a) 40 W bulb will be brighter in series and 100 W in parallel
(b) 100 W bulb will be brighter in series and 40 W bulb in parallel
(c) 40 W bulb will be brighter in both the cases
(d) 100 W bulb will be brighter in both the cases
22. The colour code of 10Ω resistance with 5% tolerance is
- (a) black, black, brown, silver (b) brown, black, black, gold
(c) black, brown, black, gold (d) brown, brown, black, gold
23. A voltage of 600V can be obtained virtually from
- (a) dry battery (b) nickel cadmium battery
(c) head & tail of an eel (c) transformer
24. Zero ohm resistor is indicate by
- (a) three black strip (b) two black strip
(c) one black strip (d) all are correct
25. Four identical resistors, each of one ohm are connected as shown. The equivalent resistance between A and B is

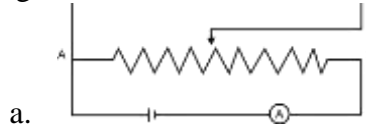


- (a) 1.5 ohm (b) 2.5 ohm
(c) 1ohm (d) 3.0 ohm
26. The resistance of a wire is R. It is stretched uniformly so that its length is doubled The resistance now becomes
- (a) 2 R (b) 4R
(c) R/2 (d) R/4
27. The specific resistance of a wire
- (a) varies with its length
(b) varies with its mass
(c) varies with its cross section
(d) does not depend on its length, cross section and mass
28. Three resistances, each of 4Ω , are connected to form a triangle. The resistance between any two terminals is
- (a) 2Ω (b) 6Ω
(c) $8/3\Omega$ (d) 12Ω

29. A copper wire is connected across a battery. The drift velocity of the electrons is v . If another copper wire of the same length and double the radius is connected across the same battery, the drift velocity will be

- (a) v (b) $v/2$
(c) $2v$ (d) $4v$

30. In the given circuit as the sliding contact C is moved from A to B



- (a) the readings of both the ammeter and the voltmeter remain constant
(b) the readings of both the ammeter and the voltmeter increase
(c) the reading of the ammeter remains constant but that of the voltmeter increases
(d) The reading of the ammeter remains constant but that of the voltmeter decreases

31. Two point charge put air has a force F . What is the force between the charges if distance between them is halved and a dielectric of relative primitively 4 is placed between the charges.

- (a) F (b) $2F$
(c) $F/4$ (d) $4F$

32. In photocopier which of the following is photoconductor

- (a) selenium (b) aluminum with selenium
(c) aluminum (d) none of these

33. The electric field between the oppositely charged plates of surface charge density σ is σ/ϵ_0 . If one of the plates is removed then electric field becomes

- (a) zero (b) $2\sigma/\epsilon_0$
(c) $\sigma/2\epsilon_0$ (d) $\sigma/4\epsilon_0$

34. If the distance between the plates of a capacitor is halved and area of each plate is doubled then its capacitance becomes

- (a) doubled (b) halved
(c) quadrupled (d) remains same

35. In a D.C circuit with a voltage of 10 volt a resistor of 10 ohm and a current passing for 10 seconds, find the heat produced

- (a) 1000 J (b) 100 J (c) 10 J (d) 1 J

36. A capacitor has a capacitance of $4\mu\text{F}$ in presence of air. Find the capacitance in μF when a medium of dielectric constant 8 is placed between the plates

- (a) 32 (b) 16 (c) 2 (d) none

37. 1.0×10^7 electrons pass through a conductor in $1\mu\text{s}$. the current flowing the conductor

- (a) $1.6\mu\text{A}$ (b) $1.4\mu\text{A}$ (c) $1\mu\text{A}$ (d) $0.5\mu\text{A}$

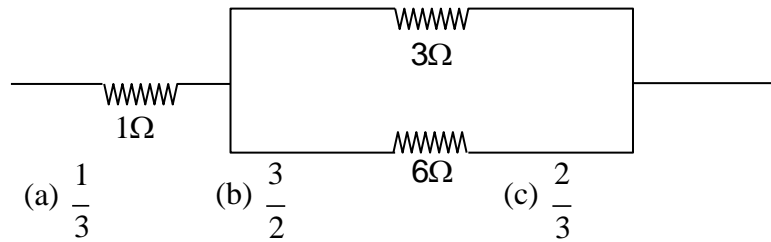
38. Which of the following is the best conductor

- (a) copper (b) gold (c) aluminum (d) silver

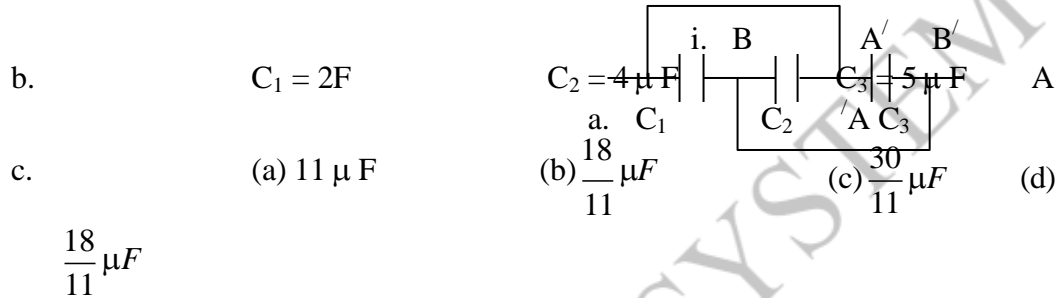
39. Gauss's law is applicable on

- (a) plane surfaces only (b) curved surfaces only
(c) closed surfaces only (d) all of these

40. In the figure the ratio of currents in the 3Ω and 1Ω resistor is



41. Three capacitors are connected in such a way its equivalent capacitance is



42. In Millikan's oil drop experiment, if field is reversed for suspended oil drop, then its acceleration will be

- (a) g (b) $g/2$ (c) zero (d) $2g$

43. A soap bubble is given a negative charge, then its radius

- (a) decreases (b) increases (c) remains same (d) bubble will disappear

44. The electric intensity outside the two oppositely charged parallel metal plates is

- (a) maximum (b) minimum (c) infinite (d) zero

45. Thermistors are made from mixture of oxides of

- (a) manganese and nickel (b) cobalt and copper
(c) nickel and iron (d) all of these

