

# FUTA post-UTME past questions

*Technology for Self Reliance*

## Physics Questions

- A boy runs 100 m due north and then 100 m due east. What is his displacement?  
A. 200m 45oE      B. 10,000m 45oE  
C. 200m 45oN      D. 100 2m 45oN
- The speed of an air force jet was 400 m/s when it flew past an anti-aircraft gun. Calculate its distance from the gun 4 s later when the gun was fired  
A. 100 m      B. 1600 m  
C      D. 1600 km
- A mango fruit dropped to the ground from the top of a tree 40 m tall. Find how long it takes the fruit to reach the ground if acceleration due to gravity  $g = 10 \text{ m/s}^2$   
A. 2 s      B. 80 s  
C 4 s      D. 2 s
- A 0.1-m long elastic band extends 5 mm when a load of 80 N is hung from its end. Calculate the strain on the band  
A. 5 B. 0.5 C. 0.05 D.16
- Which of the following statements describes what happened when an ice block that floats in a glass of water that is filled to the brim melts?  
A. The level of the water remains the same.  
B. There is a drop in the level of water in the glass due to condensation on its outside.  
C. The water in the glass overflows  
D. The water level drops because melted ice occupies less volume.
- A machine with a mass of 4 kg fires a 45 g bullet at a speed of 100 m/s. Find the recoil speed of the machine gun.  
A. 1.1 m/s B. 2 m/s C. 3.5m/s D. 0 m/s
- Which of the following would you use to determine the weight of an object?  
A. chemical balance    B. beam balance  
C. spring balance    D. weight balance
- The force that causes an object to move in a circular path is called  
A. centrifugal force    B. centripetal force  
C. centre-seeking force    D. none of the above
- A solid suspended by a piece of string is completely immersed in water. On attempting to lift the solid out of the water, the string breaks when the solid is partly out of the water. This is because  
A. the tension in the string decreases as the solid is lifted  
B. the mass of the solid has increase  
C. the solid apparently weighs less when completely immersed in water than when partially immersed  
D. part of the solid still in water is exerting more force on the string
- The following statements were made by some students describing what happened during an experiment to determine the melting point of solids  
i. The temperature of the solid was constant until melting started  
ii. The temperature of the solid rose until melting started  
iii. During melting, the temperature was rising  
iv. During melting, the temperature was constant  
v. The temperature continued to rise after all the solid had melted  
vi. temperature stopped rising after the solid had melted  
which of the following gives correct statements in the right order?

- A. 2, 4 and 5                      B. 2, 3 and 6  
C. 1, 3 and 6                      D. 1, 3 and 5
11. When some grains of table salt were put in a cup of cold water, kept at constant temperature and left undisturbed, all the water tasted salty after some time. This is due to  
A. capillarity                      B. surface tension  
C. mixing                          D. diffusion
12. Given that the latent heat of fusion of ice is 80 cal/g, how much heat will change 100 g of ice at 0°C into water at the same temperature?  
A. 8 kcal                      B. 8 cal                      C. 800 cal  
D. 8000 kcal
13. A blacksmith dropped a 1.5 kg iron bead at 300°C into some quantity of water. If the temperature of the water rose from 15°C to 18°C, what is the mass of the water assuming no heat is lost to the surrounding? (Take the specific heat of iron as 0.46 J kg<sup>-1</sup> C<sup>-1</sup> and that of water as 4.2x10<sup>3</sup> J kg<sup>-1</sup> C<sup>-1</sup>)  
A. 15.44 kg                      B. 194.58 g                      C. 15.44 g  
D. 194.58 kg
14. Which of the following properties are not those of a suitable thermometric liquid?  
I. It should be a good conductor of heat  
II. It should be opaque  
III Its expansion should be regular  
IV. It should wet glass  
V It should have a high melting point and low boiling point  
A. I and II                      B. II and III  
C. III and IV                      D. IV and V
15. A gas at pressure P1 N/m<sup>2</sup> and temperature 30°C is heated to 61°C at constant volume. Find its new pressure.  
A. 1.1 N/m<sup>2</sup>                      B. 1.2 P1 N/m<sup>2</sup>  
C. 1.01 P1 N/m<sup>2</sup>                      D. 1.1 P1 N/m<sup>2</sup>
16. A steel bar has a width of 10 cm at 50°C At what temperature will it fit exactly into a hole of constant width 10.005 cm if coefficient of linear expansion of steel is 11x10<sup>-6</sup> C<sup>-1</sup>?  
A. 75°C                      B. 0.005°C                      C. 75.5°C                      D. -75.5°C
17. The amount of heat that is required to raise the temperature of unit mass of a substance one degree Celsius is called  
A. Heat capacity                      B. thermal capacity  
C. Specific heat                      D. Heat energy
18. Two lamps rated 60 W and 240 V each are connected in series. What is the total power dissipated in both?  
A. 30 W                      B. 60 W                      C. 90 W                      D. 120W
19. Three 3 resistors connected in parallel have a potential difference of 24 V applied across the combination. What is the current in each resistor?  
A. 8A                      B. 3A                      C. 24 A                      D. 4 A
20. If PHCN charges 25 k per kWh, find the cost of operating for 36 hours a lamp requiring 1.5 A on a 240 V line.  
A. N324                      B. N32.4                      C. N3.24                      D. N0.324
21. In order to convert a galvanometer to a voltmeter A. a low resistance shunt is connected in parallel B. a low resistance shunt is connected in series C. a high resistance multiplier is connected in parallel  
D. a high resistance multiplier is connected in series



