Physic Test 1

1. The unit of electrical voltage is
a) ampere
b) ohm
c) volt
d) coulomb
e) none of the previous options

2. Which of the unit's equation is correct?
a) $N = m.kg.s^{-2}$
b) $Pa = kg.m^2.s^{-1}$
c) $W = kg.m.s^{-1}$
d) $J = kg.m^{-1}.s^{-2}$
e) none of the previous options

3. The initial velocity of a body moving vertically up from the earth's surface is $40\,m.s^{-1}$. Calculate the maximum height of the body ($g \approx 10\,m.s^{-2}$).
a) $160\,m$
b) $5\,m$
c) $30\,m$
d) $80\,m$
e) none of the previous options

4. A body falls toward the earth from a height of $320\,m$ ($g \approx 10\,m.s^{-2}$). The body hits the ground with a velocity
a) $160\,m.s^{-1}$
b) $64\,m.s^{-1}$
c) $80\,m.s^{-1}$
d) $141\,m.s^{-1}$
e) none of the previous options

5. A wheel is rolling, its circumference is $0.5\,m$ and its translational velocity is $2\,m.s^{-1}$. What is the angular velocity of rotation around its own axis?
a) $12.56\,s^{-1}$
b) $25.12\,s^{-1}$
c) $4\,s^{-1}$
d) $0.16\,s^{-1}$
e) none of the previous options

6. An engine pumped up $6000\,l$ of water to a height of $10\,\mathrm{m}$ during 5 minutes. Calculate its power ($\rho = 10^3\,\mathrm{kg.m^{-3}}, g \approx 10\,\mathrm{m.s^{-2}}$).
a) $12\,000\,\mathrm{W}$
b) $2\,000\,\mathrm{W}$
c) $200\,\mathrm{W}$
d) $120\,000\,\mathrm{W}$
e) none of the previous options

7. A space probe is approaching to Venus, r is the probe distance from the centre of Venus. The force of gravity acting on the probe
a) does not depend on the distance from the surface of Venus
b) is proportional to r^{-1}
c) is proportional to r^{-2}
d) does not depend on the mass of Venus
e) none of the previous options

8. A ball filled with air has a mass of $1.5\,\mathrm{kg}$ and its volume is $0.01\,\mathrm{m^3}$. Calculate the force needed to hold it below the water surface ($g \approx 10\,\mathrm{m.s^{-2}}$).
a) $50\,\mathrm{N}$
b) $850\,\mathrm{N}$
c) $100\,\mathrm{N}$
d) $115\,\mathrm{N}$
e) none of the previous options

9. There is a horizontal pipe. The amount of liquid that flows through the cross-section of $A_1 = 15\,\mathrm{cm^2}$ in $1\,\mathrm{s}$ is $15\,l$. A cross-section extends to $A_2 = 25\,\mathrm{cm^2}$. Calculate the amount of liquid that flows through the cross-section A_2 in $1\,\mathrm{s}$.
a) $15\,l$
b) $30\,l$
c) $45\,l$
d) $25\,l$
e) none of the previous options

10. Ideal gas enclosed in a vessel has pressure p and temperature $15\,°\mathrm{C}$. It is isochorically heated so that its pressure is doubled. Calculate the temperature.
a) $130\,°\mathrm{C}$
b) $-129\,°\mathrm{C}$
c) $30\,°\mathrm{C}$
d) $303\,°\mathrm{C}$
e) none of the previous options

11. The total work done by an ideal gas is equal to zero. This statement is true for
a) isothermal process
b) adiabatic process
c) isobaric process
d) isochoric process
e) none of the previous processes

12. An electric force $F = 8\,\text{N}$ moved an electric charge along the line of force, that the passed distance of $20\,\text{cm}$. Calculate the work.
a) $40\,\text{J}$
b) $0\,\text{J}$
c) $1.6\,\text{J}$
d) $160\,\text{J}$
e) none of the previous options

13. A $12\,\text{V}$ battery is connected in series with resistor with own resistance R and an electric heater in which is voltage drop of $6\,\text{V}$. How much dissipated power is consumed by the resistor when the heater draws $5\,\text{W}$?
a) $0.5\,\text{W}$
b) $2.5\,\text{W}$
c) $10\,\text{W}$
d) $0\,\text{W}$
e) none of the previous options

14. Parallel connected resistances $10\,\Omega$ and $40\,\Omega$ may be replaced by a single resistance
a) $50\,\Omega$
b) $8\,\Omega$
c) $4\,\Omega$
d) $0.25\,\Omega$
e) none of the previous options

15. If the current through the inductor increases two times the energy of the magnetic field of the inductor is
a) not changed
b) increased four times
c) doubled
d) decreases on one half

e) none of the previous options

16. A mass point performs a harmonic motion. The maximum force acting on it is
a) at the equilibrium position
b) at the maximum of speed
c) in one half of amplitude
d) at the maximum of amplitude
e) none of the previous options

17. An optical power of a lens is
a) the aperture of a lens
b) the thickness of an optical glass
c) the mass of a lens
d) the reciprocal value of the focal length
e) none of the previous options

18. A thin convex lens displayed an object $25\,\mathrm{cm}$ away from the centre of the lens at a distance of $1\,\mathrm{m}$ on the opposite side from the centre of the lens. Its focal length is
a) $0.2\,\mathrm{m}$
b) $0.3\,\mathrm{m}$
c) $0.25\,\mathrm{m}$
d) $2\,\mathrm{m}$
e) none of the previous options

19. The nucleus $^{16}_{8}\mathrm{O}$ contains
a) 8 protons, 16 electrons
b) 8 protons, 8 neutrons
c) 8 protons, 16 neutrons
d) 8 electrons, 16 protons
e) none of the previous options

20. An amount of substance the copper piece, which has a mass of $1\,\mathrm{kg}$ (molar mass of copper is $63.5\,\mathrm{g.mol^{-1}}$)
a) $63.5\,\mathrm{kg}$
b) $63.5\,\mathrm{mol}$
c) $\frac{1}{63.5}\,\mathrm{mol}$
d) $\frac{1}{63.5}\,\mathrm{kg}$
e) none of the previous options