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Q31

**With reference to radioisotope thermoelectric generators (RTGs), consider the following statements: 1. RTGs are miniature fission reactors. 2. RTGs are used for powering the onboard systems of spacecrafts. 3. RTGs can use Plutonium-238, which is a by-product of weapons development Which of the statements given above are correct? (a) 1 and 2 only (b) 2 and 3 only (c) 1 and 3 only (d) 1, 2 and 3 Official key: B.**

UPSC Civil Services Prelims 2024 · General Studies · 2 marks · Science and Technology

Science, technology, space, defence, IT - Prelims GS Paper I.

**Explanation**

**(a)**

1 and 2 only. RTGs are not miniature fission reactors.

**(b) Official key**

2 and 3 only. Used on spacecraft; Pu-238 from the nuclear complex, including weapons-related production historically.

**(c)**

1 and 3 only. Drops the true spacecraft use; keeps the false fission claim.

**(d)**

- **All three. Statement 1 fails:** RTGs are radioisotope decay heat + thermocouples, not a fission pile.

**Summary**

Official key is (b) 2 and 3 only. An **RTG** converts heat from radioactive decay (often **plutonium-238**) into electricity with thermocouples. It is not a miniature fission reactor. RTGs power spacecraft (Voyager, Curiosity, etc.). Pu-238 has been produced in reactors tied to the weapons complex. So 1 is false; 2 and 3 hold.

**Related possible facts**

These can be asked in a future Prelims paper.

**RTG**

Radioisotope thermoelectric generator.

**Plutonium-238**

Alpha emitter; high power density; not the Pu-239 of weapons pits.

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