بنك الأسئلة في مقرر الفيزياء الطبية– المستوى الأول (161-تحض3)

Chapter 3
Newton's laws of motion

Ques. no.	Question					
1	The mass of a body is:					
	A	the same at different places on Earth	**B**	a vector quantity	**C**	measured by meter
2	Which of the following is a scalar quantity?					
	A	Force	**B**	Mass	**C**	Weight
3	The weight of a body is.....					
	A	The same at different places on the universe.	**B**	a vector quantity	**C**	measured by kilogram
4	Mass differs from weight in that:					
	A	all objects have weight but some of them have no mass	**B**	weight is a vector and mass is not	**C**	the mass of an object is equal to the weight
5	The mass of an object that has 490 N-weight is equal to..... (Considering g=10 m/sec^2)					
	A	4.9 kg	**B**	49 kg	**C**	490 kg
6	The weight of an object that has a mass of 50 kg is equal to …… (considering g=9.8 m/sec^2)					
	A	400 N	**B**	420 N	**C**	490 N
7	According to Newton's first law, an object in motion.....					
	A	continues to move with a velocity that is constant in magnitude and direction.	**B**	continues to move with a velocity that is constant in magnitude but in opposite direction.	**C**	continues to move with an increasing acceleration and in the same direction.
8	The object is said to be in equilibrium if the net force acting on it equal to.....					
	A	The object's weight	**B**	The object's mass	**C**	Zero
9	If 300 gram-body is at rest, what is the upward normal force? (g=10 ms^{-2})					
	A	0.3 N	**B**	30 N	**C**	300 N
10	At equilibrium, the upward normal force on a body is equal to……					
	A	tensile force	**B**	its weight	**C**	friction force

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Ques. no.	Question					
11	Walking on the ground is an example of Newton 's ……law.					
	A	first	**B**	second	**C**	third
12	If one object exerts a force on a second, then the second object exerts ……..force on the first.					
	A	an equal	**B**	an opposite	**C**	an equal but opposite
13	According to Newton's second law of motion, the …….. the mass of an object, the higher acceleration can be produced.					
	A	larger	**B**	zero	**C**	smaller
14	In Newton's second law, The force is proportional to the acceleration, the proportionality constant is the object's……					
	A	force	**B**	weight	**C**	mass
15	The acceleration "a" resulted from the force "F" on mass "m" is given by the relation:					
	A	) a= Fm	**B**	F = a / m	**C**	) a = F / m
16	If 100 N net force is applied to a 1000 gm-body, the body is accelerated by an acceleration 'a' equal to.....ms^{-2}.					
	A	0.1	**B**	1	**C**	100
17	A man pushes a 20 kg box with a horizontal force of 50 N. What acceleration will produce?					
	A	0.4 ms^{-2}	**B**	1 ms^{-2}	**C**	2.5 ms^{-2}
18	Equal forces F act on two isolated bodies A and B. When the mass of B is twice that of A. What is the magnitude of the acceleration of A?					
	A	1/4 that of B	**B**	1/2 that of B	**C**	two times that of B
19	According to Newton's second law of motion, the acceleration of an object is equal to the net force acting on the object divided by its ……					
	A	weight	**B**	mass	**C**	volume
20	The universal law of gravitation states that: All objects in the universe…..…….. each other.					
	A	repulse	**B**	attract	**C**	didn't affect

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Ques. no.	Question					
21	The gravitational forces between two spheres are directed along					
	A	a line connecting their surfaces	**B**	a line connecting their centers	**C**	a line out of their actual objects.
22	The universal law of gravitation is referred to as inverse square law because the gravitation force varies as:					
	A	r^2	**B**	$1/r$	**C**	$1/r^2$
23	Two spheres have gravitational masses m_1 and m_2 and their centers are separated by a distance r. If the distance between them becomes half its original value (1/2 r), then the force between them will increase.....					
	A	2 times	**B**	4 times	**C**	6 times
24	The acceleration due to gravity on a planet of radius three that of the earth and mass three times the mass of the earth is equal to..... (g , The acceleration of gravity on the earth).					
	A	3g	**B**	1/3g	**C**	1/9 g
25	Find the acceleration due to gravity on a planet has the same mass of the earth and half the radius of the earth? (g_E , The acceleration of gravity on the earth).					
	A	¼ g_E	**B**	½ g_E	**C**	$4g_E$
26	If the distance between the centers of two masses becomes (1/4) its original value, then the gravitational force between them will					
	A	increase 4 times	**B**	decrease 4 times	**C**	increase 16 times
27	The gravitational force between two balls of 3 kg mass separated by 10 cm is equal to.....($G= 6.67 \times 10^{-11}$ N m^2 kg^{-2})					
	A	6×10^{-12}N	**B**	6×10^{-9} N	**C**	6×10^{-8} N
28	The gravitational force between two objects of 1 kg mass separated by 1m is equal to.....					
	A	the gravitational acceleration (g)	**B**	the gravitational constant (G).	**C**	1N
29	If the mass of the earth (M_E) were doubled ($2M_E$) and its radius (R_E) stayed constant. How would your weight changed? (W_E: your weight on the earth)					
	A	2 W_E	**B**	1/2 W_E	**C**	1/4 W_E
30	On the moon g_m=1.62 ms^{-2} (g_m is the acceleration of gravity on the moon). An asronaught has a weight of 500 N on the earth. What is his weight on the moon? (Use the acceleration of gravity on the earth, g =10 ms^{-2}) .					
	A	51 N	**B**	61 N	**C**	81 N

