Question block created by wizard

This exam contains 52 questions.

$cg = \frac{h}{3}$

$cg = \frac{4r}{3\pi}$

$M = F \cdot d$

$M_+ = M_-$

$F = \sigma \cdot A$

$F = m \cdot A$

$F_B \cdot b = F_A \cdot a$

$MA = \frac{r_B}{r_A}$

$F = k \cdot \Delta l$

$F \cdot \Delta t = m \cdot \Delta v$

$imp = F \cdot \Delta t$

$p = m \cdot \Delta v$

$F_s = \frac{m \cdot v^2}{r}$

$W = m \cdot g \cdot \Delta h$

$W = Q - \Delta U$

$E_{kin} = \frac{1}{2} \cdot m \cdot v^2$

$E_{pot} = m \cdot g \cdot h$

$Q = m \cdot c \cdot \Delta T$

$\eta = \frac{W}{Q_H} (\times 100\%)$

$f_S^{max} = \mu_s \cdot F_N$

$f_k = \mu_k \cdot F_N$

$\rho = \frac{m}{V}$

$\mathrm{sg} = \frac{\rho_{substance}}{\rho_{water\ (277K)}}$

$\mathrm{mfr} = \rho \cdot A \cdot v$

$F = \frac{9}{5}\,^{o}C + 32$

$v_f = v_0 + \Delta v$

$p = \rho \cdot g \cdot h$

$p = p_{atm} + p_{liquid}$

$s = v \cdot t$

$s_f = v_0 \cdot t + \frac{1}{2} \cdot a \cdot t^2$

$v = a \cdot t$

$v_f = v_0 + a \cdot t$

$v = f \cdot \lambda = \frac{\lambda}{T}$

$v = \frac{2 \cdot \pi \cdot r}{T}$

$v = \sqrt{a_c \cdot r}$

$T = 2\pi \cdot \sqrt{\frac{l}{g}}$

$\theta = \omega \cdot t = \frac{2\pi}{T} \cdot t$

$\Delta V = \beta \cdot V_0 \cdot \Delta T$

$R = \frac{p \cdot V}{T} = \frac{2 \cdot c_p}{5} = \frac{2 \cdot c_V}{3} = R_s \cdot m$

$\frac{1}{f} = \frac{1}{d_i} + \frac{1}{d_o}$

$m = \frac{h_i}{h_o}$

$T = \frac{1}{f}$

$I = \frac{P}{A}$

$4{,}186\ kJ = 1kcal$

1. The period number equals the ...

- o (a) the total number of electrons of an atom.
- • (b) number of shells.
- o (c) number of electrons in the outer shell.

If choice b is selected set score to 1.

2. An atom consists of 14 protons and its mass number is 29.

Determine the number of neutrons in this atom.

- o (a) 2
- • (b) 15
- o (c) 43

If choice b is selected set score to 1.

3. When you break down a compound, do you get one, two or more kind of atoms?

- o (a) One kind of atoms.
- • (b) Two or more kind of atoms.
- o (c) Two kind of atoms.

If choice b is selected set score to 1.

4. Which of the following expressions is a property of a liquid?

- o (a) There are very strong forces of attraction between the particles of a liquid.
- o (b) Liquids have no surface, and no fixed shape or volume.
- • (c) Liquids have much greater density than gases.

If choice c is selected set score to 1.

5. Which of the following expressions is a property of a solid?

- o (a) A solid has no fixed shape.
- • (b) A solid will expand a little on heating.
- o (c) It is not possible to change the volume of a fixed mass of a solid.