22. Which of the following is not applicable to an ac generator?  
A. Armature                      B. Commutator  
C. Field magnet                D. Slip rings
23. A potential difference of 5 V is used to produce a current of 4 A for 4 hours through a heating coil. What is the heat produced?  
A. 80 J   B. 4.8 kJ   C. 20 J   D. 4800 kJ
24. Determine the absolute temperature at which the Fahrenheit temperature is twice the Celsius temperature.  
A. 299.82K   B. 433.15K  
C. 273.25K   D. 406.35K
25. Which of the following law forms the basis of the thermometry?  
A. Charles' and Gay-Lussac's law  
B. First law of thermodynamics  
C. Boyle's and pressure law  
D. Zeroth law of thermodynamics
26. A 500m long aluminium chair expands when it was placed in the sun. Its temperature increases from 20°C to 60°C Determine its new length. [ $\alpha = 2.30 \times 10^{-5} \text{K}^{-1}$ ].  
A. 500.46m   B. 456.65m  
C. 540.28m   D. 460.32m
27. An electric heater which produces 900 W of power is used to vaporize water. How much water at 100°C can be changed to steam in 3 mins by the heater? [Heat of vaporization =  $2.26 \times 10^6 \text{ J/kg}$ , Specific heat capacity of water =  $4.2 \times 10^3 \text{ J/kg. K}$ ]  
A. 0.0226 kg                      B. 0.275 kg  
C. 0.072 kg                        D. 0.167 kg
28. The amount of heat required to produce unit temperature rise in a substance is called:  
A. Latent heat   B. Heat capacity
- C. Specific heat capacity  
D. Specific latent heat
29. An ideal gas has a volume 100 cm<sup>3</sup> at  $1 \times 10^5 \text{ Pa}$  and 27°C What is its volume at  $2 \times 10^5 \text{ Pa}$  and 60°C?  
A. 42.5 cm<sup>3</sup>                      B. 55.5 cm<sup>3</sup>  
C. 50.2 cm<sup>3</sup>                      D. 40.5 cm<sup>3</sup>
30. Which of the following thermometer can be used to measure high temperature up to 1000°C?  
A. Electrical thermometer   B. Pyrometer  
C. Bimetal thermometer  
D. Thermoelectric thermometer
31. 4000 J of heat is applied to a 1.5 kg silver pendant initially at temperature of 150°C Determine its final temperature [Latent heat =  $336 \text{ Jkg}^{-1}$ , specific heat capacity =  $233 \text{ J/kg. K}$ ].  
A. 26.4°C                        B. 38.4°C  
C. 41.5°C                        D. 15.5°C
32. The specific heat capacity of a substance depends on all the following except:  
A. Mass of the substance  
B. Change in temperature  
C. Surface area of the substance  
D. Energy needed
33. Which of the following quantities is a vector?  
A. Mass   B. Velocity   C. Distance   D. Speed
34. A hose ejects water at 80 cl/s through a hole 2 mm in diameter. The water impinges on a wall and drops off without rebounding. What is the force on the wall?  
A. 2.04 N   B. 240.0 N   C. 20.4 N   D. 24.0 N
35. A train travelling at 72 km/h undergoes a uniform retardation of 2 m/s when brakes are applied Find the distance travelled from the place where the brakes were applied

