

# Unit 5 - Week 4

## Course outline

### How to access the portal?

#### Week 1

#### Week 2

#### Week 3

#### Week 4

##### Energy Storage

 Electrochemical Energy Storage (Batteries)

 Supercapacitors

 Hydrogen Storage

 Thermal Energy Storage

 **Quiz : Assignment 4**
 Solutions for Assignment 4

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### Feedback Link

## Assignment 4

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

**Due on 2019-08-28, 23:59 IST.**

1) Quantity of available energy in the storage systems after charging is known as \_\_\_\_\_

1 point

- Storage capacity
- Available power
- Durability
- Self-discharge

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Storage capacity

2) Solid electrolyte interphase is formed from

1 point

- Oxidation of electrolyte on the electrode surface
- Reduction of the electrolyte on the electrode surface
- Melting of electrode material in electrolyte solution
- None of these

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Reduction of the electrolyte on the electrode surface

3) Primary battery is such a battery

0 points

- Which can be recharged
- Which cannot be reconditioned by replacing chemical
- Which cannot be reused
- Which cannot be recharges

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Which cannot be recharges

4)  $Zn|ZnSO_4 (0.01M)||CuSO_4 (1.0M)|Cu$ , the emf of this Daniel cell is  $E_1$ . When the concentration of  $ZnSO_4$  is changed to 1.0M and that of  $CuSO_4$  changed to 0.01M, the emf changes to  $E_2$ . From the following, which one is the relationship between  $E_1$  and  $E_2$ ?  
(Given  $\frac{RT}{F} = 0.059$ )

1 point

- $E_1 = E_2$
- $E_1 < E_2$
- $E_1 > E_2$
- $E_1 = 0 \neq E_2$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $E_1 > E_2$

5) Which of the following is used as an electrode material for pseudocapacitor?

1 point

- Activated carbon
- Graphene
- Polypyrrole
- Carbon material for negative electrode and metal oxide for positive electrode

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Polypyrrole

6) Match the following types of electrolyte material used for supercapacitors in section 'A' with their corresponding examples in section 'B'

1 point

Section A	Section B
1. Organic electrolytes	A. Pyrrolidinium
2. Aqueous electrolytes	B. (TEABF <sub>4</sub> ) in acetonitrile solvent
3. Ionic liquids	C. Dry polymer electrolyte
4. Soli state polymer electrolyte	D. KOH

Where (TEABF<sub>4</sub>) is Tetraethyl ammonium tetrafluoroborate

- 1-B, 2-C, 3-D, 4-A
- 1-B, 2-D, 3-A, 4-C
- 1-A, 2-C, 3-B, 4-D
- 1-C, 2-D, 3-A, 4-B

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
1-B, 2-D, 3-A, 4-C

7) The weight percentage of hydrogen stored to the total weight of the system (hydrogen + container) is known as

1 point

- Volumetric density
- Gravimetric density
- Charge density
- Force density

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Gravimetric density

8) The chemical formula of zeolite is

1 point

- $FeSO_4 \cdot 7H_2O$
- $Al_2(SO_4)_3 \cdot 18H_2O$
- $Na_2O \cdot Al_2O_3 \cdot xSiO_2 \cdot yH_2O$
- $Na_2Al_2O$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $Na_2O \cdot Al_2O_3 \cdot xSiO_2 \cdot yH_2O$

9) What are the units of specific heat capacity,  $C_p$ ?

1 point

- Joule/Kilogram Kelvin
- Joule
- Joule/Kelvin
- Joule/Kilogram

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Joule/Kilogram Kelvin

10) Thermal storage of energy is possible in the form of

1 point

- Sensible heat
- Latent heat
- Chemical reaction
- All of these

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
All of these