Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

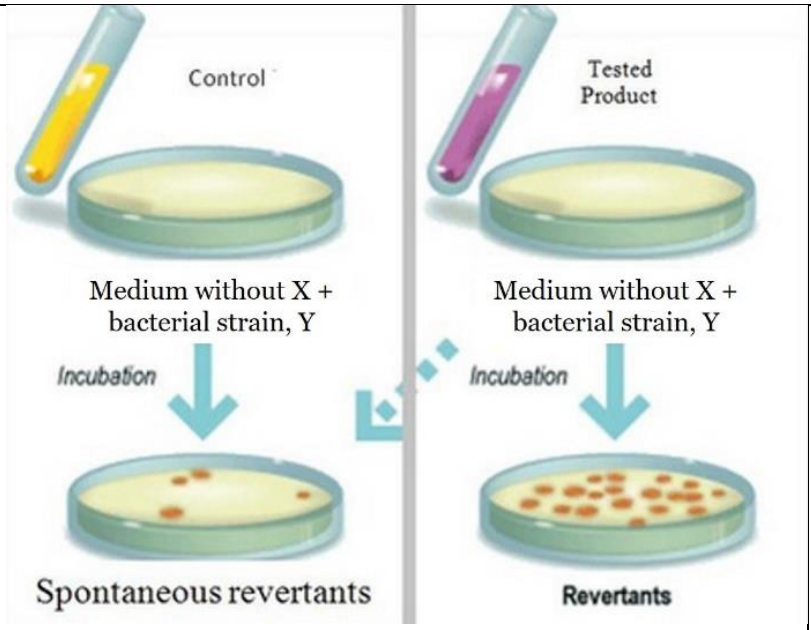
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2023

Course: Toxicology and Nano biotechnology — **Semester : IV**
Program: B. Tech Biotechnology — **Duration : 3 Hours**
Course Code: HSTX 2001 — **Max. Marks: 100**

Instructions: Attempt all Questions

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	Cos
Q 1	Which of the following toxicity can occur due to single exposure? a) Acute toxicity b) Sub-acute toxicity c) Sub-chronic toxicity d) Chronic toxicity	**1.5**	**CO3**
Q 2	Which of the following is characteristic of a non-genotoxic carcinogen? a) has no influence on the promotional stage of carcinogenesis b) would be expected to produce positive responses in in vitro assays for mutagenic potential c) typically exerts other forms of toxicity and/or disrupts cellular homeostasis d) generally shows little structural diversity e) typically has little effect on cell turnover	**1.5**	**CO4**
Q 3	Prolonged muscle relaxation after succinyl choline is an example of a/an -- a) IGE- mediated allergic reaction b) idiosyncratic reaction c) immune complex reaction d) reaction related to a genetic increase in the activity of a liver enzyme	**1.5**	**CO3**
Q 4	If two organophosphate insecticides are absorbed into an organism, the result will be----	**1.5**	**CO3**

	a) additive effect b) synergistic effect c) potentiation d) subtraction effect		
Q 5	Compare between "Chemical and Receptor" antagonism.	**1.5**	**CO3**
Q 6	List three characteristics that determine the toxic response of a toxicant.	**1.5**	**CO4**
Q 7	Which of the following are tools used in risk analysis? a) toxicology b) epidemiology c) clinical trials d) all of the above.	**1.5**	**CO4**
Q 8	The LD50 is best described as which of the following: a) the dose at which 50 % of all test animals die b) the dose at which 50 % of the animals demonstrate a response to the chemical c) the dose at which all of the test animals die d) the dose at which at least one of the test animals dies	**1.5**	**CO3**
Q 9	Compare between risk assessment and risk management	**1.5**	**CO3**
Q 10	What is Bio-transformation?	**1.5**	**CO4**
Q 11	1 nanometer= _____ m. A. 10^{-3} B. 10^{-4} C. 10^{-9} D. 10^{-6}	**1.5**	**CO1**
Q 12	Recall the name of Noble prize winner who gave the concept of Nanotechnology.	**1.5**	**CO1**
Q 13	Write the advantages of synthesis of nanoparticles by biological methods.	**1.5**	**CO1**
Q 14	Recall the conditions of absorption of Infrared radiation by a molecule.	**1.5**	**CO1**
Q 15	Define Biosensor.	**1.5**	**CO1**
Q 16	DLS is used to measure _____ and _____ of nanoparticles.	**1.5**	**CO1**
Q 17	Explain homogenous and heterogenous nucleation.	**1.5**	**CO1**
Q 18	Explain about i-Pills.	**1.5**	**CO1**
Q 19	Enlist different applications of nanobiotechnology.	**1.5**	**CO1**
Q 20	Briefly explain the health and safety issues of nanoparticles	**1.5**	**CO2**

Section B (4Qx5M=20 Marks)			
Q		**5**	**CO**
Q1	Describe the applications of UV visible spectroscopy in characterization of nanoparticles.	**5**	**CO1**
Q2	Describe the principle of dynamic light scattering (DLS) and its applications in characterization of nanoparticles.	**5**	**CO1**
Q3	Discuss the functions of following Phase I- xenobiotic metabolizing enzymes, with relevant examples for each: i) Mono-oxygenases ii) Epoxide hydrolases	**5**	**CO3**
Q4	How does the intestinal gut flora influence xenobiotic metabolism in humans? Explain with the help of a relevant example.	**5**	**CO4**
Section C (2Qx15M=30 Marks)			
Q1	 The diagram depicts a test to determine the mutagenicity of an unknown compound. Answer the following questions: a) What is the test called? b) Name the bacterial strain, Y used in the test? c) What mutation is used as an indicator of mutagenicity potential of the test compound? d) What is X?	**2+2+2+1+ 2+2+2+2**	**CO4**

	e) Discuss what would happen if the media was supplemented with ample amount of X f) Is the tested product mutagenic? Justify your answer. g) What are revertants? h) Why do you think the Ames test is preferable for first-tier screening of xenobiotics rather than *in-vivo* or animal models?		
Q2	a) Classify nanoparticles based on method of synthesis. b) Differentiate among chemical, physical and biological methods of synthesis of nanoparticles with suitable examples. c) Discuss nanomedicine based targeted drug delivery and state the goals for nanomedicine.	**4+7+4**	**CO1**
Section D (2Qx10M=20 Marks)			
Q			
Q1	a) Define nanostructures. b) Discuss various kinds of nanostructures (0D, 1D, 2D, and 3D) with a suitable example of each category.	**2+8**	**CO2**
Q2	a) Compare between "Genotoxic and Non genotoxic" carcinogens, with relevant examples for each. b) List three factors affecting the extent and rate of xenobiotic metabolism c) What is a Comet assay? Make a flowchart to explain the steps involved in the assay. State one application of the Technique.	**2+3+5**	**CO3**