46. 100w bulb rated 220v is connected 110v. The power consumed is

- (a) 100 watt (b) 50w (c) 25w (d) none

47. The equivalent resistance of two wires in parallel is $\frac{6}{5}\Omega$. If the resistance of one of the

wire is 2Ω , that of other is

- (a) $\frac{3}{5}$ (b) 3 (c) 2 (d) $\frac{5}{3}$

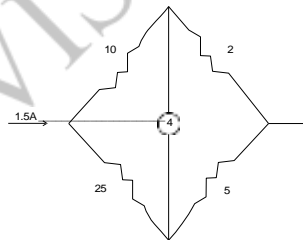
48. A copper and steel wire of equal length and equal thickness are connected in series with a battery. Which will get more heated

- (a) steel (b) copper (c) equally heated (d) none

49. A proton and a sodium ion enter a magnetic field with same speed, then the ratio of their radii of trajectory is

- (a) 1:11 (b) 1: $\sqrt{11}$ (c) 1:23 (d) 1: $\sqrt{23}$

50. A charged particle moves along a circle under the action of possible electric & magnetic field which of the following is possible.
 (a) $E=0, B=0$ (b) $E \neq 0, B=0$ (c) $E=0, B \neq 0$ (d) $E \neq 0, B \neq 0$
51. ELECTROENCE PHALOGRAPHY stands for
 (a) ECG (b) ETG (c) EPG (d) EEG
52. If current through resistor is halved, wattage developed by it would be,
 (a) halved (b) quadrupled (c) cut to one-fourth (d) doubled
53. Hair springs in pivoted type galvanometer are used
 (a) as current leads (b) to produce restoring torque
 (c) both a and b (d) none
54. How many electrons will have charge of 1C
 (a) 6.2×10^{18} (b) 1.6×10^{-19}
 (c) 6.2×10^{19} (d) 6.2×10^{20}
55. The minimum resistance obtain from five resistors of $1/5\Omega$ is
 (a) $\frac{1}{50}\Omega$ (b) $\frac{1}{25}\Omega$
 (c) $\frac{1}{10}\Omega$ (d) none
56. The resistance of wire is R , it is cut into four equal parts and are bundled side by side. The resistance of bundle is
 (a) R (b) $\frac{R}{4}$ (c) $\frac{R}{16}$ (d) $\frac{R}{8}$
57. The current through galvanometer is



58. (a) 1.2A (b) 1A
 (c) 0.8A (d) zero
60. The value of ϵ_r for various dielectric is always
 (a) less than unity (b) equal to unity
 (c) larger than unity (d) none of the above

NUST (Med/Engg.) + GIKI + FMDC**(PHYSICS) CH. 14+15 (II)**

- A uniform electric field and a uniform magnetic field exist in a region in the same direction. An electron is projected with velocity pointed in the same direction. The electron will
 - turn to its right
 - turn to its left
 - keep moving in the same direction but its speed will increase
 - keep moving in the same direction but its speed will decrease
- An electron is injected into a uniform magnetic field with components of velocity parallel to and normal to the field direction. The path of the electron is a
 - helix
 - parabola
 - circle
 - straight line
- An electron is moving in circle of radius r in a uniform magnetic field B . Suddenly the field is reduced to $B/2$. The radius of the circle now becomes
 - $r/2$
 - $2r$
 - $r/4$
 - $4r$
- Protons and α -particles of equal momenta enter a uniform magnetic field normally. The radii of their orbits will have the ratio
 - 1
 - 0.5
 - 2
 - 4
- A proton and an α -particle enter a magnetic field normally. If the force experienced by the proton is double of that experienced by the α -particle, the ratio of their speeds is
 - 0.5
 - 2
 - 1
 - 4
- Magnetic effect of current was discovered by
 - Faraday
 - Kirchhoff's
 - Oersted
 - Joule
- If a particle of charge 10^{-12} C moving along the X-direction with a velocity 10^5 m/s experiences a force of 10^{-10} N in y-direction, then the minimum magnetic field is
 - 6.25×10^3 T in the positive z-direction
 - 10^{-15} T in the negative Z-direction
 - 10^{-3} T in the positive Z-direction
 - 10^{-3} T in the negative Z-direction
- Lorentz force is given by
 - $q(E + V \times B)$
 - $q(E - v \times B)$
 - $q(E + v \cdot B)$
 - $q(E \times B + V)$
- If the length of a wire is doubled and its cross section is also doubled, then its resistance will?
 - become four times
 - become two times
 - become are fourth
 - remain unchanged
- The inductance of a coil is proportional to
 - its length
 - the resistance of the coil
 - the number of turns
 - the square of the number of turns

11. A coil having 500 square loops, each of side 10 cm, is placed normal to a magnetic field which increases at the rate of 1.0T/s .The induced emf in volts is
(a) 0.1 (b) 0.1
(c) 0.5 (d) 5.0
12. The speed of electromagnetic waves in vacuum is given by
(a) $\mu_0 \epsilon_0$ (b) $1/\mu_0 \epsilon_0$
(c) $\sqrt{\mu_0 \epsilon_0}$ (d) $1/\sqrt{\mu_0 \epsilon_0}$
13. Armature current in a dc motor will be maximums when the
(a) motor has acquired maximum speed (b) motor has acquired intermediate speed
(c) motor just started moving (d) motor is switched off
14. If the number of turns of an inductor are doubled and current flowing through it is also doubled then energy stored becomes
(a) double (b) four times
(c) eight times (d) 16 times
15. E/B has dimension
(a) MLT^{-1} (b) LT^{-2}
(c) LT^{-1} (d) $L^{-1} T$
16. In CRO if sweep is off and a sinusoidal voltage is applied across Y plates then the trace on the screen is
(a) horizontal line (b) sinusoidal
(c) vertical line (d) no wave form
17. To induce an emf in a coil the linking magnetic flux
(a) must decrease (b) must remain constant
(c) must increase (d) can either increase or decrease
18. A coil having 500 square loops, each of side 10 cm, is placed normal to a magnetic field which increases at the rate of 1.0T/s .The induced emf in volts is
(a) 0.1 (b) 0.1
(c) 0.5 (d) 5.0
19. In an electromagnetic wave the electric field vector E and the magnetic field vector B are
(a) perpendicular to each other (b) at 45° to each other
(c) parallel to each other (d) can have any angle between them
20. Armature current in a dc motor will be maximums when the
(a) motor has acquired maximum speed (b) motor has acquired intermediate speed
(c) motor just started moving (d) motor is switched off
21. Core of a dynamo is laminated because
a. magnetic field increase
b. magnetic saturation level in core increase
c. residual magnetism in core decrease
d. loss of energy in core due to eddy current decreases
22. A galvanometer can be made sensitive by
(a) using a small and thick suspension wire (b) increasing the magnetic field
(c) decreasing the area of the coil (d) decreasing the turns of coil
23. Laminated core in a transformer is used to reduce
(a) Eddy current losses (b) Hysteresis losses
(c) iron losses (d) heat losses due to resistance
24. When current flows through a conductor in a direction out of the plane of paper the magnetic field has direction
(a) from left to right (b) from right to left
(c) clock wise (d) anti clockwise

