

(PHYSICS: BASIC MECHANICS)

		Answer Key
1)	What is the magnitude of the unit vector?	A
	A. 1	B. 0
	C. 2	D. None of these
2)	What is the magnitude of the vector, $12i - 8j - 24k$?	B
	A. 18	B. 28
	C. 38	D. 48
3)	What is the difference between a position vector and unit vector?	D
	A. Position vector has magnitude = 1 and direction, while the unit vector has magnitude = 0 and no direction	B. Position vector has magnitude = 0 and direction, while unit vector has magnitude = 0 and no direction
	C. Position vector has some magnitude and direction, while the unit vector has magnitude = 0 and no direction	D. Position vector has some magnitude and direction, while the unit vector has magnitude = 1 and a specified direction
4)	What is not the condition for the equilibrium in three dimensional system of axis?	D
	A. $F_x=0$	B. $F_y=0$
	C. $\sum F_z=0$	D. $\sum F \neq 0$
5)	What does the moment of the force measure?	A
	A. The tendency of rotation of the body along any axis	B. The moment of inertia of the body about any axis
	C. The couple moment produced by the single force acting on the body	D. The total work is done on the body by the force
6)	The tendency of rotation of the body along any axis is also called	C
	A. Moment of inertia	B. Moment of couple
	C. Torque	D. Force
7)	Which of the following is true?	A
	A. Total moment of various forces acting on the body is the vector sum of all moments	B. Total moment of various forces acting on the body is the algebraic sum of all moments
	C. Total moment of various forces acting on the body is always zero	D. Total moment of various forces acting on the body is the vector sum of all moments which is perpendicular to each other forces
8)	What does Newton's third law states?	B
	A. The rate of change of momentum is equal to the force applied	B. For every reaction, there is an opposite reaction
	C. The body tends to be rotated if the force is applied tangentially	D. The body is rest until a force is applied
9)	Moment of inertia of solid sphere is	C
	A. $\frac{2}{3} Mr^2$	B. $\frac{1}{2} Mr^2$
	C. Mr^2	D. $\pi r^4/2$
10)	The necessary condition of equilibrium of a body is	D
	A. Algebraic sum of horizontal components of all the forces must be zero	B. Algebraic sum of vertical components of all the forces must be zero
	C. Algebraic sum of the moments of the forces about a point must be zero	D. All (A), (B) and (C)
11)	Newton's law of Collision of elastic bodies states that when two moving bodies collide each other, their velocity of separation	C
	A. Is directly proportional to their velocity of approach	B. Is inversely proportional to their velocity of approach
	C. Bears a constant ratio to their velocity of approach	D. Is equal to the sum of their velocities of approach
12)	The angle of projection at which the horizontal range and maximum height of a projectile are equal is	D
	A. 36°	B. 45°
	C. 56°	D. 76°
13)	If the resultant of two equal forces has the same magnitude as either of the forces, then the angle between the two forces is	D
	A. 30°	B. 60°
	C. 90°	D. 120°

14)	The maximum acceleration of a particle moving with simple harmonic motion is		C
	A. ω	B. ωr	
	C. $\omega^2 r$	D. ω/r	
15)	The rate of change of displacement of a body is called		A
	A. Velocity	B. Acceleration	
	C. Momentum	D. None of these	
16)	When work is done in moving a particle around a closed loop in a field is zero, forces in the field are called		C
	A. Zero forces	B. Non-Conservative forces	
	C. Conservative forces	D. Viscous forces	
17)	Substances that elongate considerably and undergo plastic deformation before they break are known as		C
	A. Brittle substances	B. Breakable substances	
	C. Ductile substances	D. Elastic substances	
18)	Tensile stress is equal to		A
	A. Force per unit area	B. Force per unit volume	
	C. Extension per unit length	D. Extension per unit area	
19)	The radial component of velocity for a particle moving in a circular path is		D
	A. Constant	B. Radius itself	
	C. Variable	D. Zero	
20)	Young's modulus formula is		B
	A. Tensile strain/tensile stress	B. Tensile stress/tensile strain	
	C. Tensile stress \times tensile strain	D. Length/area	
21)	Standing waves is also called		A
	A. Stationary waves	B. Static waves	
	C. Progressive waves	D. None of these	
22)	Forces are called concurrent when their lines of action meet in		A
	A. One point	B. Two points	
	C. Plane	D. Perpendicular planes	
23)	Effect of a force on a body depends upon		D
	A. Magnitude	B. Direction	
	C. Position or line of action	D. All these	
24)	Which of the following is not the unit of distance?		B
	A. Angstrom	B. Milestone	
	C. Micron	D. Millimeter	
25)	The weight of a body is due to		B
	A. Centripetal force of earth	B. Gravitational force of attraction towards the centre of the earth	
	C. Forces experienced by body in atmosphere	D. Force of attraction experienced by particles	
26)	Which of the following is a vector quantity		C
	A. Energy	B. Mass	
	C. Momentum	D. Angle	
27)	The coefficient of friction depends on		D
	A. Area of contact	B. Shape of surfaces	
	C. Strength of surfaces	D. Nature of surface	
28)	The escape velocity from the surface of the earth is approximately equal to		B
	A. 9.81 km/sec	B. 11.2 km/sec	
	C. 14 km/sec	D. 22 km/sec	
29)	Coulomb friction is the friction between		A
	A. Bodies having relative motion	B. Two dry surfaces	
	C. Two lubricated surfaces	D. Solids and liquids	
30)	The maximum frictional force which comes into play when a body just begins to slide over another surface is called		A
	A. Limiting friction	B. Sliding friction	
	C. Rolling friction	D. Kinematic friction	
31)	A body moves, from rest with a constant acceleration of 5 m per sec. The distance covered in 5 sec is most nearly		B
	A. 38 m	B. 62.5 m	
	C. 96 m	D. 240 m	
32)	Which of the following is not the unit of energy		C

	A. Kg-m	B. Kcal	
	C. Watts	D. Watt hours	
33)	The product of mass and velocity is known as		D
	A. Work	B. Moment	
	C. Impulse	D. Momentum	
34)	The velocity of a mass of 5 kg after falling a height of 5 m from rest would be approximately equal to		B
	A. 5 m/sec	B. 10 m/sec	
	C. 25 m/sec	D. 50 m/sec	
35)	A ball is thrown up. The sum of kinetic and potential energies will be maximum at		D
	A. Ground	B. Highest point	
	C. In the centre while going up	D. At all the points	
36)	Energy is defined as		B
	A. Rate of doing work	B. Capacity of doing work	
	C. Power of doing work	D. All of the above	
37)	Moment of inertia of a body does not depend upon		A
	A. Angular velocity of body	B. Mass of the body	
	C. Distribution of mass in the body	D. Axis of rotation of the body	
38)	A wound watch spring possesses energy stored in the form of		C
	A. Kinetic energy	B. Potential energy	
	C. Mechanical potential energy	D. Mechanical kinetic energy	
39)	Momentum is defined as		D
	A. Force x distance	B. Mass x acceleration	
	C. Mass x time	D. Mass x velocity	
40)	Which of the following have same units		D
	A. Momentum and impulse	B. Work and kinetic energy	
	C. Kinetic energy and potential energy	D. All these	
41)	Rate of change of momentum is proportional to the		D
	A. Displacement	B. Velocity	
	C. Acceleration	D. Force	
42)	If the momentum of a given body is doubled, its kinetic energy will		B
	A. Increase by 2 times	B. Increase by four times	
	C. Remain same	D. Get halved	
43)	For a particle moving with a simple harmonic motion, the frequency is		B
	A. Directly proportional to periodic time	B. Inversely proportional to periodic time	
	C. Inversely proportional to its angular velocity	D. Directly proportional to its angular velocity	
44)	In simple harmonic motion, acceleration of a particle is proportional to		B
	A. Rate of change of velocity	B. Displacement	
	C. Velocity	D. Direction	
45)	A body is thrown vertically upwards from the ground with a speed of 980 cm/sec. It will rise to a height of		B
	A. 980 cm	B. 490 cm	
	C. 49 cm	D. 10 cm	
46)	When a body falls freely under gravitational force, it possesses		C
	A. Maximum weight	B. Minimum weight	
	C. No weight	D. No effect on its weight	
47)	Which of the following remains constant during flight of a projectile		B
	A. Angle of projectile	B. Horizontal component of velocity	
	C. Vertical component of velocity	D. Sum of its kinetic energy and potential energy	
48)	The velocity of a satellite in order that it remains in a particular orbit, depends upon		C
	A. Mass of the satellite	B. Initial velocity of projection	
	C. Distance of satellite from the centre of earth	D. Inclination of the plane of the orbit with equatorial plane	
49)	A satellite is kept on moving in its orbit around the earth due to		B
	A. Centrifugal force	B. Centripetal force	
	C. Gravitational force	D. Resultant forces acting on satellite	
50)	Which of the following pairs of physical quantities have identical dimension?		D
	A. Momentum and impulse	B. Work and energy	
	C. Torque and energy	D. All of the above	

51)	The escape velocity of a body on earth	A. Increases with the increase of its mass	B. Decreases with the increase of its mass	C
		C. Remains unchanged with variation of mass	D. Varies as the square of the change in mass	
52)	A simple pendulum is set into oscillations. The bob of the pendulum comes to rest after some time due to	A. Friction of air	B. Its mass	A
		C. Tension in the string	D. Gravity	
53)	The energy of a damped oscillator	A. Decreases linearly with time	B. Increases linearly with time	C
		C. Decreases exponentially with time	D. Increases exponentially with time	
54)	The type of motion when the acceleration is proportional to displacement is called	A. Translation	B. Rotational	D
		C. Gyroscopic	D. Simple harmonic	
55)	Which of the following is not a scalar quantity	A. Time	B. Weight of body	C
		C. Temperature	D. Mass of body	
56)	If the momentum of a given particle is doubled then its kinetic energy will	A. Be halved	B. Be doubled	C
		C. Be quadrupled	D. Be same	
57)	For a vector F , $F \cos \beta$ is equal to zero. What does this refer to?	A. Y-axis component is zero	B. X-axis component is zero	A
		C. $\beta = 180^\circ$	D. Z-axis component is zero	
58)	What if we multiply a scalar to the unit vector?	A. The magnitude will change accordingly	B. The direction will change accordingly	A
		C. The direction will change by a factor of the square root of the scalar	D. The magnitude will not change accordingly	
59)	The tendency of rotation of the body along any axis is also called	A. Moment of couple	B. Moment of inertia	D
		C. Force	D. Torque	
60)	When a person opens a door, he applies	A. Force	B. Torque	B
		C. Moment	D. None of the above	

PHYSICS: CLASSICAL MECHANICS)

				Answer Key
61)	Newtonian Mechanics is also known as			C
	A. Particle Mechanics	B. Wave Mechanics		
	C. Classical Mechanics	D. None		
62)	Classical Mechanics is applied to the bodies whose speed remain-----in comparison with the speed of light.			A
	A. Small	B. large		
	C. Comparable	D. none		
63)	----- is applied to the bodies whose speeds are comparable with the speed of light.			A
	A. Classical Mechanics	B. Quantum Mechanics		
	C. Relativistic Mechanics	D. none		
64)	----- is applied to the physical system of molecular or smaller size.			B
	A. Classical Mechanics	B. Quantum Mechanics		

	C. Relativistic Mechanics	D. none	
65)	Conservative forces have		B
	A. Velocity	B. Co-ordinates	
	C. both a & B	D. None	
66)	Non-Conservative forces depends on----		C
	A. Velocity	B. Co-ordinates	
	C. both a & B	D. None	
67)	Holonomics Constraints can be expressed in terms of		D
	A. time and velocity	B. only time	
	C. only coordinates	D. co-ordinates and time	
68)	If q_j is cyclic in lagrangian then-----		B
	A. P_j is not conserved	B. P_j is conserved	
	C. The Lagrangian is circular	D. none	
69)	If no force acting on a particle then the total linear momentum is----		D
	A. Zero	B. not conserve	
	C. maximum	D. conserve	
70)	If no torque is acting on a particle then the total angular momentum is-----		C
	A. Zero	B. minimum	
	C. constant	D. not conserve	
71)	The field in which work done is zero is called ----- field.		A
	A. Coservative	B. non-conservative	
	C. circular	D. none	
72)	If the forces acting on a particle is conserve then the total energy will be-----		A
	A. $T+V$	B. $T-V$	
	C. $T \times V$	D. None	
73)	If the constraint is not expressed in form of equation then it is called ---- constraint		B
	A. Holonomic	B. Non-holonomic	
	C. Scleronomous	D. none	
74)	Double pendulom has ----- degree of freedom.		C
	A. Three	B. four	
	C. two	D. one	
75)	Single pendulom has ----- degree of freedom		D
	A. three	B. four	
	C. two	D. one	
76)	A rod of length L lying in xy -plane has-----degree of freedom		A
	A. three	B. four	
	C. two	D. one	
77)	Virtual displacements are infinitesimal and -----		

	A. finite	B. instantaneous	B
	C. infinite	D. none	
78)	Principle of Virtual displacements is applicable to a system in the -----		C
	A. Not in equilibrium	B. finite state	
	C. equilibrium state	D. zero state	
79)	The Langrangian ' L ' is expressed as---		D
	A. T+V	B. T	
	C. V	D. T-V	
80)	The usual expression for the conserved angular momentum in a central force problem is---		A
	A. $l=mr^2\dot{\theta}$	B. $l=m/r^2\dot{\theta}$	
	C. $l=l/k$	D. $l=mr^2\dot{\theta} /v$	
81)	Hamilton's Principle states that any variation in the line integral between two fixed points is----		B
	A. Maximum	B. zero	
	C. minimum	D. Non-zero	
82)	Units of linear momentum is –		C
	A. kgm/s^2	B. $kg.m^2/s^2$	
	C. kgm/s	D. kgm^2/s	
83)	The work done due to frictional force is always		D
	A. zero.	B. negative	
	C. Both a & b	D. positive	
84)	If $F(r) < 0$ then the central force is		B
	A. positive or attractive	B. negative or attractive	
	C. positive or repulsive	D. negative or repulsive	
85)	If $F(r) > 0$ then the central force is		C
	A. positive or attractive	B. negative or attractive	
	C. positive or repulsive	D. negative or repulsive	
86)	In a central force angular momentum is always -----		D
	A. zero	B. Non-zero	
	C. negative	D. constant	
87)	In a central force arial velocity is always -----		A
	A. Constant	B. None-zero	
	C. negative	D. positive	
88)	The equation that is used to find shortest distance between two points on a given surface is known as----- equation		B
	A. Lagrangian	B. Euler's lagrangian	
	C. Catenary	D. None of these	
89)	Routh's Procedure deals with		C
	A. Polar Co-ordinates	B. Generalized co-ordinates	
	C. cyclic co-ordinates	D. none	

90)	A particle of mass 5kg and velocity 3 cm/s has a momentum----		D
	A. 1.5kgm/s	B. 0.015kgm/s	
	C. 0.15kgcm/s	D. 0.15kgm/s	
91)	If direction of 'F' and 'r' is reversed then torque is		A
	A. remains unchanged	B. also changed	
	C. magnitude changes	D. none	
92)	In Conservative system the potential energy is ---		B
	A. depends on velocity	B. depends on coordinates	
	C. depends on time	D. none	
93)	A rigid body possesses ____ degrees of freedom.		D
	A. one	B. two	
	C. four	D. six	
94)	A 1200kg car moves down the road at 20 cm/s. What is its momentum.		A
	A. 240kgm/s	B. 240kgcm/s	
	C. 2400kgm/s	D. 24000kgcm/s	
95)	A skater moves with a constant velocity of 12km/s. If her momentum is 600kgm/s, what is its mass.		B
	A. 72kg	B. 0.05kg	
	C. 50kg	D. 46kg	
96)	Rate of change of momentum is known as----		C
	A. Torque	B. momentum	
	C. force	D. none	
97)	A curve between two points along which a body can move under gravity in shorter time than any other curve is called---		D
	A. geodesics	B. Euler's lagrangian	
	C. Catenary	D. brachistochrone	
98)	A 100kg body moving with velocity of 10cm/s has K.E.		A
	A. 0.5 J	B. 10000 J	
	C. 5000 J	D. 0.05 J	
99)	If 'P' is the momentum of an object of mass 'm' the expression $P^2/2m$ has base units identical to		B
	A. Energy	B. Velocity	
	C. Power	D. Force	
100)	What must change when a body is accelerating		D
	A. force acting on a body	B. mass of body	
	C. the speed of body	D. velocity of body	
101)	Total weight of body acts		C
	A. at its one end	B. at its other end	
	C. at its centre of gravity	D. at its centre	
102)	If the force acting on a body is doubled, then acceleration becomes		

	A. doubled	B. half	A
	C. One fourth	D. constant	
103)	A 57 kg woman runs up a flight of stairs having a rise of 4.5m in 3.5 s. What average power must she supplied		B
	A. 722.2 W	B. 718.2 W	
	C. 708.2 W	D. 24.2 W	
104)	A swimmer moves through the water at a speed of 0.22m/s. The drag force opposing this motion is 110 N. How much power is developed by the swimmer.		C
	A. 20.4 W	B. 26.2 W	
	C. 24.2 W	D. 16.3 W	
105)	1kWh=		D
	A. 3.6 J	B. 3.6 KJ	
	C. 3.6 mJ	D. 3.6 MJ	
106)	1 rad=		B
	A. 56.3	B. 57.3°	
	C. 61.7°	D. 67.3°	
107)	Which of the following relation is correct		D
	A. 1Weber m ⁻² = Nm ⁻¹ A ⁻¹	B. 1T= 10 ⁴ GAUSS	
	C. 1webm ⁻² = 1 Tesla	D. ALL	
108)	Hamiltonian 'H' represent the -----energy of the system		A
	A. Total	B. zero	
	C. potential	D. kinetic	
109)	The quantity $r^2\dot{\theta} / 2$ represents the-----		B
	A. Escape velocity	B. arial velocity	
	C. circular velocity	D. none	
110)	f the moment arm and force lies in x-z plane. Then direction of torque is		A
	A. along y- axis	B. along x- axis	
	C. along z axis	D. along x-y plane	
111)	When a conservative force does negative work on a body th potential of the body		B
	A. Decrease	B. increase	
	C. Remain same	D. decreases when force is small and increases when force is large	
112)	Due to the presence of central force arial velocity is		B
	A. zero	B. constant	
	C. Non-constant	D. None of these	
113)	If $\frac{\partial H}{\partial t}=0$ Then		B
	A. the Hamiltonian is not necessarily a constant of motion, but it is necessarily the total energy of the system	B. the Hamiltonian is a constant of motion, but it is not necessarily the total energy of the system	
	C. None of these	D. Both a & b	
114)	Relativistic Mechanics give the same results as Classical Mechanics Except		A

	A.	When the bodies treated at a speed approaching a speed of light	B.	When applied to atomic or molecular system	
	C.	None of these	D.	Both a & b	
115)	Constraints that can be expressed in terms of co-ordinates and time $f(r_1, r_2, r_3, \dots, t) = 0$ are said to be				A
	A.	Holonomic	B.	Non-Holonomic	
	C.	Scleronomous	D.	rheonomous	
116)	Scleronomous constraint means				B
	A.	moving	B.	stationary	
	C.	Time independent	D.	Both a & c	
117)	Reheonomous constraint means				A
	A.	moving	B.	stationary	
	C.	Time independent	D.	Both a & c	
118)	The study and description of the possible motions of mateial bodies is called				C
	A.	dynamics	B.	statics	
	C.	kinematics	D.	none	
119)	The path which is cycloid is known as				B
	A.	Catenary	B.	Brachistochrone	
	C.	cyclone	D.	. Helical	
120)	The torque depends upon:				C
	A.	Magnitude of force	B.	Magnitude of Displacement	
	C.	Magnitude of force and Displacement	D.	none of these	

(BASIC QUANTUM/MODERN PHYSICS)

					Answer Key
121)	Modern Physics mainly based upon				A
	A.	quantum physics	B.	newton physics	
	C.	classical physics	D.	nuclear physics	
122)	Nature of radiation emitted by a body depends upon				C
	A.	mass	B.	volume	
	C.	temperature	D.	pressure	
123)	At high temperature, a body generally emits radiations of				A
	A.	shorter wavelength	B.	longer wavelength	
	C.	lower frequency	D.	non of these	
124)	An ideal black body is				D
	A.	Most efficient radiator	B.	a perfect absorber of radiation	
	C.	a body whose absorptive power is unity	D.	all of these	
125)	Blackbody energy distribution curves are the graphs between				C
	A.	Temperature and intensity	B.	wavelength, temperature, and intensity	
	C.	wavelength and intensity	D.	wavelength and temperature	
126)	Wien's theory explains energy distribution in black body for				B
	A.	larger wavelength	B.	shorter wavelength	
	C.	medium wavelength	D.	infinite wavelength	