- A. 10 m B. 50 m C. 100 m D. 250 m
36. A force of 200 N pulls a sledge of mass 50 kg and overcomes a constant frictional force of 40 N. What is the acceleration of the sledge?  
A. 4.0 m/s B. 50 m/s C. 4.5 m/s D. 3.2 m/s
37. An object A of mass 2 kg is moving with a velocity of 3 m/s and collides head-on with another object B of mass 1kg moving in the opposite direction with a velocity of 4 m/s. Assuming the objects move off together after collision, calculate their common velocity.  
A. 0.67 m/s B. 0.50 m/s  
C. 0.35 m/s D. 0.55 m/s
38. In elastic collision, which of the following quantities is conserved?  
A. Kinetic energy B. Potential energy  
C. Activation energy D. Conservation energy
39. A weight of 20 N hangs from a fixed point by a light inextensible string. It is pulled aside by a horizontal force with the string inclined at an angle of  $30^\circ$  to the vertical. The tension in the string is  
A. 11 N B. 40 N C. 5 N D. 30 N
40. A stone of mass 50 kg released from a height of 2 m above the ground. If the stone falls freely to a height of 5 m above the ground, its velocity is  
A. 19.6 m/s B. 49.0 m/s C. 17.15 m/s  
D. 39.2 m/s
41. Calculate the kinetic energy of a trolley of mass 40 kg moving with a velocity 0.5 m/s  
A. 20 J B. 5 J C. 15 J <C> 10 J
42. A car of mass 500 kg accelerates from rest at  $1 \text{ m/s}^2$ . What is the total distance covered in 1 minute?  
A. 2000 m B. 3600 m C. 1800 m D. 2400 m
43. Niagara falls are 50 m high. Calculate the potential energy of 0.1 cubic meter of water at the top relative to the bottom. Density of water is  $1000 \text{ kg m}^{-3}$ .  
Take  $g = 10 \text{ m/s}^2$   
A. 48 kJ B. 50 kJ C. 51 kJ D. 61 kJ
44. A bullet of mass 15 g is fired from a rifle with a velocity 100 m/s. If the mass of the rifle is 1 kg. What is the recoil velocity of the rifle?  
A. 1.5 m/s B. 1.8 m/s C. 1.2 m/s D. 2.1 m/s
45. A ball is thrown vertically upwards with a velocity of 30 m/s. Find the greatest height attained  
A. 40 m B. 50 m C. 55 m D. 45 m
46. The tension in a rope pulling a log is 100 N, the mass of the log is 50 kg and the frictional force on the log is 20 N. What is the acceleration of the log?  
A.  $2 \text{ m/s}^2$  B.  $1.6 \text{ m/s}^2$  C.  $1.8 \text{ m/s}^2$  D.  $2.2 \text{ m/s}^2$
47. A body of mass 1 kg falls freely from rest through a height of 150 m. Calculate the velocity of the body when it strikes the floor ( $g=10 \text{ m/s}^2$ ).  
A. 54.8 m/s B. 45.2 m/s C. 38.7 m/s D. 65.8 m/s
- 48.. A car moving with a velocity of 16 m/s accelerates uniformly at the rate of  $1 \text{ m/s}^2$  to reach a velocity of 20 m/s. Find the distance covered  
A. 85 m B. 75 m C. 82 m D. 72 m
49. An athlete runs 100 m in 12 s. What is his speed in km/h?  
A. 33 km/h B. 36 km/h  
C. 30 km/h D. 27 km/h
50. Which of the following statements best describes the specific heat capacity of a substance?  
A. The quantity of heat required to produce a unit temperature rise;  
B. The random kinetic energy of the particles composing a system;