25. When two current carrying conductors are placed parallel to each other such that current direction is same in both of them. Then they
(a) attract each other (b) repel each other
(c) neither attract no repel (d) attract and repel alternatively
26. In a loop of wire current is flowing in anticlockwise direction. It acts as
(a) north pole (b) south pole
(c) neutral (d) may be north or south pole
27. When ohmmeter give full (maximum) deflection it indicates
(a) zero resistance (b) infinite resistance
(c) small resistance (d) none of these
28. When north pole of a magnet is moved towards the face of a coil then the face of coil act as
(a) north pole (b) south pole
(c) neutral (d) we cannot predict about it
29. In alternating current, inductor behaves like
(a) capacitor (b) resistor
(c) diode (d) transistor
30. A coil is rotated in a uniform magnetic field about an axis perpendicular to the field. The emf induced in the coil would be maximum when the plane of the coil is
(a) parallel to the field (b) perpendicular to the field
(c) at 45° to the field (d) in none of the above positions
31. In which of the following the commutators are used
(a) A.C generator (b) D.C generator
(c) D.C motor (d) both b and c
32. The loss a power in transformer is due to
(a) eddy current (b) magnetic hysteresis
(c) resistance of coils (d) all
33. When a current carrying conductor is placed in a magnetic field. It moves from a region of
(a) stronger to weak filed (b) weak to strong field
(c) strong to weak if current is large (d) weak to strong if current is large
34. Which of the following force does no work on moving charge particle
(a) electric (b) gravitational
(c) friction (d) magnetic
35. Which of the following have smallest e/m ratio
(a) electron (b) proton
(c) deuteron (d) α - particle
36. E/B has dimension
(a) MLT^{-1} (b) LT^{-2}
(c) LT^{-1} (d) $L^{-1}T$
37. In CRO if sweep is off and a sinusoidal voltage is applied across Y plates then the trace on the screen is
(a) horizontal line (b) sinusoidal
(c) vertical line (d) no wave form
38. An avometer is used to measure
(a) resistance (b) potential difference
(c) current (d) all
39. Galvanometer is used to
(a) measure the flow of current (b) detect flow of current
(c) measure potential difference (d) both a and b
40. Who discovered that electric current produce magnetic field?
(a) Oersted (b) Faraday
(c) Michelson (d) none of these
41. Power loss in transformer is caused by

- (a) eddy current (b) Hysteresis loss
(c) resistance of coil (d) all
42. _____ is the energy expended in magnetize and demagnetize the core material in each cycle of the A.C.
(a) power loss (b) heat loss
(c) Hysteresis loss (d) all of the above
43. The magnetic field in the motor is provided by
(a) permanent magnetic (b) electro magnetic
(c) may be a or may be b (d) none of these
44. emf induced in the secondary is proportional to the time rate of change of current in the
(a) secondary
(b) primary
(c) sometimes to the secondary & some times to the primary
(d) both a & b
45. Because of their self induction the will are know as
(a) insulator (b) conductor
(c) inductor (d) capacitor
46. In transformer when the voltage in the secondary is increased the current in the secondary
(a) increases (b) decreases
(c) remain same (d) becomes zero
47. To improve efficiency of transformer and to minimize loss of power insulation should be
(a) large (b) small
(c) perfect (d) none
48. To improve efficiency of transformer the flux coupling between primary & secondary coils should be
(a) small (b) maximum
(c) may be small or may be maximum (d) none of these
49. For ideal transformer
(a) $P_{in} = P_{out}$ (b) $P_{in} > P_{out}$
(c) $P_{in} < P_{out}$ (d) $P_{in} \leq P_{out}$
50. The force experienced by a current carrying conductor is
(a) directly proportional to current through conductor
(b) directly proportional to the length of conductor
(c) directly proportional to magnetic field
(d) all of above

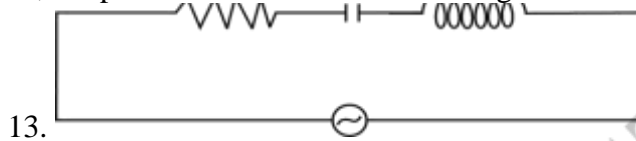
NUST (Med/Engg.) + GIKI + FMDC**(PHYSICS) CH. 16+17 (II)**

- The root – mean – square value of the alternating current is equal to
 - twice the peak value
 - $(1/\sqrt{2})$ times the peak value
 - half the peak value
 - equal to the peak value
- Hot wire ammeters can be used for measuring
 - alternating current only
 - both alternating and direct current
 - direct current only
 - neither alternating nor direct current
- The rate of heat production in a resistor due to an alternating current of rms value 10A is same as that due to a direct current of
 - 10A
 - $10\sqrt{2}$ A
 - $10/\sqrt{2}$ A
 - 5A
- When an ac source is connected across a resistor
 - the current leads the voltage
 - the current lags behind the voltage
 - the current and voltage are in phase
 - anyone of the above may be true depending upon the value of the resistance
- The heat produced in a given resistor in a given time by the sinusoidal current $10 \sin(\omega t)$ will be the same as that by a steady current of magnitude
 - $10/\sqrt{2}$
 - $10\sqrt{2}$
 - 10
 - $10/2$
- An inductive coil has a resistance of 100Ω . When an ac signal of frequency 1000 Hz is applied to the coil, the voltage leads the current by 45° . The inductance of the coil is
 - $\frac{1}{10\pi}$
 - $\frac{1}{40\pi}$
 - $\frac{1}{20\pi}$
 - $\frac{1}{60\pi}$
- The reactance of a capacitor at 50 Hz is 10Ω . Its reactance at 100 Hz is
 - 2.5Ω
 - 10Ω
 - 5Ω
 - 20Ω
- In an LCR circuit, the energy is dissipated in
 - R only
 - R and C only
 - R and L only
 - R, L and C
- Amorphous solids are called
 - polymeric
 - glassy solids
 - crystal
 - all