127)	The value of Stefan's constant is $\text{Wm}^{-2}\text{K}^{-4}$		B
	A. 3.67×10^{-8}	B. 5.67×10^{-8}	
	C. 7.67×10^{-8}	D. 9.67×10^{-8}	
128)	According to Max Planck energy is released or absorbed in discrete packets called		C
	A. mesons	B. positrons	
	C. quanta	D. none of these	
129)	According to Max Planck the energy of quanta is		D
	A. $E=mc^2$	B. $E=mv^2$	
	C. $E=h/f$	D. $E=hf$	
130)	The Planck's constant has the dimensions		C
	A. $[\text{ML}^2\text{T}^{-2}]$	B. $[\text{MLT}^{-2}]$	
	C. $[\text{ML}^2\text{T}^{-1}]$	D. $[\text{ML}^{-2}\text{T}^2]$	
131)	A beam of red light and a beam of blue light have exactly the same energy. Which beam contains the greater number of photons?		B
	A. blue	B. red	
	C. both a and b	D. none of these	
132)	A photon is always considered to be		B
	A. at rest	B. moving with speed of light	
	C. moving with speed of electron	D. moving with speed of sound	
133)	The momentum of a photon is		A
	A. $P = h/\lambda$	B. $P = \lambda/h$	
	C. $P = hf$	D. $P = mc^2$	
134)	An human eye can detect the electromagnetic radiation of the type..... radiations.		D
	A. infrared	B. far infrared	
	C. X - rays	D. red	
135)	A photon is considered to have		D
	A. energy	B. momentum	
	C. wavelength and frequency	D. all of these	
136)	The speed of photon as compared with the speed of light is always		A
	A. same	B. less	
	C. greater	D. none of these	
137)	The photo electric effect was explained by		B
	A. Hertz	B. Einstein	
	C. Max Planck	D. Lummer and Pringshein	
138)	The maximum K.E of emitted photo electrons depends upon		D
	A. the intensity of incident light	B. frequency of incident light	
	C. particular metal surface	D. both b and c	
139)	The no. of photo electrons emitted is directly proportional to the		B
	A. frequency of incident light	B. the intensity of incident light	
	C. both a and b	D. none of these	
140)	There is certain frequency below which no electrons are emitted from the metal surface, this frequency is known as frequency		B
	A. critical	B. threshold	
	C. maximum	D. minimum	
141)	The value of threshold frequency for different metals is		A

	A. different	B. same	
	C. zero	D. none of these	
142)	When the light certain frequency falls on the metal surface, the electrons are ejected		B
	A. slowly	B. instantaneously	
	C. one by one	D. none of these	
143)	Photoelectric effect is the converse process of		B
	A. LASER	B. X-rays	
	C. pair production	D. none of these	
144)	In photoelectric effect, if intensity of incident radiation is increased, then there is increase in		D
	A. K.E of electrons	B. number of protons	
	C. photoelectric current	D. both b and c	
145)	The Photoelectric effect can be explained by		C
	A. wave theory of light	B. special theory of relativity	
	C. quantum theory of light	D. electromagnetic theory of light	
146)	A device based on Photoelectric effect is called		B
	A. photo diode	B. Photo cell	
	C. voltaic cell	D. Photo cathode	
147)	In Compton shift, the factor h/m_0c is known as		A
	A. Compton wavelength	B. Compton frequency	
	C. Compton energy	D. Compton mass	
148)	The angle of scattering for which the Compton shift is maximum is		D
	A. 0°	B. 45°	
	C. 90°	D. 180°	
149)	The Compton effect conforms		B
	A. wave nature of light	B. particle nature of light	
	C. dual nature of light	D. none of these	
150)	The process in which energy is converted into matter is called		B
	A. Compton effect	B. pair production	
	C. annihilation of matter	D. photoelectric effect	
151)	For pair production, there must be conservation of		D
	A. mass	B. energy	
	C. momentum	D. all of these	
152)	Which of the following radiation has photons of maximum energy?		B
	A. x-rays	B. γ -rays	
	C. microwaves	D. none of these	
153)	The pair production and annihilation of matter are		B
	A. similar phenomenon	B. opposite to each other	
	C. bases upon classical physics	D. none of these	
154)	The wavelength of x-rays is of the order		C
	A. 10^{-3} m	B. 10^{-19} m	
	C. 10^{-10} m	D. 10^{-12} m	
155)	De-broglie's hypothesis was conformed experimentally by		B
	A. Lummer and Pringsheim	B. Davissan and Germer	
	C. Einstein and Max Plank	D. Wien's and Stifean	
156)	De-broglie got noble prize for his work on		C
	A. wave nature of particles	B. corpuscular nature of particles	
	C. dual nature of particles	D. all of these	

157)	Which light emits greater no. of electrons from a metal surface				A
	A.	bright light	B.	dim light	
	C.	high frequency light	D.	low frequency light	
158)	In order to reduce uncertainty in momentum, one must use light of				A
	A.	larger wavelength	B.	shorter wavelength	
	C.	any wavelength	D.	none of these	
159)	The unit of Planks constant is				C
	A.	volt	B.	$J s^{-1}$	
	C.	$J s$	D.	Nm	
160)	Rest mass of photon is				A
	A.	zero	B.	infinity	
	C.	hf/c	D.	hc/m	
161)	The separation of ordinary white light into its components by the use of prism or grating is called				B
	A.	diffraction	B.	dispersion	
	C.	spectroscopy	D.	all of these	
162)	Which of the following is an example of continuous spectra				A
	A.	black body radiation spectrum	B.	molecular spectra	
	C.	atomic spectrum	D.	none of these	
163)	The spectral series were identified in the spectrum of hydrogen by				D
	A.	Einstein	B.	Compton	
	C.	Planks	D.	J. J Balmer	
164)	The spectrum of visible sunlight ranges from				C
	A.	430nm-650nm	B.	600nm-900nm	
	C.	400nm-700nm	D.	300nm-500nm	
165)	The simplest spectrum is that of				B
	A.	Oxygen	B.	hydrogen	
	C.	nitrogen	D.	chlorine	
166)	Balmer series contains the wavelength in the				A
	A.	visible region	B.	UV region	
	C.	IR region	D.	none of these	
167)	Brackett and Pfund series of spectral lines lies in the				D
	A.	visible region	B.	UV region	
	C.	IR region	D.	far IR region	
168)	When electron in hydrogen atom jumps from higher orbit into first orbit the set of lines emitted is called				A
	A.	Lyman series	B.	Balmer series	
	C.	paschen series	D.	Pfund series	
169)	According to Bohr's atomic model, the angular momentum of electron in an orbit is equal to an integral multiple of				B
	A.	$2h/\pi$	B.	$h/2\pi$	
	C.	$2\pi/h$	D.	$mh/2\pi$	
170)	According to postulate of Bohr's theory				C
	A.	$E_n - E_p = f\lambda$	B.	$E_n - E_p = hc$	
	C.	$E_n - E_p = hf$	D.	$E_p - E_n = hf/c$	
171)	If an electron jumps from lower to higher orbit it will				A
	A.	absorb energy	B.	emit energy	
	C.	either of these	D.	none of these	

172)	The radius of first Bohr's orbit for hydrogen atom is				C
	A.	0.053 m	B.	0.053mm	
	C.	0.053nm	D.	0.053 μ m	
173)	1 Aungstrom is equal to				B
	A.	10^{-8} m	B.	10^{-10} m	
	C.	10^{-12} m	D.	none of these	
174)	First Ionization energy of hydrogen atom is				C
	A.	13.6 eV	B.	3.4 eV	
	C.	-13.6 eV	D.	none of these	
175)	When an electron exists in its lowest state, it is called				D
	A.	normal state	B.	ground state	
	C.	excited state	D.	both a and b	
176)	X-rays were discovered by				C
	A.	Balmer	B.	Einstein	
	C.	Roentgen	D.	Curie	
177)	The velocity of x-rays is equal to that of				C
	A.	cathode rays	B.	alpha rays	
	C.	gemma rays or light rays	D.	none of these	
178)	X-rays are				A
	A.	electromagnetic waves	B.	transverse waves	
	C.	longitudinal waves	D.	mechanical waves	
179)	x-rays are				B
	A.	high energy electrons	B.	high energy photons	
	C.	radio waves	D.	un-known wave nature	
180)	Photo cell is a device which converts				D
	A.	electrical energy into chemical energy	B.	heat energy into electrical energy	
	C.	mechanical energy into electrical energy	D.	light energy into electrical energy	
181)	Which of the following shell is closest to the nucleus				A
	A.	K-shell	B.	L-shell	
	C.	M-shell	D.	N-shell	
182)	The transition of electrons between the various shells give rise to				A
	A.	characteristic x-rays spectrum	B.	continuous x-rays spectrum	
	C.	both a and b	D.	none of these	
183)	A x-ray photon produced due to transition of electron from M shell to K shell is called				B
	A.	$K\alpha$	B.	$K\beta$	
	C.	$K\gamma$	D.	none of these	
184)	x-rays can cause				A
	A.	cancer	B.	malaria	
	C.	both a and b	D.	none of these	

(PHYSICS- QUANTUM MECHANICS)

		Answer Key
185)	The state of two distinguishable particles (ignoring spin) can be written as	B

	A. A superposition state	B. Product state	
	C. Orthogonal states	D. Normal states	
186)	The state of two indistinguishable particles can be written as		A
	A. A superposition state	B. Product state	
	C. Orthogonal states	D. Normal states	
187)	The exchange operator is also called-----operator.		D
	A. symmetric	B. Antisymmetric	
	C. Null	D. Permutation	
188)	The N particles of a system are said to be identical if the various observables of the system are ----- when any two particles are interchanged.		A
	A. Symmetrical	B. Antisymmetrical	
	C. Identical	D. None	
189)	The spin of composite particle is half odd integer, this particle obey-----		C
	A. Bose-Einstein statistics	B. Maxwell-Boltzmann statistics	
	C. Fermi-Dirac statistics	D. Bose-Fermi statistics	
190)	The violation of Pauli-exclusion principle for identical fermions leads to		C
	A. $\psi(r_1, r_2) = 1$	B. $\psi(r_1, r_2) = n$	
	C. $\psi(r_1, r_2) = 0$	D. $\psi(r_1, r_2) = 2n$	
191)	The properties of ^3He are completely different from those of ^4He , because ^3He is a----- and ^4He is a -----.		B
	A. Boson, antiparticle	B. Fermion, boson	
	C. Boson, fermion	D. Isotope, boson	
192)	The spin triplet state is ----- and singlet state is -----.		A
	A. symmetric, antisymmetric	B. antisymmetric, symmetric	
	C. Both are symmetric	D. Both are antisymmetric	
193)	The antisymmetric wave functions for a system of non-interacting identical particles as		C
	A. A matrix	B. Secular equation	
	C. Slater determinant	D. Singular matrix	
194)	For even permutation under particle exchange		D
	A. $(-1)^P=0$	B. $(-1)^P=P$	
	C. $(-1)^P=-1$	D. $(-1)^P=1$	
195)	Potential of harmonic oscillator is given by $V=$ _____		B
	A. mgh	B. $\frac{1}{2}kx^2$	
	C. $\frac{p^2}{2m}$	D. kx	
196)	Energy eigenvalue of simple harmonic oscillator is given by $E =$ _____		C
	A. $h\nu$	B. $Nh\nu$	
	C. $(n + \frac{1}{2}) \hbar\omega$	D. $\hbar\omega$	
197)	The zero-point energy for simple harmonic oscillator is given by $E =$ _____		B
	A. $\frac{1}{2} h\nu$	B. $\frac{1}{2} \hbar\omega$	
	C. $\frac{3}{2} \hbar\omega$	D. $\frac{5}{2} \hbar\omega$	
198)	The energy levels of the linear harmonic oscillator are-----		A
	A. all nondegenerate	B. n-fold degenerate	
	C. $(n + 1/2)$ -fold degenerate	D. $(2n + 1)$ -fold degenerate	
199)	The Number operator $\hat{N} = \hat{a}^\dagger \hat{a}$ is-----		C
	A. Unitary	B. Projection	
	C. Hermitian	D. All of these	
200)	The operator \hat{a} is called-----		B
	A. Number operator	B. Lowering operator	
	C. Raising operator	D. Conjugate operator	

201)	The Schrödinger picture is useful when describing phenomena with -----Hamiltonians.		A
	A. time-independent	B. time-dependent	
	C. Free particle	D. Bound particle	
202)	In Heisenberg picture the time dependence of the -----is completely frozen		B
	A. operators	B. Base kets	
	C. State kets	D. Both b and d	
203)	Perturbation theory is valid for		D
	A. Time dependent states	B. Time-dependent Hamiltonian only	
	C. Non-degenerate levels only	D. Stationary states	
204)	Perturbation theory can be used to approximate energies and states of a system with		B
	A. High deviations	B. Small deviations	
	C. Exactly solvable Hamiltonian	D. Hamiltonian that cannot be reduced to exactly solvable Hamiltonian	
205)	In time-independent perturbation theory-----.		A
	A. Hamiltonian is frozen in time	B. Hamiltonian is evolving in time	
	C. Hamiltonian is time dependent and state is stationary	D. None	
206)	A diagonal matrix of some operator A can be represented as:		C
	A. $\langle n A_{nm} m \rangle$	B. A_{nm}	
	C. $a_m \delta_{nm}$	D. None of the above	
207)	Trace of a matrix can be written as:		D
	A. A_{mm}	B. $\sum_m A_{mm}$	
	C. $\sum \delta_{mn} A_{mn}$	D. both b and c	
208)	The natural language of quantum mechanics is-----		C
	A. classical mechanics	B. Tensor analysis	
	C. Linear algebra	D. Riemann geometry	
209)	Why are operators important in the study of quantum mechanics?		C
	A. Schrodinger used operators in the derivation of his equation.	B. Operators are used in solving the Schrodinger equation to find wave functions.	
	C. Applying an operator to a wave function reveals some information about the particle it describes.	D. None	
210)	An f-fold degenerate energy state has-----		B
	A. f- energy levels corresponding to each state vector	B. f-state vectors corresponding to this energy level	
	C. One state vectors corresponding to this energy level	D. (n+f)-state vectors corresponding to this energy level	
211)	The first Born approximation consists then of approximating the ----- wave function by----- wave function.		C
	A. Transmitted, scattered	B. Scattered, transmitted	
	C. Scattered, plane	D. Plane, scattered	
212)	Time evolution operator follow-----property.		A
	A. Composition	B. Trichotomy	
	C. Schwarz inequality	D. None	
213)	The time evolution operation is unitary. The result is consequence of the		D
	A. Conservation of probability current density	B. Conservation of energy	
	C. Conservation of time	D. Conservation of probability	
214)	An operator S is said to be unitary if		A
	A. $\hat{S}^\dagger = \hat{S}^{-1}$	B. $\hat{S}^\dagger = \hat{S}$	
	C. $\hat{A}^\dagger = a$	D. None	
215)	The link between observables and operators is useful because		D
	A. Observables can be replaced by operators	B. An operator is an observable	
	C. There is no link	D. We can find information about an observable using its corresponding operator	
216)	The state vector can be represented by -----which has a countably infinite number of components:		C

	A. Row vector	B. Transpose of column vector	
	C. Column vector	D. Rectangular matrix	
217)	The vectors of dual Hilbert space can be represented by -----which has a countably infinite number of components:		D
	A. Row vector	B. Transpose of row vector	
	C. Column vector	D. Both A and B	
218)	Hermitian adjoint of a column vector is-----vector.		B
	A. Row vector	B. Column vector	
	C. Not possible	D. None	
219)	The importance of the differences between $ \psi\rangle^*$ and $ \psi\rangle^T$ is that $ \psi\rangle^*$ is a -----and $ \psi\rangle^T$ is a -----.		B
	A. Bra, ket	B. Ket, bra	
	C. Row, column	D. Both A and C	
220)	The eigenvalues of a unitary matrix have absolute value equal to		A
	A. One	B. Infinity	
	C. Zero	D. Is not possible to find	
221)	When $E > 0$, we obtain-----		C
	A. Single state	B. Microstate	
	C. Scattering state	D. Bound state	
222)	Physically realizable states lying in Hilbert space correspond to		B
	A. Continuous spectrum	B. Discrete spectrum	
	C. Configuration space	D. None	
223)	Quantum Numbers are obtained by solutions of _____		D
	A. Heisenberg's Uncertainty Principle	B. Dirac equation	
	C. Hydrogen atom	D. Schrodinger equation	
224)	Maxwell-Boltzmann law is for the _____		A
	A. Distinguishable particles	B. Indistinguishable particles	
	C. Fermions	D. Bosons	
225)	The wave function of fermions is _____		D
	A. Continuous	B. Single Valued	
	C. symmetric	D. Both A and B	
226)	Fermi-Dirac statistics cannot be applied to _____		C
	A. Electrons	B. Fermions	
	C. Photons	D. Protons	
227)	The Schrodinger wave equation is _____		D
	A. Must contain a scalar potential	B. Non linear	
	C. real	D. Is same as Newton's law of acceleration	
228)	If ψ and Φ are two solutions of the Schrodinger equation then-----is also its solution.		D
	A. $\Psi + \Phi$	B. $a\Psi + b\Phi$ where a,b are scalar	
	C. Ψ/Φ	D. Both A and B	
229)	In continuous spectrum, energy of particle is-----energy of system.		A
	A. Greater than	B. Less than	
	C. Equal to	D. None	
230)	Unbound states have-----		D
	A. Boundary conditions	B. Discrete spectrum	
	C. Zero energy	D. No boundary condition	
231)	The wavefunction of a free particle is		B
	A. Scattered wave	B. Plane wave	
	C. Standing wave	D. Longitudinal wave	
232)	The Born interpretation of the wave function refers to:		C
	A. The wave function could be both real and imaginary	B. the amplitude represents the intensity of the wave function	
	C. the square of the amplitude gives the probability density	D. the wave function is the solution of the Schrodinger wave equation	
233)	Any wave function having anti-symmetry property is said to be of _____ parity		A
	A. Odd	B. Even	
	C. Zero	D. Infinite	
234)	If there exist only one eigenvector corresponding to a given eigenvalue, then eigenvalue is said to be		B

	A. Degenerate	B. Non-degenerate	
	C. Discrete	D. Equal to one	
235)	Operators representing observables have ----- eigenvalue.		C
	A. zero	B. imaginary	
	C. real	D. one	
236)	The uncertainty in measurement of momentum means:		B
	A. Position is delocalized	B. measurement on identically prepared system yields different result	
	C. measurement on identically prepared system yields same result	D. None	
237)	According to time-independent perturbation theory, the first order correction to energy is -----.		D
	A. Expectation value over perturbed states	B. Expectation value over orthogonal states	
	C. Expectation value over normal states	D. Expectation value over unperturbed states	
238)	If two states share same energy, then energy eigenvalue is said to be-----degenerate.		B
	A. n-fold	B. Two-fold	
	C. Infinite-fold	D. None	
239)	The exchange operator-----Hamiltonian operator.		A
	A. Commutes with	B. Anti-commute with	
	C. Adjoint to	D. Hermitian to	
240)	Two operator are said to commute when		C
	A. Their commutator is one	B. Their wavefunctions are normalized	
	C. Both have simultaneous eigenfunctions	D. None	
241)	If A & B are a canonically conjugate pair of observables, then $[A,B]=$		B
	A. $i\hbar/2$	B. $i\hbar$	
	C. $2\hbar$	D. $2i\hbar$	
242)	A stationary state can be represented as:		C
	A. $\varphi(x, t) = \varphi(x)$	B. $\varphi(x, t) = \varphi(t)$	
	C. $\varphi(x, t) = \varphi(x)\exp(-iEt/\hbar)$	D. Both a and c	
243)	Collection of square integrable wavefunctions is an example of		A
	A. Hilbert space	B. Vector space	
	C. Configuration space	D. Phase space	
244)	If the particle moving in a _____ potential then the solution of the wave equation are describe as a stationary states		B
	A. Time-dependent	B. Time independent	
	C. velocity dependent	D. velocity independent	

(PHYSICS: ELECTROSTATICS AND MAGNETOSTATICS)

			Answer Key
245)	The magnetostatic is highly relies on which property		C
	A. Resistance	B. Capacitance	
	C. Inductance	D. Momentum	
246)	Using Maxwell equation which of the following cannot be calculated directly		C
	A. B	B. D	
	C. A	D. H	
247)	Which of the following relation will hold good?		D
	A. $D=uH$	B. $B=\epsilon E$	
	C. $E= \epsilon D$	D. $B=uH$	
248)	Find the magnetic field when the magnetic vector potential is a unit vector		C
	A. 1	B. -1	
	C. 0	D. 2	