- C. The quantity of heat required to change the temperature of a unit mass of the substance by one degree;  
 D. The quantity of heat required to vaporise a unit mass of the substance at constant temperature.
51. Determine the temperature whose Fahrenheit and Kelvin scales have the same reading to the nearest degree.  
 A. 273K B. 300K C. 500K D. > 574K
52. The SI unit of specific heat capacity of a substance is:  
 A.  $\text{JK}^{-1}$  B.  $\text{Jkg}^{-1}\text{K}^{-1}$  C. Joules D.  $\text{Cal/g}^{\circ}\text{C}$
53. The density of nitrogen at standard temperature and pressure is  $1.251 \text{ kgm}^{-3}$ . Calculate the root mean square velocity of nitrogen molecules.  
 A. 240 m/s B.  $1 \times 10^4$  m/s C. 340 m/s  
 D. 493 m/s
54. A malaria patient has a body temperature of  $98.6^{\circ}\text{F}$ . What is this temperature on the Celsius scale?  
 A.  $37^{\circ}\text{C}$  B.  $20^{\circ}\text{C}$  C.  $32^{\circ}\text{C}$  D.  $35^{\circ}\text{C}$
55. A thermos bottle containing 250 g of coffee at  $90^{\circ}\text{C}$  is added with a 20 g of milk at  $5^{\circ}\text{C}$ . After thorough mixing, what is the final temperature?  $c$  for water, coffee and milk is  $1.00 \text{ Cal/g}^{\circ}\text{C}$   
 A.  $84^{\circ}\text{C}$  B.  $84^{\circ}\text{K}$  C.  $84^{\circ}\text{F}$  D.  $55^{\circ}\text{C}$
56. Determine the temperature  $T_f$  that results when 150 g of ice at  $0^{\circ}\text{C}$  is mixed with 300 g of water at  $50^{\circ}\text{C}$ .  
 A.  $67^{\circ}\text{C}$  B.  $6.7^{\circ}\text{C}$  C.  $48^{\circ}\text{C}$  D.  $80^{\circ}\text{C}$
57. The only mode of heat energy transfer that needs no material medium is:  
 A. Convection B. Radiation  
 C. Conduction D. Thermal conduction
58. When heat energy is added to a system which of the following observations usually occur:  
 (I) The internal energy of the system increases;  
 (II) Work may be done on the surroundings;  
 (III) The volume of system is directly proportional to the temperature.  
 A. I and II only B. I, II and III C. III only  
 D. None of the above.
59. The transfer of heat energy from one part of a body to another part without the actual movement of any part of the body is called convection.  
 A. True B. False C. Neither true nor false  
 D. I cannot tell.
- 60.. Which of the following quantities are scalars?  
 I. Mass II. Work III. force IV. Magnetic flux  
 A. II and III only B. I and II only  
 C. IV only D. I and IV only
61. A force  $(15i - 16j + 27k)\text{N}$  is added to a force  $(23j - 40k)\text{N}$ . What is the magnitude of the resultant?  
 A. 17N B. 28N C. 63N D. 21N
62. Which of the following statements is/are correct about an object in equilibrium under parallel forces?  
 I. The total force in one direction equals the total force in the opposite direction.  
 II. The body must not rotate.  
 III The resolved components along the x-axis equals the resolved components along the y-axis.  
 A. I and II only B. I, II and III  
 C. II and III only D. I and III only.
63. A car moving with a speed of 90 km/h was brought to rest in 10 s by the application of the brakes. How far did the car travel after the brakes were applied  
 A. 150 m B. 15 m C. 250 m D. 125 m
64. A metre rule is found to balance at the 48 cm mark. When a body of mass 60 g is suspended at the 6 cm mark, the balance point is found to be at the 30 cm



mark. Find the mass of the metre rule.

