STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086 (For candidates admitted from the academic year 2015-16 & thereafter)

SUBJECT CODE: 15CH/AE/AP45

B.Sc. DEGREE EXAMINATION, APRIL 2019 FOURTH SEMESTER

COURSE : **ALLIED ELECTIVE** PAPER: **APPLIED CHEMISTRY** PAPER : APPLIED TIME : 3 HOURS

MAX. MARKS: 100

SECTION - A ANSWER ALL THE QUESTIONS (30x1=30)

I.

. C	Choose the correct answ	er:						
1.	Identify the primary sta	dard among the following b. HCl c. K ₂ Cr ₂ O ₇ d. H ₂ SO ₄						
	a. NaOH	b. HCl	c. K ₂ Cr ₂ O ₇	d. H ₂ SO ₄				
2.	. Which among the following is a dimensionless quantity?							
	a. Normality	b. specific gravity	c. molality	d. all of these				
3. Which of the following concentration unit is temperature independent?								
	a. Molality	b. molarity	c. normality	d. none of these				
4. Identify the top-down approach for the preparation of nanomaterials from the followin								
	a. Gas phase agglomeration		b. mechanical grinding					
	c. Molecular self ass	sembly	d. all of these					
5.	is the principa	al factor which causes	the properties of nanon	naterials to differ				
	significantly from other	r materials.						
	a. size distributionc. quantum size effects		b. specific surface feature					
			d. all of these					
6. Identify the natural polymer from the following								
	a. polyethylene	b. PVC	c. Silicones	d. cellulose				
7.	7 is an antibiotic.							
	a. Morphine	b. Aspirin	c. Penicillin	d. Phenacetin				
8.	Which among the follo							
	a. Saccharin	b. CHCl ₃	c. Halothane	d. Chloramphenicol				
9.	2. The extent of adsorption of a gas on a solid depends on							
	a. nature of gas	b. pressure of gas	c. temperature	d. all of these				

- 10. Identify the incorrect statement with regard to a catalyst.
 - a. It accelerates the rate of reaction
 - b. It alters the enthalpy of reaction
 - c. It reduces the activation energy of reaction
 - d. It affects both forward and backward reaction to the same extent.

II. Fill in the blanks:

11. The concentration of extremely dilute solutions can be expressed as							
2. The number of atoms of silver present in 5 moles of silver is							
13. The normality of $0.1 \text{ M H}_2\text{SO}_4$ is							
14. In TEM, the electrons are used to create an image of the sample.							
15. The interaction between a sharp probe and a sample are used for imaging in technique.							
16. The extent of physisorption of a gas on a solid with increase in temperature.							
17. Formation of ammonia from nitrogen and hydrogen by Haber's process is an example for							
catalysis.							
18 is the process of removing the skin from the animal.							
19. An example for Non – Narcotic analgesic is							
20 is the active ingredient present in Dettol preparations.							

III. State whether true or false:

- 21. Crystals of potassium hydrogen phthalate is an example for a primary standard.
- 22. Gelatin is a natural nano material.
- 23. Enzyme catalysts are highly specific in their catalytic action.
- 24. Malachite green is an azo dye.
- 25. Formation of self-assembled monolayers requires the application of external pressure.

IV. Answer in a line or two:

- 26. What are buffer solutions?
- 27. Mention any two characteristic properties of objects in the nano scale.
- 28. What are zeolites?
- 29. Which substance is used as a tanning agent in vegetable tanning?
- 30. How many millimoles of hydrogen atoms are present in 0.2 g of hydrogen gas?

SECTION - B

ANSWER ANY FIVE QUESTIONS:

(5x6=30)

- 31. Calculate the molality of the solution containing 14.3 g of sucrose (Molar mass = 342.3 gmol-1) in 676 g of water.
- 32. What are the principal differences between electron and scanning probe microscopic techniques?
- 33. Discuss the preparation, properties and uses of gold nano particles.
- 34. Distinguish between physisorption and chemisorption.
- 35. Write a brief account on classification of dyes.
- 36. Explain the various processes involved before the tanning of leather.
- 37. Discuss the applications of zeolites as a catalyst.

i) Silk

ANSWER ANY TWO QUESTIONS:	(2x20=40)	
38. a) Write a note on primary and secondary standards.	(6)	
b) How many grams of NaCl are required to prepare 100 mL of a solution		
of 1 M NaCl? (Formula mass of NaCl = 58.5 gmol ⁻¹)	(4)	
c) Discuss the principle and applications of Scanning Tunneling Electron		
Microscope (STEM).	(10)	
39. a) Write a brief account on toxic effects of nanomaterials.	(5)	
b) Discuss the characteristic features of enzymes as catalysts.	(5)	
c) Write the synthesis and applications of Congo red dye.	(5)	
d) Discuss the uses of chemicals as food preservatives with examples.	(5)	
40. a) Write a short note on different methods of tanning of leather.		
b) Illustrate the importance of green synthesis in synthesis of nanoparticles.	(5)	
c) Discuss the applications of the following:	(5)	

ii) Silicones