Instructions: Total marks: 10. Each of the 09 questions carries 01 mark. An additional 01 mark will be awarded to the students submitting the answer sheet within 3.30 pm (Sharp).

1. Identify the performance factor(s) for biosensors that attribute to their functional traits from the following list:
(A) Selectivity
(B) Cost
(C) Portability
(D) Design
(E) Market
(F) Sensitivity

0

2. Write the word/phrase against each acronym letter of "ASSURED", the criteria World Health Organization has suggested. Zero mark will be awarded for an incomplete or incorrect answer against any acronyms.

(1)

A: Affordable   S: Specific   S: Selective   U: User friendly

R: Rapid and Robust   E: Equipment free   D: Deliverable to end point

3. In PTC thermistor:
(A) Resistance increases with increasing temperature
(B) Resistance decreases with increasing temperature
(C) Resistance increases with decreasing temperature
(D) Resistance decreases with decreasing temperature
(E) Resistance does not change with decreasing temperature
(F) Resistance does not change with increasing temperature

0

Identify the correct answer.

4. Fill the gaps each with an appropriate word:
Organophosphates _____X_____ **inhibit acetylcholinesterase, which hydrolyses acetylcholine,** the _____X_____ **of the parasympathetic nervous system.**

5. The sensitivity of calorimetric biosensors could be increased by increasing _____Enthalpy X_____ output by the _____heat² X_____ reaction steps.
Fill the gaps each with an appropriate word.

6. In SPR phenomenon, if the evanescent field intensity decayed over a distance of 80 nm from the interface, then what would be the wavelength of the incident light?
(A) 160 nm
(B) 200 nm
(C) 240 nm   X
(D) 280 nm
(E) 300 nm
(F) None of the above.

7. Identify the correct relations among the amount of charge(C) developed, piezoelectric coefficient (d), force applied along the x-direction (F_x), the number of stacked elements (n), and crystal dimensions a, b for a longitudinal effect in piezoelectric materials from the following equations:

(A) $C_x = d_{xy} F_x n\, a/b$
(B) $C_x = d_{xx} F_x n\, b/a$
(C) $C_x = 2d_{xx} F_x n\, a/b$
(D) $C_x = d_{xx} F_x n$
(E) $C_x = 2d_{xy} F_x n$
(F) $C_x = d_{xy} F_x n$

8. Identify the correct answer(s) without making any assumption from the following statements:

For oxidation of a target analyte on the electrode surface, the
(A) $F_F >$ E of LUMO of the target
(B) $F_F >$ E of HOMO of the target
(C) $F_F >$ E of HOMO and LUMO of the target.
(D) $F_F <$ E of LUMO of the target
(E) $F_F =$ E of LUMO of the target
(F) $F_F <$ E of HOMO of the target
The terminology/symbols follow the usual meaning as discussed in the classes.

9. From the cyclic voltammogram below, correlate the pattern of the graphs with the correct reaction(s):
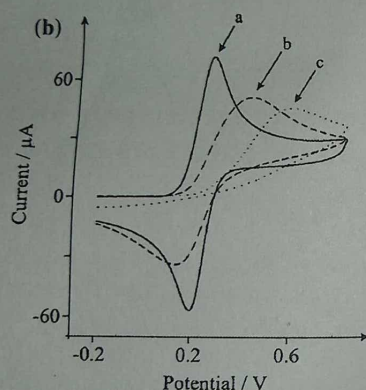
(A) a → quasi-reversible
(B) a → non-reversible
(C) a → reversible
(D) b → reversible
(E) b → irreversible
(F) b → quasi-reversible
(G) c → reversible
(H) c → quasi-reversible

END