A. 60 g B. 360 g C. 80 g D. 180 g.

65. A ball of mass 0.1 kg moving with a horizontal velocity of 15 m/s is shot into a wooden block of mass 0.4 kg lying at rest on a smooth horizontal surface. Find their common velocity after impact. A 15.0 m/s B. 3.8 m/s C. 7.5 m/s D.. 3.0 m/s
66. A body of mass 2 kg moves velocity of 10 m/s. Neglecting air resistance, determine the kinetic energy of the body.  
A. 200 N B. 200 J C. 100 J D. 100 N
67. Three forces of magnitude 15 N, 10 N and 5 N act on a particle in the direction which make  $120^\circ$  with one another. Find the resultant and the angle the resultant makes with the x-axis.  
A. 8.66 N,  $30^\circ$  B. 4.33 N,  $60^\circ$   
C. 7.4 N,  $45^\circ$  D. 2.52 N,  $60^\circ$
68. Which of the following statements best defines a couple?  
A. Two parallel and opposite forces acting on one another.  
B. Two equal forces acting in the same direction.  
C. Two parallel and opposite forces acting on a body whose lines of action do not coincide  
D. None of the above.
69. A force  $F = (5i + 3j)$ N acts on a body and causes a displacement  $r = (7i - j)$ m. Determine the work done.  
A. 53 J B. 32 J C. 35 J D. 21 J.
70. A force of 0.6 N acts on a body of mass 40 g, initially at rest. What is the resulting acceleration? A. 35 m/s<sup>2</sup> B. 40 m/s<sup>2</sup> C. 15 m/s<sup>2</sup> D. 25 m/s<sup>2</sup>
71. Which of the following statements is not correct about stable equilibrium?  
A. the body returns to its original position when it is slightly displaced and released  
B. a slight displacement raises its centre of gravity.  
C. a slight displacement lowers its centre of gravity.  
D. a slight displacement does not raise or lower its centre of gravity.
72. A body is projected vertically upwards with a velocity of 9.78 m/s. How high does it travel before it comes to rest momentarily at the top of its motion?. ( $g = 9.78 \text{ m/s}^2$ )  
A. 2.45 m B. 4.89 m C. 6.89 m D. 9.78 m
73. Calculate the time taken for a car to cover a distance of 125 m if the initial speed is 5 m/s and it has a constant acceleration of  $1.5 \text{ m/s}^2$   
A. 8 s B. 10 s C. 15 s D. 12 s
74. Calculate the braking force to bring a body of mass 1 kg to rest from 25 m/s on a level ground in 60 m with uniform retardation.  
A. 5.2 N B. 5.5 N C. 5.6 N D. 5.0 N
75. A drop hammer is lifted to a height of 50 m above the ground and then allowed to fall from rest on to a forging at ground level. Calculate the downward velocity of the hammer when it strikes the forging. ( $g=10 \text{ m/s}^2$ )  
A .10.95 m/s B. 25.8 m/s C. 31.6 m/s D. 35.5 m/s
76. A uniform rod of weight 10 N is balanced at a point 75 cm from the end B The pivot is removed to point 30 cm from A What force must be applied at A to balance the rod horizontally?  
A. 25 N B. 10 N C. 30 N D. 15 N
77. An equilateral triangular lamina has each side equal to 50 cm. How far is the centre of gravity

from each vertex?

