

## Unit 4 - Week 3

### Course outline

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#### Week 3

Nanogenerators: Introduction & Piezoelectric Nanogenerators

Triboelectric Nanogenerators

Pyroelectric Nanogenerators

Thermoelectric Nanogenerators & Electromagnetic generators

Other Energy Resources

Quiz : Assignment 3

Solutions for Assignment 3

#### Week 4

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## Assignment 3

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

**Due on 2019-08-21, 23:59 IST.**

1) What does it mean "piezo" in piezoelectricity word? 1 point

- To release  
 To press  
 To magnetize  
 To electrify

No, the answer is incorrect.

Score: 0

Accepted Answers:

To press

2) The expression to determine the strain (S) in piezoelectric material is given by 1 point

Here,  $d$ : Piezoelectric coefficient or charge constant  
 $s$ : Elastic compliance and  
 $\epsilon$ : Dielectric constant (permittivity).

- $S = s^E + dE$   
  $S = s^E T + E$   
  $S = s^E T + dE$   
  $S = dT + \epsilon^T E D$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$S = s^E T + dE$

3) Who demonstrated first about nanogenerators? 1 point

- Prof. Zhong Lin Wang's group  
 Prof. Yury Gogotsi's group  
 Prof. Harry Atwater's group  
 Prof. Martin Winter's group

No, the answer is incorrect.

Score: 0

Accepted Answers:

Prof. Zhong Lin Wang's group

4) Charge generation can be increased in TENG materials by 1 point

- Changing the substrate morphology by surface modification  
 Enlarging the contact area of materials  
 Selecting materials with larger difference in the ability to attract and retain electrons  
 All of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

All of these

5) Pyroelectric nanogenerators are used in \_\_\_\_\_. 1 point

- Infrared thermometer  
 Infrared thermal imaging  
 Sensors  
 All of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

All of these

6) What is the chemical formula of strontium Barium Niobate (SBN)? 1 point

- $Sr_{1-x}Ba_{1-x}Nb_2O_6$  with  $0.15 \leq x \leq 0.55$   
  $Sr_xBa_{1-x}Nb_2O_6$  with  $0.25 \leq x \leq 0.75$   
  $Sr_xBa_{1-x}Nb_4O_6$  with  $0.25 \leq x \leq 0.75$   
  $Sr_xBa_xNb_2O_6$  with  $0.35 \leq x \leq 0.65$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$Sr_xBa_{1-x}Nb_2O_6$  with  $0.25 \leq x \leq 0.75$

7) The phenomenon of conversion of heat energy directly into electrical energy directly into electrical energy when the junction of two dissimilar metals are kept at different temperatures is called 1 point

- Seebeck effect  
 Peltier effect  
 Thompson effect  
 Joule's effect

No, the answer is incorrect.

Score: 0

Accepted Answers:

Seebeck effect

8) Electromagnetic generators works on \_\_\_\_\_ principle 1 point

- Electrostatic induction  
 Electrodynamical induction  
 Electromagnetic induction  
 Contact electrification

No, the answer is incorrect.

Score: 0

Accepted Answers:

Electromagnetic induction

9) In nuclear power stations which nuclear reaction is performed? 1 point

- Nuclear fusion  
 Nuclear fission  
 90% fission and 10% fusion  
 90% fusion and 10% fission

No, the answer is incorrect.

Score: 0

Accepted Answers:

Nuclear fission

10) Nano WC/Co composites are coated on tidal turbine blades as \_\_\_\_\_ 1 point

- Anti-reflective coating  
 Absorber coatings  
 Anti-corrosive coating  
 Dust repellent coating

No, the answer is incorrect.

Score: 0

Accepted Answers:

Anti-corrosive coating