10. In the LCR parallel ac circuit at resonance
- (a) the source current is maximum
 - (b) the impedance of the circuit is minimum and is equal to R
 - (b) the angular frequency of the source is $\omega = 1/\sqrt{LC}$
 - (c) the impedance of the circuit is maximum and is equal to R.
11. The impedance of a circuit containing inductance L and resistance R is given by

- (a) LR
- (b) $\sqrt{R^2 + \omega^2 L^2}$
- (c) L/R
- (d) $\sqrt{\omega^2 R^2 + L^2}$

12. In the given circuit, the phase difference between voltages across R and C is



- (a) zero
- (b) π
- (c) $\pi/2$
- (d) $3\pi/2$

14. In the given LR circuit, the source has angular frequency ω . The power factor of the circuit is



- (a) $\frac{L}{R}$
- (b) $\frac{R}{\sqrt{R^2 + \omega^2 L^2}}$
- (c) $R/\omega L$
- (d) $R + \omega L$

16. The young's modulus of a wire of length L and radius r is Y. If the length is reduced to L/2 and radius to r/2, its young's modulus will be

- (a) Y/2
- (b) 2Y
- (c) Y
- (d) 4Y

17. If the work done in stretching a wire by 1mm is 2 J, the work necessary for stretching another wire of the same material but double the radius and half the length by 1 mm is

- (a) 16 J
- (b) 4 J
- (c) 8 J
- (d) (1/4) J

18. Conductivity of semi conductor is of order of

- (a) 10^{-6} to $10^{-4} \Omega^{-1} m^{-1}$
- (b) $10^7 \Omega m^{-1}$
- (c) 10^{-10} to $10^{-20} (\Omega m)^{-1}$
- (d) none of these

19. Energy bands in solids which are either partially filled or empty are called

- (a) valance band
- (b) forbidden band
- (c) conduction band
- (d) inner most band

20. Domains contain nearly

- (a) 10^{08} - 10^{09} atoms
- (b) 10^{15} - 10^{20} atoms
- (c) 10^{12} - 10^{16} atoms
- (d) none of these

21. After curie temperature iron become

- (a) ferromagnetic
- (b) paramagnetic
- (c) diamagnetic
- (d) none of these

22. Two wires of copper have lengths in the ratio 1:2 and radii in the ratio 2:1. their Young's moduli are in the ratio

- (a) 1:1
- (c) 1:8
- (b) 8:1
- (d) 1:4

23. Squids (super conducting quantum interference devices) are used to detect very weak magnetic field produced by
(a) nuclear fission (b) radio transmitter
(c) brain (d) microwave
24. In resonance parallel circuit branch currents (I_L & I_C) may each be greater than
(a) source voltage (b) V_c
(c) source current (d) V_c angle
25. Metal detectors works on the principle of
(a) Doppler effects (b) organ pipe
(c) beats (d) all of these
26. If germanium has to be doped with a donor impurity, the foreign atom should be
(a) tetravalent (b) trivalent
(c) pentavalent (d) none of the above
27. In an insulator, the forbidden energy gap between the valance band and the conduction band is of the order of
(a) 1 MeV (b) 0.1 MeV
(c) 1 eV (d) 5 eV
28. A hole in a p – type semi – conductor is
(a) an excess electron (b) a missing atom
(c) a missing electron (d) a donor level
29. In R.L series circuit with increase in frequency of A.C source the impedance of the circuit
(a) increase (b) remains same
(c) decreases (d) may increase or decrease
30. In case of R.C series circuit
(a) I leads v by $\pi/2$ (b) I and v are in phase
(c) I lags V by $\pi/2$ (d) none
31. Power in A.C circuit is give by
(a) $P = VI$ (b) $P = VI \cos\theta$
(c) $P = VI \sin\theta$ (d) $p = VI \tan\theta$ (d)
32. In three phase AC supply the P.D across two live wires is
(a) $\sqrt{2}V$ (b) $\sqrt{3}V$
(c) $\sqrt{5}V$ (d) $\sqrt{7}V$
33. In metal detector when a metal object is brought near the search coil its inductance
(a) increase
(b) decrease
(c) Increases or decrease depend upon A.C frequency
(d) remains same
34. Saturated domains have
(a) high retativity (b) low coercivity
(c) high coercivity (d) both a and b
35. All the magnetic materials lose their magnetic properties when
(a) dipped in water (c) dipped in oil
(b) brought near a piece of iron (d) strongly heated
36. The concept of domain is related with
(a) non-magnetic (b) paramagnetic
(c) diamagnetic (d) ferromagnetic