249)	The permittivity is also called		B
	A. Electrostatic energy	B. Dielectric constant	
	C. Dipole moment	D. Susceptibility	
250)	Dielectric constant will be high in		C
	A. Conductor	B. Semiconductor	
	C. Insulator	D. Superconductor	
251)	Find the susceptibility of a material whose dielectric constant 2.26		A
	A. 1.26	B. 3.26	
	C. 5.1	D. 1	
252)	The susceptibility of free space is		B
	A. 1	B. 0	
	C. 2	D. ∞	
253)	Find the inductance of a material with 100 turns, area 12 units and current of 2A in air		A
	A. 0.75 mH	B. 7.5 mH	
	C. 75 mH	D. 753mH	
254)	Which of the following cannot be computed using the Biot savart law?		C
	A. Magnetic Field intensity	B. Magnetic Flux density	
	C. Electric Field intensity	D. Permeability	
255)	Tesla is unit of		C
	A. Field strength	B. Inductance	
	C. Flux density	D. Flux	
256)	A magnetic field exists around		D
	A. Iron	B. Copper	
	C. Aluminium	D. Moving charges	
257)	The ratio of intensity of magnetization to the magnetization force is known as		B
	A. Flux density	B. Susceptibility	
	C. Relative permeability	D. None of the above	
258)	The force between two long parallel conductor is inversely proportional to		D
	A. Radius of conductor	B. Current in one conductor	
	C. Product of current in two conductors	D. Distance between the conductors	
259)	The use of permanent magnets is not made in		C
	A. Magnetos	B. Energy meters	
	C. Transformers	D. Loud speakers	
260)	Reciprocal of permeability is		A
	A. Reluctivity	B. Susceptibility	
	C. Permittivity	D. Conductance	
261)	One tesla is equal to		C
	A. 1 wb/mm ²	B. 1 wb/m	
	C. 1 wb/m ²	D. 1 wb/m ²	
262)	The unit of flux is the same as that of		D
	A. Reluctance	B. Resistance	
	C. Permeance	D. Pole strength	
263)	The commonly used material for shielding or screening magnetism is		C
	A. Copper	B. Aluminium	
	C. Soft iron	D. brass	
264)	Hysteresis loop in case of magnetically hard materials is more in shape as compared to magnetically soft materials.		C

	A. Circular	B. Triangular	
	C. Rectangular	D. None of the above	
265)	Which of the following cannot be computed using the Biot Savart law?		
	A. Magnetic field intensity	B. Magnetic flux density	C
	C. Electric field intensity	D. Permeability	
266)	For time varying currents, the field or waves will be		
	A. Electrostatic	B. Magneto static	C
	C. Electromagnetic	D. Electrical	
267)	Find the displacement current when the flux density is given by t^3 at 2 seconds.		
	A. 3	B. 6	C
	C. 12	D. 27	
268)	The Ampere law is based on which theorem?		
	A. Green's theorem	B. Gauss divergence theorem	C
	C. Stoke's theorem	D. Maxwell theorem	
269)	The Faraday's law states about which type of EMF?		
	A. Transformer EMF	B. Back EMF	A
	C. Generator EMF	D. Secondary EMF	
270)	The H quantity is analogous to which component in the following?		
	A. B	B. D	C
	C. E	D. V	
271)	Find the magnetic field intensity due to a solenoid of length 12cm having 30 turns and current of 1.5A.		
	A. 250	B. 325	D
	C. 175	D. 375	
272)	Identify which of the following is the unit of magnetic flux density?		
	A. Weber	B. Weber/m	C
	C. Tesla	D. Weber ⁻¹	
273)	The Laplacian of the magnetic vector potential will be		
	A. $-\mu J$	B. $-\mu I$	A
	C. $-\mu B$	D. $-\mu H$	
274)	The magnetostatics highly relies on which property?		
	A. Resistance	B. Capacitance	C
	C. Inductance	D. Moment	
275)	In electric fields, $D = \epsilon E$. The correct expression which is analogous in magnetic fields will be		
	A. $H = \mu B$	B. $B = \mu H$	B
	C. $A = \mu B$	D. $H = \mu A$	
276)	The most effective and quickest way of making a magnet from soft iron is by		
	A. Placing it inside a coil carrying current	B. Induction	A
	C. The use of permanent magnetic	D. Rubbing with another magnetic	
277)	What will be the current passing through the ring shaped air cored coil when number of turns is 800 and ampere turns are 3200?		
	A. 2	B. 4	B
	C. 6	D. 8	
278)	Which of the following statements is correct?		
	A. The magnetic flux inside an exciting coil is lower than its outside surface	B. The magnetic flux inside an exciting coil is zero	D
	C. The magnetic flux inside the exciting coil is greater than its outside surface	D. The magnetic flux inside the exciting coil is same as on its outside surface	

279)	How does the magnetic compass needle behave in a magnetic field?		C
	A. It assures a position right angle to magnetic field	B. It starts rotating	
	C. It assures a position which follows a line of magnetic flux	D. None of the above	
280)	Which of the following materials are diamagnetic?		C
	A. Silver	B. Copper	
	C. Silver and copper	D. Iron	
281)	For which of the following materials the saturation value is the highest?		D
	A. Ferromagnetic materials	B. Paramagnetic materials	
	C. Diamagnetic materials	D. Ferrites	
282)	The attraction capacity of electromagnet will increase if the		D
	A. core length increases	B. core area increases	
	C. flux density decreases	D. flux density increases	
283)	Core of an electromagnet should have		C
	A. low coercivity	B. high susceptibility	
	C. both of the above	D. none of the above	
284)	Magnetism of a magnet can be destroyed by		D
	A. heating	B. hammering	
	C. by inductive action of another magnet	D. by all above methods	
285)	A long straight wire carries a current $I=10$ A. At what distance the magnetic field $H=1$ Am ⁻¹ ?		C
	A. 1.39 m	B. 1.19 m	
	C. 1.59 m	D. 1.79 m	
286)	The law which states that the line integral of the magnetic field around a close curve is equal to the free current through a surface, is		C
	A. Tellegen's theorem	B. Gauss' law	
	C. Ampere's law	D. Coulomb's law	
287)	The lines of force due to charged particles are		B
	A. Always straight	B. Always curved	
	C. Sometimes curved	D. None of the above	
288)	The dissipation factor of a good dielectric is of the order of		A
	A. 0.0002	B. 0.002	
	C. 0.02	D. 0.2	
289)	Which of the following expression is correct for electric field strength?		A
	A. $E= D/E$	B. $E=D^2/t$	
	C. $E=jtD$	D. $E=nD^2$	
290)	The power dissipated in a pure capacitor is		A
	A. Zero	B. Proportional to applied voltage	
	C. Proportional to value of capacitor	D. Both (b) and (c) above	
291)	Energy stored in the electric field of a capacitor when charged from a D.C source of voltage is equal to joules		A
	A. CV^2	B. C^2V	
	C. V^2C	D. CV	
292)	A unit tube of flux is known as tube		B
	A. Newton	B. Faraday	
	C. Michale	D. None of above	
293)	Mica capacitors are characterized by all of the following except		C

	A. Stable operation	B. Accurate value	
	C. Low leakage reactance	D. Low losses	
294)	The flux-density at a distance of 0.1 m from a long straight wire, carrying a current of 200 A is		B
	A. 5×10^{-4} Wb/m ²	B. 4×10^{-4} Wb/m ²	
	C. 3×10^{-4} Wb/m ²	D. 2×10^{-4} Wb/m ²	
295)	Which of the following materials is used for the generation of ultrasonic waves by using magnetostatic effect?		B
	A. Paramagnetic material	B. Ferromagnetic material	
	C. Diamagnetic material	D. Both paramagnetic and diamagnetic material	
296)	Magnetic flux will be----- if the surface area vector of a surface is perpendicular to the magnetic field.		A
	A. Zero	B. Unity	
	C. Close to maximum	D. Maximum	
297)	What is the SI unit for magnetic reluctance?		D
	A. Tesla	B. Henry	
	C. Tesla ⁻¹	D. Henry ⁻¹	
298)	In an electric magnetic circuit, for establishing a magnetic field.		C
	A. The movement of coil is required	B. Energy need not be spent, through energy is required to maintain it	
	C. Energy must be spent, through no energy is required to maintain it	D. Energy is not at all required	
299)	Two magnetic poles are located 5 cm apart in air. If each pole has a strength of 5 mWb, find the force of repulsion between them		B
	A. $\frac{1}{\pi^2}$ N	B. $\frac{6250}{\pi^2}$ N	
	C. $\frac{625}{\pi^2}$ N	D. $\frac{62.5}{\pi^2}$ N	
300)	In a magnetic flux density, the total magnetic lines of force crossing a unit area in plane to the direction of flux are at ____		C
	A. Acute angles	B. Obtuse angles	
	C. Right angles	D. None of the above	
301)	What does the constant ' μ ' indicate, while specifying the relation between magnetic flux density (B) and magnetic field intensity (H)?		D
	A. Persistivity	B. Permittivity	
	C. Permissibility	D. Permeability	
302)	If a conductor with length of 5m is located along z-direction with a current of about 3A in az direction & $B = 0.04 a_x$ (T), then what would be the value of force experienced by conductor?		B
	A. $0.6a_x$ N	B. $0.6a_y$ N	
	C. $0.6a_z$ N	D. None of the above	
303)	The main and important constituent of perm alloy is		D
	A. Tungsten	B. Chromium	
	C. Cobalt	D. Nickel	
304)	Basically, a degaussing is the process of		B
	A. Remagnetizing metallic parts	B. Demagnetizing metallic parts	
	C. Removal of magnetic impurities	D. Removing gases from materials	

PHYSICS - ELECTROMAGNETICS

		Answer Key
305)	Faraday's law for free charges is	C
A.	$\nabla \times \mathbf{E} = -\frac{\partial B}{\partial t}$	
B.	$\nabla \times \mathbf{E} = -\mu_0 \frac{\partial B}{\partial t}$	
C.	both a and b	D. none of the above
D.	none of the above	
306)	Ampere's law for free charges is	A
A.	$\nabla \times \mathbf{B} = \mu_0 \mathbf{J}_{tot}$	
B.	$\nabla \cdot \mathbf{B} = \mu_0 \mathbf{J}_{tot}$	
C.	both a and b	D. none of the above
D.	none of the above	
307)	When the magnetic field is perpendicular to the surface of the Earth, what is the polarization of the TEM wave?	A
A.	Horizontal	
B.	Vertical	
C.	Circular	D. Elliptical
D.	Elliptical	
308)	Which of the following are electromagnetic?	D
A.	Gamma wave	
B.	Radio wave	
C.	light	D. all above
D.	all above	
309)	Which of the following types of electromagnetic energy has the shortest wavelength	A
A.	Gamma wave	
B.	Radio wave	
C.	light	D. all above
D.	all above	
310)	For Isotropic media speed of light obey	C
A.	$n < 1$	
B.	$n \leq 1$	
C.	$n \geq 1$	D. None of above
D.	None of above	
311)	SI units of electrical conductivity	D
A.	Siemens/m	
B.	Mho/m	
C.	(Amps/Volt)/m	D. All the above
D.	All the above	
312)	The SI units of DC resistance	C
A.	Ohms	
B.	Volts/Ampere	
C.	Both (A) and (B)	D. None
D.	None	
313)	The average thermal speeds of "free" electrons in metals when T=300k	C
A.	1.2×10^5 m/s	
B.	1.17×10^5 m/s	

	C. Both a and b	D. None	
314)	The electric field intensity at a point in space is equal in magnitude to:		C
	A. The potential difference there	B. The electric charge there	
	C. The force a charge of one coulomb would experience there	D. The force an electron would experience there	
315)	TEM stands for		A
	A. Transverse Electromagnetic	B. Transmitted Electromagnetic	
	C. True Electromagnetic	D. none of the above	
316)	Wave speed in terms of frequency f and wavelength λ is expressed as.		C
	A. f/λ	B. λ/f	
	C. λf	D. $(\lambda + f)$	
317)	Faraday's law for insulator is		C
	A. $\nabla \times E = -\frac{\partial B}{\partial t}$	B. $\nabla \times E = -\mu \frac{\partial H}{\partial t}$	
	C. both a and b	D. none of the above	
318)	A metal bar of mass m moves on two parallel conducting rails separated by distance d and connected by resistance R and uniform magnetic field B produced into page. If bar move with speed v the electrical power is		A
	A. $(Bdv)^2/R$	B. Bdv/R	
	C. Both	D. None	
319)	A metal bar of mass m moves on two parallel conducting rails separated by distance d and connected by resistance R and uniform magnetic field B produced into page. If bar move with speed v the mechanical power is		B
	A. Bdv/R	B. $(Bdv)^2/R$	
	C. Both	D. None	
320)	A solenoid of radius a , produce AC so that field is $(B(t) = B_0 \cos(\omega t)\hat{z})$. A circular loop of wire of radius $a/2$ and resistance R , place inside and coaxial with it. The flux produce is		D

	A.	$\frac{\pi a^2}{4} B$	B.	$\frac{\pi a^2}{4} B_0 \cos(\omega t)$	
	C.	$\frac{\pi a^2}{4} B_0 \cos(2\pi f t)$	D.	All above	
321)	A solenoid of radius a, produce AC so that field is $(B(t) = B_0 \cos(\omega t)\hat{z})$. A circular loop of wire of radius a/2 and resistance R, place inside and coaxial with it. The emf produce is				C
	A.	$\frac{\pi a^2 \omega}{4} B_0 \sin(\omega t)$	B.	$\frac{\pi a^2}{4} \omega B_0 \sin(2\pi f t)$	
	C.	Both above	D.	$\frac{\pi a^2}{4} B_0 \cos(\omega t)$	
322)	A solenoid of radius a, produce AC so that field is $(B(t) = B_0 \cos(\omega t)\hat{z})$. A circular loop of wire of radius a/2 and resistance R, place inside and coaxial with it. The current produce is				A
	A.	$\frac{\pi a^2 \omega}{4R} B_0 \sin(\omega t)$	B.	$\frac{\pi a^2}{4R} B_0 \sin(2\pi f t)$	
	C.	Both above	D.	$\frac{\pi a^2 \omega}{4R} B_0 \cos(\omega t)$	
323)	The work done in carrying a charge q once around a circle of radius “r” with charge Q at the center is:				D
	A.	$\frac{qQ}{4 \pi \epsilon_0 r}$	B.	$\frac{qQ}{4 \pi \epsilon_0} \frac{1}{\pi r}$	
	C.	$\frac{qQ}{4 \pi \epsilon_0} \frac{1}{2 \pi r}$	D.	zero	
324)	The SI unit of self-inductance and mutual inductance is				D
	A.	ohm-m	B.	tesla	
	C.	gilbert	D.	henry	
325)	Mathematical formulation for electromagnetic waves was provided by				A
	A.	Maxwell	B.	Hertz	
	C.	Ampere	D.	Einstein	
326)	A particle carrying a charge of 2e falls through a potential difference of 3.0V. It acquired energy				A
	A.	$9.6 \times 10^{-19} \text{ J}$	B.	$8.6 \times 10^{-19} \text{ J}$	

	C. $7.6 \times 10^{-19} \text{ J}$	D. $6.6 \times 10^{-19} \text{ J}$	
327)	Flux through any closed surface is $1/\epsilon$ times the total charged enclosed is		B
	A. Ampere's law	B. Gauss's law	
	C. Coulomb's law	D. None	
328)	How many electrons pass through an electric bulb in one minute if the 300mA current is passing through it?		A
	A. 1.125×10^{20}	B. 2.125×10^{20}	
	C. 3.125×10^{20}	D. None	
329)	$V=RI$ is known as		D
	A. Ampere's law	B. Gauss's law	
	C. Coulomb's law	D. Ohm's law	
330)	Magnetic field that will cause a maximum force of $7.0 \times 10^{-3} \text{ N}$ on a 20.0 cm straight wire carrying a current of 10.0 A		A
	A. $3.5 \times 10^{-3} \text{ T}$	B. $4.5 \times 10^{-3} \text{ T}$	
	C. $3.5 \times 10^{-2} \text{ T}$	D. None	
331)	The induced emf in a coil which is directly proportional to the rate of change of magnetic flux is known as		D
	A. Ampere's law	B. Gauss's law	
	C. Coulomb's law	D. Faraday's law	
332)	The emf produced in metal rod of length 25 cm is moving at 0.5 ms^{-1} in direction perpendicular to a 0.25 T magnetic field is		A
	A. $3.13 \times 10^{-2} \text{ V}$	B. $2.13 \times 10^{-2} \text{ V}$	
	C. $1.13 \times 10^{-2} \text{ V}$	D. None	
333)	Force per unit positive charge is known as:		A
	A. Intensity	B. Electric field	
	C. Magnetic field	D. None of the above	
334)	Ampere's Circuital Law and which of the following law in electrostatics are analogous		B
	A. Lenz's	B. Gauss's	
	C. Biot-Savart's	D. Faraday's	
335)	Ampere's Circuital Law can be applied _____ the conductor.		B
	A. Inside	B. Outside	
	C. Both (a) and (b)	D. None of these	
336)	Maxwell's equations are based on _____ law(s).		D
	A. Faraday's	B. Gauss's	
	C. Ampere's	D. All of these	
337)	Maxwell's equations involve		B
	A. Charge density	B. Current density	
	C. Magnetic intensity	D. All of these	
	Magnetic flux density is a relation of		C
	A. Current and area	B. Area and its direction	
	C. Magnetic flux and area	D. None of these	

350)	What is the equation for the entropy of a system S if its two parts 1 and 2 having entropies S_1 and S_2 , respectively, are considered in thermal equilibrium?	A
	A. $S=S_1+S_2$	B. $S=S_1-S_2$
	C. $S=(S_1+S_2)/2$	D. $S=S_1S_2$
351)	Which of the following statement is not true?	B
	A. For an irreversible process, $dS>0$	B. Entropy is a conserved quantity
	C. For a reversible process, $dS=0$	D. For an isolated system, $dS\geq 0$
352)	The heat capacity of sodium metal is 1500JK^{-1} , if the mass of the sodium metal is 75kg, the specific heat capacity would be	D
	A. $75\text{ J Kg}^{-1}\text{ }^{\circ}\text{C}^{-1}$	B. $112500\text{ J kg}^{-1}\text{ }^{\circ}\text{C}^{-1}$
	C. $15\text{ J kg}^{-1}\text{ }^{\circ}\text{C}^{-1}$	D. $20\text{ J kg}^{-1}\text{ }^{\circ}\text{C}^{-1}$
353)	The amount of energy required to change the liquid into gas and vice versa without any change in temperature is termed as	D
	A. Heat capacity	B. Latent heat of fusion
	C. Specific heat capacity	D. Latent heat of vaporization
354)	Thermal energy that is absorbed during the process of melting is called	B
	A. Specific latent heat	B. Latent heat of fusion
	C. Latent heat capacity	D. None of the above
355)	In the process of melting, thermal energy is	B
	A. Not required	B. Taken in
	C. Given out	D. Neither taken in nor given out
356)	During boiling process, the temperature of the substance will	D
	A. Increase	B. Decrease
	C. Depend on heat capacity of substance	D. Remain constant
357)	If the boiling point of an object is high, then its rate of evaporation will	B
	A. Be fast	B. Be slow
	C. Depend on the density of object	D. Depend on the boiling temperature
358)	If a two sided fair coin and a six faced dice are thrown simultaneously then the probability of getting TAIL for the coin and FIVE for the dice will be	A
	A. $1/12$	B. $1/8$
	C. $7/12$	D. $1/6$
359)	Statistical methods provide greater accuracy when the number of observations are	A
	A. Very high	B. Medium
	C. Very small	D. None of these
360)	In statistical physics the value of probability of occurrence of an event cannot be	A
	A. Negative	B. Zero
	C. 1	D. $1/2$
361)	If two events A and B are occurring independently then the probability of occurrence of these two independent events will be equal to	B
	A. $A+B$	B. $A \times B$
	C. $A-B$	D. A/B
362)	In a two state system if we conduct extremely large number of trials on a fair coin then which of the following is true?	A
	A. There are low fluctuations in the measurement	B. Probability of getting heads is high
	C. There are no fluctuations in the measurement	D. Probability of getting tails is high
363)	For a system to have minimum entropy which of the following statement is true	D
	A. Temperature of the system is below 0 K	B. System is not in thermal equilibrium

	C. System has only one particle	D. System has only one available energy state	
364)	Regarding the entropy of an object, which of the following statement is true?		C
	A. It increases when an object releases heat	B. It becomes zero at 0 °C	
	C. It drops down when an object releases heat	D. It always increases irrespective of losing or gaining heat	
365)	Which of the following is a non-spontaneous process at room temperature?		B
	A. Evaporation of water	B. Burning of match stick	
	C. Melting of ice	D. None of these	
366)	Efficiency of a Carnot heat engine whose source and sink temperatures are at 525 K is:		D
	A. 100%	B. 50%	
	C. 25%	D. 0%	
367)	For good heat conductors usually the values of heat capacity are.		B
	A. High	B. Low	
	C. Infinite	D. Zero	
368)	Joule is a unit of		D
	A. Heat	B. Work	
	C. Momentum	D. Both (A) & (B)	
369)	On which of the following thermometer's scales, the interval between the lower and upper fixed points is divided into 180 equal part		C
	A. Centigrade scale	B. Kelvin scale	
	C. Fahrenheit scale	D. None of these	
370)	When the temperature of water is gradually increased from 0 degree Celsius to room temperature, then which of the following statement is correct about its volume		D
	A. It increases gradually	B. Its decreases gradually	
	C. First it increases and then decreases	D. First it decreases and then increases	
371)	On which of the following factors the average kinetic energy of gas molecules depends		B
	A. Pressure	B. Temperature	
	C. Volume	D. Mass	
372)	Gaps are left in railway tracks to compensate their expansion during		C
	A. Floods	B. Rainy season	
	C. Hot season	D. Snowfall	
373)	Which of the following materials will take less time to reach at thermal equilibrium when kept in direct contact with each other		A
	A. Conductors	B. Insulators	
	C. Semi-conductors	D. All will take equal time	
374)	Which of the molecules of a gas can rotate about three axis?		B
	A. Monatomic	B. Polyatomic	
	C. Diatomic	D. All the low density gas molecules	
375)	When the volume of a gas is held fixed, then its pressure will approach zero at		B
	A. 100 °C	B. 0 K	
	C. 4 °C	D. -40 F	
376)	At a given temperature which of the gas molecules will have greater average speeds:		A
	A. Monoatomic molecules	B. Diatomic molecules	
	C. Polyatomic molecules	D. CO ₂ molecules	