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Ques. no.	Question					
31	An astronaut weighs 400 N on the earth. What is his weight on the planet Y, which has a radius $R_y = R_E/3$ and a mass $M_y = M_E/6$?					
	A	200 N	**B**	4000N	**C**	600 N
32	A piece of gold weights 1 N on the earth. Its weight on the moon will be…….. that on the earth: (the acceleration of gravity on the moon= 1/6 the acceleration of gravity on the earth).					
	A	larger than	**B**	equal to	**C**	smaller than
33	During the horizontal acceleration, we feel that our weight is…….					
	A	decrease	**B**	increase	**C**	the same
34	During upward acceleration we feel our weight is ……					
	A	heavier	**B**	reduced	**C**	not changed
35	When an object is in a free fall, its effective weight is ……..:					
	A	equal to its mass	**B**	smaller than its mass	**C**	zero
36	An artificial satellite in orbit around the earth is in free fall when it has …… equals zero.					
	A	an effective weight	**B**	a mass	**C**	a volume
37	A person of mass (m) stands on a spring scale in an elevator. Find the effective weight of the person if the elevator is accelerating upward at 0.15 g? (g, the acceleration of gravity).					
	A	0.85 mg	**B**	1.0 mg	**C**	1.15 mg
38	A person of mass (m) stands on a spring scale in an elevator. Find the effective weight of the person if the elevator is accelerating downward at 0.25 g (g, the acceleration of gravity).					
	A	0.75	**B**	1.0	**C**	1.25
39	A ball in free fall has acceleration (a) equal to (g), its effective weight equal to ……..					
	A	mg	**B**	2 mg	**C**	zero
40	The effective weight (w^e) of a person is ……					
	A	equal to (m g)	**B**	the total forces the person exerts on a spring scale	**C**	equal to the normal force exerted by the person

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بنك الأسئلة في مقرر الفيزياء الطبية– المستوى الأول (161-تحض3)

Ques. no.	Question					
41	Frictional forces in fluids are called ……. forces.					
	A	normal	**B**	tensile	**C**	viscous
42	The maximum possible static friction force for an object is …….					
	A	equals the weight of the object	**B**	equal to the kinetic friction force	**C**	smaller than the kinetic friction force
43	The friction is a force that always acts to……the motion of one object sliding on another.					
	A	follow	**B**	resist	**C**	accelerate
44	A 75-N block is on a flat, horizontal surface. If the block continues to move when the horizontal force T= 30 N. The coefficient of kinetic friction μ_k is equal to……..					
	A	0.04	**B**	0.40	**C**	2.25
45	A block is on a flat, horizontal surface, If T=20 N is applied and the block remain at rest, what is the friction force?					
	A	0.05 N	**B**	0.5 N	**C**	20 N
46	The kinetic friction force f_k is ……the maximum static friction force f_s (max):					
	A	smaller than	**B**	equal to	**C**	greater than
47	A 60-N block is on a flat, horizontal surface. If the block start to slide when the horizontal force T=42 N is applied. What is the coefficient of static friction μ_s?					
	A	0.40	**B**	0.50	**C**	0.70
48	The maximum static force f_s (max) for an object is independent of the ……					
	A	object's weight	**B**	normal force N	**C**	contact area
49	The coefficient of the kinetic friction μ_k is……the coefficient of the static friction μ_s.					
	A	equal to	**B**	greater than	**C**	smaller than
50	The coefficient of the static friction μ_s is……the coefficient of the kinetic friction μ_k.					
	A	equal to	**B**	greater than	**C**	smaller than

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بنك الأسئلة في مقرر الفيزياء الطبية– المستوى الأول (161-تحض3)