37. In an A.C cycle which one is equal to zero
(a) rms current (b) mean square current
(c) average current (d) power dissipation in resistor
38. In case of a capacitor connected across an A.C supply
(a) voltage and current are in phase (b) voltage lags current by $\frac{\pi}{2}$
(c) voltage lead current by $\pi/2$ (d) none of these
39. At what time the instantaneous voltage is half of the maximum voltage (T is time period)
(a) $\frac{T}{2}$ (b) $\frac{T}{12}$ (c) $\frac{T}{6}$ (d) $\frac{T}{4}$
40. In R-C series circuit
(a) voltage and current are in phase (b) voltage leads current by $\frac{\pi}{2}$
(c) current leads voltage by $\frac{\pi}{2}$ (d) none of these
41. Speed of electromagnetic waves is given by
(a) $\mu_0 \epsilon_0$ (b) $\sqrt{\mu_0 \epsilon_0}$ (c) $\frac{1}{\sqrt{\mu_0 \epsilon_0}}$ (d) $\frac{1}{\mu_0 \epsilon_0}$
42. If the instantaneous current in a circuit is given by $I=2\sin(\omega t+\theta)$ amperes, the rms value of the current is
(a) $\sqrt{2}A$ (b) $2A$ (c) $2\sqrt{2} A$ (d) zero
43. Hot wire ammeter can be used for measuring
(a) a.c only (b) d.c only (c) both a.c and d.c (d) neither a.c nor d.c
44. When a PN junction is biased in the forward direction,
(a) only holes on the P-type side are injected into N-type side.
(b) only electrons on the N-type side are injected
(c) the majority carriers on each side are injected
(d) none of these
45. The potential barrier at a PN junction is because of the charge on either side of the junction these charges are,
(a) majority carrier (b) minority carriers
(c) both majority and minority carriers (d) fixed donor and acceptor ions
46. Minority carriers present in p type semiconductor are due to
(a) Bais voltage (b) thermal agitation
(c) addition of impurity (d) ionization of impurity
47. When a spiral spring is stretched by a weight attached to it, the strain is,
(a) elastic (b) tensile (c) bulk (d) shear
48. Volumetric strain is inversely proportional to
(a) normal stress (b) bulk modulus (c) compressibility (d) none of these



ENTRY TEST ASSIGNMENTS



49. An A.C current given by $I = 14.14 \sin (wt + \pi/6)$ has an rms value of current in ampere?
(a) 10 (b) 14.14 (c) 1.96 (d) 7.07
50. In 3 phase A.C phase difference between voltages is
(a) 30° (b) 120° (c) 60° (d) 90°

SCIENTIA VISION SYSTEM

NUST (Med/Engg.) + GIKI + FMDC**(PHYSICS) CH. 18+19 (II)**

- Which of the following arrangements corresponds to decreasing order of specific charge?
(a) electron, proton, α - particle
(b) proton, α - particle, electron
(c) α - particle, proton, electron
(d) electron, α - particle, proton
- The photoelectric effect is the ejection of electrons from the surface of a metal when
(a) it is heated to a high temperature
(b) electrons of suitable velocity strike it
(c) radiation of suitable wavelength falls on it
(d) it is placed in a strong electric field
- Photoelectric effect can be explained only by assuming that electromagnetic radiation
(a) is a transverse wave
(b) can be polarized
(c) is a longitudinal
(d) consists of quanta
- The momentum of a photon of frequency f is
(a) hf/c^2
(b) hfc
(c) hf/c
(d) hfc^2
- When ultraviolet radiation is incident on a surface, no photoelectrons are emitted from the surface. If another beam causes photoelectrons to be emitted, it may consist of
(a) radio waves
(b) X - rays
(c) infrared rays
(d) visible
- Matter waves are
(a) electromagnetic waves
(b) transverse waves
(c) longitudinal mechanical waves
(d) neither electromagnetic nor mechanical waves
- An electron and a proton are accelerated through the same potential. If their masses are m_e , and m_p respectively, then the ratio of their de-Broglie wavelength is
(a) 1
(b) m_p / m_e
(c) m_e / m_p
(d) $\sqrt{m_p / m_e}$
- Compton effect shows that
(a) X - rays are waves
(b) X - rays can penetrate matter
(c) X - rays have high energy
(d) photons have momentum
- A pn junction is said to be reverse biased when
(a) no potential difference is applied across it
(b) a potential difference is applied across it making p-region positive and N-region negative
(c) a potential difference is across it making p - region negative and N - region positive
(d) a magnetic field is applied in the region of the junction
- the p - side of a junction diode is earthed and the n - side is given a potential of $-2V$ - the diode will
(a) break down
(b) not conduct
(c) conduct
(d) conduct partially
(e) the base is made very thin and is highly doped

11. In a transistor
- (a) length of emitter is greater than that of collector
 - (b) length of collector is greater than that of emitter
 - (c) both collector and emitter have the same length
 - (d) none of these
12. In a transistor the emitter current is
- (a) slightly more than the collector current
 - (b) equal to the collector current
 - (c) slightly less than the collector current
 - (d) equal to the base current
13. A diode can convert
- (a) ac into dc but not dc into ac
 - (b) ac into dc and dc into ac
 - (c) dc into ac but not ac into dc
 - (d) neither ac into dc nor dc into ac
14. Holes are charge carriers in
- (a) intrinsic semiconductor
 - (b) p – type semiconductors
 - (c) ionic solids
 - (d) metals
15. A photon of energy 1.5MeV collides with a heavy nucleus which of the following is the dominant phenomenon
- (a) Compton's effect
 - (b) pair production
 - (c) photoelectric effect
 - (d) all are equally probable
16. In a pnp transistor, the p-type crystal acts as
- (a) emitter only
 - (b) collector only
 - (c) either emitter or collector
 - (d) neither emitter nor collector.
17. The current gain in a common emitter transistor is
- (a) more than 1
 - (b) less than 1
 - (c) equal to 1
 - (d) zero
18. In an intrinsic semi conductor the number of
- (a) electrons are greater
 - (b) holes are greater
 - (c) electrons and holes are equal
 - (d) none of these
19. The work function for aluminium surface is 4.2eV and that the sodium surface is 2.0 eV. The two metals were illuminated with appropriate radiation so as to cause photo emission then
- (a) both aluminium and sodium will have the same threshold frequency
 - (b) the threshold frequency of aluminium will be more than that of sodium
 - (c) the threshold frequency of aluminium will be less than that of sodium
 - (d) the threshold wavelength of aluminium will be more than that of sodium
20. A crystal lattice is
- (a) a random arrangement of atoms in a crystal
 - (b) a random arrangement of molecules in a crystal
 - (c) an ordered arrangement of points in space
 - (d) a piece of crystal
21. The photoelectrons emitted from a metal surface
- (a) are all at rest
 - (b) have the same kinetic energy
 - (c) have the same momentum
 - (d) have speeds varying from zero upto a certain maximum value
22. The maximum kinetic energy of photoelectrons emitted from a surface when photons