- A. 34.64 cm B. 33.3 cm C. 36.9 cm  
D. 28.9 cm

78. A man can row a boat at 13 m/s in still water. If he aims at crossing to the opposite bank of a river flowing at 5 m/s, at what angle to the bank of the river must he row the boat?  
A. 67.4° B. 21° C. 56.8° D. 22.6°
79. The lower and upper fixed points of a thermometer are 30 mm and 180 mm respectively. Calculate the temperature in degrees Celsius when the thermometer reads 45 mm.  
A. 10.0°C B. 15.0°C C. 20.0°C  
D. 30.0°C
80. An immersion heater rated 400 W, 220 V is used to heat a liquid of mass 0.5 kg. If the temperature of the liquid increases uniformly at the rate of 2.5°C per second, calculate the specific heat capacity of the liquid assuming no heat loss,  
A. 1100 J/kg.K | B. 320 J/kg.K  
C. 200 J/kg.K D. 176 J/kg.K
81. A balloon filled with 1000 cm<sup>3</sup> of gas at 127°C and pressure of 70 cm Hg. If the pressure changes to 28 cm Hg and temperature to -23.3°C, calculate the new volume of the gas.  
A. 136 cm<sup>3</sup> B. 218 cm<sup>3</sup> C. 250 cm<sup>3</sup>  
D. 485 cm<sup>3</sup>
82. A density glass bottle contains 44.25 g of a liquid at 0°C and 42.02 g at 50°C Calculate the real cubic expansivity of the liquid (Linear expansivity of glass =  $1.0 \times 10^{-5} \text{ K}^{-1}$ )  
A.  $1.09 \times 10^{-3} \text{ K}^{-1}$  B.  $1.06 \times 10^{-3} \text{ K}^{-1}$   
C.  $3.0 \times 10^{-5} \text{ K}^{-1}$  D.  $1.03 \times 10^{-3} \text{ K}^{-1}$
83. Which of the following properties is not used to measure the temperature of a substance?  
A. variation of pressure with temperature  
B. mass of a liquid  
C. change in resistance of a conductor  
D. change in colour with temperature
84. The clinical thermometer is characterized by having a  
A. wide range of temperatures B. wide bore  
C. long stem D. constriction
85. The amount of heat given out or absorbed when a substance changes its state at a constant temperature is known as  
A. latent heat B. heat capacity  
C. specific heat capacity D. specific latent heat
86. A block of aluminium is heated electrically by a 25 W heater. If the temperature rises by 10°C in 5 minutes, what is the heat capacity of aluminium?  
A. 850 J/K B. 750 J/K C. 650 J/K  
D. 500 J/K
87. In a gas experiment, if the volume of the gas is plotted against the reciprocal of the pressure, the unit of the slope of the resulting curve is:  
A. power B. work C. temperature D. force
88. Thermal equilibrium between two objects exist when:  
A. the heat capacity of both objects are the same  
B. one object loses heat continuously to the other  
C. temperature of both objects are equal  
D. the quantity of heat in both objects is the same.
89. A shepherd calling to fellow shepherd heard his voice reflected by a rock 3 s later. Calculate the velocity of sound in air if the rock is 510 m away.  
A. 510 m/s B. 1.5 m/s C. 340 m/s D. 170 m/s
90. An object 3 cm high placed on the axis of a converging lens form an image 30 cm from the lens.

