## Section 4 Final Evaluation

**1. *In vitro* to *in vivo* extrapolation (IVIVE) is modeling software that can utilize *in vitro* data and mathematically translate that into relevant *in vivo* information utilizing pharmacokinetic (PK).**

True

False

**Answer**

True

**2. Which of the following is a common tool used for both Quantitative Structure Activity Relationships (QSAR) and Physiologically based pharmacokinetic (PBPK)?**

GastroPlus

ADMET Predictor

ACD Toxsuite

Derek

**Answer**

GastroPlus

**3. HumanOmni 5 Quad (Omni 5), illumina Omni Arrays and the Affymetrix platforms are common methods used in:**

Transcriptomics

Genomics

Proteomics

Metabolomics

**Answer**

Genomics

**4. Quantitative Structure Activity Relationships (QSAR) approaches for predictive toxicity testing requires all the following EXCEPT:**

Lots of data in order to build robust databases.

Validation of QSAR relationships with large sets of in vitro and in vivo datasets.

Extensive collaboration between scientists across different disciplines of toxicology.

A mass spectrophotometer.

**Answer**

A mass spectrophotometer.

**5. Computational modeling tools utilizes the in vitro data and integrate them into human physiology with the help of...**

Physiologically based pharmacokinetic model.

High-throughput in vitro model.

Hypothesis and diagnostic model.

Mathematical and computational model.

**Answer**

Physiologically based pharmacokinetic model.

**6. Systems toxicology aims to fill this gap and utilize these data from different systems and integrate them into meaningful assessment for safety. This gap is:**

Lack of modern equipment and technology for data collection.

Lack of interpretation and utilization of collected data.

Lack of human resources and management.

Lack of organ and system models.

**Answer**

Lack of interpretation and utilization of collected data.

**7. Adverse Output Pathways (AOP) can be assessed in the following stages:**

Molecular initiating event

Intermediate response at cellular level

Toxic response at organic level

All of the above

**Answer**

All of the above

**8. In Metabolomics, the major difference between liquid chromatography mass spectrometers (LCMS) and nuclear magnetic resonance (NMS) is...**

NMR samples cannot be reused for other purposes while LCMS samples can be reused for other purposes.

NMR is a destructive process whereas LCMS is a non-destructive process.

NMR is a non-destructive process whereas LCMS is a destructive process.

NMR samples cannot be returned to the biorepository whereas LCMS samples can be returned to the biorepository.

**Answer**

NMR is a non-destructive process whereas LCMS is a destructive process.

**9. In the study of the underlying mechanisms of different diseases at the genomic level, the most common form of variants at this level is:**

Polyploidy

Aneuploidy

Single Nucleotide Polymorphism (SNP)

Micronuclei variants

**Answer**

Single Nucleotide Polymorphism (SNP)

**10. ____ is used for analysis of proteomics data:**

A mass spectrophotometer

DNA micro array

Illumni Omni Array

DNA sequencing

**Answer**

A mass spectrophotometer

**11. The ToxCast program utilizes which kind of assays?**

In vivo

In vitro

In silico

All of the above

**Answer**

In vitro

**12. The following agencies were established to address the challenge of large number of chemicals that go to market with very limited or no toxicity testing:**

Environmental Protection Agency (EPA) in the US.

Registration Evaluation Authorization and Restriction of Chemicals (REACH) in Europe.

Both A & B are correct.

Occupational Safety and Health Administration (OSHA).

**Answer**

Both A & B are correct.

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