- of energy $6eV$ fall on it is $4eV$. The stopping potential is
(a) $2V$ (b) $4V$ (c) $6V$ (d) $10V$
23. Which gate has only one input terminal
(a) OR (b) AND
(c) NOT (d) NAND
24. The SI unit of Stefan's constant is
(a) $Wm^{-2}k^2$ (b) $Wm^{-2}k^{-4}$
(c) $Wm^{-4}k^4$ (d) $Wm^{-4}k^{-4}$
25. The presence of antimatter was predicted by
(a) Dirac (b) Anderson
(c) Compton (d) Gauss's
26. A single electron from energy can not be created. It violates
(a) law of conservation of energy (b) law of conservation of momentum
(c) law of conservation of charge (d) both b & c
27. In full wave rectifier the ripple's frequency of output signal will be
(a) increases (b) decreases
(c) double (d) remains constant
28. With increase in temperature the potential barrier
(a) increases
(b) decreases
(c) remains same
(d) may increase or decrease depending upon material
29. In comparator when $V_- < V_+$ then
(a) $V_o = +V_{cc}$ (b) $V_o = -V_{cc}$
(c) $V_o = V_-$ (d) $V_o = V_+$
30. For an operational amplifier the output resistance is the resistance between
(a) inverting input and ground terminal (b) non inverting input and ground
(c) output terminal and ground (d) Input and output terminal
31. The number of photons produced in annihilation of matter are
(a) one (b) two
(c) three (d) four
32. Special theory of relativity deals with
(a) inertial frames (b) non inertial frames
(c) inertial frames if speed is high (d) non inertial if speed is high
33. In black body radiation spectrum energy is distributed
(a) uniformly (b) non uniformly
(c) uniform at low temperature (d) uniformly at high temperature
34. When temperature of black body increases then λ_m
(a) shifts towards longer wavelength
(b) shifts towards shorter wavelength
(c) does not shift
(d) shift towards shorter wavelength at high temperature
35. When temperature of black body is doubled then the total energy emitted per sec per unit area becomes

- (a) double (b) four times
(c) eight times (d) sixteen times
36. At which speed mass of an object becomes double then its rest mass
(a) c (b) $\frac{c}{\sqrt{2}}$
(c) $\frac{c}{2}$ (d) $\frac{\sqrt{3}}{2}c$
37. The number of gates used in exclusive OR gate are
(a) 3 (b) 5
(c) 4 (d) 6
38. With increase of the intensity of light in photoelectric effect which one not changed.
(a) K.E (max) of photo electron (b) threshold frequency
(c) stopping potential (d) all of these
39. Open loop gain is of the order of
(a) 10^7 (b) 10^4 (c) 10^5 (d) 10^2
40. In normal operation which junction of transistor remain forward bias
(a) EB junction (b) CB junction
(c) EC junction (d) none of these
41. The voltage gain of OP non-inverting amplifier is 1. It is possible when we take
(a) $R_1 = 0$ (b) $R_2 = 0$
(c) $R_2 = \infty$ (d) not possible with OP amplifier
42. A particle with rest mass m_0 and relativistic mass m has kinetic energy equal to,
(a) m_0C^2 (b) mC^2 (c) $(m-m_0)C^2$ (d) $(m_0-m)C^2$
43. When two nuclei of masses m_1 and m_2 fuse to form nucleus of mass m and some energy is released then
(a) $(m_1+m_2)>m$ (b) $(m_1+m_2)<m$ (c) $(m_1+m_2)=m$ (d) $(m_1-m_2)=m$
44. TRANSISTOR stands for,
(a) transfer of resistor (b) transfer of current
(c) transfer of power (d) transfer of voltage
45. When a PN junction is biased in the forward direction,
(a) only holes on the P-type side are injected into N-type side.
(b) only electrons on the N-type side are injected
(c) the majority carriers on each side are injected
(d) none of these
46. The potential barrier at a PN junction is because of the charge on either side of the junction these charges are,
(a) majority carrier (b) minority carriers
(c) both majority and minority carriers (d) fixed donor and acceptor ions
47. Minority carriers present in p type semiconductor are due to
(a) Bias voltage (b) thermal agitation

- (c) addition of impurity (d) ionization of impurity
48. In a p – type semiconductor,
- (a) holes are the only carriers
 - (b) electrons are the only carriers
 - (c) holes are the majority carriers and electrons are the minority carriers
 - (d) electrons are the majority carriers and hole are the minority carriers
49. In insulators
- (a) the valance band is partially filled with electrons
 - (b) the conduction band is partially filled with electrons
 - (c) the conduction band is filled with electrons and the valance band is empty
 - (d) the conduction band is empty and the valance band is filled with electrons
50. When the pn junction diode is reverse biased, then the
- (a) potential barrier increases (b) potential barrier decreases
 - (c) current decreases (d) both a & b
51. In a p – type semiconductor the electrical conduction is due to
- (a) only holes
 - (b) only electrons
 - (c) large number of holes and less electrons
 - (d) large number of electrons and less holes
52. In certain circuit a collector current of 10 mA and a base current of $40\mu\text{A}$. What is the current gain of the transistor
- (a) 500 (b) 250
 - (c) 125 (d) 75
53. General theory of relativity is applicable on
- (a) inertial frame of reference (b) non-inertial frame of reference
 - (c) both (a) and (b) (d) none of these
54. LED operates at
- (a) forward biased (b) reversed biased
 - (c) unbiased (d) may forward or reversed biased
55. Uncertainty principle proves the non existence of electron in
- (a) atom (b) molecule
 - (c) matter (d) nucleus

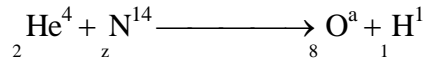
NUST (Med/Engg.) + GIKI + FMDC**(PHYSICS) CH. 20+21 (II)**

