

# **FBR Neutronics: Core and Blanket Characteristics**

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## 1 Quiz

### 1.1 Questions

1. Define specific fissile inventory.
2. Higher degree of enrichment required for a fast reactor in comparison with that of thermal reactor is attributed to the
  - (a) low cost of  $\text{PuO}_2$
  - (b) high cost of  $\text{UO}_2$
  - (c) low fission cross section in fast spectrum
  - (d) none of the above
3. Which one of the following defines Power density?
  - (a) amount of thermal energy produced per unit volume of fuel
  - (b) amount of thermal energy produced per unit mass of fuel
  - (c) amount of thermal energy produced per unit volume of core
  - (d) amount of thermal energy produced per unit mass of core
4. Define burnup.
5. Which one of the following are possible with increase in temperature of sodium in a fast reactor?
  - (a) increase in neutron leakage
  - (b) negative reactivity changes
  - (c) decrease in neutron leakage
  - (d) positive reactivity changes
6. Are higher burnups desirable in nuclear reactors? Justify your answer.

### 1.2 Answers

1. Specific fissile inventory is defined as the mass of fissile material required per unit reactor thermal power.
2. (c) low fission cross section in fast spectrum
3. (a) amount of thermal energy produced per unit volume of fuel
4. Burnup is defined as the amount of thermal energy produced (in terms of product of thermal output and number of days) per unit mass of heavy metal.
5. (a) & (b)
6. Yes. Higher burnups are desirable in nuclear reactors.  
Justification: Higher burnup is an indication of effective utilization of heavy metal