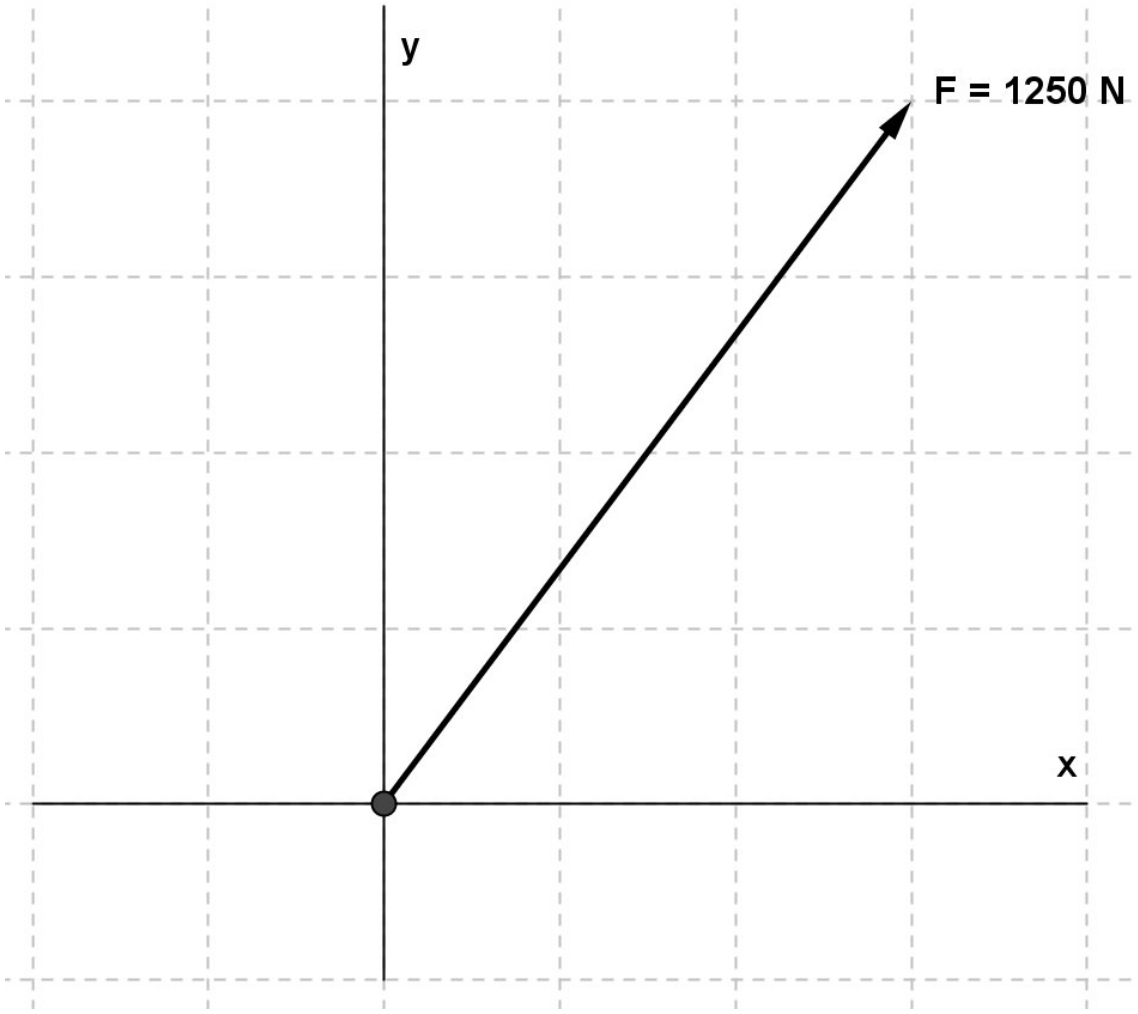
If choice b is selected set score to 1.

6. How do you call the change of matter from liquid to solid?

- o (a) Subliming.
- • (b) Freezing.
- o (c) Evaporating.

If choice b is selected set score to 1.

7. Calculate the force that causes a horizontal displacement.



o (a) 625 N

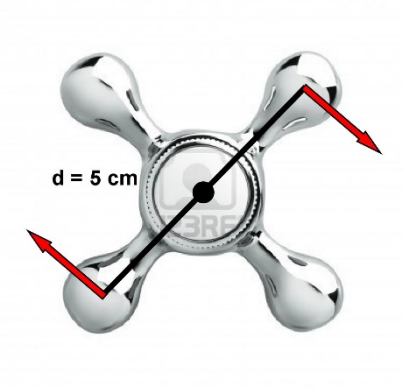
• (b) 750 N

o (c) 1000 N

If choice b is selected set score to 1.