Chapter 4
Statics

Ques. no.	Question					
51	The greatest torque is obtained when the force is applied ……..…… to wrench					
	A	in parallel	**B**	at angle $\Theta=0^0$	**C**	at right angle
52	The ability of a force to cause rotation is called……:					
	A	friction	**B**	equilibrium	**C**	torque
53	The torques that tend to produce a **counter-clockwise** rotation are taken to be ……					
	A	positive	**B**	negative	**C**	zero
54	For a rigid body to be in **rotational** equilibrium, the …… on it must be zero.					
	A	net force	**B**	net weight	**C**	net torque
55	a weight W=mg locates at a distance X from the origin, then the torque around the origin is given by……					
	A	X m	**B**	X / W	**C**	X W
56	For two vectors A and B, if A x B = 0, this means that the angel between them is equal to……					
	A	30	**B**	90	**C**	180
57	Torque unit may be expressed in……:					
	A	N.sec	**B**	m.sec	**C**	Nm
58	A couple is a pair of forces with:					
	A	equal magnitudes and the same direction.	**B**	equal magnitudes but opposite directions acting along the same line.	**C**	equal magnitudes but opposite directions acting along different lines
59	Two children of weights w_1 and w_2 are balanced on a board pivoted about its center, at distances x_1 andx_2, respectively. Which one of the following ratios (x_1/x_2) is correct?					
	A	$\frac{X_1}{X_2}=\frac{W_2}{W_1}$	**B**	$\frac{X_1}{X_2}=\frac{1}{W_1 W_2}$	**C**	$\frac{X_1}{X_2}=\frac{W_1}{W_2}$
60	Two weights are balanced on a horizontal meter stick. If the weight at x=0 is 20 N and the pivot is at x=0.6 m. What is the weight "W" at x=1 m. (Neglect the weight of the stick).					
	A	20 N	**B**	30 N	**C**	40 N

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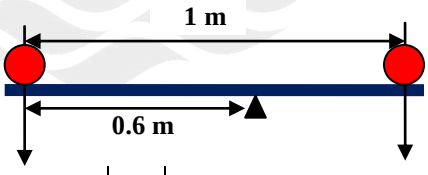
Ques. no.	Question					
61	For two vectors A and B, if A x B = 0.5 AB, this means that the angle between them is equal to……					
	A	0°	**B**	30°	**C**	60°
62	If the weight of an object is concentrated at a point, this point is called……					
	A	The center of gravity	**B**	The geometrical center	**C**	The effective weight
63	An object will hang so that its center of gravity is ……the point of suspension.					
	A	on	**B**	above	**C**	below
64	If there are two weights on a weightless plank, the center of gravity is found to be as the following:					
	A	$X = \frac{w_1x_1 + w_2x_2}{w_1 + w_2}$	**B**	$X = \frac{w_1x_1 - w_2x_2}{w_1 + w_2}$	**C**	$X = \frac{w_1x_1 + w_2x_2}{w_1w_2}$
65	One of the conditions for the equilibrium of a rigid body is the net torque on it must be:					
	A	- ∞	**B**	+ ∞	**C**	Zero
66	For a rigid body to be in **translational** equilibrium, the ……on it must be zero.					
	A	net weight	**B**	net force	**C**	net torque
67	Torque unit may be expressed in……					
	A	Ns^{-1}	**B**	$m\ s^{-1}$	**C**	N m
68	Two weights are balanced on a horizontal meter stick as shown in the figure. What is the value of unknown weight "W" ? 					
	A	20 N	**B**	30 N	**C**	40 N
69	The torques that tend to produce a **clockwise** rotation are taken to be ……					
	A	zero	**B**	positive	**C**	negative
70	The maximum torque is obtained when the force is applied at angle……between the force and the wrench.					
	A	$\theta=90^{\circ}$	**B**	$\theta=45^{\circ}$	**C**	$\theta= 30^{\circ}$