377)	At room temperature, how many maximum degrees of freedom an atom in a solid can possess		C
	A. 2	B. 4	
	C. 6	D. 3	
378)	At room temperature, the root mean square speed of gas molecules is slightly greater than their		A
	A. Average speed	B. Maximum speed	
	C. Collision speed	D. Terminal speed	
379)	The linear thermal coefficient of a solid is less than its volume thermal expansion coefficient by a factor of		C
	A. 1/2	B. 3/2	
	C. 3	D. 5/2	
380)	The equipartition theorem of energy can be applied under which of the following conditions		D
	A. When ice is melting	B. When water is boiling	
	C. When gas is liquifying	D. When gas is expanding	
381)	For isotropic solids the linear thermal coefficient of expansion depends on		D
	A. Length of a material	B. Diameter of a material	
	C. Volume of a material	D. None of these	
382)	The Kelvin temperature is numerically equal to the _____ and may be measured by means of a ____		B
	A. Heavy water temperature, liquid thermometer	B. Ideal gas temperature, gas thermometer	
	C. Ideal gas temperature, liquid thermometer	D. None of these	
383)	Which of the following is chosen as the standard thermometric substance?		D
	A. Conducting solid	B. Non-conducting solid	
	C. Liquid	D. Gas	
384)	The water has maximum density at 4 C because at this temperature		D
	A. Its mass becomes maximum	B. Its volume becomes maximum	
	C. Both (A) & (B)	D. None of these	
385)	While reducing the volume of a container by keeping its temperature constant, the pressure exerted by the gas molecules on the container walls increases because the molecules		C
	A. Move with high velocities	B. Strike the walls with greater force	
	C. Strike the walls more frequently	D. Remain in contact with the walls for a shorter time	
386)	When a cycle tyre suddenly bursts, the air inside the tyre expands. This process is		B
	A. isothermal	B. adiabatic	
	C. isobaric	D. isochoric	
387)	The efficiency of a heat engine working between the freezing point and boiling point of water is		C
	A. 6.25%	B. 0%	
	C. 26.8%	D. 100%	
388)	Which of the following temperature scales doesn't have negative numbers?		B
	A. Celsius	B. Kelvin	
	C. Fahrenheit	D. All of these	
389)	Which of two temperature change are equivalent?		C
	A. 1 K = 1 F	B. 1 F = 1 C	
	C. 1 K = 1 C	D. None of these	
390)	A container with rigid walls filled with a sample of ideal gas. The absolute temperature of the gas is doubled. What happens to the pressure of the gas?		A
	A. Doubles	B. Triples	
	C. Decreased to one-half	D. None of these	

391)	A sample of ideal gas has an internal energy U and is then compressed to one-half of its original volume while the temperature stays the same. What is the new internal energy of the ideal gas in terms of U ?		A
	A. U	B. $1/2U$	
	C. $2U$	D. $4U$	
392)	The process of heat transfer from object to another because of molecular motion and interaction is called:		B
	A. Convection	B. Conduction	
	C. Radiation	D. Induction	
393)	When we touch a piece of metal and a piece of wood that are placed in the same room, the piece of metal feels much colder than the piece of wood. This happens because of the difference in:		D
	A. Specific heat	B. Temperature	
	C. Density	D. Thermal conductivity	
394)	The process of heat transfer by the movement of mass from one place to another is called:		A
	A. Convection	B. Conduction	
	C. Radiation	D. None of these	
395)	Which mechanism of heat transfer is involved in heat flow from Sun to Earth?		C
	A. Conduction	B. Convection	
	C. Radiation	D. Induction	
396)	If the absolute temperature of a radiating object is doubled, by what factor does the rate of energy emission change?		D
	A. 2	B. 4	
	C. 8	D. 16	
397)	Which of the following is a characteristic of an adiabatic process?		C
	A. $\Delta U = 0$	B. $W = 0$	
	C. $Q = 0$	D. $\Delta V = 0$	

(PHYSICS: NUCLEAR PHYSICS)

			Answer Key
398)	In neutral atom, the electrons are bound to the nucleus by.		D
	A. Magnetic force	B. Electrostatic force	
	C. Friction force	D. Centripetal force	
399)	Minimum energy required to pull nucleus apart is called		D
	A. Ionization energy	B. electron affinity	
	C. chemical energy	D. binding energy	
400)	Phenomenon in which radiations split matter into ions is called		B
	A. Denaturing	B. Ionization	
	C. Condensation	D. Atomization	
401)	During second half-life original material is decayed		C
	A. one quarter	B. two quarter	
	C. three quarter	D. none	
402)	Lifetime of unstable nuclei is.		B
	A. Limited	B. unlimited	
	C. 100 years	D. 50 years	
403)	Radiation that does not change its direction inside magnetic field is.		C
	A. Alpha	B. beta	
	C. gamma	D. x-ray	
404)	An electron traveling at $0.980c$ has a total energy of		D
	A. 0.511 MeV	B. 0.756 MeV	
	C. 1.736 MeV	D. 2.55 MeV	

405)	Particles that participate in the strong nuclear interaction are called.		B
	A. Neutrinos	B. hadrons	
	C. leptons	D. electrons	
406)	The fact that the binding energy per nucleon is roughly a constant over most of the range of stable nuclei is a consequence of the fact that the nuclear force is.		A
	A. Short range	B. long range	
	C. weak	D. strong	
407)	A certain radioactive element has a half-life of 20 d. The time it will take for 7/8 of the atoms originally present to disintegrate is		C
	A. 20 d	B. 40 d	
	C. 60 d	D. 80 d	
408)	In scintillation, the energy of alpha particles is transferred into		A
	A. Energy of fluorescent	B. Energy of ZnS	
	C. Energy of scintillation	D. Light	
409)	In electrostatic generator, which are moved downward by the conveyor belt?		D
	A. Atoms	B. Ions	
	C. Negative Ions	D. none	
410)	In proton synchrotron the magnet is excited periodically up to:		B
	A. 10,000	B. 15,000	
	C. 20,000	D. 25,000	
411)	In electron synchrotron the time of one revolution of electron in the circular orbit is equal to:		C
	A. Amplitude	B. Frequency	
	C. Period	D. angular frequency	
412)	Magnetic field modulation is used in:		D
	A. Cyclotron	B. Synchrocyclotron	
	C. Betatron	D. Synchrotron	
413)	In proton synchrotron a magnet produces a field normal to the		A
	A. Chamber	B. Electric field	
	C. Proton	D. Quadrants	
414)	Which one is involved when proton is converted into neutron?		C
	A. -Ve meson	B. + Ve meson	
	C. -Ve π^0 meson	D. +Ve π^0 meson	
415)	In mass spectrograph, ions remain undeflected if:		B
	A. $qB=mv$	B. $BV=E$	
	C. $qV=B$	D. $Bq=E$	
416)	When the daughter element has a very short half-life and parent element has a very long half-life then		C
	A. $\lambda_1 - \lambda_2 = 0$	B. $\lambda_1 > \lambda_2$	
	C. $\lambda_2 > \lambda_1$	D. all	
417)	Rutherford considered nucleus at the center of atom as a:		A
	A. Positive charge	B. Negative charge	
	C. Concentrated energy	D. None	
418)	In radioactive equilibrium, number of atoms of each member element is directly proportional to its:		A
	A. Average life	B. Half-life	
	C. rate of formation	D. rate of disintegration	
419)	Constituent components of an atom having mass no. 'A' and atomic no. 'Z' is.		C
	A. $Z(H1+Nmn)$	B. $Zn(H1+Nmn)$	
	C. $Zm(H1+Nmn)$	D. $Zm(H1+Nm)$	

420)	Which one of the following radiations is extremely penetrating		C
A.	Alpha	B. beta	
C.	gamma	D. x-ray	
421)	A travelling wave LINAC can accelerate electrons up to		B
A.	1000 KeV	B. 1000 MeV	
C.	1000 GeV	D. 1000 TeV	
422)	To impart high energy in F.M. cyclotron the orbit of the ions needs to be:		
A.	Magnetized	B. expanded	
C.	energized	D. stabilized	
423)	A 100 g sample of a radioactive element has a half-life of 5 days. How many grams of radioactive material will remain after 15 days?		C
A.	100 g	B. 50 g	
C.	25 g	D. 12.5 g	
424)	The correct expression relating the energy E of a particle to its rest mass m_0 , its momentum p, and the speed of light c, is		D
A.	$E^2 = p^2c^2 + m_0c^2$	B. $E^2 = p^2c^2 + (m_0c)^2$	
C.	$E_2 = p^2c + (m_0c^2)^2$	D. $E^2 = p^2c^2 + (m_0c^2)^2$	
425)	In liquid drop model, the symmetry effect is known to be inversely proportional to:		D
A.	$A + 2Z$	B. $A - 2Z$	
C.	atomic number	D. mass number	
426)	Product of Half-life and decay constant is		B
A.	69.3	B. 0.693	
C.	0.639	D. 63.9	
427)	Which of the following rays are emitted during radioactivity?		D
A.	Alpha-rays	B. Beta-rays	
C.	Gamma-rays	D. All the above	
428)	The difference in the mass of the resultant nucleus and the sum of the masses of two parent nuclear particle is known as		A
A.	Mass defect	B. solid defect	
C.	weight defect	D. nucleus defect	
429)	The half-life of radioactive nuclei is.		A
A.	$0.693 / \lambda$	B. $0.793 / \lambda$	
C.	0.693λ	D. 0.793λ	
430)	Energy given to nucleus to dismantle it increases the		C
A.	Kinetic energy of individual nucleons	B. mechanical energy of individual nucleons	
C.	Potential energy of individual nucleons	D. chemical energy of individual nucleons	
431)	In scintillation, the energy of alpha particles is transferred into:		A
A.	Energy of fluorescent	B. Energy of ZnS	
C.	Energy of scintillation	D. Light	
432)	Nucleus is		A
A.	Positively charged	B. negatively charged	
C.	neutral	D. charge keeps on changing.	
433)	Important feature of Pion is that it has:		C
A.	Finite energy	B. Infinite energy	
C.	Finite range	D. Infinite range	
434)	Particles which can be added to the nucleus of an atom without changing its chemical properties are.		C
A.	Electrons	B. Protons	

	C. Neutrons	D. Alpha particles	
435)	If M is the mass of a nucleus and A is its mass number, then $(M-A)/M$ is called its		D
	A. Binding energy	B. Fermi energy	
	C. Mass defect	D. Packing fraction	
436)	The average binding energy of a nucleon inside an atomic nucleus is about.		B
	A. 8 eV	B. 8 MeV	
	C. 8 J	D. 8 ergs	
437)	Alpha, beta, and gamma radiations come out of a radioactive substance.		A
	A. Spontaneously	B. When it is put in a reactor.	
	C. When it is heated.	D. Under pressure	
438)	If the half-life of a radioactive sample is 10 hours, its mean life		A
	A. 14.4 hours	B. 7.2 hours	
	C. 24 hours	D. 6.93 hours	
439)	When two deuterium nuclei fuse together to form a tritium nucleus, we get a		D
	A. neutron	B. deuteron	
	C. alpha particle	D. proton	
440)	One-sixteenth of the initial amount of a radioactive isotope remains undecayed after two hours. The half-life of the isotope is.		C
	A. 15 min	B. 45 min	
	C. 30 min	D. 60 min	
441)	Cathode rays are.		A
	A. stream of electrons	B. stream of positively charged particles.	
	C. streams of uncharged particles	D. Electromagnetic waves	
442)	Positive rays are.		B
	A. electromagnetic waves	B. Ions	
	C. electrons	D. neutrons	
443)	The number of electrons in an atom of atomic number Z and mass number A is		A
	A. Z	B. A	
	C. $A-Z$	D. $(A-Z)/2$	
444)	In stable nuclei, the number of neutrons (N) is related to the number of protons (Z) as		D
	A. $N < Z$	B. $N = Z$	
	C. $N > Z$	D. $N \geq Z$	
445)	Which of the three basic forces can provide an attraction between two neutrons?		B
	A. Electrostatic and nuclear	B. Gravitational and nuclear	
	C. Electrostatic and gravitational	D. Only Nuclear	
446)	The probability of a radioactive atom to survive 5 times longer than its half-life period is		C
	A. $2/5$	B. 2×5	
	C. 2^{-5}	D. 2^5	
447)	Decay rate of a radioactive sample is directly proportional to		C
	A. Temperature of sample	B. Final Amount of sample	
	C. Initial Amount of sample	D. All of these	
448)	Lifetime of unstable nuclei is		B
	A. Limited	B. Unlimited	
	C. 100 years	D. 50 years	
449)	The charge on beta particle is		B
	A. +e	B. -e	
	C. +2e	D. None	

450)	After two half-lives the number of decayed nuclei of an element are		D
	A. N	B. N/2	
	C. N/4	D. 3N/4	
451)	The amount of energy equivalent to 1amu is		C
	A. 9.315 MeV	B. 9315 MeV	
	C. 931.5 MeV	D. 9315 MeV	
452)	The rate of decay of radioactive substance		C
	A. Remains constant with time	B. Increase with time	
	C. Decrease with time	D. May increase or decrease with time	
453)	Radiations emitted by a radioactive element are		C
	A. Visible	B. Visible by pyrex glass	
	C. Invisible	D. None	
454)	The element formed due to radioactive decay is called		B
	A. Parent element	B. Daughter element	
	C. Mother element	D. Son element	
455)	A sample contains N radioactive nuclei. After 4 half-lives number of nuclei decayed is		B
	A. N/16	B. 15N/16	
	C. N/8	D. 7N/8	
456)	The energy required to break a nucleus of an atom is called		C
	A. Atomic energy	B. Nuclear energy	
	C. Binding energy	D. Breaking energy	
457)	Which one of the following is not the nuclear radiations		D
	A. Alpha Particle	B. Beta Particle	
	C. Gamma rays	D. X-Rays	

(PHYSICS: ELECTRONICS)

			Answer Key
458)	Crystal of Germanium or Silicon in its pure form at absolute zero acts as		C
	A. A conductor	B. a semiconductor	
	C. an insulator	D. both (a) and (c)	
459)	Computer chips are made from		B
	A. Iron	B. silicon	
	C. Helium	D. strontium	
460)	Whenever a covalent bond breaks it creates		C
	A. an electron	B. a hole	
	C. an electron hole pair	D. a positron	
461)	The impurity in the Germanium is usually in the ratio of		

	A. $1:10^4$	B. $1:10^8$	B
	C. $1:10^{12}$	D. $1:10^{16}$	
462)	Depletion region contains:		
	A. Protons	B. positive ions	D
	C. negative ions	D. both B and C	
463)	A P-type crystal is		
	A. neutral as a whole	B. impurity added crystal	A
	C. pure crystal	D. positively charged	
464)	Majority charge carriers in the P-region of p-n junction are		
	A. Electrons	B. positrons	C
	C. Holes	D. neutrons	
465)	The maximum number of electrons which the M-shell of an atom contains is		
	A. 32	B. 8	C
	C. 18	D. 50	
466)	A transistor has		
	A. One pn junction	B. Two pn junction	B
	C. Three pn junction	D. Four pn junction	
467)	The number of depletion layers in a transistor is		
	A. Four	B. Three	D
	C. One	D. Two	
468)	The base of a transistor is doped		C
	A. Heavily	B. Moderately	
	C. Lightly	D. None of the above	
469)	The element that has the biggest size in a transistor is		A
	A. Collector	B. Base	
	C. Emitter	D. Collector base junction	
470)	In a PNP transistor, the current carriers are		
	A. acceptor ions	B. Donor ions	D
	C. Free electrons	D. Holes	
471)	The collector of a transistor is Doped		
	A. Heavily	B. Moderately	B
	C. Lightly	D. None of the above	
472)	A transistor is a operated device		
	A. Current	B. Voltage	A
	C. Both voltage and current	D. None of the above	
473)	In a NPN transistor, are the minority carriers		
	A. Free electrons	B. Holes	B
	C. Donor ions	D. Acceptor ions	
474)	The emitter of a transistor is doped		
	A. Lightly	B. Heavily	B
	C. Moderately	D. None of the above	
475)	In a transistor, the base current is about of emitter current		

	A. 25%	B. 20%	D
	C. 35%	D. 5%	
476)	At the base-emitter junctions of a transistor, one finds		C
	A. a reverse bias	B. a wide depletion layer	
	C. low resistance	D. None of the above	
477)	The input impedance of a transistor is		B
	A. High	B. Low	
	C. very high	D. almost zero	
478)	A JFET has three terminals, namely		C
	A. cathode, anode, grid	B. Emitter, base, collector	
	C. Source, gate, drain	D. None of the above	
479)	A JFET is similar in operation to Valve		B
	A. diode	B. Pentode	
	C. triode	D. Tetrode	
480)	A JFET is also called transistor		A
	A. Unipolar	B. Bipolar	
	C. Unijunction	D. None of the above	
481)	A JFET is a driven device		B
	A. Current	B. Voltage	
	C. Both current and voltage	D. None of the above	
482)	The gate of a JFET is biased		A
	A. Reverse	B. Forward	
	C. Reverse as well as forward	D. None of the above	
483)	In a p-channel JFET, the charge carriers are		B
	A. Electrons	B. Holes	
	C. Both electrons and holes	D. None of the above	
484)	A MOSFET has terminals		D
	A. Two	B. Five	
	C. Four	D. Three	
485)	A JFET has power gain		B
	A. Small	B. Very high	
	C. Very small	D. None of the above	
486)	The input control parameter of a JFET is		A
	A. Gate voltage	B. Source voltage	
	C. Drain voltage	D. Gate current	
487)	The channel of a JFET is between the		B
	A. Gate and drain	B. Drain and source	
	C. Gate and source	D. Input and out put	
488)	A Monostable 555 timer has the following number of states:		B
	A. 0	B. 1	
	C. 2	D. 3	
489)	An Astable 555 timer has the following number of stable states:		A
	A. 0	B. 1	
	C. 2	D. 3	
490)	The output of the Astable circuit _____.		A
	A. Constantly switches between two states	B. Is low until a trigger is received	
	C. Is high until a trigger is received	D. Floats until triggered	
491)	With most Monostable Multivibrators, what is the Q output when trigger has occurred?		A
	A. low	B. +5V	

	C. Set	D. High	
492)	What is another name for a Bistable Multivibrator?		C
	A. On-off switch	B. Oscillator	
	C. Flip -flop	D. None	
493)	What is the difference between an Astable Multivibrator and a Monostable Multivibrator?		A
	A. The Astable is free running	B. The Astable needs to be clocked	
	C. The Monostable is free running	D. None	
494)	What is the meant of inputs are 1 in logic gates?		A
	A. Switches are CLOSE	B. Switches are OPEN	
	C. False statement	D. None of the above	
495)	According to Boolean algebra, OR gate performs:		C
	A. Decimal addition	B. Binary addition	
	C. Logical addition	D. Hexadecimal addition	
496)	AND gate gives an output only:		A
	A. When all inputs are 1	B. When all inputs are 0	
	C. When either all are 1 or all 0	D. None of the above	
497)	In logic gates, three variables can only have a value:		C
	A. 0	B. 1	
	C. Either 0 or 1	D. None of the above	
498)	According to Boolean algebra, AND gate performs		D
	A. Logical addition	B. Logical subtraction	
	C. Arithmetic multiplication	D. Logical multiplication	
499)	A logic gate is an electronic circuit which:		D
	A. Makes logic decision	B. Allows electron flow only in one direction	
	C. Works on binary algebra	D. Alternate between 0 and 1 value	
500)	In positive logic, logic state 1 corresponds to:		C
	A. +ve voltage	B. Zero voltage level	
	C. Higher voltage level	D. Lower voltage level	
501)	In positive logic, logic state 0 corresponds to:		D
	A. -ve voltage	B. Zero voltage level	
	C. More -ve voltage level	D. Lower voltage level	
502)	An XOR gate produces an output only when its two inputs are		C
	A. High	B. Low	
	C. Different	D. Same	
503)	When an input electrical signal A= 10100 is applied to a NOT gate, its output signal is		A
	A. 01011	B. 10101	
	C. 10100	D. 00101	
504)	The only function of a NOT gate is to		C
	A. Stop a signal	B. Recomplement a signal	
	C. Invert an input signal	D. Act as a universal gate	
505)	A NOR gate is ON only when all its inputs are		D
	A. ON	B. +ve	
	C. High	D. OFF	
506)	In a certain 2-input logic gate, when A= 0, B= 0 then C= 1 and when A= 0, B= 1, then again C= 1. It must be _____ gate:		C

