

13. Classical theories predict that most of the energy from a blackbody should be radiated
- a. as thermal radiation in the infrared region.
  - b. at the wavelength given by Wien's displacement law.
  - c. as ultraviolet light.
  - d. a blackbody should not radiate.

14. The ultraviolet catastrophe predicts that:

- a. all objects should radiate extreme amounts of ultraviolet light.
- b. as an object get hotter its light will change from dull red to blue light
- c. a blackbody can absorb an infinite amount of radiation if the radiation is in the ultraviolet region.
- d. the radiated energy approaches zero as the wavelength approaches zero.

15. If a blackbody is at 2000°C, what will be the peak wavelength emitted?

- a. 1.67  $\mu\text{m}$
- b. 1.45  $\mu\text{m}$
- c. 1.27  $\mu\text{m}$
- d. 580 nm
- e. None of the above options

16. Briefly discuss the differences between ionizing and non-ionizing radiation by giving several examples for each type of radiation. [5marks]

Ans.

[2marks]

- Ionizing radiation has capacity to break molecular bonds.
- ionizing radiation is radiation that carries enough energy to detach electrons from atoms causing the atom to become charged or ionized.

[2marks]

- Non-ionizing radiation has no capacity to break molecular bonds.
- Nonionizing radiation is the type of electromagnetic radiation with no enough energy to ionize atoms.

[1mark]

- Ionizing radiation: UV, X-rays, Cosmic radiation,  $\alpha$ -particles,  $\beta$ -particles
- Non- ionizing radiation: RF, MW, IR, VISIBLE

17. Is 5G an ionizing radiation? Briefly discuss your answer in a concise manner. [5marks]

Ans.

- 5G is a non-ionizing radiation [3marks]
- Concise explanation[2marks]

18. State the sub-types of ultraviolet light. State which has the highest energy. [5marks]

Ans.

- UV-A, UV-B, UV-C [3marks]
- UV-C has the highest energy[2marks]