8. On a wheelop cross key two forces are acting. Each force equals 50 N and the diameter of the tap is 5 cm.

Determine the moment of this couple of forces.



- o (a) 5 Nm
- o (b) 1,25 Nm

- • (c) 2,5 Nm

If choice c is selected set score to 1.

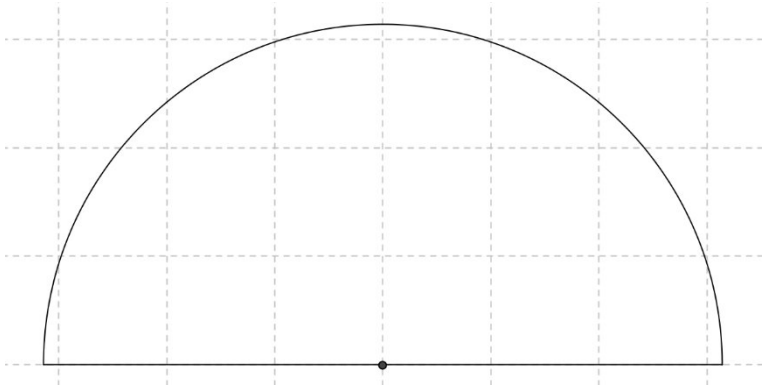
9. To determine the centre of gravity of a three dimensional body you can use the method of....

- • (a) measuring and equating moments.

- o (b) equating the CG of several parts of the body.
- o (c) measuring the CG of several parts of the body.

If choice a is selected set score to 1.

10. Calculate the centre of gravity of a semicircle with a radius of π m.



- • (a) 1,33 m

- o (b) 0,75 m
- o (c) 1,04 m

If choice a is selected set score to 1.

11. The Young's modules is used to calculate?

- o (a) The tension in an object.
- • (b) The stretching of an object.
- o (c) The tear or torsion of an object.

If choice b is selected set score to 1.

12. An atom consists of 14 protons and its mass number is 29.

Determine the number of neutrons in this atom.

- • (a) 15
- o (b) 43
- o (c) 2,07

If choice a is selected set score to 1.

13. If an object is sinking, the....

- o (a) weight of the object < buoyant force.
- • (b) weight of the object > buoyant force.
- o (c) weight of the object = buoyant force.

If choice b is selected set score to 1.

14. An airplane is taxiing on the runway with a length of 4500 m. The time from start till end is about 225 s.

Calculate the speed of the airplane.

- o (a) 50 km/h
- • (b) 72 km/h
- o (c) 101 km/h

If choice b is selected set score to 1.

15. An airplane is accelerating to take-off. Its initial speed was 0 m/s and the final speed is 45 m/s. The time for this take-off was 10 s.

Calculate the acceleration of the plane.

- o (a) 0,22 m/s^2

- (b) 450 m/s^2
- (c) 4,5 m/s^2

If choice c is selected set score to 1.

16. The acceleration of a free falling body is called the acceleration due to....

- (a) the mass of the object.
- (b) gravity.
- (c) the velocity of the object.

If choice b is selected set score to 1.

17. What does "uniform circular motion" mean?

- (a) An accelerating motion in a straight line.
- (b) A circular motion with constant speed.
- (c) An accelerating motion in a circle movement.

If choice b is selected set score to 1.

18. In which part of the perpendicular movement equals the speed of the pendulum 0 (zero) m/s?

- (a) In the equilibrium position.
- (b) Halfway the extreme and the equilibrium position.
- (c) In the extreme positions.

If choice c is selected set score to 1.

19. If the angular speed of a harmonic motion decreases, what will happen to the frequency of this harmonic motion?

- (a) The frequency will decrease.
- (b) The frequency will increase.
- (c) Angular speed and frequency are not related.

If choice a is selected set score to 1.

20. Which combination of gears gives a speed reduction?

- (a) A difference in teeth always gives a speed reduction.
- (b) The output gear has less teeth than the input gear.
- (c) The output gear has more teeth than the input gear.