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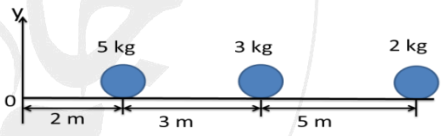
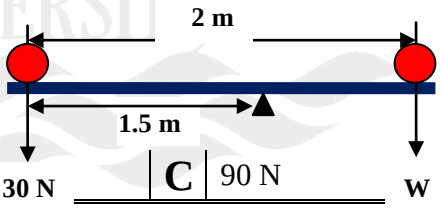
Ques. no.	Question.					
71	For two vectors A and B, if A x B = 0, this means that the angel between them is equal to……					
	A	30	**B**	90	**C**	0
72	The minimum torque is obtained when the force is applied …… to wrench					
	A	at angle θ=90°	**B**	at angle θ=45°	**C**	at angle θ=180°
73	A cyclist applies a downward force (F) of 200 N to the pedal of his bicycle of length 15 cm. The magnitude of maximum torque equals ……					
	A	0.075 Nm	**B**	13.33 Nm	**C**	30 Nm
74	For two vectors A and B, if A x B = AB, this means that the angel between them is equal to……					
	A	0°	**B**	30°	**C**	90°
75	If the three balls in the figure are located at 2,3 and 5 m from the origin, then the center of gravity is located at……..…from this origin 					
	A	1.5 m	**B**	3.5 m	**C**	4.5 m
76	Two weights are balanced on a horizontal meter stick as shown in the given figure. What is the value of the unknown weight "W"? 					
	A	22.5 N	**B**	45 N	**C**	90 N
77	A mechanic holds a wrench at 0.2 m from the center of a nut. How large is **the force** applied to the nut if he pulls at right angles to the wrench with a torque of 40 Nm?					
	A	100 N	**B**	200 N	**C**	400 N
78	For a rigid body to be in rotational equilibrium, the ……on it must be zero.					
	A	net force	**B**	net friction	**C**	net torque
79	The couple is a pair of forces with …….					
	A	equal magnitudes but opposite directions acting at the same line of action	**B**	equal magnitudes but opposite directions acting at different lines of action	**C**	different magnitudes but opposite directions acting at different lines of action
80	To be in equilibrium, an object will hang so that its suspension point is located …… the center of gravity.					
	A	at	**B**	beside	**C**	above

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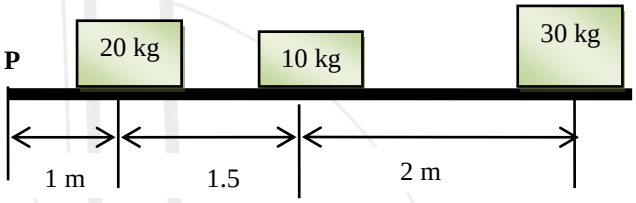
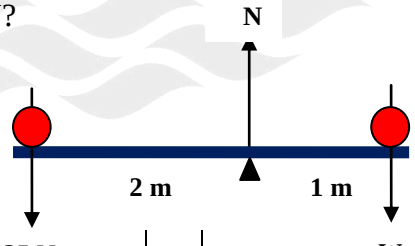
Ques. no.	Question
81	In the shown figure, the center of gravity is located at……m from the point P?  **A** 1.6 m **B** 2 m **C** 3 m
82	The geometrical center of uniformly symmetric object is located at its……. **A** center of mass **B** effective weight **C** center of gravity
83	The maximum torque is obtained when the force is applied at angle……to wrench. **A** $\theta=90^{\circ}$ **B** $\theta=45^{\circ}$ **C** $\theta=30^{\circ}$
84	A cyclist applies a downward force (F) of 200 N to the pedal of his bicycle of length 20 cm. The magnitude of maximum torque equals …… **A** 4000 Nm **B** 40 Nm **C** 1000 Nm
85	For two parallel vectors A = 5 and B= 2.5, the value of A x B is equal to…… **A** 0 **B** 0.5 **C** 2
86	If the system in the figure is in rotational equilibrium, where W_1 = 25 N and W_2 is unknown, what is the value of the normal force N?  **A** 25 N **B** 50 N **C** 75 N

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بنك الأسئلة في مقرر الفيزياء الطبية– المستوى الأول (161-تحض3)

Ques. no.	Question
87	An object will hang so that its point of suspension is locate……the center of gravity. **A** at **B** above **C** below
88	The center of gravity coincides with the center of mass: **A** always **B** if the body has a uniform distribution of mass **C** if the acceleration due to gravity is uniform over the body
89	In the formula $F = Gm_1m_2/r^2$, the quantity G: **A** is used only when earth is one of the two masses **B** is a universal gravitational constant **C** is greatest at the surface of earth
90	An object at the surface of earth (at a distance R from the center of earth) weighs 90 N. Its weight at a distance 3R from the center of earth becomes: **A** 10 N **B** 30 N **C** 270 N

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بنك الأسئلة في مقرر الفيزياء الطبية– المستوى الأول (161-تحض3)

