Use of SI Units & Prefixes
TOPIC QUESTIONS (1)

Level	AS Level
Subject	Physics
Exam Board	AQA
Paper Type	Multiple Choice

Time Allowed : 30min

1. Photons of wavelength 290 nm are incident on a metal plate. The work function of the metal is
   eV

What is the maximum kinetic energy of the emitted electrons?

    A   0.19 eV

    B   4.3 eV

    C   6.9 eV

    D   8.4 eV

2. A diffraction grating has 500 lines per mm. When monochromatic light is incident normally on thegrating the third-order spectral line is formed at an angle of 60° from the normal to the grating.

What is the wavelength of the monochromatic light?

    A   220 nm

    B   580 nm

    C   960 nm

    D   1700 nm

3. A mobile phone operates at a constant power of 200 mW
It has a 3.7 V lithium-ion battery that has a charge capacity of 9400 CWhat

is the time taken for the battery to discharge completely?

    A   2 hours

    B   48 hours

    C   120 hours

    D   140 hours

4. During a single fission event of uranium-235 in a nuclear reactor the total mass lost is 0.23 u.
Thereactor is 25% efficient.

How many events per second are required to generate 900 MW of power?

    A 1.1×10^{14}

    B 6.6×10^{18}

    C 1.1×10^{20}

    D 4.4×10^{20}

5. What **cannot** be used as a unit for the Young modulus?

   A $N\,m^{-2}$

   B Pa

   C $C\;kg\,m^{-2}\,s^{-2}$

   D $D\;kg\,m^{-1}\,s^{-2}$

6. Which one of the following **cannot** be used as a unit for electric field strength?

A $J\,m^{-1}\,C^{-1}$

B $J\,A^{-1}\,s^{-1}m^{-1}$

C $N\,A^{-1}\,s^{-1}$

D $J\,C\,m^{-1}$

7. Which of the following is a possible unit for rate of change of momentum?

A $N\,s$

B $N\,s^{-1}$

C $kg\,ms^{-1}$

D $kg\,ms^{-}_{\ 2}$

8.   Which one of the following could be a unit of gravitational potential?

A   N

B   J

C $N\,kg^{-1}$

D $J\,kg^{-1}$

9. The fission of one nucleus of uranium 235 releases 200 MeV of energy. What is the value of thisenergy in J?

A 3.2×10^{-25} J

B 3.2×10^{-17} J

C 3.2×10^{-11} J

D 2.0×10^{6} J

10. Which line, **A** to **D**, gives correct units for both magnetic flux and magnetic flux density?

	magnetic flux	magnetic flux density
A	Wb m^{-2}	Wb
B	Wb	T
C	Wb m^{-2}	T m^{-2}
D	T m^{-2}	Wb m^{-2}

11. The units of physical quantities can be expressed in terms of the fundamental (base) units of theSI system. In which line in the table are the fundamental units correctly matched to the physical quantity?

	Physical quantity	**Fundamental units**	
A	charge	A s^{-1}	○
B	power	kg m^2 s^{-3}	○
C	potential difference	kg m^2 s A^{-1}	○
D	energy	kg m^2 s^{-1}	○

12. Which of the following is **not** a unit of power?

A   N m s^{-1}

B   J s

C   W

D $kg\,m^2\,s^{-3}$

13. The gravitational constant, G, is a constant of proportionality in Newton's law of gravitation. Thepermittivity of free space, ε_0, is a constant of proportionality in Coulomb's law.

When comparing the electrostatic force acting on a pair of charged particles to the gravitationalforce between them, the product $\varepsilon_0 G$ can appear in the calculation.

Which is a unit for $\varepsilon_0 G$?

A $C^2\,kg^{-2}$

B $C^2\,m^{-2}$

C $F\,kg^2\,N^{-1}\,m^{-2}$

D   it has no unit

14. In which of the following do both quantities have the same unit?

A   Electrical resistivity and electrical resistance.

B   Work function Planck constant

C   Pressure and the Young modulus.

D Acceleration and rate of change of momentum.

15. Which of the following is **not** a unit of power?

A $N\,m\,s^{-1}$

B $kg\,m^2\,s^{-3}$

C $J\,s^{-1}$

D $kg\,m^{-1}\,s^{-1}$

16. Which of the following gives a correct unit for $\left(\dfrac{g^2}{G}\right)$?

A N

B N kg^{-1}

C N m

D N m^{-2}

17. Which one of the following is a possible unit of impulse?

A Ns^{-1}

B kg ms^{-1}

C kg ms^{-2}

D sN^{-1}

18. Which one of the following gives a correct unit for   ? $\left(\dfrac{g}{G} \right)^{2}$

A $N\,m^{-2}$

B $N\,kg^{-1}$

C   N m

D   N

19. A 1.0 µF capacitor initially stores 15 µC of charge. It then discharges through a 25 Ω resistor.

What is the maximum current during the discharge of the capacitor?

    A   0.60 mA

    B   1.2 mA

    C   0.60 A

    D   1.2 A

20. Which list puts the forces in order of increasing magnitude?

   A   2 pN < 2 fN < 2 TN < 2 GN

   B   2 pN < 2 fN < 2 GN < 2 TN

   C   2 fN < 2 pN < 2 TN < 2 GN

   D   2 fN < 2 pN < 2 GN < 2 TN