If choice c is selected set score to 1.

21. 3,8 kg = ... mg

- o (a) 38.000
- • (b) 3800000
- o (c) $3{,}8 \cdot 10^5$

If choice b is selected set score to 1.

22. Which definition is the definition of mass?

- o (a) The mass of a substance is proportional to the amount of matter.
- • (b) The mass of a substance is directly proportional to the amount of matter.
- o (c) The mass of a substance is inversely proportional to the amount of matter.

If choice b is selected set score to 1.

23. What is the first step toward ensuring accuracy and reproducible units in which measurements are made?

- o (a) An international agreement.
- • (b) Defining the units.
- o (c) Making the measurements reproducible as possible.

If choice b is selected set score to 1.

24. I beat a hammer with a force of 300 N on a nail. The nail shoots partly in the wood.

What is the magnitude of the reaction force of the nail?

- o (a) < - 300N
- o (b) > - 300 N
- • (c) = - 300 N

If choice c is selected set score to 1.

25. "Inertia is the natural tendency of an object to remain at rest or in motion at a constant speed along a straight line."

This is the....

- • (a) first law of Newton.

- (b) second law of Newton.
- (c) third law of Newton.

If choice a is selected set score to 1.

26. I push a car over 400 m with a force of 600 N.

Calculate the work I have done.

- (a) 0,67 J
- (b) 1,5 J
- (c) 240.000 J

If choice c is selected set score to 1.

27. If work is done on an object, the object will move.

Is it possible for a moving object to do work?

- (a) Only if it is allowed to pull another object.
- (b) If it is allowed to push or pull another object.
- (c) Only if it is allowed to push another object.

If choice b is selected set score to 1.

28. A ball has a momentum of 1,2 kg·m/s and a mass of 200 g.

Calculate the velocity of the ball.

- (a) 6 m/s
- (b) 0,16 m/s
- (c) 0,24 m/s

If choice a is selected set score to 1.

29. The impulse-momentum theorem states that....

- (a) the work done by a net-force is equal to the change in the object's kinetic energy.
- (b) the work done by a net-force is not equal to the change in the object's kinetic energy.
- (c) the impulse produced by a net-force is equal to the change in the object's momentum.

If choice c is selected set score to 1.

30. Which law applies to a gyroscope?

- (a) The law of conservation of angular momentum.

- o (b) The law of conservation of momentum.
- o (c) The first law of Newton

If choice a is selected set score to 1.

31. An object is about to slide over a surface.

What can you tell about the f_s^{max} and the f_k?

- (a) $f_s^{max} = f_k$
- o (b) $f_s^{max} < f_k$
- o (c) $f_s^{max} > f_k$

If choice a is selected set score to 1.

32. Determine the specific gravity of blood with a density of 1060 kg/m³

- o (a) 0,94
- (b) 1,06
- o (c) 0,94 kg/m³

If choice b is selected set score to 1.

33. The definition of specific gravity is:

- o (a) Density water (4°C) / density substance
- (b) Density substance / density water (4°C)
- o (c) Density water (4°C) · density substance

If choice b is selected set score to 1.

34. What is the property of a steady flow?

- (a) In steady flow every particle passing through a specific point has the same velocity.
- o (b) In steady flow the direction of the fluid particles at any point in the fluid changes as time passes.
- o (c) In steady flow the velocity of the fluid particles at any point is different as time passes.

If choice a is selected set score to 1.

35. When using Bernoulli's equation:

$$p_1 + \tfrac{1}{2} \cdot \rho \cdot v_1^2 + \rho \cdot g \cdot y_1 = p_2 + \tfrac{1}{2} \cdot \rho \cdot v_2^2 + \rho \cdot g \cdot y_2$$

What happens to the pressure if the density and the speed of the fluid stays the same?

The pressure...

- o (a) decreases.
- • (b) stays the same.
- o (c) increases.

If choice b is selected set score to 1.

36. Calculate: 60°C = ...°F

- o (a) 76 °F
- o (b) $65^1/_3$ °F
- • (c) 140 °F

If choice c is selected set score to 1.

