1 A correct unit for radiant energy flux is

☒ **A** N m^{-1} s^{-1}

☒ **B** Nm^{-1}

☒ **C** W

☒ **D** W m^2

(Total for Question = 1 mark)

2 A lamp consists of a filament in a vacuum. Under normal working conditions the filament has a temperature of 1600 K. A similar filament lamp that is gas-filled has a filament temperature of 3200 K.

The ratio of the wavelength at which maximum intensity of radiation is emitted by the vacuum lamp to that for the gas-filled lamp is

☒ **A** 1:2

☒ **B** 1:1

☒ **C** 2:1

☒ **D** 16:1

(Total for Question 8 = 1 mark)

3 X and Y are identical stars. When viewed from Earth the flux from star X is 4 times the flux from star Y. Which of the following explanations is possible?

☒ **A** X is twice as far away as Y.

☒ **B** X is four times as far away as Y.

☒ **C** Y is twice as far away as X.

☒ **D** Y is four times as far away as X.

(Total for Question = 1 mark)

4 For a black-body radiator, the frequency at which maximum radiation of energy occurs is proportional to

☒ **A** T^{-4}

☒ **B** T^{-1}

☒ **C** T

☒ **D** T^{4}

(Total for Question = 1 mark)

5 About 25% of the mass of our Universe is thought to consist of dark matter. A key property of dark matter is that it

☒ **A** absorbs all electromagnetic-radiation.

☒ **B** cannot be detected.

☒ **C** emits no detectable electromagnetic-radiation.

☒ **D** exerts no gravitational force.

(Total for Question = 1 mark)

6 The gravitational field strength at the surface of Mars is one third that at the surface of the Earth. A mass-spring system with a frequency of 3.0 Hz at the surface of the Earth would have a frequency at the surface of Mars of

☒ **A** 5.2 Hz

☒ **B** 3.0 Hz

☒ **C** 1.7 Hz

☒ **D** 1.0 Hz

(Total for Question = 1 mark)

7 If the surface temperature of the Sun were to double, the rate at which energy from the Sun is received on the Earth would increase by a factor of

☒ **A** 2

☒ **B** 4

☒ **C** 8

☒ **D** 16

(Total for Question = 1 mark)

8 At night the Earth's surface cools down as energy is radiated away into space.

Most of the energy is radiated away as

☒ **A** infrared radiation.

☒ **B** microwaves.

☒ **C** ultraviolet radiation.

☒ **D** visible light.

(Total for Question = 1 mark)