	A. XOR	B. AND	
	C. NAND	D. NOR	
507)	A logic gate has inputs A, B and C. The output from the logic gate will be available when ——— inputs are presents:		D
	A. A and C	B. B and C	
	C. A and B	D. A, B and C	
508)	What is the meant of inputs are 0 in logic gates?		B
	A. Switches are CLOSE	B. Switches are OPEN	
	C. High voltage	D. None of the above	
509)	The monostable Multivibrator has the possible out puts		C
	A. Two	B. Three	
	C. One	D. Four	
510)	A circuit that operates in such a way that its output is high when all its inputs are high		C
	A. NAND	B. NOR	
	C. AND	D. OR	
511)	The output of an OR gate with three inputs, A, B and C is LOW when		A
	A. A=0,B=0,C=0	B. A=0,B=0,C=1	
	C. A=0,B=1,C=1	D. All of the above	
512)	Any Boolean function can be represented in a		D
	A. Plane	B. Graph	
	C. Flow chart	D. Truth table	
513)	According to Boolean algebra, OR gate performs:		C
	A. Decimal addition	B. Binary addition	
	C. Logical addition	D. Hexadecimal addition	
514)	. With OR operation $1+1=$ ———		C
	A. 10	B. 2	
	C. 1	D. 0	
515)	What is another name for a Bistable Multivibrator?		C
	A. On-Off switch	B. Oscillator	
	C. Flip-flop	D. None	
516)	Which one is not arithmetic operation?		C
	A. Multiply	B. Divide	
	C. Add	D. Subtract	
517)	The expression $X=A \cdot B$ is read as		A
	A. X equals A AND B	B. X equals A OR B	
	C. X equals A NOT B	D. None of the above	

(PHYSICS: SOLID STATE PHYSICS)

			Answer Key
518)	A unit cell that contains lattice points only at the corners is known as		A
	A. Primitive unit cell	B. Secondary unit cell	
	C. Layered unit cell	D. Derived unit cell	
519)	If (326) are the miller indices of a plane, the intercepts made by the plane on the three crystallographic axes are		A

	A.	(2a,3b, c)	B.	(a, b, c)	
	C.	(a, 2b, 3c)	D.	None of these	
520)	In simple cubic lattice, the ratio $d_{100}: d_{110}:d_{111}$ is				
	A.	$6:\sqrt{3} : 2$	B.	$6:3: \sqrt{2}$	C
	C.	$\sqrt{6}: \sqrt{3}: \sqrt{2}$	D.	$\sqrt{6}: \sqrt{3}: 1$	
521)	Iron has a Body-Centered Cubic (BCC) structure with atomic radius 0.123 Å. Find the lattice constant.				
	A.	0	B.	4.587 Å	D
	C.	2.314 Å	D.	0.2840 Å	
522)	The interplanar spacing of (220) planes of a Face-centered cubic (FCC) structure are 1.7458 Å. Calculate the lattice constant.				
	A.	4.983 Å	B.	2.458 Å	A
	C.	0	D.	5.125 Å	
523)	What is the possible number of different types of lattices (3D)?				
	A.	4	B.	8	C
	C.	14	D.	17	
524)	Non-primitive unit cells is/are:				
	A.	SC	B.	FCC	D
	C.	BCC	D.	Both B and C	
525)	In Schottky imperfection:				
	A.	Volume of the crystal increases	B.	Volume of the crystal decreases	D
	C.	Density of the crystal decreases	D.	Both A and C	
526)	According to Einstein model, if a crystal solid consists of N atoms, then independent oscillators are?				
	A.	1N	B.	2N	C
	C.	3N	D.	6N	
527)	Atoms vibrate with different frequencies in solid, according to?				
	A.	Debye Model	B.	Einstein Model	A
	C.	Dulong Pettit's Law	D.	Universal solid law	
528)	At lower temperature, phonon heat capacity C_v varies as (according to Debye model)?				
	A.	$T^{3/2}$	B.	T^2	C
	C.	T^3	D.	T	
529)	Transfer of heat take place in solids due to				
	A.	Electron	B.	Proton	D
	C.	Phonon	D.	Both A and C	
530)	Amorphous substances are isotropic because they havein all direction				
	A.	Same value of physical property	B.	Different values of physical properties	A
	C.	Definite geometrical shape	D.	Constant interfacial angle	
531)	The axial relationship in a monoclinic crystal system is.....				B

	A.	$a \neq b = c$	B.	$a \neq b \neq c$	
	C.	$a = b \neq c$	D.	$a = b = c$	
532)	In the equation $n\lambda = 2d \sin \theta$ which is known as Bragg's equation is.....				
	A.	Density	B.	Diameter	C
	C.	Distance between planes	D.	Dielectric constant of particular crystal	
533)	Miller indices are the Of the values of intercepts (unit intercept)				
	A.	Square	B.	Reciprocal	B
	C.	Cubic	D.	Square root	
534)	At the zone boundaries -----				
	A.	Phase velocity is zero	B.	Group velocity is zero	B
	C.	Both are zero	D.	None of these	
535)	For Acoustical branch, at $K=0$				
	A.	The two atoms are in phase	B.	The two atoms are out of phase	A
	C.	Both A and B	D.	Possess any direction	
536)	In-direct transition cannot occur without the involvement of -----				
	A.	Electron	B.	Proton	C
	C.	Phonon	D.	Photon	
537)	For square lattice of periodicity (a), area of Brillouin zone is				
	A.	$4 (\pi \cdot \pi / a \cdot a)$	B.	$4 \pi / a \cdot a$	A
	C.	$\pi / 4 a \cdot a$	D.	None of these	
538)	For monovalent metal, radius of fermi circle is				
	A.	$0.592 \pi / a$	B.	$0.732 \pi / a$	C
	C.	$0.798 \pi / a$	D.	$0.797 \pi / a$	
539)	Which condition is true for divalent metal?				
	A.	$\pi / a > k(F) > 1.414 \pi / a$	B.	$\pi / a < k(F) > 1.414 \pi / a$	C
	C.	$\pi / a < k(F) < 1.414 \pi / a$	D.	$\pi / a > k(F) < 1.414 \pi / a$	
540)	For trivalent metal, area of fermi circle is				
	A.	$0.59 \pi / a$	B.	$1.38 \pi / a$	B
	C.	$1.98 \pi / a$	D.	$0.79 \pi / a$	
541)	The condition $0 < k(F) < 1.414 \pi / a$ is true				
	A.	Simple cube	B.	Body centered cube	B
	C.	Face centered cube	D.	All of these	
542)	The potential inside the metallic crystals---- according to Kronig-Penny Model.				C

	A.	Constant	B.	Zero	
	C.	Array of square wells	D.	Periodic	
543)	What is the atomic packing factor of BCC structure?				
	A.	0.54	B.	0.68	B
	C.	0.45	D.	0.86	
544)	Which of the following point defects is non-stoichiometric in nature?				
	A.	Schottky defect	B.	Metal excess defect	B
	C.	Interstitial defect	D.	Impurity defect	
545)	The Miller indices h, k, and l of parallel planes in a BCC lattice should satisfy which of the following X-ray diffraction reflection rules?				
	A.	$h + k + l$ should be even	B.	h, k, and l should all be either even or odd	A
	C.	h, k, and l should form Pythagoras triplet	D.	all planes allow reflections	
546)	In which of the following Bravais lattices, not all axial angles are right angles?				
	A.	Tetragonal	B.	Rhombohedral	B
	C.	Orthorhombic	D.	Cubic	
547)	At absolute zero, the boundary that separates the filled and empty states in k-space is called?				
	A.	Partition surface	B.	Fermi surface	B
	C.	Zone boundary	D.	Harrison's surface	
548)	In free electron model, E-k curve is?				
	A.	Parabolic	B.	Non parabolic	A
	C.	Both a and b	D.	None of these	
549)	Diffraction is not possible to occur if the wavelength of X-rays is				
	A.	Less than 2d	B.	Equal to d	D
	C.	Equal to 2d	D.	Greater than 2d	
550)	For one dimension crystal, the average kinetic energy in the ground state is				
	A.	$1/2E_F$	B.	$1/3E_F$	B
	C.	$3/5E_F$	D.	$2/3E_F$	
551)	The effective mass of an electron in a semiconductor can be				
	A.	Negative near the bottom of the end	B.	A scalar quantity with a small magnitude	A
	C.	Zero at the center of the band	D.	Negative near the top of the band	
552)	Which type of defect are point defects?				
	A.	One dimensional defect	B.	Zero dimensional defect	B
	C.	Two dimensional defect	D.	Three dimensional defect	
553)	In intrinsic germanium at room temperature the numbers of				
	A.	Electrons are more than holes	B.	Electrons and holes are equal	B
	C.	Holes are more than electrons	D.	There are no holes and electron	
554)	Orbits that move from zone to zone without closing are:				
	A.	Electron orbits	B.	Hole orbits	C
	C.	Open orbits	D.	None of these	
555)	The atomic radius of sodium is 1.86 angstrom. What is fermi energy of sodium at absolute zero.				
	A.	2.11 eV	B.	3.11eV	B
	C.	4.0eV	D.	-2.11eV	
556)	If the ratio of band gap to the temperature is large, then				
	A.	The concentration of intrinsic carriers will be low	B.	The conductivity will be low	D

	C.	The concentration of intrinsic carriers will be high	D.	Both A & B	
557)	Reconstructing Fermi surface on the basis of the empty-lattice model is known as:				B
	A.	Ewald construction	B.	Harrison construction	
	C.	Extrinsic concentration	D.	Intrinsic concentration	
558)	For a given semiconductor then product of electron & hole concentration of a given temperature				B
	A.	varies	B.	remains constant	
	C.	changes with temperature	D.	both b & c	
559)	In intrinsic semiconductor, which relation is correct				A
	A.	$E(c) - E(f) = E(g) / 2$	B.	$E(c) + E(f) = E(g) / 2$	
	C.	$E(c) / E(f) = E(g) / 2$	D.	$E(c) \times E(f) = E(g) / 2$	
560)	In phase space the electrons occupying in the ground states represents by				A
	A.	Points inside k-space	B.	Points outside k-space	
	C.	Points near boundary of k-space	D.	All of these	
561)	Doped atom, when added to an intrinsic semiconductor,				A
	A.	Introduce quantum states that are close to the edges of the forbidden band	B.	Introduce quantum states that are near the center of the forbidden band	
	C.	Increase the energy of electrons in the valence band	D.	Increase the energy of electrons in the conduction band	
562)	Frenkel defect belongs to which of the following classes?				A
	A.	Point defect	B.	Linear dislocation	
	C.	Interfacial defect	D.	Bulk defect	
563)	In equilibrium state of a PN junction diode				D
	A.	Fermi energy level of P- region is higher than that of N-region	B.	Fermi energy level of N-region is lower than that of P-region	
	C.	Fermi energy levels of both the regions are a minimum value	D.	Fermi energy levels of both the regions attend thermal equilibrium	
564)	Lattice points have another name which is called				A
	A.	Lattice site	B.	Lattice arrangement	
	C.	Lattice circle	D.	Lattice array	
565)	Fermi energy level for P-type extrinsic semiconductor lies				B
	A.	At the middle of the band gap	B.	Close to the conduction band	
	C.	Close to the valence band	D.	None of these	
566)	Fermi surface always intersect with zone boundaries				D
	A.	Perpendicularly	B.	Parallel	
	C.	At the slope of zone boundaries	D.	Both A&C	
567)	In ohmic contact, which is positively charged				A
	A.	Metal	B.	Semiconductor	
	C.	Partially metal and partially semiconductor	D.	None of these	
568)	Which relation is true for p-type semiconductor?				D
	A.	$N(p) + P(n) = n(i) / p(i)$	B.	$N(p) / P(p) = n(i) \times p(i)$	
	C.	$N(n) P(p) = n(i) \times n(i)$	D.	None of these	
569)	The intrinsic carrier concentration for germanium at 300 K is				C
	A.	3.4 E19 meter cube	B.	1.4 E19 meter cube	
	C.	2.4 E19 meter cube	D.	3.9 E19 meter cube	

570)	The random motion of holes and free electrons due to thermal agitation is called				A
	A.	Diffusion	B.	Pressure	
	C.	Ionization	D.	None of these	
571)	The defect when an ion occupies an interstitial position in the crystal lattice is called:				C
	A.	Schottky defect	B.	Crystal defect	
	C.	Frenkel defect	D.	None of these	
572)	If $m_p = m_n$, then the fermi level is exactly in the :				B
	A.	Top of the forbidden gap	B.	Middle of the forbidden gap	
	C.	Bottom of conduction band	D.	Middle of valence band	
573)	What is the atomic radius of a BCC crystal structure?				B
	A.	$a/2$	B.	$\sqrt{3}a/2$	
	C.	$a/\sqrt{2}$	D.	None of these	
574)	If work function of metal is less than work function of n- type semiconductor then contact between them is				A
	A.	Rectifying contact	B.	Ohmic contact	
	C.	Lattice contact	D.	Rectify contact	
575)	When a pentavalent impurity is added to a pure semiconductor, it becomes				D
	A.	An insulator	B.	An intrinsic semiconductor	
	C.	p-type semiconductor	D.	n-type semiconductor	
576)	The axial relationship of a rhombohedral crystal system is given as _____				A
	A.	$a = b = c$	B.	$a = b \neq c$	
	C.	$a \neq b = c$	D.	$a \neq b \neq c$	
577)	Which of the following compound shows both Schottky and Frenkel defect?				B
	A.	Silver(I) iodide	B.	Silver(I) bromide	
	C.	Magnesium sulphide	D.	Titanium oxide	

(PHYSICS WAVES AND OSCILLATIONS)

Waves and Oscillations (Dr. Shazia Shukrullah)					Answer Key
578)	If frequency of wave is 0.002 Hz then Its time period is				B
	A.	100 s	B.	500 s	
	C.	5000 s	D.	50 s	
579)	An object with a mass M is suspended from an elastic spring with a spring constant k. The object oscillates with period T. If the mass of oscillations is quadrupled, how it will change the period of oscillations.				D
	A.	The period is decreased by factor four	B.	The period is decreased by factor two	
	C.	The period is increased by factor four	D.	The period is increased by factor two	
580)	Forced vibration are known as				C
	A.	Simple harmonic vibration	B.	Natural vibration	
	C.	Driven harmonic vibration	D.	Free vibration	
581)	The distance travelled by the disturbance in one time period is				B
	A.	Wave distance	B.	Wave velocity	
	C.	Wave work	D.	Wave number	

582)	The distance covered by a body in one complete vibration is 20cm. What is the amplitude of body	A
	A. 5 cm	B. 7.5 cm
	C. 10 cm	D. 15 cm
583)	Light waves in vacuum are perfectly	D
	A. Plane	B. Scattering
	C. Dispersive	D. Nondispersive
584)	Center of the physical pendulum is	D
	A. $\frac{L}{Md}$	B. $\frac{I}{Mgd}$
	C. $\frac{I}{2\pi Md}$	D. $\frac{I}{Md}$
585)	A sound source of frequency 600 Hz is moving towards an observer with velocity 20 m/s. The speed of sound is 340 m/s. The frequency heard by observer will be	C
	A. 30 Hz	B. 63.5 Hz
	C. 637.5 Hz	D. 630.5 Hz
586)	The main principle used in Interference is	B
	A. Heisenberg's Uncertainty Principle	B. Superposition Principle
	C. Quantum Mechanics	D. Fermi Principle
587)	The displacement of the spectrum to shorter wavelengths in the light coming from distant objects moving toward the observer	B
	A. Red shift	B. Blue shift
	C. Orange shift	D. No shift
588)	Young's Double Slit Experiment was conducted in	A
	A. 1801	B. 1885
	C. 1920	D. 1930
589)	What kind of sources are required for Young's Double Slit experiment	C
	A. Intense	B. Bright
	C. coherent	D. Incoherent
590)	Doppler effect in sound is	A
	A. Echocardiography	B. Ultrasound machine
	C. Stethoscope	D. MRI machine
591)	Two coherent sources produce a dark fringe when phase difference between the interfering waves is n integer	B
	A. 2π	B. $(2n-1)\pi$
	C. n	D. Zero
592)	Calculate the angular deviation of the third order bright fringes in radians when light of wavelength illuminates two parallel slits 7.7 μm apart	B
	A. 215	B. 0.215
	C. 12.4	D. Zero
593)	The position of Zero order bright fringe in double slit experiment is	B
	A. Maximum	B. Zero
	C. $\frac{\pi}{d}$	D. $\frac{L}{D}$
594)	What is the wavelength of the light, if mirror in interferometer is moved through 0.233 mm and 792 fringes counted with light meter	A
	A. $5.88 \times 10^{-7} \text{ m}$	B. $5.88 \times 10^7 \text{ m}$
	C. $9.88 \times 10^{-7} \text{ m}$	D. None of these
595)	The power transferred per unit area is equal to	B
	A. Interferometer	B. Intensity of light
	C. Power of light	D. Area
596)	Which of the following is an electromagnetic wave	C
	A. α rays	B. β rays
	C. γ rays	D. X rays

597)	The displacement of S.H.M when starts from the mean position is $X =$				A
	A.	$X_m \sin(\omega t + \varphi)$	B.	$X_m \sin(\omega t - \varphi)$	
	C.	$X_m \cos(\omega t + \varphi)$	D.	$X_m \cos(\omega t - \varphi)$	
598)	The region of the electromagnetic spectrum that allows wavelengths to pass largely un attenuated through the earth atmosphere is called				D
	A.	Simple light	B.	Violet region	
	C.	Narrow band	D.	Optical window	
599)	Which of the following does not show any interference pattern				A
	A.	Excessively thin film	B.	Soap bubble	
	C.	A thick film	D.	Wedge Shaped film	
600)	Which of the following is a unique property of laser				C
	A.	Directional	B.	Speed	
	C.	Coherence	D.	Wavelength	
601)	Zero order fringe can be identified using				A
	A.	White light	B.	Yellow light	
	C.	Monochromatic light	D.	Achromatic light	
602)	Phase difference between two coherent sources should be				A
	A.	Zero	B.	2π	
	C.	π	D.	$\pi/2$	
603)	what will be the wave velocity if string tension is 3.6 N and its linear density is 25 g/m				B
	A.	10 m/s	B.	12 m/s	
	C.	16 m/s	D.	20 m/s	
604)	The average amount of power transmitted in a medium per unit of its cross-sectional area is called				D
	A.	Interference	B.	Diffraction	
	C.	Wave speed	D.	Wave intensity	
605)	With the propagation of a longitudinal wave through a material medium, the quantities transmitted in the propagation direction are				B
	A.	Energy, momentum and mass	B.	Energy	
	C.	Energy and mass	D.	Energy and linear momentum	
606)	Which of the following statements is true				C
	A.	Both light and sound waves can travel in the vacuum	B.	Both light and sound waves in air are transverse	
	C.	The sound waves in air are longitudinal while the light waves are transverse	D.	Both light and sound waves in air are longitudinal	
607)	A particle on the trough of a wave at any instant will come to the mean position after a time				B
	A.	$T/2$	B.	$T/4$	
	C.	T	D.	$2T$	
608)	If a particle is oscillating on the same horizontal plane in the ground				C
	A.	It has only kinetic energy but no potential energy	B.	It has only potential energy but no kinetic energy	
	C.	It has both kinetic and potential energies	D.	It has neither kinetic nor potential energies	
609)	When two waves of same amplitude add constructively, the intensity becomes				D
	A.	Double	B.	Half	
	C.	One-Fourth	D.	Four Times	
610)	Radial line in torsional oscillator is called				D
	A.	Torsional constant	B.	Torsional line	
	C.	Reference point	D.	Reference line	
611)	The loudness of sound varies directly with the vibrating body's				B
	A.	Intensity	B.	Amplitude	
	C.	Pitch	D.	Quality	
612)	The human ear responds to intensities in range				A
	A.	10^{-12}Wm^{-2} to 1Wm^{-2}	B.	15Wm^{-2} to 18Wm^{-2}	
	C.	10^8Wm^{-2} to 2Wm^{-2}	D.	10^{-3}Wm^{-1} to 10^{-6}Wm^{-1}	
613)	What is the frequency of the wave of wavelength 3.27cm travel with speed of 243 m/s				C
	A.	1023 Hz	B.	134 Hz	
	C.	7431 Hz	D.	431 Hz	