37. How much heat is used to warm up m = 1,5 kg copper (c_{copper} = 400 J/(kgK)) from 20 °C to 80 °C (ΔT = 60 °C)?

- • (a) 36000 J
- o (b) 16000 J
- o (c) 4,44 J

If choice a is selected set score to 1.

38. Give the definition of heat conduction.

Conduction is the process...

- o (a) in which energy is transferred by means of electromagnetic waves.
- • (b) whereby heat is transferred directly through a material, any bulk motion of the material playing no role in the transfer.
- o (c) in which heat is carried from place to place by the bulk movement of a fluid or gas.

If choice b is selected set score to 1.

39. 2000m^3 Water (volume of a swimming pool) is heated from 10°C to 30°C. (β_{water} = 2,1·10^{-4}/°C)

Calculate the volume expansion of the water at 30°C?

- o (a) 6,1 m^3

- (b) 2008,4 m^3

- (c) 8,4 m^3

If choice c is selected set score to 1.

40. The internal energy of a gas decreases with 1500J, the supplied heat is 2500J.

Calculate the work done on the gas.

- (a) W= -1000 J
- (b) W= 1000 J

- (c) W= 4000 J

If choice c is selected set score to 1.

41. Calculate the specific gas constant of 2 kg gas, with a specific heat capacity with constant volume of 6 J/K.

- (a) 0,5 J/(kgK)

- (b) 2 J/(kgK)

- (c) 18 J/(kgK)

If choice b is selected set score to 1.

42. The coefficient of performance of a heat pump is 2,5. The heat delivered into a house is 25000J.

How much work has to be done?

- (a) 10000 J

- (b) 62500 J
- (c) 5000 J

If choice a is selected set score to 1.

43. The frequency of a light wave is $6 \cdot 10^{14}$ Hz. The wavelength of this wave is 500 nm.

Calculate the speed of the light.

- (a) $1{,}2 \cdot 10^{21}$ m/s

- (b) $3 \cdot 10^{8}$ m/s

- (c) $3 \cdot 10^{7}$ m/s

If choice b is selected set score to 1.

44. The angle of reflection with respect to the normal on a plane mirror is 20 degrees.

Determine the angle of incidence with respect to the mirror.

- (a) 70 °

o (b) 90 °
o (c) 20 °

If choice a is selected set score to 1.

45. The focal length of a convex mirror is -2 m, an object is at 3 m in front of the mirror.

Determine the distance of the image.

o (a) - $^{5}/_{6}$ m

- (b) -1,2 m

o (c) 1,2 m

If choice b is selected set score to 1.

46.

When the angle of incidence reaches a certain value, called the critical angle θc, the angle of refraction is.....

o (a) < 90 °

- (b) 90 °

o (c) 180 °

If choice b is selected set score to 1.

47. Modal dispersion means modes arrive at the fibre end...

o (a) at the same time depending on the numerical aperture.

- (b) at slightly different times.

o (c) at the same time.

If choice b is selected set score to 1.

48. The frequency of a wave is 40 Hz.

Calculate the period of this wave.

o (a) 0,25 s

- (b) 0,025 s

o (c) 40 s

If choice b is selected set score to 1.

49. The wave length is 500m, the frequency is 20Hz.

Calculate the speed of the wave.

o (a) 0,04 m/s
o (b) 25 m/s

- (c) 10.000 m/s

If choice c is selected set score to 1.

50. When two waves meet out of phase, we call this....

o (a) neutral interference.
o (b) constructive interference.

- (c) destructive interference.

If choice c is selected set score to 1.

51. The power of a sound source is 5π W. Calculate the sound intensity on a distance of 10 m of the source.

o (a) $\pi \cdot 10^{3}$ W/m^2
o (b) 5 W/m^2

- (c) $1{,}25 \cdot 10^{-2}$ W/m^2

If choice c is selected set score to 1.

52. When an ambulance with siren leaves you, the frequency of the siren seems to be higher / lower or constant ?

- (a) lower

o (b) higher
o (c) constant

If choice a is selected set score to 1.

If assessment score is 0% to 100% Feedback