Chapter 11
Thermodynamics

Ques. no.	Question					
91	The energy content per unit mass has a unit of……					
	A	kJ s^{-1}	**B**	kJ $litre^{-1}$	**A**	kJ g^{-1}
92	The basal metabolic rate is the rate of energy consumption for a person while……					
	A	sleeping	**B**	sitting upright	**A**	resting but awake
93	How much internal energy is used by a 70-kg man when bicycling for 2 hours? (the metabolic rate per unit mass for bicycling =7.6 Wkg^{-1})					
	A	3830.4 kJ	**B**	957.4 kJ	**C**	504.4 kJ
94	The efficiency of food utilization is the ratio between the rate at which ……is done and the difference in actual and basal metabolic rates.					
	A	thermal energy	**B**	mechanical work	**C**	internal energy
95	When a gas at a constant pressure P expands by an amount ΔV, the work done by the system is.....…....					
	A	P-ΔV	**B**	P/ΔV	**C**	PΔV
96	A gas does work in an isobaric process at p = $5x10^5$ Pa. If the initial volume of the gas is 6 x 10^{-2} m^3 and the final volume is 2 x 10^{-2} m^3, the work done on the gas is equal to…….					
	A	20 k J	**B**	15 k J	**C**	-20 k J
97	The equation of state for an ideal gas is given by…….					
	A	PV=nR	**B**	PV=nKT	**C**	PV=nRT
98	The internal energy of the ideal gas depends only on the …….					
	A	temperature	**B**	volume	**C**	pressure
99	At constant volume, the heat added to a system is equal to ……					
	A	the heat capacity of the system	**B**	the work done by the system	**C**	the change in internal energy of the system
100	If heat is added to a system and some work is done by the system, the difference between these quantities is called……					
	A	external energy	**B**	kinetic energy	**C**	internal energy

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Ques. no.	Question
101	The change in internal energy of the system when 1500 J of heat leaves it and 400 J of work is done on it is equal to…… **A** 1900 J **B** -1100 J **C** -1900 J
102	A man consumes 80 liters h^{-1} of oxygen, and the energy equivalent of the oxygen is 20.2 kJ $litre^{-1}$. Calculate the rate of internal energy change? **A** 400 kJ h^{-1} **B** 1616 kJ h^{-1} **C** 3.96 kJ h^{-1}
103	The ……is defined as the ratio of the energy released divided by the mass. **A** energy consumed **B** energy content per unit mass **C** energy equivalent of oxygen
104	The rate of change of internal energy can be measured accurately by observing the rate at which a person uses……in converting food into energy and waste materials. **A** water **B** sugar **C** oxygen
105	The basal metabolic rate per unit mass of 20 year old woman is ……. **A** 1.2 W kg^{-1} **B** 1.1 W kg^{-1} **C** 1.0 W kg^{-1}
106	The change in internal energy of the system when 1500 J of heat enter it and 400 J of work is done on it is equal to…… **A** 1900 J **B** -1900 J **C** -1100 J
107	The basal metabolic rate of 60 kg woman is ……. **A** 60 W **B** 66 W **C** 72 W
108	……..is the rate of energy consumption while resting but awake. **A** heat transfer rate **B** Basal metabolic rate **C** Metabolic rate
109	At constant volume the work done is…….. **A** positive **B** negative **C** zero
110	In an isometric process, there is no change in the…….. **A** temperature **B** pressure. **C** volume

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بنك الأسئلة في مقرر الفيزياء الطبية– المستوى الأول (161-تحض3)

Chapter 12

Thermal properties of matter

Ques. no.	Question Ques.					
111	The ……is the ratio between the heat transferred to temperature change.					
	A	work	**B**	heat capacity	**C**	internal energy
112	For ideal monatomic gas, the difference c_P-c_V is equal to……					
	A	5/2 R	**B**	R	**C**	3/2 R
113	For ideal monatomic gas, the molar heat capacity at constant volume C_v is equal to…….					
	A	1/2 R	**B**	3/2 R	**C**	5/2 R
114	For ideal monatomic gas, the molar heat capacity at constant pressure C_P can be written as……					
	A	C_v + 2R	**B**	C_v + R	**C**	C_v – R
115	For ideal monatomic gas, the molar heat capacity at constant pressure C_p is equal to……					
	A	R	**B**	3/2 R	**C**	5/2 R
116	The specific heat capacity, c, is equal to the heat capacity, C, divided by ……					
	A	The temperature different, Δ□	**B**	The number of moles, n	**C**	The mass of one mole, M
117	The calorimeter is used to measure ……					
	A	The thermal energy	**B**	The temperature	**C**	The heat capacity
118	At constant volume, the heat added is equal to the ……					
	A	heat capacity	**B**	The change of internal energy	**C**	specific heat capacity
119	The ratio of the molar heat capacity of an ideal gas at constant volume C_v to its molar heat capacity at constant pressure C_p (i.e C_v / C_p) for monatomic gases is equal to……					
	A	1.00	**B**	0. 60	**C**	1.66
120	The heat capacity is measured by using……..					
	A	Thermometer	**B**	calorimeter	**C**	parometer

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بنك الأسئلة في مقرر الفيزياء الطبية– المستوى الأول (161-تحض3)