614)	The line or surface on which the disturbance has the same phase at all points is called		A
	A. Wave front	B. Wave speed	
	C. Doppler effect	D. Newtons Ring	
615)	Calculate the distance between adjacent bright fringes of the green light of wavelength 560 nm and viewing screen is separated 1.2m from a double-slit source, the distance between the two slits is 0.030mm		B
	A. 1.2 cm	B. 2.2 cm	
	C. zero	D. 2.4 cm	
616)	Differentiate the following equation with respect to time $V = -\omega x_m \sin(\omega t + \varphi)$		A
	A. $-\omega^2 x$	B. $\omega^2 x$	
	C. $\omega x_m \cos(\omega t + \varphi)$	D. $\omega^2 x \cos(\omega t + \varphi)$	
617)	The magnitude of applied torque is directly proportional to		D
	A. Velocity	B. Displacement	
	C. Acceleration	D. Angle	
618)	The device used in the Michaelson Morley experiment was		C
	A. Telescope	B. Plain Grating	
	C. Interferometer	D. Prism	
619)	What is the name of the force that causes oscillatory motion		C
	A. Damping force	B. Driving force	
	C. Restoring force	D. Oscillating force	
620)	Periodic motion is motion in which		D
	A. An object moves in a circle	B. An object moves with constant velocity	
	C. An object moves with constant acceleration	D. An object returns to its initial position at some later time	
621)	When the movable mirror of a Michaelson Interferometer is shifted through 0.0589 mm, 200 fringes cross the field. What is the wavelength of the light		A
	A. 5890 Å	B. 5245 Å	
	C. 4965 Å	D. 6894 Å	
622)	Which of the following is not periodic motion		B
	A. A mass oscillating on a spring	B. Projectile motion	
	C. A swinging pendulum	D. A planet orbiting the sun	
623)	Which differential equation describes the motion of a mass on a spring		A
	A. $\frac{d^2 x}{dt^2} + \frac{k}{m} x = 0$	B. $\frac{d^2 x}{dt^2} + \frac{m}{k} x = 0$	
	C. $\frac{d^2 x}{dt^2} + x = 0$	D. $\frac{d^2 x}{dt^2} + \frac{k}{m} x^2 = 0$	
624)	When travelling wave is a sin or cos function of (x+Vt) is called		A
	A. Plane progressive wave	B. Nonharmonic wave	
	C. Wave function	D. Wave force	
625)	In vibratory motion		D
	A. P.E. remains constant	B. K.E. remains constant	
	C. Total energy remains constant	D. Total momentum remains constant	
626)	The space occupied by a compression or space occupied by a rarefaction is equal to		B
	A. $\frac{\lambda}{4}$	B. λ	
	C. 2λ	D. $\frac{\lambda}{2}$	
627)	An object of mass 1.53 kg is attached to the bottom of a vertical spring makes 72 complete oscillations in 180s. Find its force constant		D
	A. 6.6 m/s ²	B. 8.6 m/s ²	
	C. 9 m/s ²	D. 9.6m/s ²	

628)	In damped harmonic oscillation which one decreases		C
	A. Amplitude of vibration	B. Energy of vibration	
	C. Both amplitude and energy	D. Neither amplitude nor energy	
629)	The contact point between plano convex lens and plane glass plate behaves as		B
	A. Plane medium	B. Denser medium	
	C. Curved medium	D. Glow medium	
630)	Calculate the amplitude for a SHM using the equation $x = 3\sin 2\pi t + 4\cos 3\pi t$		B
	A. 3	B. 5	
	C. 4	D. 7	
631)	What is the constant of proportionality of an oscillator if the damping force is directly proportional to the velocity		A
	A. kg.s^{-1}	B. kg.m.s^{-1}	
	C. kg.s	D. kg.m.s^{-2}	
632)	What is the phase difference between the prongs of the tuning fork		D
	A. 5π	B. 3π	
	C. 2π	D. π	
633)	Which of the following does not exhibit polarization		A
	A. Longitudinal wave in a gas	B. Transverse wave in a gas	
	C. Neither A nor B	D. Both A nor B	
634)	The phase difference between the acceleration of a particle executing simple harmonic motion and the instantaneous velocity is		C
	A. π	B. 0.707π	
	C. Zero	D. 0.5π	
635)	In a simple harmonic oscillation, the acceleration against displacement for one complete oscillation will be		D
	A. an ellipse	B. a circle	
	C. a parabola	D. a straight line	
636)	A hollow sphere is filled with water. It is hung by a long thread. As the water flows out of a hole at the bottom, the period of oscillation will		A
	A. first increase and then decrease	B. first decrease and then increase	
	C. increase continuously	D. decrease continuously	
637)	X-ray waves, television waves and radio waves are the examples of		D
	A. Mechanical waves	B. Transverse waves	
	C. Longitudinal waves	D. Electromagnetic waves	

(PHYSICS: MATERIALS SCIENCES)

			Answer Key
638)	Those materials which have plenty of free electrons for electrical conduction are called:		B
	A. Dielectrics	B. Conductors	
	C. Insulators	D. Conductor	
639)	Lead is:		A
	A. Ductile	B. A semiconductor	
	C. Brittle	D. polymer	
640)	Curie temperature for iron is:		A
	A. 750°C	B. 500°C	
	C. 570°C	D. 1500°C	
641)	Which one of the following is not a trivalent?		A
	A. Sb	B. Al	
	C. Ga	D. B	
642)	A domain may contain _____ atoms:		D
	A. 10^7	B. 10^{17}	

	C. 10^6	D. 10^{13}	
643)	The material used for the core of a transformer:		A
	A. Soft Magnetic Materials	B. Hard Magnetic Materials	
	C. Dia-magnetic Materials	D. Steel	
644)	Which of the following material has only bulk modulus?		D
	A. Concrete	B. Mercury	
	C. Water	D. Both B & C	
645)	The area of hysteresis loop is the measure of:		D
	A. Hysteresis loss	B. Heat dissipated	
	C. Work done against domain	D. All of these	
646)	Conductors have conductivities of the order of:		B
	A. $10^3 (\Omega\text{m})^{-1}$	B. $10^7 (\Omega\text{m})^{-1}$	
	C. $10^{-7} (\Omega\text{m})^{-1}$	D. $10^{-6} (\Omega\text{m})^{-1}$	
647)	Area under the stress–strain curve is:		D
	A. Work done	B. Energy	
	C. Energy per unit area	D. Energy density	
648)	A metallic wire is stretched by suspending weight to it. If ϵ is the longitudinal strain and Y is its Young's modulus then energy density will be:		D
	A. $Y \epsilon^2$	B. $\frac{1}{2} Y \epsilon$	
	C. $\frac{1}{2} Y^2 \epsilon$	D. $\frac{1}{2}$ stress \times strain	
649)	The slope of stress–strain curve of a typical ductile material is equal to:		D
	A. Energy stored	B. Energy density	
	C. Stress per unit area	D. Young's modulus	
650)	The bond that exists in a semiconductor is:		B
	A. Ionic bond	B. Covalent bond	
	C. Metallic bond	D. Hydrogen bond	
651)	In insulators:		D
	A. the valence band is partially filled with electrons	B. the conduction band is partially filled with electrons	
	C. the conduction band is filled and the valence band is empty	D. the conduction band is empty and the valence band is fully filled	
652)	The dimension of stress is similar to the dimension of:		B
	A. Strain	B. Modulus of elasticity	
	C. Torque	D. Force	
653)	Above curie temperature iron is:		A
	A. Paramagnetic	B. Diamagnetic	
	C. Ferromagnetic	D. Non-magnetic	
654)	Very weak magnetic signals are detected by:		C
	A. Magnetic resonance imaging	B. X-ray machine	
	C. Squid	D. Oscilloscope	
655)	In a hysteresis loop, a ferromagnetic specimen attains its saturation state of magnetism at:		B
	A. Instantaneous value of A.C.	B. Peak values of A.C.	
	C. First quarter of A.C. cycle only	D. R. M. S. value of A.C.	
656)	The magnetic fields produced by electron in an atom is due to:		C
	A. Spin motion	B. Orbital motion	
	C. Both A & B	D. Wave motion	
657)	A material with high retentivity and large coercivity is useful to make:		B
	A. Electromagnet	B. Permanent magnet	

	C. Choke	D. Core of transformer	
658)	Two wires of copper have lengths in the ratio 1 : 2 and radii in the ratio 2 : 1, their Young's modulus are in the ratio:		A
	A. 1 : 1	B. 1 : 8	
	C. 4 : 1	D. 8 : 1	
659)	The hysteresis loop can be drawn for _____ material:		C
	A. Diamagnetic	B. Paramagnetic	
	C. Ferromagnetic	D. Both A & C	
660)	In terms of which of the following properties, metals are better than ceramics? In terms of which of the following properties, metals are better than ceramics:		B
	A. Hardness	B. Ductility	
	C. Toughness	D. Yield strength	
661)	Which of the following is true for polymers?		D
	A. They have very high molecular mass	B. They do not have a linear stress-strain curve	
	C. They have high strength to mass ratio	D. All of the mentioned	
662)	The point coordinates of the vertex just opposite to the origin are:		D
	A. 0 0 0	B. 0 0 1	
	C. 0 1 1	D. 1 1 1	
663)	Miller indices for perpendicular planes are always the.		B
	A. Same	B. Different	
	C. Negative	D. None of these	
664)	Most Bravais lattices are of the type:		A
	A. Primitive unit cell	B. Body centered unit cell	
	C. End centered unit cell	D. Face centered unit cell	
665)	In which of the following Bravais lattices, not all axial angles are right angles?		B
	A. Tetragonal	B. Rhombohedral	
	C. Orthorhombic	D. Cubic	
666)	Coordination number for an ideal BCC metallic crystal is:		A
	A. 8	B. 6	
	C. 12	D. Varies with different metals	
667)	In Bragg's equation [$n\lambda = 2d\sin\theta$], θ is the angle between:		C
	A. specimen surface and incident rays	B. normal to specimen surface and incident rays	
	C. parallel lattice surfaces d distance apart and incident rays	D. normal to parallel lattice surfaces d distance apart and incident rays	
668)	X-rays have larger wavelengths than which of the following?		A
	A. Gamma rays	B. Beta rays	
	C. Microwave	D. Visible light	
669)	X-ray diffraction patterns are used for studying crystal structure of solids because:		C
	A. They have very high energy; hence they can penetrate through solids	B. They are electromagnetic radiation, and hence do not interact with matter (crystals)	
	C. Their wavelengths are comparable to inter-atomic distances	D. Their high frequency enables rapid analysis	
670)	Crystallinity ----- with increasing rate of cooling of a liquid.		B
	A. Increases	B. Decreases	
	C. Remains unchanged	D. None of these	
671)	Iron has a Body-Centered Cubic (BCC) structure with atomic radius 0.123 Å. Find the lattice constant.		D
	A. 0 Å	B. 4.587 Å	
	C. 2.314 Å	D. 0.2840 Å	
672)	Which of the following covalent compounds conduct electricity?		D
	A. Silica	B. Hydrogen chloride	
	C. Diamond	D. Graphite	

673)	Which of the following substances possess the highest elasticity?				B
	A.	Rubber	B.	Steel	
	C.	Glass	D.	Copper	
674)	What is the SI unit of the modulus of elasticity of substance?				A
	A.	Nm^{-2}	B.	Jm^{-2}	
	C.	Nm^{-1}	D.	Being a number, it has no unit	
675)	What are the dimensions of stress?				C
	A.	MLT^{-2}	B.	$\text{ML}^{-2}\text{T}^{-1}$	
	C.	$\text{ML}^{-1}\text{T}^{-2}$	D.	MLT^{-1}	
676)	A rubber cord of cross-sectional area 2cm^2 has a length of 1m . When a tensile force of 10N is applied the length of the cord increases by 1cm . What is the young's modulus of rubber?				B
	A.	$2 \times 10^8 \text{ Nm}^{-2}$	B.	$5 \times 10^6 \text{ Nm}^{-2}$	
	C.	$0.5 \times 10^{-6} \text{ Nm}^{-2}$	D.	$0.2 \times 10^{-6} \text{ Nm}^{-2}$	
677)	Materials that undergo plastic deformation before breaking are called				B
	A.	Brittle	B.	Ductile	
	C.	Amorphous	D.	Polymers	
678)	Any alteration produced in shapes length or volume when a body is subjected to some external force is called:				D
	A.	Stiffness	B.	Toughness	
	C.	Extension	D.	Deformation	
679)	The Curie temperature is that at which:				B
	A.	Semiconductor becomes conductors	B.	Ferromagnetic becomes paramagnetic	
	C.	Paramagnetic becomes diamagnetic	D.	Metals become superconductor	
680)	A ferromagnet will become fully magnetized at:				C
	A.	High voltage A.C	B.	Low voltage A.C	
	C.	Alternating current at its peak value	D.	D.C current at peak value	
681)	Materials in which valence electrons are tightly bound to their atoms at low temperature are called				C
	A.	Semiconductors	B.	Superconductors	
	C.	Insulator	D.	Conductors	
682)	The band theory of solids explains satisfactorily the nature of:				D
	A.	Electrical insulators alone	B.	Electrical conductors alone	
	C.	Electrical semiconductors alone	D.	All of the above	
683)	A vacant or partially filled band is called:				A
	A.	Conduction band	B.	Valence band	
	C.	Forbidden band	D.	Empty band	
684)	What type of bonding makes up ceramic materials?				A
	A.	Covalent bonds	B.	London dispersion forces	
	C.	Metallic bonds	D.	Ionic bonds	
685)	The maximum attainable stress for a metal is called:				D
	A.	Yield stress	B.	fracture stress	
	C.	maximum stress	D.	ultimate tensile stress	
686)	All are attributes of ceramics, except:				B
	A.	covalent bonded	B.	low melting point	
	C.	high stiffness	D.	High hardness	
687)	All are not attributes of metals, except:				D
	A.	electrical insulators	B.	thermal insulators	
	C.	high melting points	D.	ductile	
688)	Below are examples of plastic deformation, except:				B
	A.	a wire coiled 10 times around a magnetic core	B.	broken glass	
	C.	bent nail in wood	D.	molded clay	
689)	The larger the spring constant, the spring would be more:				

	A. Extensible	B. Stiffer	B
	C. compressive	D. brittle	
690)	Pressure in fluid depends upon:		D
	A. Depth below the surface	B. Density of fluid	
	C. The value of g	D. All of above	
691)	Particles that most effects material properties:		D
	A. Neutrons	B. Protons	
	C. Electrons	D. Valance electron	
692)	Which one of the following is not a strong bond?		A
	A. Van der Waals forces	B. Covalent bonds	
	C. Metallic bonds	D. Ionic bonds	
693)	Schottky-defect in ceramic material is:		C
	A. Interstitial impurity	B. Vacancy interstitial pair of cations	
	C. Pair of nearby cation and anion vacancies	D. Substitutional impurity	
694)	Flow of electrons is affected by the following:		D
	A. Thermal vibrations	B. Impurity atoms	
	C. Crystal defect	D. All of these	
695)	A unit cell that contains lattice points only at the corners is known as:		A
	A. Primitive unit cell	B. Secondary unit cell	
	C. Layered unit cell	D. Derived unit cell	
696)	Pure silicon at 0 K is an:		D
	A. Intrinsic semiconductor	B. Extrinsic semiconductor	
	C. Metal	D. Insulator	
697)	The energy required to break a covalent bond in a semiconductor:		B
	A. Equal to 1 eV	B. Is equal to the width of the forbidden gap	
	C. Is greater in Ge than in Si	D. Is the same in Ge and Si	

(PHYSICS (OPTICS AND LASERS))

			Answer Key
698)	Directionality property of laser can be used in		D
	A. surveying	B. remote sensing	
	C. lidar	D. All Correct	
699)	Nd - YAG laser is a		C
	A. two level laser	B. Three level laser	
	C. Four level laser	D. Five level laser	
700)	In Nd-YAG laser, YAG means		D
	A. Yttrium Aluminum	B. $Y_3Al_5O_{12}$	
	C. Yellow Aluminum	D. Both A and B	
701)	The pumping source in Nd: YAG laser is		B
	A. Chemical	B. optical	
	C. Electrical	D. Mechanical	
702)	The active medium in Nd: YAG laser is		A
	A. Nd	B. YAG	
	C. Y	D. AD 1	
703)	The ratio of He to Ne in He-Ne laser is		A
	A. 1:10	B. 2:13	

	C. 10:1	D. 3:15	
704)	Which is correct about laser		A
	A. monochromatic	B. white	
	C. bi-chromatic	D. none	
705)	Population inversion in laser means		B
	A. number of atoms in ground state are more than number of atoms in excited state	B. number of atoms in ground state are less than number of atoms in excited state	
	C. number of atoms in ground state is equal to number of atoms in excited state	D. none	
706)	Why are lasers used for cutting materials		D
	A. It never gets dull	B. Repeatability	
	C. Accuracy	D. All of the above	
707)	What does the acronym LASER stand for?		B
	A. Light Absorption by Stimulated Emission of Radiation	B. Light Amplification by Stimulated Emission of Radiation	
	C. Light Alteration by Stimulated Emission of Radiation	D. Light Attracted by Stimulated Emission of Radiation	
708)	Which scientist first came up with the idea of stimulated emission?		D
	A. Alexander Graham Bell	B. Isaac Newton	
	C. Arthur Schalow	D. Albert Einstein	
709)	What determines the color of light?		B
	A. its intensity	B. its wavelength	
	C. its source	D. All of these	
710)	Snell's law relates _____.		C
	A. Light Reflection	B. Light Transmission	
	C. Light Refraction	D. Light Absorption	
711)	Wavelength of He-Ne laser is		B
	A. 6928Å	B. 6328Å	
	C. 6428Å	D. 6398Å	
712)	Principle of laser is		B
	A. Spontaneous absorption	B. Stimulated emission	
	C. Induced emission	D. Both b and c	
713)	Spontaneous emission has the following disadvantages over stimulated emission:		D
	A. Incoherent	B. Polychromatic	
	C. Less Intensity and Less directionality	D. All are correct	
714)	MASER stands for ___?		A
	A. Microwave Amplification by Stimulated Emission of Radiation	B. Maximum Amplification by Stimulated Emission of Radiation	
	C. Magnified Amplification by irradiated Emission of Radiation	D. None of these	
715)	Visible light's wavelength range _____.		C
	A. 0.39-0.77mm	B. 0.39-0.77μm	
	C. 0.39-0.77nm	D. 0.39-0.77cm	
716)	Metals can _____ the light beams.		
	A. reflect	B. Refract	

	C. All of these	D. Transmit	A
717)	Snell's law relates _____.		B
	A. Light Reflection	B. Light Refraction	
	C. Light Transmission	D. Light Absorption	
718)	Optically active crystals rotate the?		C
	A. Vibrating plane	B. Interference plane	
	C. Polarization plane	D. Diffraction plane	
719)	When light incident normally on thin film, the path difference depends upon?		D
	A. Thickness of the film only	B. The angle of incidence only	
	C. Nature of the film only	D. All thickness, nature, and angle of incidence	
720)	Huygen wave theory explain?		A
	A. Diffraction	B. Polarization	
	C. interference	D. Photoelectric effect	
721)	According to Einstein, light travels from one place to another in the form of?		B
	A. Waves	B. Photons	
	C. particles	D. None of these	
722)	Which one of the following is nearly monochromatic light?		B
	A. Light from a fluorescent tube	B. Light from a sodium lamp	
	C. Light from a mercury lamp	D. Light from a simple lamp	
723)	Two sources of light are coherent if they emit rays of?		C
	A. Same wavelength	B. Same wavelength with a constant phase difference	
	C. The same amplitude of vibration	D. Same amplitude and wavelength	
724)	In Young's double slit experiment, the fringe spacing is equal to (d=slit separation and D = distance of the screen from slits):		C
	A. $d\lambda D$	B. $2\lambda d/D$	
	C. $\lambda D/d$	D. $\lambda d/D$	
725)	In the Young double-slit experiment, if white light is used?		B
	A. Alternate dark and bright fringes will be seen	B. Colored fringes will be seen	
	C. No interference fringes will be seen	D. Impossible to predict	
726)	In an interference pattern:		D
	A. Bright fringes are wider than dark fringes	B. Dark fringes are wider than bright fringe	
	C. Dark fringes are wider than bright fringe	D. Both dark and bright fringes are of equal width	
727)	In Young's double-slit experiment, the separation between the slit is halved and the distance between the slit and screen is doubled. The fringe width is		D
	A. Remain the same	B. Double	
	C. Half	D. Quadrupled	
728)	When one mirror of a Michelson Interferometer is moved a distance of 0.5 mm, we observe 2000 fringes. What will be a wavelength of light used?		B
	A. 5000nm	B. 500m	
	C. 5000A°	D. 2000μm	
729)	Light on passing through a Polaroid is?		A
	A. Plane polarized	B. Un-polarized	
	C. Circularly polarized	D. Elliptically polarized	
730)	Which one of the following cannot be polarized?		B
	A. Radio waves	B. Ultraviolet rays	
	C. X-rays	D. Ultrasonic waves	
731)	In a double-slit experiment, if one of the two-slit is covered then?		A
	A. No interference fringes are observed	B. No fringes observed	