- If the focal length of the lens is 15 cm the height of the image is  
A. 3 cm B. 1 cm C. 6 cm  
D. none of the above
91. An object is placed between two plane mirrors inclined at  $60^\circ$  to each other. If the object is equidistant from each find the number of images formed  
A. 2 B. 3 C. 4 D. 6
92. Before frying, the volume of  $0.8 \text{ g/cm}^3$  vegetable oil was  $500 \text{ cm}^3$ . If the density of the oil was  $0.5 \text{ g/cm}^3$  after frying and there was no loss of oil due to spilling, what is the new volume of the oil?  
A.  $400 \text{ cm}^3$  B.  $800 \text{ cm}^3$  C.  $600 \text{ cm}^3$  D.  $200 \text{ cm}^3$
93. A  $650 \text{ kg}$  car that was initially at rest traveled with an acceleration of  $4 \text{ m/s}^2$ . Find its kinetic energy after 4 s.  
A.  $5200 \text{ J}$  B.  $31200 \text{ J}$  C.  $83200 \text{ J}$  D.  $832 \text{ kJ}$
94. The temperature at which the water vapour present in the air and begins to condense is called  
A. condensation point B. dew point  
C. boiling point D. critical point
95. Which of the following types of waves will travel through vacuum? I. light waves II. sound waves III. Radio waves  
A. I only B. I and II only C. II and III only  
D. I and III only
96. In a simple pendulum experiment, a student increased the length of the inextensible string by a factor of 9. By what factor is the period increased?  
A. 3 B.  $1/3$  C. 2 D.  $1/2$
97. A vapour is said to be saturated when:  
A. the vapour of a substance is in equilibrium with its own liquid  
B. the vapour of a substance is in equilibrium with its own gas  
C. the vapour of a substance is in equilibrium with its own solid-liquid phase  
D. none of the above
98. A wave travels with a velocity of  $360 \text{ m/s}$ . If its wavelength is  $120 \text{ cm}$  then its period is:  
A.  $0.0017 \text{ s}$  B.  $0.33 \text{ s}$  C.  $33 \text{ s}$  D.  $1.7 \text{ s}$
99. The heights of the mercury thread in a mercury-in-glass thermometer when melting ice and then in steam are  $2 \text{ cm}$  and  $22 \text{ cm}$  respectively. What would be the height of the mercury thread at  $70^\circ$ ?  
A.  $14 \text{ cm}$  B.  $12 \text{ cm}$  C.  $16 \text{ cm}$  D.  $18 \text{ cm}$
100. An object is placed  $45 \text{ cm}$  in front of a concave mirror of focal length  $15 \text{ cm}$ . What is the linear magnification produced?  
A.  $1/3$  B. 2 C. 3 D.  $1/2$
101. A man has five  $40 \text{ W}$  electric light bulbs, six  $60 \text{ W}$  bulbs and two  $100 \text{ W}$  bulbs in his house. If all the points are on for five hours daily and PHCN charges  $12 \text{ k}$  per unit, what is his bill for 30 days?  
A. N13.68 B. N0.46 C. N2.74  
D. none of the above
102. In a resonance tube experiment, the first resonance position is  $16 \text{ cm}$  when the velocity of sound in air is  $327.68 \text{ m/s}$ . Find the frequency of the tuning fork used  
A.  $512 \text{ kHz}$  B.  $256 \text{ Hz}$  C.  $128 \text{ Hz}$  D.  $512 \text{ Hz}$
103. Half-life of a radioactive substance is:  
A. the average life time of the substance  
B. the time it takes the substance to decay to half of its original quantity  
C. the time it takes the activity of the substance to



decay to half of its original value  
D. all of the above

104. The headlamp bulb of a motor car is rated 60 W, 12 V. Calculate the resistance of its filament. 109. The nucleus of an atom consists of:  
A. 0.2 B. 5 C. 2.4 D. 2 V  
A. protons and neutrons B. protons and electrons  
C. electrons and neutrons  
D. electrons, protons and neutrons
105. In an electrolysis experiment, a cathode of mass 4.5 g weighs 4.52 g after a current of 4.5 A flows for 1 hour. The electrochemical equivalent of the deposited substance is: 111. A certain quantity of heat increases the temperature of 185 g of water from 10°C to 20°C and increases the temperature of an equal volume of 140 g of oil from 7°C to 18°C The ratio of the specific heat of the oil to that of water is:  
A. 0.00444 g/C B. 0.00741 g/C  
C. 0.00074 g/C D. 0.00007 g/C  
A. 0.83 B. 1.26 C. 1.07 D. 0.93
106. An object falls freely under gravity from a given height. At half way point, its kinetic energy is: 112. The motion of the pendulum bob is:  
A. exactly half of its initial potential energy  
B. exactly half of its kinetic energy  
C. exactly half of its final potential energy  
D. zero  
A. rotational B. circulatory  
C. oscillatory D. none of the above
- 107.. The silvered walls of a vacuum flask are used to prevent: 113. Which of the following is not one of the factors that affect the capacitance of a capacitor?  
A. heat loss due to opacity  
B. heat loss due to radiation  
C. heat loss due to convection  
D. heat loss due to conduction  
A. temperature B. area of plates  
C. distance between the plate  
D. dielectric between the plates
108. The law of universal gravitation states that: 114. Which of the following statements is true of gamma-rays?  
A. All bodies on the surface of the earth are attracted towards the centre of the universe  
B. Any two bodies attract each other with a force which is directly proportional to product of their masses and inversely proportional to the square of the distance between them.  
C. All bodies attract each other with a force which is directly proportional to product of their masses and inversely proportional to the square of the distance between them.  
D. they originate outside the nucleus of the atom
115. The virtual image formed of an object placed 10 cm from a convex lens is 2. Find the focal length of the lens.  
A. 7.5 cm B. 15 cm C. 30 cm  
D. 10 cm
116. A milliammeter of resistance 2.5  $\Omega$  and full scale deflection of 50 mA is to be used to measure a





potential difference of 50 V. What is the resistance of the multiplier?