Ques. no.	Question.
121	The specific heat capacity can be given as…….. **A** 1/m ΔQ ΔT **B** ΔQ/ m ΔT **C** m ΔQ /ΔT
122	The ratio of the heat added to 1 mole of a substance to the temperature change is called the ……. **A** specific heat capacity **B** internal energy **C** molar heat capacity
123	The transition from one phase to another is called…… **A** Phase diagram **B** phase change **C** critical point
124	Metals have ……specific heat capacity as compared with that of insulators. **A** equal **B** low **C** high
125	……. point is the point at which the three phases are existed together **A** freezing **B** triple **C** melting
126	……. point is the point at which a kilogram of liquid and kilogram of gas have the same volume and the distinction between the two phases vanishes **A** freezing **B** triple **C** critical
127	The transition from solid to liquid phase is called …… **A** vaporization **B** melting **C** sublimation
128	The transition from liquid to solid phase is called …… **A** condensation **B** melting **C** freezing
129	The transition from liquid to gas phase is called …… **A** vaporization **B** melting **C** condensation
130	The transition from gas to liquid phase is called …… **A** vaporization **B** condensation **C** melting

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Ques. no.	Question					
131	The transition from solid to gas phase is called ……					
	A	deposition	**B**	sublimation	**C**	vaporization
132	The transition from gas to solid to phase is called ……					
	A	deposition	**B**	vaporization	**C**	sublimation
133	How much a heat is required to melt 100 g of ice at 0 ^{o}C (L_f = 333 kJ kg^{-1})?					
	A	333 kJ	**B**	33.3 kJ	**C**	3.33 kJ
134	The ……..is the energy absorbed or liberated in phase change					
	A	heat energy	**B**	latent heat	**C**	internal energy
135	Transfer of heat by conduction can be described by the following relation:					
	A	$H = e\sigma A T^4$	**B**	$H = k A \frac{\Delta T}{L}$	**C**	$H = q A \Delta T$
136	The rate of heat loss by conduction has a unit of……					
	A	Kelven	**B**	Joule (J)	**C**	Watt (W)
137	Thermal conductivity constant, k, has the unit of……					
	A	m K^{-1}	**B**	W m^{-2} K^{-1}	**C**	W m^{-1} K^{-1}
138	The transfer of heat from one place to another by the actual movement of material is called ……					
	A	conduction	**B**	convection	**C**	absorption
139	In a warm room, a naked person has a skin temperature of 35°C. If the room temperature is 29 °C and the surface area is 1.5 m^2. What is the rate of heat loss due to convection? (q=7.1 W/m^{2}K)					
	A	42.6 W	**B**	53.9 W	**C**	63.9 W
140	The rate of heat loss by convection has a unit of……					
	A	Kelvin	**B**	W m^{-2} K^{-1}	**C**	Watt (W)

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Ques. no.	Question.					
141	In a room of 29 °C temperature, a naked resting person of 1.5 m^2 surface area and has a skin temperature of 37 °C, the rate of heat loss by convection is equal to…… (using q=7.1 $Wm^{-2}K^{-1}$).					
	A	1.69 W	**B**	56.8 W	**C**	85.20 W
142	Transfer of heat by convection can be described by the following relation:					
	A	$H = e\sigma A T^4$	**B**	$H = q A \Delta T$	**C**	$H = e\sigma A T$
143	Transfer of heat by radiation can be described by the following relation:					
	A	$H = e\sigma A T^4$	**B**	$H = k A \frac{\Delta T}{L}$	**C**	$H = q A \Delta T$
144	The transfer of heat by……..…does not require the presence of any medium (solid, liquid and gas).					
	A	conduction	**B**	radiation	**C**	convection
145	Stefan's law describes the fact that the rate of heat loss through radiation is proportional to the ……power of the temperature.					
	A	first	**B**	second	**C**	fourth
146	32. The object of 345 K temperature at the surface has the wave length of maximum radiation λ_{max} equals to……. (Wien's displacement constant B = 2.898 $\times 10^{-3}$ m K)					
	A	1.19 $\times 10^5$ m	**B**	84 $\times 10^{-7}$ m	**C**	84 $\times 10^{-4}$ m
147	The rate at which heat energy radiates, H, from a surface of area A and temperature T is proportional to ……					
	A	$A \Delta T$	**B**	$A \Delta T^4$	**C**	$A T^4$
148	The star of 6000 K temperature at the surface. What is the wavelength (λ_{max}) at which the radiation is most intense? (Wien's displacement constant B = 2.898 $\times 10^{-3}$ m K)					
	A	9.66 $\times 10^{-8}$ m	**B**	4.83 $\times 10^{-7}$ m	**C**	1.04 $\times 10^5$ m
149	The emitted radiation from the human body is most intense at the wavelength (λ_{max}) in the range of …… spectrum.					
	A	ultraviolet	**B**	infrared	**C**	visible
150	What is the rate of heat loss due to radiation for a motor car of 350 k surface temperature and 0.5 m^2 surface area ? (Using e=1 and σ =5.67 x $10^{-8} Wm^{-2}k^{-4}$)					
	A	9.92 x10^{-6} W	**B**	3.47 x10^{-3} W	**C**	425.4 W