	C.	No diffraction fringes are observed	D.	Interference pattern not disturbed	
732)	In Michelson interferometer to switch the fringe from bright to dark the mirror should be displaced through?				D
	A.	$\lambda/5$	B.	$\lambda/6$	
	C.	$\lambda/3$	D.	$\lambda/4$	
733)	Which experiment shows that wavelength of light is smaller than that of sound?				A
	A.	Diffraction	B.	Polarization	
	C.	Interference	D.	Reflection	
734)	A convex lens gives a virtual image only when the objects lies				D
	A.	Between principal focus and center of curvature	B.	Beyond 2 f	
	C.	At the principal focus	D.	Between the principal focus and an optical center	
735)	If an object is placed away from 2f of a converging lens then the image will be				C
	A.	Real and erect	B.	Virtual and erect	
	C.	Real and inverted	D.	Virtual	
736)	The minimum distance between an object and its real image in a convex lens is				C
	A.	2 f	B.	2.5f	
	C.	4f	D.	3f	
737)	The power of a concave lens is				B
	A.	Real	B.	negative	
	C.	Virtual	D.	Positive	
738)	The diameter of a lens is called				B
	A.	Focal length	B.	Aperture	
	C.	Principal axis	D.	Radius of curvature	
739)	A point where the incident parallel rays of light converge or appear to diverge after passing through a lens is called				C
	A.	Center of curvature	B.	Optical center	
	C.	Focus	D.	Aperture	
740)	A lens, which is thicker at the centre and thinner at the edges is called				C
	A.	Concave lens	B.	Plano-convex lens	
	C.	Convex lens	D.	Plano-concave lens	
741)	A spectrometer is used to find				D
	A.	Wavelength of light	B.	The wavelength of different colors	
	C.	Refractive index of the prism	D.	All of the above	
742)	A convex and concave lens of focal length f is in contact the focal length of the combinations will be				B
	A.	0	B.	infinite	
	C.	f/2	D.	2f	
743)	Magnification of the astronomical telescope is				C
	A.	f_o+f_e	B.	f_e/f_o	
	C.	f_o/f_e	D.	$(1+f_o/f_e)L/f_o$	
744)	The equation $\theta = 1.22 \lambda/D$ was devised by				B
	A.	Newton	B.	Raleigh	
	C.	Einstein	D.	Planks	
745)	A convex lens acts as a diverging lens if the				D
	A.	The object is beyond C	B.	If the object is within f	
	C.	If the object is within C	D.	Both B and C	
746)	Michelson calculated the speed of light using the instruments				A
	A.	Spectrometer	B.	Interferometer	
	C.	Galvanometer	D.	None of these	
747)	The function of a collimator in the spectrometer is				A
	A.	To produce parallel beams of light	B.	To make them	
	C.	To filter the light rays	D.	No function	
748)	In a double slit experiment, we observe				B
	A.	Interference fringes only	B.	Both interference and diffraction fringes	
	C.	Diffraction fringes only	D.	Polarized fringes	
749)	Which one of the following properties of light does not change with the nature of the medium?				D
	A.	Velocity	B.	Amplitude	
	C.	Wavelength	D.	Frequency	

750)	Central spot of Newton's rings		A
	A. Bright	B. Dark	
	C. Dark for large wavelength	D. Bright for large wavelength	
751)	Diffraction fringes are		B
	A. Equally spaced	B. The distance between them decreases	
	C. The distance between them increases	D. They are adjacent with no space in between	
752)	A thing that emits its own light is		A
	A. Luminous	B. Non-luminous	
	C. Incandescent	D. Bright	
753)	Optical active crystals rotates the		B
	A. vibrating plane	B. polarization plane	
	C. diffraction plane	D. interference plane	
754)	Which is not optically active?		C
	A. Sugar	B. Tartaric acid	
	C. Water	D. sodium chlorate	
755)	Light reaches the earth from sun in nearly		D
	A. 15 minutes	B. 8 minutes	
	C. 10 minutes	D. 8 minutes 30 second	
756)	appearance of color in thin films is due to		C
	A. Diffraction	B. Dispersion	
	C. Interference	D. polarization	
757)	The blue color of the sky is due to		B
	A. Diffraction	B. Scattering	
	C. Polarization	D. Reflection	

(PHYSICS: MMP)

			Answer Key
758)	A "periodic function" is given by a function which		B
	A. Has a period $T = 2\pi$	B. Satisfies $f(t+T) = f(t)$	
	C. Satisfies $f(t+T) = -f(t)$	D. Has a period $T = \pi$	
759)	Which of the following is an "even" function of t?		A
	A. t^2	B. $t^2 - 4t$	
	C. $\sin(2t) + 3t$	D. $t^3 + 6$	
760)	What are Fourier coefficients?		C
	A. The terms that are present in the Fourier series	B. The terms that are obtained through Fourier series	
	C. The terms which consist of the Fourier series along with their sine or cosine values	D. The terms which are of resemblance to Fourier transform in a Fourier series	
761)	Which are the Fourier coefficients in the following?		A
	A. a_0, a_n and b_n	B. a_n	
	C. b_n	D. a_n and b_n	
762)	What is the disadvantage of exponential Fourier series?		C
	A. It is tough to calculate	B. It is not easily visualized	
	C. It cannot be easily visualized as sinusoids	D. It is hard for manipulations	
763)	How does Fourier series make it easier to represent periodic signals?		A
	A. Harmonically related	B. Periodically related	
	C. Sinusoidally related	D. Exponentially related	
764)	Laplace transform is a		A
	A. Linear operation	B. Non-linear operation	
	C. Static operation	D. Dynamic operation	
765)	The inverse Laplace transform is known as the		A
	A. Bromwich integral	B. Miller Integral	

	C. Newton integral	D. Gauss Integral	
766)	Laplace's use of generating functions was similar to what is now known as the		B
	A. p-transform	B. z-transform	
	C. s-transform	D. e-transform	
767)	Laplace transform of 1 is		A
	A. 1/s	B. s	
	C. s/2	D. 2/s	
768)	The Laplace transform for continuous time signals is a		B
	A. Time domain approach	B. Frequency domain approach	
	C. Distance domain approach	D. Coordinated domain approach	
769)	$Y'' + ay' + by = 2x$ is a _____ ODE		D
	A. Non-linear	B. Homogenous	
	C. Non-homogenous	D. Linear and non-homogenous	
770)	What is another name for the gamma function?		B
	A. Euler's integral of the first kind	B. Euler's integral of the second kind	
	C. The beta function	D. The zeta function	
771)	A system consisting of two particles moves on a plane. Then the degree of freedom is		C
	A. 2	B. 3	
	C. 4	D. 6	
772)	For a conservative holonomic dynamical system, the Lagrangian L, kinetic energy T and potential energy V are connected by		B
	A. $L = T + V$	B. $L = T - V$	
	C. $L = 2T + V$	D. $L = 2T - V$	
773)	Kinematics is concerned with		C
	A. the physical causes of the motion	B. The condition under which no motion is apparent	
	C. The geometry of the motion	D. None of these	
774)	The basis of polynomial interpretation is		A
	A. Taylor's Theorem	B. Weierstrass Approximation Theorem	
	C. Rolle's Theorem	D. Mean Value Theorem	
775)	'Mathematical Expectation of the product of two random variables is equal to the product of their expectations' is true for		B
	A. Any two random variables	B. If the random variables are independent	
	C. If the covariance between the random variables is non zero	D. If the variance of the random variable are equal	
776)	The domain where function $f(x) = 2x^2 - 1$ and $g(x) = 1 - 3x$ are equal, is		D
	A. $\{1/2\}$	B. $\{2\}$	
	C. $\{1/2, 2\}$	D. $\{1/2, -2\}$	
777)	Domain of the function $\cos^{-1}(4x - 1)$ is		B
	A. $(0, 1/2)$	B. $[0, 1/2]$	
	C. $[1/2, 2]$	D. None of these	
778)	The number of real solutions of the equation $ x ^2 - 3 x + 2 = 0$		A
	A. 4	B. 1	
	C. 3	D. 2	
779)	The number of the real solutions of the equation $x^2 - 3 x + 2 = 0$		B
	A. 2	B. 4	
	C. 1	D. 3	
780)	In Bessel's function, $P_n(1) =$		D
	A. 0	B. -1	
	C. Equal to $P_n(-1)$	D. 1	
781)	In Bessels's function, $P_n(x)$ is a		C
	A. Non-terminating series	B. Oscillatory series	
	C. Terminating series	D. None of these	
782)	In Bessel's function, $P_n(-1) =$		D
	A. -1	B. 0	
	C. 1	D. $(-1)^n$	
783)	The numbers which can be put in the form of p/q where p,q belong to Z, $q \neq 0$ are		A
	A. Rational numbers	B. Irrational numbers	

	C. Natural numbers	D. Integers	
784)	The numbers which cannot be put in the form of p/q where p, q belong to Z , $q \neq 0$ are		B
	A. Rational numbers	B. Irrational numbers	
	C. Complex numbers	D. Whole numbers	
785)	It is a		B
	A. Rational	B. Irrational	
	C. Natural number	D. None	
786)	5.333..... is		A
	A. Rational	B. Irrational	
	C. An Integer	D. A prime integer	
787)	If any matrix A has only one row, then it is called		A
	A. Row matrix	B. Column matrix	
	C. Square matrix	D. Rectangular matrix	
788)	If a matrix A has same number of rows and columns, then A is called		C
	A. Row matrix	B. Column matrix	
	C. Square matrix	D. Rectangular matrix	
789)	If any matrix A has different numbers of rows and columns, then A is		D
	A. Row matrix	B. Column matrix	
	C. Square matrix	D. Rectangular matrix	
790)	Two matrix A and B are said to be conformable for addition if		D
	A. Number of columns in A = number of rows in B	B. Number of rows in B = number of columns	
	C. Rows of A = columns of B	D. Order of A = order of B	
791)	1 radian is equal to _____ degrees.		A
	A. 57.296	B. 5.7296	
	C. 175.27	D. 17.527	
792)	An arrangement of numbers according to some definite rule is called		A
	A. Sequence	B. Combination	
	C. Series	D. Permutation	
793)	A sequence is also known as		B
	A. Real sequence	B. Progression	
	C. Arrangement	D. Complex sequence	
794)	A sequence is a function whose domain is set of		C
	A. Integers (Z)	B. Rational Numbers (Q)	
	C. Natural numbers	D. Real numbers	
795)	A sequence whose range is R i.e. set of real numbers, is called		A
	A. Real sequence	B. Imaginary sequence	
	C. Natural sequence	D. Complex sequence	
796)	In vector mechanics, $\mathbf{a} \cdot \mathbf{b} =$		B
	A. $ab \sin \theta$	B. $ab \cos \theta$	
	C. $ab \tan \theta$	D. ab	
797)	A vector having magnitude only is called		C
	A. Scalar	B. Resultant	
	C. Unit vector	D. Temperature	
798)	The vector product of two vectors is also called		D
	A. Scalar product	B. Dot product	
	C. Point product	D. Cross product	
799)	Projection of vector A in the direction of x-axis is represented by the angle of		A
	A. Cos	B. Sin	
	C. Tan	D. Both A and B	
800)	Scalar product of A.B with angle 180 degrees would produce results equal to		B
	A. A.B	B. (-AB)	
	C. AB	D. B	
801)	Vector sum of two vectors holds the		D
	A. Multiplicative property	B. Distributive property	
	C. Associative property	D. Commutative property	
802)	A vector whose magnitude is zero is called		D

A.	Scalar	B.	Resultant
C.	Unit vector	D.	Null vector

Misc. questions

				Answer Key	
803)	By passing an electric discharge through a gas at low pressure, the electron was discovered by			C	
	A.	Dirac	B.		Chadwick
	C.	J. J. Thomson	D.		Bohr
804)	Structure of nucleus was first explained by			B	
	A.	Bohr	B.		Rutherford
	C.	Einstein	D.		Schrodinger
805)	A particle having the mass of an electron and the charge of a proton is called a			D	
	A.	photon	B.		proton
	C.	neutron	D.		positron
806)	The chemical behavior of an atom is determined by			C	
	A.	Mass number	B.		Atomic weight
	C.	Charge number	D.		Molecular weight
807)	Mass defect per nucleon is related to			A	
	A.	Binding energy	B.		Packing fraction
	C.	Changer number	D.		Molecular weight
808)	The idea of laser device was first introduced by C.H. Townes and Authers Schowian in			C	
	A.	1858	B.		1958
	C.	1998	D.		2008
809)	Laser beam can be used to generate three dimensional image of object in a process called			A	
	A.	Holography	B.		Reflection
	C.	Transmission microscopy	D.		Total internal reflection
810)	An atom can reside in normal excited state for			A	
	A.	10^{-8} second	B.		0.1 second
	C.	1 sec	D.		100 sec
811)	The transitions of inner shell electrons in heavy atoms give rise to the emission of			C	
	A.	Gamma rays	B.		laser
	C.	X rays	D.		Cosmic rays
812)	For the production of x-rays, the target metal is bombarded by			D	
	A.	Protons	B.		neutrons
	C.	Alpha rays	D.		electrons
813)	The x-rays diffraction with crystal with first studied by			A	
	A.	Bragg	B.		Dirac
	C.	Milikan	D.		Bohr
814)	The characteristics x-rays appear as			B	
	A.	Band spectrum	B.		Line spectrum on continuous spectrum
	C.	Continuous spectrum	D.		All of these
815)	The radius of first orbit of Hydrogen is also called as			B	
	A.	Lyman radius	B.		Bohr radius
	C.	Dirac radius	D.		Quantum number
816)	Balmer series is obtained when the transitions in hydrogen atom terminates on			B	
	A.	First orbit	B.		Second orbit
	C.	Third orbit	D.		Fourth orbit
817)	De Broglie suggest for a length of Bohr's orbit in relation to deBroglie wavelength is that			A	
	A.	It should be equal to integral multiple of wavelength	B.		It should be less than wavelength
	C.	It should be greater than wavelength	D.		It has no link with wavelength.
818)	mvr is the expression for			D	
	A.	Liner momentum	B.		Angular acceleration
	C.	Liner velocity	D.		Angular momentum
819)	Electromagnetic rays which lies above the x-rays region are called				

	A. Infra red rays	B. Ultra violet rays	C
	C. Gamma rays	D. Alpha rays	
820)	Which series is in visible region of EM radiation spectrum		
	A. Lyman	B. Balmer	B
	C. Paschen	D. Brackett	
821)	Uncertainty principle states that		C
	A. $\Delta x \cdot \Delta E \approx h$	B. $\Delta E \cdot \Delta P \approx h$	
	C. $\Delta x \cdot \Delta P \approx h$	D. None of these	
822)	The condition $hf > 2m_0c^2$ refers to the process of		B
	A. Compton effect	B. Pair production	
	C. Photoelectric effect	D. Principle of solar cell working	
823)	In Compton effect the shift in wavelength refers to the wavelength of		D
	A. electrons	B. Protons	
	C. Atoms	D. Photons	
824)	The relation between work function and maximum energy of photoelectrons was discovered by		C
	A. Bohr	B. Max Planck	
	C. Einstein	D. None of these	
825)	The nature of radiation emitted by a body depends upon its		C
	A. Mass	B. Volume	
	C. Temperature	D. No. of atoms	
826)	The maximum number of the photoelectrons released in photocell is dependent on		C
	A. Frequency of incident light	B. Intensity of incident light	
	C. Wavelength of incident light	D. None of these	
827)	In photoelectric emission, the energy of emitted electron is		A
	A. Less than that of photon	B. Greater than that of photon	
	C. Equal to that of photon	D. All of these	
828)	If the energy of photon is 10 eV and work function is 5 eV, then the a value of stopping potential will be		D
	A. 10V	B. 20V	
	C. 15V	D. 5V	
829)	The amount of photoelectric current depends upon		D
	A. Energy of incident photons	B. Wavelength of incident photons	
	C. Frequency of incident photons	D. Intensity of incident photons	
830)	The uncertainty principle relates uncertainties in the measurements of energy and		C
	A. Velocity	B. Time	
	C. Momentum	D. Mass of particle	
831)	The Davison and Germer experiment relates to		D
	A. Interference	B. Polarization	
	C. Momentum	D. Electron diffraction	
832)	The electrons behave as waves because they can be		C
	A. Reflected by electric field	B. Deflected by magnetic field	
	C. Diffracted by crystals	D. None of these	
833)	The shape of Intensity vs wavelength curve of radiation emitted from a hot body depends upon		A
	A. Its temperature	B. Its volume	
	C. Its mass	D. None of these	
834)	According to special theory of relativity all laws of physics are same in all		B
	A. Non inertial frames	B. Inertial frames	
	C. Both A and B options are correct	D. Both A and B options are wrong	
835)	Which one of the following physical quantities change with relativistic speed		D
	A. Length	B. Mass	
	C. Time	D. All of these	
836)	Mathematical formulation for electromagnetic waves is given the name		C
	A. Lagrange equations	B. Hamilton's equations	
	C. Maxwell's equations	D. Jacobi's equation	
837)	Emitter base junction is always		
	A. Forward biased	B. Reverse biased	

	C. At ground potential	D. None of these	A
838)	The forward current through a semi conductor diode circuit is due to		B
	A. Electrons only	B. Majority carriers	
	C. Holes only	D. Minority carriers	
839)	In semi conductor diode the width of depletion region is increased when the PN junction is		B
	A. Forward Biased	B. Reverse Biased	
	C. At ground potential	D. None of these	
840)	Electrons present in P-type material due to thermal pair generation are		B
	A. Majority carriers	B. Minority carriers	
	C. Neutral charges	D. None of these	
841)	The crystal of germanium or silicon in its pure form at room temperature acts as		C
	A. Insulator	B. Conductor	
	C. Semi conductor	D. Quantum dot	
842)	An n-type substance is		A
	A. Electrically neutral	B. Negatively charged	
	C. Positively charged	D. None of these	
843)	The temp at which a ferromagnetic disappear, the substances becomes paramagnetic is known as		B
	A. Critical temperature	B. Curie temperature	
	C. Absolute temperature	D. All of these	
844)	Soft magnetic material are used for making		B
	A. Permanent magnets	B. Electromagnets	
	C. Solenoids	D. None of these	
845)	Gauss's Law can only be applied to		C
	A. Surface of any shape	B. Only open surfaces	
	C. Closed surface	D. None of these	
846)	When dielectric material is placed in an electric field it		B
	A. Conducts electricity	B. Becomes polarized	
	C. melts	D. Undergoes electrolysis	
847)	The value of ϵ_r for various dielectrics is always.		A
	A. Greater than one	B. Less than one	
	C. Equal to one	D. Always negative	
848)	When the temperature of a conductor is raised, its resistance		B
	A. Decreases	B. Increases	
	C. Remains the same	D. Becomes zero	
849)	The number of Lagrange equations needed to solve a problem involving double pendulum is		B
	A. one	B. two	
	C. three	D. four	
850)	If $F(r) < 0$, it means that the		A
	A. The central force is negative	B. The central force is attractive	
	C. Both are correct	D. Both are wrong	
851)	If the force acting on a body is doubled, then acceleration becomes		B
	A. Half	B. doubled	
	C. Remains same	D. constant	
852)	1 watt-hour is equal to (in joule)		C
	A. 36	B. 360	
	C. 3600	D. 36000	
853)	A radioactive element has a half life of 5000 years, its full life will be		D
	A. 10000 years	B. 2500 years	
	C. 5000 years	D. None of these	
854)	An observer moves in a rocket in the direction parallel (one meter long). The observed length of the meter stick is		B
	A. Greater than one meter	B. Less than one meter	
	C. Equal to one meter	D. None of these	
855)	An array of points in space is called		

	A. crystal	B. Unit cell	C
	C. lattice	D. Brillion zone	
856)	The vectors in Hilbert space are orthogonal if the inner product of these vectors is		C
	A. Greater than 1	B. negative	
	C. zero	D. Vectors in Hilbert space cannot be orghogonal	
857)	A body is moving in a circle at a constant speed. Which of the following is true about it		D
	A. Force is along the tangent	B. There is no force acting on it	
	C. There is no acceleration	D. Force is directed towards center	
858)	Protons are		A
	A. Bosons	B. Fermions	
	C. Anti particles	D. None of these	
859)	The equipotential surfaces associated with a charged point particles are:		A
	A. Concentric spheres centered at the charge	B. Plane surface perpendicular to the radius	
	C. Horizontal planes	D. None of these	
860)	The electrical force of attraction between two oppositely charges is directly proportional to the magnitude of		D
	A. Addition of charges	B. Difference of charges	
	C. Ratio of charges	D. Product of charges	
861)	The unit "henry" is equivalent to		A
	A. Volt.second/ampere	B. volt	
	C. ampere	D. Ohm.meter	
862)	If an electron has zero orbital angular momentum, what is true about it?		C
	A. It is at rest in atom	B. Its orbital and spin angular momenta cancel each other	
	C. Its orbit around nucleus is spherically symmetric	D. All options are correct	
863)	The amplitude of an alternating voltage by an AC generator is 30 V and its frequency is 100 Hz. The value of voltage at 3 millisecond is		A
	A. 1 V	B. 2 V	
	C. 3 V	D. 4 V	
864)	The efficiency of Carnot engine operating between 0 °C and 100 °C is		D
	A. Infinite	B. 10%	
	C. 100%	D. None of these	
865)	According to the theory of relativity		A
	A. Moving class run slower	B. Moving class run faster	
	C. Velocity of light is measured relative to ether	D. None of these	
866)	The Stern-Gerlach experiment makes use of		C
	A. Strong but uniform magnetic field	B. Weak but uniform magnetic field	
	C. Strong but non uniform magnetic field	D. Weak but non uniform magnetic field	
867)	The Fermi energy of a metal depends primarily on:		B
	A. Temperature of metal	B. Number density of conduction electrons in metal	
	C. Mass density of metal	D. None of these	