- The energy equivalent of one atomic mass unit is
(a) 1.6×10^{-19} J (b) 931 MeV
(c) 6.02×10^{23} J (d) 9.31×10^2 MeV
- Which of the three basic forces gravitational, electrostatic and nuclear is / are able to provide an attraction between two neutrons?
(a) electrostatic and nuclear (b) electrostatic and gravitational
(c) gravitational and nuclear (d) only nuclear
- For atomic nucleus, the binding energy per nucleon ----- with increase in mass number
(a) increases continuously
(b) decrease continuously
(c) remains constant
(d) first increases and than decreases with increase in mass number
- A radioactive element ${}^A_Z X$, on emitting an α - particle, changes into
(a) ${}^{A-4}_{Z-2} Y$ (b) ${}^{A-4}_Z Y$
(c) ${}^{A-4}_{Z-2} Y$ (d) ${}^A_{Z+2} Y$
- The nucleus ${}^{115}_{48} Cd$, after two successive β^- decays will give
(a) ${}^{115}_{48} Sn$ (b) ${}^{114}_{48} In$
(c) ${}^{113}_{50} Sn$ (d) ${}^{115}_{46} Pd$
- A radioactive substance has a half life of 4 months. Three _ fourths of the substance will decay in
(a) 6 months (b) 12 months
(c) 8 months (d) 16 months
- α , β and γ radiations come out of radioactive substance
(a) spontaneously (b) when it is heated
(c) when it is put in a reactor (d) under pressure
- Which of the following statement is correct?
(a) two isobars always have the same mass number
(b) two isotopes always have the same mass number
(c) two isotones always have the same mass number
(d) two isobars always have the same atomic number
- Which of the following isotopes is normally fissionable?
(a) ${}^{238}_{92} U$ (b) ${}^{235}_{92} U$
(c) ${}^{239}_{94} Pu$ (d) ${}^4_2 He$
- Heavy water is used as a moderator in a nuclear reactor. The function of the moderator is
(a) to control the energy released in the reactor
(b) to absorb neutrons and stop the chain reaction
(c) to cool the reactor
(d) to slow down the neutron to thermal energies

11. Which of the following is a pair of isobars?
 (a) 1_1H and 2_1H (b) ${}^{12}_6C$ and ${}^{13}_6C$
 (c) 2_1H and 3_1H (d) ${}^{30}_{15}P$ and ${}^{30}_{14}Si$
12. The ratio of life time of metastable excited state to the normal state is
 (a) $1:10^5$ (b) $1:10^4$
 (c) $10^5:1$ (d) $1:10^6$
13. The example of nuclear fusion is
 (a) formation of barium and krypton from uranium
 (b) formation of helium from hydrogen
 (c) formation of plutonium -235 from uranium -235
 (d) formation of water from hydrogen and oxygen
14. Nuclear fission experiments show that the neutrons split the uranium nuclei into two fragment of about the same size. This process is accompanied by the emission of several
 (a) protons and positrons (b) neutrons
 (c) α - particles (d) protons and α - particles
15. Curie is a unit of
 (a) energy of gamma rays (b) intensity of gamma rays
 (c) half - life (d) radioactivity
16. Enriched uranium is better as a fuel for a nuclear reactor because it has greater proportion of
 (a) ${}^{233}U$ (b) ${}^{238}U$
 (c) ${}^{235}U$ (d) ${}^{239}U$
17. The half life of a radioactive element is 1500 years the fraction of sample that would survive after 6000 years is,
 (a) $\frac{1}{2}$ (b) $\frac{1}{4}$
 (c) $\frac{1}{8}$ (d) $\frac{1}{16}$
18. When an electron in an atom goes from a lower to a higher orbit its
 (a) K.E increases, P.E. decreases (b) K.E increases, P.E. increases
 (c) K.E. decreases, P.E. increases (d) K.E decreases, P.E. decreases
19. The Balmer series is found in the spectrum of
 (a) hydrogen (b) oxygen
 (c) nitrogen (d) all
20. To ionize hydrogen atom from its ground state energy required is
 (a) 13.6 ev (b) -13.6 ev
 (c) +3.4 (d) -3.4ev
21. Under lying principle of laser operation is
 (a) induced absorption (b) spontaneous emission
 (c) stimulated emission (d) all
22. In order to separate isotopes of an element which method is used
 (a) chemical (b) physical
 (c) both a and b (d) none
23. Circulation of blood can be studied by
 (a) sodium -24 (b) carbon 14
 (c) strontium 90 (d) Iodine 131
24. Radioactivity was discovered by
 (a) Becquerel in 1876 (b) Marie curie in 1896
 (c) Becquerel in 1896 (d) Marie curie in 1876

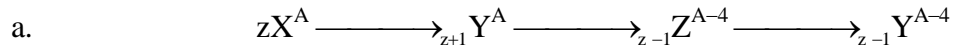
25. Dead time of G-M counter is approximately
(a) 10^{-6} sec (b) 10^{-5} sec
(c) 10^{-4} sec (d) 10^{-3} sec
26. Which of the following detector is suitable for fast counting
(a) solid state detector (b) G-M counter
(c) Wilson cloud chamber (d) all are correct
27. In solid state detector p-n junction is operated under
(a) forward bias
(b) reverse bias
(c) no bias at all
(d) reverse bias for small energy particle and no bias for large
28. In which of the following detectors, the size of the pulse is independent of the energy of the particle
(a) G.M counter (b) solid state detector
(c) Wilson cloud chamber (d) none
29. A proton, accelerated through a p.d V has a certain de Broglie wavelength. In order to have the same de Broglie wavelength, an α - particle must be accelerated through a potential difference
(a) 4V (b) V/4
(c) 8V (d) V/8
30. The potential difference applied to an X – rays tube is increased. As a result, in the emitted radiation
(a) the intensity increases (b) the intensity remains unchanged
(c) the minimum wavelength increase (d) both b & c
31. If V is the accelerating voltage, then maximum frequency of X – rays emitted from an X – ray tube is given by
(a) $\frac{eh}{V}$ (c) $\frac{eV}{h}$ (b) $\frac{hV}{e}$ (d) $\frac{h}{eV}$
32. A potential difference of 42,000 volt is used in an X – rays tube to accelerate electron. The speed of x – rays
(a) 2×10^8 m/s (b) 3×10^8 m/s
(c) 3×10^{10} m/s (d) none of these
33. X – rays region lies between
(a) short radio waves and visible region (b) gamma rays and ultraviolet region
(c) visible and ultraviolet region (d) short radio waves and long radio waves
34. In order to study the internal structure of crystals, we use
(a) X – rays (b) infrared rays
(c) ultraviolet rays (d) visible light
35. Which of the following is true?
(a) the Lyman series is a continuous spectrum
(b) the Paschen series is a line spectrum in the infrared region
(c) the Balmer series is a line spectrum in the ultraviolet region
(d) the spectral series formula can be derived from Rutherford's model of the hydrogen atom
36. The emission of β -rays is followed by the emission of a
(a) α -ray (b) neutrino (c) antineutrino (d) neutron