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Ques. no.	Question					
151	The emissivity of the black body is near……because it is a perfect emitter.					
	A	-1	**B**	0	**C**	1
152	The inner core of the body can be kept warm in a cold environment because body tissues are……					
	A	good conductor	**B**	poor conductors	**C**	good insulators
153	What is the rate of heat loss due to radiation for a body of skin temperature of 310 k and surface area of 1.5 m^2? (Using e=1 and σ =5.67 x $10^{-8}Wm^{-2}k^{-4}$)					
	A	2.64 x10^{-5} W	**B**	2.533 W	**C**	785 W
154	Insulators have ……heat capacity as compared with that of metals					
	A	equal	**B**	low	**C**	high
155	The rate of heat loss by radiation has a unit of……					
	A	Kelvin	**B**	Joule (J)	**C**	Watt (W)
156	If 4 kJ of heat are required to increase the temperature of a body by 50 K. The value of heat capacity in Joule/Kelvin is ……..					
	A	200000	**B**	0.08	**C**	80
157	The addition of 90 kJ of heat energy to 0.6 kg metal increases its temperature from 20° C to 40° C. what is the specific heat capacity of this metal in kJ kg^{-1} K^{-1}?					
	A	7.5	**B**	2.7	**C**	0.133
158	The transfer of heat by the motion of the fluid itself is called……..					
	A	conduction	**B**	convection	**C**	radiation
159	The unit of Stefan's constant, σ, is ……..					
	A	W m^{-1} K^{-1}	**B**	W m^{-2} K^{-4}	**C**	W m^{-2} K^{-1}
160	In the equation **H = q A ΔT**, q is called ……..					
	A	Convective heat transfer constant	**B**	rate of heat loss	**C**	thermal conductivity constant

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Chapter 23
Wave Properties of Light

Ques. no.	Question Ques.
161	In the total internal reflection, the critical angle φ_c can be determined from the equation……., where n_1 and n_2 the indices of first and second medium, respectively. **A** $\varphi_c = \sin^{-1}(n_2 / n_1)$ **B** $\varphi_c = \sin^{-1}(n_1 / n_2)$ **C** $\varphi_c = \sin(n_1 / n_2)$
162	In the total internal reflection, the critical angle can be found from Snell's law by setting the sin of the angle of refraction (sin φ) equal …… **A** 0 **B** 1 **C** 90
163	If the ray is incident from air to a glass, it refracted and goes from the glass to air again, the angle of emerge equal …….. **A** the critical angle **B** the angle of incidence **C** the angle of reflection
164	In comparing two media, the one with the larger ……is said to be optically denser. **A** refractive index **B** wavelength **C** frequency
165	In a material medium, the velocity of light depends on the frequency of the wave, but it is never ……the velocity of light in a vacuum **A** greater than **B** smaller than **C** equal
166	The refractive index of a medium must be ……one. **A** greater than **B** smaller than **C** equal to
167	Light travels in a vacuum going into glass with a refractive index (n=1.7). What is the velocity of light in the glass? (The speed of light in vacuum $c = 3 \times 10^8$ m s^{-1}) **A** 2×10^8 m s^{-1} **B** 1.85×10^8 m s^{-1} **C** 1.76×10^8 m s^{-1}
168	Light with a wavelength of 700 nm in air (n_1=1) enters a glass (n_2=1.6). What is the wavelength in the glass? **A** 535.5 nm **B** 437.5 nm **C** 1120 nm
169	When light strikes a surface such as a sheet of paper with random irregularities, the reflected light travels in all directions, this is called…… **A** specular refraction **B** diffuse refraction **C** diffuse reflection
170	A ray bends …….. the normal when it enters an optically **denser** medium. **A** away from **B** towards **C** parallel to