			Answer Key
868)	Unit of angular momentum is		D
	A. kg.m/s	B. kg.m ² /s ²	
	C. kgm/s ²	D. kgm ² /s	
869)	The rate of change of angular momentum of a body is equal to		D
	A. Impulsive force	B. Applied force	
	C. Moment of inertia	D. The applied torque	
870)	Forces acting at different points but all in one plane, they are called		B
	A. concurrent forces	B. coplanar forces	
	C. equivalent forces	D. none	

871)	There is no SI base unit for area because:		D
A.	an area has no thickness	B. we live in a three (not a two) dimensional world	
C.	it is impossible to express square feet in terms of meters	D. area can be expressed in terms of square meters	
872)	A material which magnetizes to a small extent in the opposite direction to the applied external magnetic field is:		A
A.	diamagnetic	B. paramagnetic	
C.	ferromagnetic	D. ferrimagnetic	
873)	Soft ferromagnetic materials have ----- value of retentivity		B
A.	large	B. small	
C.	negative	D. None of these	
874)	The SI standard of time is based on:		D
A.	the frequency of light emitted by Kr86	B. the yearly revolution of the earth about the sun	
C.	a precision pendulum clock	D. none of these	
875)	Poisson brackets do not obey		A
A.	commutative law	B. distributive law	
C.	inverse square law	D. conservation of energy law	
876)	In electronic laboratory an LCR meter measures		D
A.	Inductance	B. Capacitance	
C.	Resistance	D. all of these	
877)	Iron, nickel and cobalt are examples of which type of materials		D
A.	paramagnetic	B. diamagnetic	
C.	non magnetic	D. ferromagnetic	
878)	A body is moving in a circle at a constant speed. Which of the following is true about it		D
A.	There is no acceleration	B. There is no force	
C.	Force is along tangent	D. Force is directed towards the center	
879)	In which thermodynamic process the pressure on the system remains constant		B
A.	isothermal	B. adiabatic	
C.	isobaric	D. isochoric	
880)	The process in which no heat enters or leaves the system is called		B
A.	isobaric	B. adiabatic	
C.	reversible	D. none of these	
881)	1 watt-hour is equal to		C
A.	36 J	B. 360 J	
C.	3600 J	D. 36000 J	
882)	Einstein got Nobel prize for the explanation of		A
A.	photoelectric effect	B. special relativity	
C.	laser principle	D. specific heat of solids	
883)	One amu is equal to		

	A. 931.48 MeV	B. 9.31 MeV	A
	C. 93.1 MeV	D. 0.931 MeV	
884)	The Balmer series of Hydrogen spectrum is in the		
	A. x ray region	B. UV region	D
	C. IR region	D. visible region	
885)	The electric intensity outside two oppositely charged plates is		
	A. zero	B. positive	A
	C. negative	D. none of these	
886)	The energy of an electron in an orbit around the nucleus is		
	A. positive	B. negative	B
	C. zero	D. none of these	
887)	The induction of emf in one coil due to change in voltage in a nearby coil is an example of		
	A. self-induction	B. mutual induction	B
	C. ampere's law	D. none of these	
888)	The x rays were discovered by		
	A. Roentgen	B. Faraday	A
	C. Maxwell	D. Einstein	
889)	The magnetic lines of force around a current carrying conducting wire are		
	A. straight	B. rectangular	D
	C. elliptical	D. circular	
890)	Electromagnetic waves have...		C
	A. longitudinal nature	B. only one wavelength	
	C. same speed in vacuum	D. mass	
891)	Carnot cycle consists of		
	A. four processes	B. six processes	A
	C. eight processes	D. ten processes	
892)	$[L_x, L_y] =$		
	A. $i\hbar L_z$	B. $i\hbar L_y$	A
	C. Zero	D. 1	
893)	If the value of angular momentum quantum number (l) is 3, then the number of possible m values is		
	A. 3	B. 7	B
	C. 9	D. none of these	
894)	The SI unit of Planck's constant		
	A. Joule-sec ⁻¹	B. Joule-sec ⁻²	C
	C. Joule-sec	D. none of these	
895)	Using Michelson Interferometer we cannot accurately measure the wavelength of:		
	A. Laser	B. Sodium Light	C
	C. white light	D. none of these	
896)	Flux through any closed surface is equal to the charge enclosed divided by		

	A. permittivity of free space	B. permeability of free space		A
	C. both of these	D. none of these		
897)	Light year is a unit of			
	A. velocity	B. time		C
	C. distance	D. none of these		
898)	According to the special theory of relativity			
	A. mass of moving object decreases	B. observed length never changes		C
	C. mass of moving object increases	D. none of these		
899)	The energies of quantum mechanical harmonic oscillator are			
	A. continuous	B. zero		D
	C. infinite	D. discrete		
900)	Kelvin and Centigrade thermometers will show same reading at			
	A. $-100\text{ }^{\circ}\text{C}$	B. $-273\text{ }^{\circ}\text{C}$		D
	C. $-40\text{ }^{\circ}\text{C}$	D. None of these		
901)	Frequency of AC supply in Pakistan is _____ Hz			
	A. 60 Hz	B. 120 Hz		C
	C. 50 Hz	D. 220 Hz		
902)	The electrical force of attraction between two oppositely charges is directly proportional to the magnitude of			
	A. addition of charges	B. difference of charges		D
	C. ratio of charges	D. product of charges		
903)	The first process of Carnot cycle is _____ expansion			
	A. isothermal	B. adiabatic		A
	C. isochoric	D. none of these		
904)	Frame of reference in which laws of motion are satisfied is called			
	A. accelerating	B. inertial		B
	C. non inertial	D. moving frame		
905)	The velocity of a body executing simple harmonic motion is maximum at _____ position			
	A. extreme	B. mean		B
	C. all positions	D. none of these		
906)	Kilowatt hour is a unit of			
	A. power	B. energy		B
	C. work	D. none of these		
907)	If an electron has zero orbital angular momentum, the magnitude of its magnetic dipole moment equals:			
	A. zero	B. half the Bohr magneton		C
	C. one Bohr magneton	D. twice a Bohr magneton		
908)	While crossing a suspension bridge the soldiers are ordered to break the steps to avoid			
	A. interference	B. resonance		B
	C. diffraction	D. superposition		

909)	A monochromatic source of light gives light of		A
	A. one color	B. two color	
	C. seven color	D. none of these	
910)	The frequency of sound when the source is moving away from the stationary listener		B
	A. increases	B. decreases	
	C. remains same	D. none of these	
911)	Time rate of change of angular momentum is called		D
	A. force	B. flux	
	C. momentum	D. torque	
912)	In photoelectric effect the energy of emitted photon increases with the		A
	A. Frequency of incident light	B. Intensity of incident light	
	C. Both of these	D. None of these	
913)	A transformer works on the principle of		B
	A. self-induction	B. mutual induction	
	C. Gauss's law	D. none of these	
914)	An AC voltage has peak value of 25 V. What is its root mean square value?		C
	A. 1.5 V	B. 1.7 V	
	C. 17.7V	D. 23.2 V	
915)	A transformer is designed to change 220 V to 9.0 V. What is the turn ratio?		B
	A. 16.4	B. 24.4	
	C. 36.4	D. 48.4	
916)	The efficiency of Carnot engine operating between 0 °C and 100 °C is		D
	A. infinite	B. 10 %	
	C. 100 %	D. none of these	
917)	A force of 10 N acts on a body to a distance of 10 meter. The work done is		C
	A. 10 J	B. 10 W	
	C. 100 J	D. 100 W	
918)	According to the theory of relativity:		D
	A. moving clocks run fast	B. energy is not conserved in high speed collisions	
	C. the speed of light must be measured relative to the ether	D. none of the above are true	
919)	The Stern-Gerlach experiment makes use of:		B
	A. a strong uniform magnetic field	B. a strong non-uniform magnetic field	
	C. a strong uniform electric field	D. a strong non-uniform electric field	
920)	Radio waves are readily diffracted around buildings whereas light waves are negligibly diffracted around buildings. This is because radio waves:		B
	A. are plane polarized	B. have much longer wavelengths than light waves	

	C. have much shorter wavelengths than light waves	D. are nearly monochromatic (single frequency)	
921)	The energy level difference of an atom is 3×10^{-18} J. The frequency of photon required to make this transition is:		B
	A. 453 Hz	B. 4.53×10^{15} Hz	
	C. 5387 Hz	D. 4.53×10^6 Hz	
922)	Weigner Seitz cell is an example of		B
	A. Cubic cell	B. Primitive cell	
	C. Reciprocal cell	D. Largest cell	
923)	If the expectation value corresponding to the Hamiltonian operator does not change with time, then the state is called		B
	A. Metastable state	B. Stationary state	
	C. Excited state	D. None of these	
924)	The number of generalized coordinates needed to describe a classical system is equal to		B
	A. No. of Cartesian coordinates	B. No. of degrees of freedom	
	C. No. of spherical coordinates	D. none of these	
925)	The wave function of bosons is		A
	A. symmetric	B. antisymmetric	
	C. zero	D. none of these	
926)	The depletion region of a junction in semiconductor is formed		C
	A. During the manufacturing process	B. When forward bias is applied to it	
	C. Under reverse bias	D. When its temperature is reduce	
927)	An observer moves in a rocket in the direction parallel (one meter long). The observed length of the meter stick is		B
	A. Greater than one meter	B. Less than one meter	
	C. equal to one meter	D. none	
928)	The equipotential surfaces associated with a charged point particles are:		D
	A. radially outward from the particle	B. vertical planes	
	C. horizontal planes	D. concentric spheres centered at the particle	
929)	The value of Hamiltonian in a classical system describes its a) internal energy b) enthalpy c) kinetic energy d) sum of kinetic and potential energy		D
	A. internal energy	B. enthalpy	
	C. kinetic energy	D. sum of kinetic and potential energy	
930)	A restriction on the freedom of motion of a system of particles in the form of a condition which must be satisfied by their coordinates is called		

	A. friction	B. constraint	B
	C. resistive force	D. normal reaction of surface	
931)	The life time of meta stable state is		C
	A. Less than life time of excited state	B. Equal to the life time of excited state	
	C. Greater than the life time of excited state	D. None of these	
932)	Heisenberg uncertainty principle is a direct consequence of _____ of operators corresponding to canonically conjugate variables of position and momentum		B
	A. Commutivity	B. Non-commutivity	
	C. Conductivity	D. None of above	

			Answer Key
933)	If $F(r) < 0$		B
	A. The central force is positive or attractive.	B. The central force is negative or attractive.	
	C. The central force is positive or repulsive.	D. The central force is negative or repulsive.	
934)	When the velocity of a body becomes equal to the velocity of light, then its inertia would be		D
	A. maximum	B. minimum	
	C. finite	D. infinite	
935)	If the force acting on a body is doubled, then acceleration becomes		B
	A. half	B. doubled	
	C. one fourth	D. constant	
936)	A baseball is thrown vertically into the air. The acceleration of the ball at its highest point is:		B
	A. zero	B. g, down	
	C. g, up	D. 2g, down	
937)	Which of the following is not a derived quantity		D
	A. force	B. torque	
	C. velocity	D. mass	
938)	Volume of a nucleus with radius R is		A
	A. $\frac{4}{3} \pi R^3$	B. $\frac{8}{3} \pi R^3$	
	C. $\frac{3}{4} \pi R^3$	D. none	
939)	The Plank's constant has the dimensions		C
	A. $[ML^2T^{-2}]$	B. $[MLT^{-2}]$	
	C. $[ML^2T^{-1}]$	D. $[ML^{-2}T^2]$	
940)	The momentum of a photon is		A
	A. $p=h/\lambda$	B. $p=\lambda/h$	
	C. $p=hf$	D. $p=mc^2$	
941)	A measurement on identical states need not give identical results but only identical		A
	A. Probability distribution	B. Charge distribution	

	C. Momentum distribution	D. Velocity distribution	
942)	The semiconductors have ----- temperature coefficient of resistance.		
	A. Positive	B. Negative	B
	C. Zero	D. None of these	
943)	A material which magnetizes strongly in the same direction to the applied external magnetic field is:		
	A. diamagnetic	B. paramagnetic	C
	C. ferromagnetic	D. none of these	
944)	For a particle in one dimensional box, the energy states are		
	A. quantized	B. continuous	A
	C. zero	D. none of these	
945)	Average acceleration of body during time interval 't' is given by slope of its		
	A. velocity-speed graph	B. velocity-time graph	B
	C. speed-time graph	D. velocity-displacement graph	
946)	Angular momentum of a particle is constant in the absence of		
	A. applied force	B. applied torque	B
	C. applied impulse	D. none of these	
947)	When internal forces in an assemblage of particles form a system in equilibrium, this is expressed in the form of a principle known as		
	A. D Alembert's principle	B. Hamiltons's principle	A
	C. Hygen's principle	D. none of these	
948)	If a system contains a coordinate but it is absent in Lagrangian then the coordinate is		
	A. zero	B. cyclic	B
	C. negative	D. none of these	
949)	The momentum corresponding to a coordinate present in the system but not in the Lagrangian remains		
	A. variable	B. zero	D
	C. increasing only	D. conserved	
950)	A central force field is always		
	A. conservative	B. non conservative	A
	C. constant	D. none of these	
951)	The device which converts solar energy in electrical energy is called		
	A. Transducer	B. Amplifier	C
	C. Photovoltaic cell	D. lead acid battery	
952)	The antiparticle of electron is		
	A. proton	B. fermion	D
	C. boson	D. positron	
953)	Maxwell's equations in electrodynamics deal with		
	A. Gauss's law	B. Ampere's law	D

	C. Faraday's law	D. All of these	
954)	In the equation $H\psi = a\psi$, a is the		C
	A. operator	B. eigen function	
	C. eigen value	D. normalization constant	
955)	Which type of radiation travels at highest speed through vacuum		D
	A. gamma rays	B. light waves	
	C. radio waves	D. all have same speed	
956)	The efficiency of Carnot engine working between two specified temperatures is		B
	A. less than any other engine	B. greater than any engine	
	C. zero	D. 100 %	
957)	Protons are		B
	A. fermions	B. bosons	
	C. chargeless	D. massless	
958)	Fiber optics communication make use of		A
	A. laser light	B. radio waves	
	C. sound waves	D. none of these	
959)	The number of neutrons in Pu having atomic number 94 and mass number 242 is		B
	A. 94	B. 148	
	C. 242	D. 336	
960)	The superconductors are the materials having		B
	A. zero conductivity	B. zero resistivity	
	C. zero temperature	D. none of these	
961)	Lenz's law is in accordance with		A
	A. The law of conservation of energy	B. The law of conservation of charge	
	C. Law of conservation of mass	D. Law of conservation of momentum	
962)	The SI unit of Rydberg constant is		A
	A. 1/m	B. 1/cm	
	C. m/s ²	D. s	
963)	A radioactive element has a half-life of 5000 years, its full life will be		D
	A. 10000 years	B. 5500 years	
	C. 6000 years	D. none of these	
964)	The energy acquired by an electron having charge e and accelerated through a potential difference of V volts is		C
	A. V/e	B. e/V	
	C. Ve	D. $Ve/2$	
965)	Which of the following radiation is not affected by electric and magnetic fields		C
	A. alpha rays	B. beta rays	
	C. x rays	D. none of these	
966)	Uncertainty principle was presented by		B
	A. Dirac	B. deBroglie	
	C. Schrodinger	D. Heisenberg	

967)	When a dielectric material is used the capacitance of a parallel plate capacitor..				B
	A.	decreases	B.	increases	
	C.	remains the same	D.	becomes zero	
968)	Pascal is a unit of				D
	A.	force	B.	work	
	C.	energy	D.	pressure	
969)	No two electrons in an atom have all same quantum numbers. This principle is				D
	A.	D Alembert's principle	B.	Hamilton's principle	
	C.	Principle of virtual work	D.	Pauli's exclusion principle	
970)	According to special theory of relativity what is true about speed of a moving body				C
	A.	it can be greater than speed of light	B.	it can become equal to speed of light	
	C.	it is always less than speed of light	D.	relativity does not impose any condition on speed	
971)	According to Kepler's laws the orbits of planets around sun are				B
	A.	circular	B.	elliptical	
	C.	rectangular	D.	none of these	
972)	The dimensions of Planck's constant are same as those of				A
	A.	angular momentum	B.	energy	
	C.	force	D.	No dimension	
973)	What is correct about velocity and force				B
	A.	both are scalar	B.	both are vector	
	C.	force scalar, velocity vector	D.	force vector, velocity scalar	
974)	Copper is an example of				A
	A.	Conductor	B.	insulator	
	C.	semiconductor	D.	Non metal	
975)	The vectors in Hilbert space are orthogonal if the inner product of these vectors is				D
	A.	1	B.	negative	
	C.	positive	D.	zero	
976)	The existence of ether medium was experimentally rejected by				C
	A.	Schrodinger	B.	Heisenberg	
	C.	Michelson-Morely	D.	Einstein	
977)	The centigrade and Fahrenheit scales have the same reading when the numerical value of temperature is				A
	A.	-40	B.	60	
	C.	-6	D.	120	
978)	The weakest of all forces is				D
	A.	Strong nuclear force	B.	Weak nuclear force	
	C.	electromagnetic	D.	gravitational force	
979)	The range of alpha particles in air is				

	A. 7 cm	B. 7 m	A
	C. 70 m	D. 7 km	
980)	The combining of Hydrogen nuclei which results in huge release of energy is called		
	A. fission	B. annihilation	D
	C. combustion	D. fusion	
981)	The product of force and time is called		
	A. mass	B. momentum	D
	C. pressure	D. Impulse	
982)	The sum of kinetic and potential energies is called		
	A. Lagrangian	B. torque	C
	C. Hamiltonian	D. none of these	
983)	The first ionization potential of hydrogen is		
	A. 13.6 eV	B. 3.4 eV	A
	C. -13.6 eV	D. none of these	
984)	The unit “henry” is equivalent to:		
	A. volt·second/ampere	B. volt/second	A
	C. ohm	D. ampere· volt/second	
985)	Force per unit area is		
	A. newton	B. pressure	B
	C. work	D. None of these	
986)	The dimensions of work are		
	A. MT^{-1}	B. MLT^{-1}	D
	C. M^2L^2T	D. ML^2T^{-2}	
987)	Newton-sec is a unit of		
	A. energy	B. work	C
	C. Linear momentum	D. Angular momentum	
988)	In conservative field the total work done in moving a body along closed path is		
	A. zero	B. positive	A
	C. negative	D. None of these	
989)	One Angstrom is equal to		
	A. 10^{-10} mm	B. 10^{-8} m	D
	C. 10^{-9} mm	D. 10^{-10} m	
990)	An object moving in a circle at constant speed:		
	A. must have only one force acting on it	B. is not accelerating	D
	C. is held to its path by centrifugal force	D. has an acceleration of constant magnitude	
991)	The production of line spectrum of x rays is due to		
	A. Bremsstrahlung process	B. Interaction of light with metals	C
	C. Inner shell transitions	D. pair production	
992)	Pair production takes place only when the energy of the photon fulfills the condition that		

	A. $hf < 0.52 \text{ MeV}$	B. $hf < 1.02 \text{ MeV}$	C
	C. $hf > 1.02 \text{ MeV}$	D. none of these	
993)	Compared to a recoiling rifle, the bullet fired has a greater		B
	A. momentum	B. kinetic energy	
	C. both of these	D. none of these	
994)	A feather and a coin dropped in a vacuum fall with equal		D
	A. Kinetic energy	B. magnetic field	
	C. momentum	D. acceleration	
995)	The Fermi energy of a metal depends primarily on:		D
	A. the temperature	B. the volume of the sample	
	C. the mass density of the metal	D. the number density of conduction electrons	
996)	An array of points in space is called		A
	A. lattice	B. Brillouin zone	
	C. unit cell	D. none of these	
997)	The cathode ray oscilloscope can be used to measure		C
	A. voltage	B. frequency	
	C. both a and b	D. neither a nor b	

	Total flux passing through a closed surface held in a magnetic field is		B
998	A. Infinity	B. Zero	
	C. Unity	D. None of these	
999	Maxwell's equations in _____ form give information at points of discontinuity in electromagnetic fields.		D
	A. Differential	B. Integral	
	C. Algebraic	D. None of these	
1000	Curl of magnetic field intensity is		A
	A. Current density	B. Magnetic field intensity	
	C. Current	D. None	

