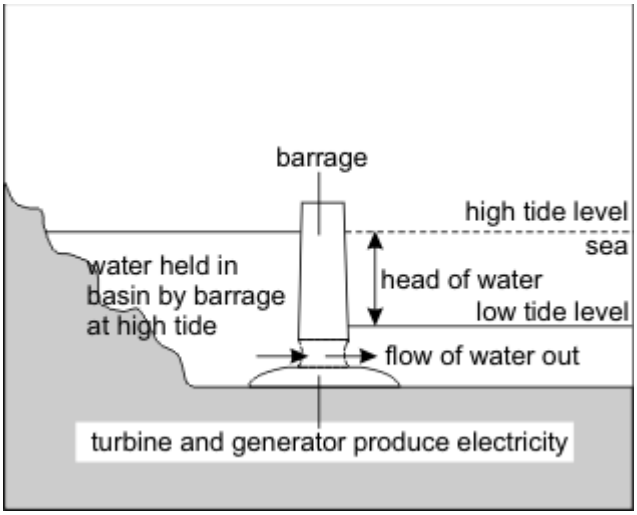
Name of the Student:_____
Max. Marks : 16 Marks **Time : 16 Minutes**

Q1.

The outline diagram below shows a tidal power generating system.



Gates in the barrage are open when the tide is coming in and the basin is filling to the high tide level. The gates are then closed as the tide begins to fall.

Once the tide outside the barrage has dropped the water can flow through large turbines in the barrage which drive generators to produce electrical energy.

In one second 1.2×10^9 kg of water flows through the turbines at a speed of 20 m/s.

(a) When used with a water speed of 20 m/s the system has an efficiency of 90% in converting the kinetic energy of the water into electrical energy. Calculate the power output of the generators.

_____

_____

_____

(2)

(b) The power output of a coal fired power station is 1000 MW (1×10^9 W).

(i) Suggest **two** advantages of coal fired power stations over tidal power generating systems.

1. _____

_____

2. _____

(ii) Suggest **two** advantages of tidal power generating systems over coal fired power stations.

1. _____

_____

2. _____

_____

(iii) Suggest and explain **one** disadvantage of a tidal power generating system.

_____

_____

_____

_____

(6)

(Total 8 marks)

Q2.

Describe, in as much detail as you can, how the energy stored in coal is transferred into electrical energy in a power station.

_____

_____

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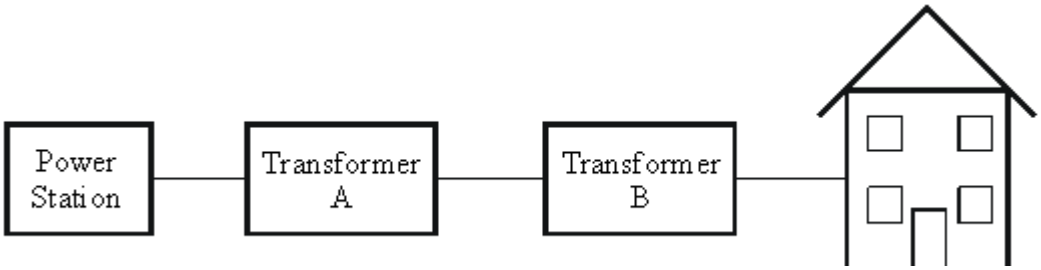
(Total 5 marks)

Q3.



Transformer A produces a very high voltage to transmit the electrical energy through the National Grid.
Explain why electrical energy is transmitted at a very high voltage.

_____

_____

_____

(Total 3 marks)