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Ques. no.	Question Ques.					
171	A beam of light is incident from air (n_1 = 1) on water (n_2 = 4/3) at angle of incidence = 30^0, the angle of refraction is ……					
	A	25^0	**B**	22^0	**C**	20^0
172	What fraction of light intensity is reflected (R) when light is normally incident in air (n_1=1) on a glass (n_2=1.73)?					
	A	0.04	**B**	0.07	**C**	0.14
173	If the reflectance (R) of a surface is 0.08, its transmittance (T) will be …….					
	A	0.98	**B**	0.92	**C**	0.02
174	The critical angle between glass (n=1.5) and water (n=1.33) is equal to					
	A	42.45°	**B**	62.45°	**C**	72.45°
175	In diffuse reflection, the reflected light travels in…….					
	A	all directions	**B**	a particular direction	**C**	a parallel direction
176	If λ_1 and λ_2 are the wavelengths of a light wave in media with refractive indices n_1 and n_2 respectively, λ_2 is equal to:					
	A	$\lambda_2 = (n_2/ n_1)\ \lambda_1$	**B**	$\lambda_2 = (n_1/ n_2)\ \lambda_1$	**C**	$\lambda_2 = (n_2 . n1)\ \lambda_1$
177	The wavelength of a beam of light ……when it goes from diamond (n=2.417) into glass (n=1.5)					
	A	increases	**B**	decreases	**C**	remains constant
178	The frequency of light wave is determined by its…….and is unaffected by the medium.					
	A	velocity	**B**	source	**C**	refractive index
179	If the index of refraction is 2, the speed of light *v* is …….times the speed in vacuum *c*.					
	A	quarter	**B**	half	**C**	double
180	At grazing incidence (ϕ=90°), the reflectance R is equal to …….					
	A	1	**B**	100	**C**	0

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Chapter 24
Mirrors, Lenses and Human Eye

Ques. no.	Question					
181	The accommodation power of the eye ……...…. with aging.					
	A	increases	**B**	decreases	**C**	does not change
182	The near point for a person with normal vision is……...…					
	A	0.02 m	**B**	0.25 m	**C**	∞
183	The ability of the eye lens to adjust its focal length is called the ……...….					
	A	accommodation.	**B**	ciliary muscles.	**C**	persbyopia
184	In hypermetropia, light from an object close to the eye is focused……...….					
	A	in front of retina	**B**	behind the retina	**C**	beside the retina
185	A nearsighted man has a far point at a distance of 2.5 m. What power glasses does he require to correct the vision?					
	A	+0.4 diopters	**B**	-0.4 diopters	**C**	-0.6 diopters
186	To correct the defect of hypermetropia (farsightedness), a ……...…. lens is used					
	A	diverging.	**B**	bifocal	**C**	converging
187	A person cannot simultaneously focus on both horizontal and vertical lines, this optical defect of his eye is called……..					
	A	astigmatism	**B**	presbyopia	**C**	hypermetropia
188	A woman has her near point 1 m from her eyes. What power glasses does she require to correct the vision?					
	A	-3 diopters	**B**	+3 diopters	**C**	-2.5 diopters
189	Astigmatism can be corrected by using ……...…. lenses.					
	A	convex	**B**	bifocal	**C**	cylindrical
190	To correct the defect of presbyopia, a ……...…. lens is used.					
	A	cylindrical	**B**	bifocal	**C**	biconvex

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Ques. no.	Question
191	To correct the defect of myopia, a ……..…. lens is used **A** cylindrical **B** diverging **C** converging
192	A nearsighted person has a far point (x_f) 1 m from the eye with accommodation power equal to 4. What is his near point (x_n) from the eye? (D= 0.02 m) **A** 0.16 m **B** 0.20 m **C** 0.25 m
193	A nearsighted man has a far point at a distance of 3 m. What power glasses does he require to correct the vision? **A** -0.33 diopters **B** +0.33 diopters **C** -3.66 diopters
194	A woman has her near point 1.56 m from her eyes. What power glasses does she require to bring her near point to 0.25 m from her eyes? + 1.36 diopter **A** - 3.36 diopter **B** + 3.36 diopter **C** + 1.36 diopter
195	The far point for a person with normal vision is…….. **A** 25 cm **B** 0 **C** ∞
196	The power of lenses and mirrors has a unit of diopter, which has a dimension of ……. **A** m **B** cm^{-1} **C** m^{-1}
197	What is the power of a concave mirror has a radius of curvature equal to 20 cm? **A** 20 diopter **B** 10 diopter **C** 5 diopter
198	A lens has the object distance equal to 25 cm when the image distance equal to 100 cm. what is the focal length of this lens? **A** 5cm **B** 20cm **C** 25cm
199	Find the accommodation power (A) for a farsighted woman has a near point (x_n) equal to 0.4 m and far point (x_f) equal to 2 m? (D= 0.02 m) **A** 1 diopter **B** 2 diopter **C** 3 diopter
200	In far vision, the ciliary muscles are relaxed, and then the power of the eye is becomes…….. **A** zero **B** large **C** small

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