Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Science

End Sem (Even) Examination May-2022

CH6CW02 Chemistry of Materials

Programme: Ph.D. Branch/Specialisation: Chemistry (Course Work)

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Green chemists reduce risk by- **1**
(a) Reducing the hazard inherent in a chemical product or process
(b) Minimizing the use of all chemicals
(c) Inventing technologies that will clean up toxic sites
(d) Developing recycled products

ii. Bioethanol is mixed with _____ to prepare transport fuel. **1**
(a) Oil (b) Petrol (c) Kerosene (d) Diesel

iii. The chemical characteristic of a molecule in numerical form, used for QSAR/QSPR studies. **1**
(a) Analog (b) Descriptors (c) Generators (d) None of these

iv. QSAR method involves: **1**
(a) Target Structure (b) Target Properties
(c) Ligand X-ray structure (d) Ligand Properties

v. Which one of the following is an example for thermal properties of nanostructure? **1**
(a) Melting temperature (b) Absorption and scattering of light
(c) Both (a) and (b) (d) None of these

vi. What's the procedure in Top-down fabrication method? **1**
(a) Nano particles > Powder > Bulk
(b) Powder > Bulk > Nano particles
(c) Bulk > Powder > Nano particles
(d) Nano particles > Bulk > Powder

vii. NMR is the study of absorption of _____by nuclei in a magnetic field? **1**
(a) Radioactive radiation (b) IR Radiation
(c) Microwaves (d) Radio Frequency radiation

P.T.O.

viii. Select the wavelength range corresponding to UV-visible region: **1**
(a) 100-10 cm (b) 200-2000 nm
(c) 400-800 nm (d) 100-1000 dm

ix. Which of the following software is used for making structure? **1**
(a) ChemSketch (b) Dragon (c) Canva (d) Coral

x. ArgusLab is used for: **1**
(a) Molecular modelling (b) Molecular graphics
(c) Drug design (d) All of these

Q.2 Attempt any two:
i. What is green chemistry? Explain 12 principle of green chemistry. **5**
ii. "Green Chemistry is sustainable chemistry"- Explain the statement. **5**
iii. Write a short note on Biomass Conversion. **5**

Q.3 i. What is the difference between soft and hard drugs? **4**
ii. Explain the main descriptors used in Quantitative structure activity relationship (QSAR). **6**
OR iii. Write a short note on LD-50 and ED-50. **6**

Q.4 Attempt any two:
i. Define Nanotechnology. What are three major applications of Nanotechnology? **5**
ii. Write any two processes for formation of Nano particles. **5**
iii. Write a short note on Nano catalysis. **5**

Q.5 Attempt any two:
i. Define Chromatography. Give its classification in detail. **5**
ii. Explain the principle and applications of UV-Vis Spectroscopy. **5**
iii. Give the principle of NMR Spectroscopy. Also explain Chemical Shift along with shielding and de-shielding. **5**

Q.6 Attempt any two:
i. What is computational chemistry? What are the different methods of computational chemistry? **5**
ii. Write a short note on Density Functional Theory. **5**
iii. Give the details about the following software: **5**
(a) Argus Lab (b) Chem Craft

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Scheme of Marking

MEDI-CAPS UNIVERSITY Knowledge is Power	Faculty of Science End Sem (Even) Examination May-2022 CH6CW02 Chemistry of Materials
	Programme: Ph.D. (Course Work). Branch/Specialisation:

Note: The Paper Setter should provide the answer wise splitting of the marks in the scheme below.

Q.1	i)	(a) Reducing the hazard inherent in a chemical product or process	1
	ii)	(b) petrol	1
	iii)	(b) Descriptors	1
	iv)	(d) Ligand Properties	1
	v)	(a) Melting temperature	1
	vi)	(c) Bulk > Powder > Nano particles	1
	vii)	(d) Radio Frequency radiation	1
	viii)	(c) 400-800 nm	1
	ix)	(a) ChemSketch	1
	x)	(d) All of the above	1
Q.2	i.	Definition + 12 Principles	1+4
	ii.	Statement details with examples	5
OR	iii.	Details about biomass and Process of Biomass Conversion direct combustion, pyrolysis, and torrefaction with example.	2+1+1+1
Q.3	i.	Any four difference	1+1+1+1
	ii.	Any three descriptors and their uses	2+2+2
OR	iii.	Details about LD-50 and ED-50.	3+3
Q.4	i.	Define nanotechnology. What are three applications of nanotechnology?	2+3
	ii.	Any two process for formation of nano particles.	$2^{1/2}+2^{1/2}$
OR	iii.	Details about nano catalysis.	5
Q.5	i.	Definition + Classification	2+3
	ii.	Principle and applications any three.	2+3
OR	iii.	Principle of NMR Spectroscopy + Chemical Shift along with shielding and desheilding.	2+3
Q.6		Attempt any two:	
	i.	Definition. Three different methods of computational chemistry	2+3
	ii.	Role of Density Functional Theory and advantages	2+3
	iii.	Introduction and applications : (a) Argus Lab (b) Chem Craft	$2^{1/2}+2^{1/2}$