A. 99.75 B. 997.5 C. 9975 D. 9.98

117. The ice and steam points of a mercury-in-glass thermometer of centigrade scale and of uniform bore correspond respectively to 3 cm and 23 cm lengths of the mercury thread. What is the temperature when the length of the mercury thread is 12 cm?  
A. 40°C B. 60°C C. 75°C D. 45°C
118. When a ray of light passes from glass to air, it is:  
A. bent towards the normal  
B. away from the normal  
C. not deviated  
D. spread out in a pure spectrum
119. What is the resistance of the filament of an electric lamp rated 220 V, 100 W?  
A. 0.45 B. 2.2 C. 484 D. 440
120. Pressure cooker cooks faster because  
A. the inside is polished  
B. inside the cooker, the boiling point of water is raised  
C. inside the cooker, the boiling point of water is lowered  
D. inside the cooker, the pressure of water is raised
121. A gasoline generator is used to power ten 40 W lamps, five 60 W lamps and a musician's 1000 W amplifying system. If the generator runs for 5 hours, the energy used is  
A. 1.7 kWh B. 8.5 kWh C. 1.0 kWh  
D. none of the above
122. Which of the following statements is not true about sound waves?  
A. Sound waves are longitudinal waves  
B. Sound waves are transverse waves

- C. Sound waves are mechanical waves**  
**D. Sound waves can not propagate through vacuum**

- 123. Which of the following statements is not true about the human eye?**  
**A. the focal length of its lens is fixed**  
**B. the focal length of its lens is variable**  
**C. image distance is fixed**  
**D. all of them**
- 124. Hypermetropia can be corrected by using**  
**A. concave spectacle lenses**  
**B. convex spectacle lenses**  
**C. plano-concave spectacle lenses**  
**D. plano-convex spectacle lenses**
- 125. In the astronomical telescope**  
**A. there are three convex lenses**  
**C. the eyepiece has a longer focal length than the objective**  
**C. the eyepiece has a shorter focal length than the objective**  
**D. the eyepiece and the objective have the same focal length**
- 126. Which of the following apparatuses is not needed for the production of pure spectrum?**  
**A. source of light**    **B. rectangular glass block**  
**C. slit**    **D. convex lens**
- 127. The principle of moment states that:**  
**A. Action and reaction are equal and opposite**  
**B. If a body is in equilibrium under the action of a number of parallel forces, sum of clockwise moment equals sum of anticlockwise moment**  
**C. If a body is in equilibrium under the action of a number of parallel forces, sum of clockwise moment about a point equals sum of anticlockwise moment about the same point.**  
**D. If a body is in equilibrium under the action of a number of parallel forces, all forces cancel out**

**ANSWERS**

1	D	21	D	41	A	61	D	81	C	101	A	121	B
2	B	22	B	42	C	62	A	82	A	102	A	122	B
3	A	23	B	43	B	63	D	83	D	103	C	123	A
4	B	24	B	44	A	64	C	84	D	104	C	124	B
5	D	25	D	45	D	65	D	85	A	105	D	125	C
6	A	26	A	46	B	66	C	86	B	106	A	126	B
7	C	27	C	47	A	67	A	87	B	107	B	127	C
8	B	28	B	48	D	68	C	88	C	108	B		
9	C	29	B	49	C	69	B	89	C	109	A		
10	A	30	B	50	C	70	C	90	A				
11	D	31	A	51	D	71	B	91	D	111	B		
12	A	32	C	52	B	72	B	92	B	112	C		

13	C	33	B	53	D	73	B	93	C	113	A
14	D	34	A	54	A	74	A	94	B	114	C
15	D	35	C	55	B	75	C	95	D	115	C
16	C	36	D	56	B	76	D	96	A	116	B
17	C	37	A	57	B	77	B	97	A	117	D
18	C	38	A	58	A	78	B	98	B	118	B
19	D	39	B	59	B	79	A	99	C	119	C
20	C	40	C	60	B	80	B	100	D	120	B

