生物醫學工程領域議題之測驗範例

測驗方式包括選擇題、問答題及申論題等形式

選擇題：

____ 1. A phase transition process in which the gas transforms into a solid state is called _____.

(A) crystallization

(B) vaporization

(C) deposition

(D) ionization

____ 2. Quantum dots manifest diverse colors contingent upon their particle sizes. They can catalyze chemical reactions and effectively _____ tumor tissue during surgical procedures.

(A) vibrate

(B) illuminate

(C) contaminate

(D) isolate

____ 3. Which of the following statements about stem cells is true?

(A) Stem cells can only be found in bone marrow.

(B) Stem cells have a limited ability to differentiate into different cell types.

(C) Embryonic stem cells are derived from developed tissues.

(D) Adult stem cells are only found in elderly individuals.

____4. In the domain of advanced materials for drug delivery applications, achieving precise release kinetics is important. Which of the following parameters significantly influences the controlled release of drugs from a delivery system?

(A) Nanostructure of the carrier material

(B) Transparency of the drug

(C) Weight of the drug container

(D) Aroma and fragrance of the drug

____5. For a wearable pulse sensor capable of measuring heart rates within the range of 30 beats per minute (bpm) to 210 bpm, what should be the designed bandwidth to cover the aforementioned heart rate range?

(A) 0.1 Hz ~ 0.7 Hz

(B) 0.4 Hz ~ 4 Hz

(C) 1 Hz ~ 3.5 Hz

(D) 30 Hz ~ 210 Hz

____ 6. Which of the following equipment is mostly non-invasive?

(A) Epidural Catheter

(B) Cochlear implant

(C) Blood glucose monitor

(D) Blood pressure monitor

問答題：

Please translate the following paragraph into Chinese

COVID-19 is one of the most severe global health crises that humanity has ever faced. Researchers have restlessly focused on developing solutions for monitoring and tracing the viral culprit, SARS-CoV-2, as vital steps to break the chain of infection. Even though biomedical engineering (BME) is considered a rising field of medical sciences, it has demonstrated its pivotal role in nurturing the maturation of COVID-19 diagnostic technologies. Within a very short period of time, BME research applied to COVID-19 diagnosis has advanced with ever-increasing knowledge and inventions, especially in adapting available virus detection technologies into clinical practice and exploiting the power of interdisciplinary research to design novel diagnostic tools or improve the detection efficiency. (Cite from Bioengineered, 12:1, 8594-8613, 2021)

申論題：

生醫工程領域廣泛的應用在疾病的預防、檢測、健康監控以及治療，對人類的健康守護有具有重大的貢獻。請根據您的學習歷程和生活經驗，描述和說明生物醫學工程科技在這些領域的應用。