37. What are the values of a and z in the following nuclear reaction



- (a) 17, 7 (b) 7, 17 (c) 13, 6 (d) 6, 13

38. In which sequence the radioactive radiations are emitted in the following nuclear reaction.



- b. (a) α, β, γ (b) β, α, γ (c) γ, α, β (d) γ, β, α

39. Curie is a unit of

- (a) energy of β -rays (b) half life
(c) radioactivity (d) intensity of γ -rays

40. S.I unit of absorbed dose of radiation are

- (a) Curic (b) Gray (c) Rad (d) None of these

41. To cure thyroid cancer we use

- (a) Na-24 (b) Iodine-131 (c) N-14 (d) Co-60

42. Solid state detector is operated on

- (a) forward biased (b) reverse biased
(c) may be forward may be reversed (d) no biasing at all

43. The magnitude of pulse in a solid state detector depends upon

- (a) energy of charged particle (b) charge of charged particle
(c) mass of charged particle (d) none of these

44. The velocity of an electron in the ground state of hydrogen atom is

- (a) $2 \times 10^5 \text{ m/sec}$ (b) $2 \times 10^6 \text{ m/sec}$
(c) $2 \times 10^7 \text{ m/sec}$ (d) $2 \times 10^8 \text{ m/sec}$

45. Each of the nuclei below is accelerated from rest through the same potential difference. Which one completes the acceleration with the lowest speed?

- (a) ${}^1_1\text{H}$ (b) ${}^4_2\text{He}$
(c) ${}^7_3\text{Li}$ (d) ${}^9_4\text{Be}$

46. Isotopes of a given element all have the same

- (a) charge/mass ratio (b) neutron number
(c) nucleon number (d) proton number

47. An electron has mass m_0 and speed $0.02c$, where c is the speed of light in free space. What is the de Broglie wavelength of this electron, expressed in terms of the Planck constant h ?

a. (a) $\frac{h}{(0.02c)}$

(b) $\frac{(0.02c)h}{c}$

b. (c) $\frac{h}{(0.02c)m_0}$

(d) $\frac{h(E_2 - E_1)}{c}$

48. Which one of the following formulas corresponds to the Bracken series for the spectral lines of the Hydrogen atoms (R is the Rydberg constant)?

(a) $R \left(\frac{1}{9} - \frac{1}{n^2} \right)$

(b) $R \left(\frac{1}{16} - \frac{1}{n^2} \right)$

(c) $R \left(\frac{1}{25} - \frac{1}{n^2} \right)$

(d) $R \left(\frac{1}{16} - \frac{1}{n^2} \right)$

SCIENTIA VISION SYSTEM

ANSWER KEY BOOK II
CHAPTER 12+13

1	A	13	A	25	C	37	A	49	
2	A	14	B	26	B	38	D	50	
3	D	15	D	27	D	39	C	51	D
4		16	C	28	C	40	C	52	C
5	B	17	C	29	A	41		53	C
6	A	18	A	30	C	42		54	A
7	A	19	C	31	A	43		55	B
8	C	20	D	32	A	44		56	C
9	C	21	A	33	C	45		57	D
10	C	22	B	34	C	46		58	C
11	A	23	C	35	B	47		59	
12	B	24	C	36	A	48		60	

CHAPTER 14+15

1	D	13	C	25	A	37	C	49	B
2	A	14	D	26	A	38	B	50	D
3	B	15	C	27	A	39	D	51	
4	C	16	C	28	A	40	A	52	
5	D	17	D	29	B	41	D	53	
6	C	18	D	30	A	42	C	54	
7	D	19	A	31	D	43	C	55	
8	A	20	C	32	D	44	B	56	
9	D	21	C	33	A	45	C	57	
10	D	22	B	34	D	46	B	58	
11	D	23	A	35	D	47	C	59	
12	D	24	D	36	C	48	B	60	

CHAPTER 16+17

1	B	13	B	25	D	37	B	49	
2	B	14	C	26	C	38	D	50	
3	A	15	A	27	A	39	C	51	
4	C	16	A	28	D	40		52	
5	A	17	C	29	B	41	C	53	
6	C	18	C	30	B	42	C	54	
7	C	19	B	31	B	43	D	55	
8	A	20	A	32	D	44	B	56	
9	B	21	C	33	D	45	B	57	
10	C	22	C	34	D	46	B	58	
11	B	23	C	35	C	47	A	59	
12	C	24	C	36	B	48	B	60	

CHAPTER 18+19

1	C	13	A	25	A	37	B	49	D
2	C	14	B	26	C	38	D	50	D
3	D	15	B	27	C	39	C	51	C
4	C	16	C	28	B	40	A	52	B
5	B	17	A	29	A	41	B	53	B
6	D	18	C	30	C	42	C	54	A
7	D	19	B	31	B	43	A	55	D
8	D	20	C	32	A	44	A	56	
9	C	21	D	33	B	45	C	57	
10	C	22	B	34	B	46	D	58	
11	B	23	C	35	D	47	B	59	
12	A	24	B	36	D	48	C	60	

CHAPTER 20+21

1	B	13	B	25	C	37	A	49	
2	B	14	B	26		38	B	50	
3	D	15	D	27	B	39	C	51	
4	C	16	C	28	A	40	B	52	
5	A	17	D	29	D	41	B	53	
6	C	18	C	30	B	42	B	54	
7	A	19	A	31	C	43	A	55	
8	A	20	A	32		44	B	56	
9	B	21	C	33	B	45	D	57	
10	D	22	B	34	A	46	D	58	
11	D	23	A	35	B	47	C	59	
12	A	24	C	36	C	48	C	60	

SCIENTIA VISION