

Certificate course on "CHEMISTRY: A SUBJECT WITH MULTIFARIOUS OPPORTUNITIES" organized by the department of Chemistry, Kharagpur College from 16 December 2022 onwards

### ATTENDANCE RECORD

SL	NAME OF THE STUDENTS	SEMI	Roll	Date						Signature
				14/12/22	02/01/23	04/01/23	05/01/23	02/01/23	03/01/23	
1	GAURAV DEBNATH	1	2019071	P	P	P	P	P	P	Gaurav Debnath.
2	ARPITA BERA	3	2119009	P	P	P	P	P	P	Arpita Bera
3	SURAJIT ADDHYA	5	2019068	P	P	ab	P	P	P	Surajit Addhya
4	ANUSPA DAS	1	2219069	P	P	P	P	P	P	Anuspa Das.
5	SASWATA MONDAL	5	2019078	P	P	P	P	P	P	Saswata Mondal
6	SHOVANWITA JANA	1	2219078	P	P	P	P	P	P	Shovanwita Jana
7	BISWAJIT MANDAL	1	2219016	P	P	P	P	P	P	Biswajit Mandal
8	AMIT KAREK	1		P	P	P	P	ab	P	Amit Karek.
9	SATYAJIT NAYEK	3	2119092	P	P	P	P	ab	P	Satyajit Nayek
10	PURABI DE	1	2219038	P	P	P	ab	P	P	Purabi De
11	PALLABI BERA	5	2019041	P	P	P	P	P	P	Pallabi Bera
12	KRISHNENDU MAITY	5	2019023	P	P	P	P	P	P	Krishnendu Maity.
13	JOYDIP PAL	5	2019074	P	P	ab	P	P	P	Joydip Pal.
14	PRASENJIT MAHATA	3	2119069	P	P	P	P	P	P	Prasenjit Mahata
15	SURAJIT BISAL	3	2119064	P	P	P	P	P	P	Surajit Bisal.
16	SOMNATH SANTRA	3	2119055	P	P	P	P	ab	P	Somnath Santra
17	SNEHASHIS SENAPATI	1	2219097	P	P	P	P	P	P	Snehashis Senapati.
18	SOURYAJIT HAHT	5	2019058	P	P	P	P	P	P	Souryajit Haht

SL	NAME OF THE STUDENTS
19	DEBANJAN PARI
20	RITWIK SAHOO
21	PRALAY KUMAR JANA
22	SHREYA ROY
23	SILPA SAHOO
24	SHANKHA SUBHRA BHUNIA
25	SURAJIT MAITY
26	DEBAPRIYA MAITY
27	STHITI DAS
28	DIPA PRADHAN
29	ARPAN DUTTA
30	SK SAHIL ALI
31	AMIYA KUNMAR GHORAI
32	DEBRAJ GHOSAL
33	RUDRA PRASAD SATPATI
34	SUBRATA MAITI
35	SUCHITA GHOSHI
36	SUCHEETA PAUL

SEM	2022-23	2023-24	2024-25	25/07/24	26/08/24	29/09/24	RSN	SIGNATURE
3	P	P	P	Ab	P	P	2119010	Debanjan Pari
3	P	P	P	P	P	P	2119034	Ritwik Sahoo
5	P	P	P	P	P	Ab	2019034	Pralay Kumar Jena
3	P	P	P	P	P	P	2119018	Shreya Roy
3	P	P	P	P	P	P	2119024	Silpa Sahoo
3	P	P	P	P	P	Ab	2119016	Shankha Subhra Bhunia
3	P	P	P	P	P	P	2119025	Surajit Maity
3	P	P	P	P	P	P	2119010	Debapriya Maity
3	P	P	P	P	P	P	2119029	Sthiti Das
3	P	P	P	P	P	Ab	2119023	Dipa Pradhan
3	P	P	P	Ab	P	P	2119012	Arpan Dutta
3	P	P	P	P	P	P	2119052	Sk Sahil Ali
3	P	P	P	P	P	P	2119017	Amiya Kumar Ghosai
3	P	P	P	P	P	P	2119019	Debraj Ghosal
3	P	P	P	P	P	Ab	2119025	Rudra Prasad Satpati
3	P	P	P	P	P	P	2119061	Subrata Maity
3	P	P	P	P	P	P	2119026	Sucheta Ghosh
1	P	P	P	P	P	P	220048	Sucheta Paul



Dr. Indranil Chakraborty  
Associate Professor & Head  
Department of Chemistry  
Jt. Course Coordinator



Dr. Subhra Mishra  
Associate Professor  
Department of Chemistry  
Jt. Course Coordinator

Certificate course on "CHEMISTRY: A SUBJECT WITH MULTIFARIOUS OPPORTUNITIES" organized by the department of Chemistry, Kharagpur College from 16 December 2022 onwards

ATTENDANCE RECORD

SL	NAME OF THE STUDENTS	SEM	Roll	Date										Signature		
				16-12-22	17-12-22	19-12-22	20-12-22	21-12-22	22-12-22	23-12-22	24-12-22	25-12-22	26-12-22			
1	GALRAV DEBNATH	1	2219074	P	P	P	P	P	P	P	P	P	P	P	P	Gaurav Debnath.
2	ARPITA BERA	3	2119009	P	P	P	P	P	P	P	P	P	P	P	P	Arpita Bera
3	SURAJIT ADDHYA	5	2019068	P	P	P	P	P	P	P	P	P	P	P	P	Surjit Addhya
4	ANUSPA DAS	1	2219064	P	P	P	P	P	P	P	P	P	P	P	P	Anuspa Das.
5	SASWATA MONDAL	5	2019048	P	P	P	P	P	P	P	P	P	P	P	P	Saswata Mondal
6	SHOVANWITA JANA	1	2219069	P	P	P	P	P	P	P	P	P	P	P	P	Shovanwita Jana
7	BISWAJIT MANDAL	1	2219016	P	Ab	P	P	P	P	P	P	P	P	P	P	Biswajit Mandal
8	AMIT KAREK	1														Amit Karek,
9	SATYAJIT NAYEK	3	2119042	P	P	P	P	P	P	P	P	P	P	P	P	Satyajit Nayek
10	PURABI DE	1	2219038	P	P	P	P	P	P	P	P	P	P	P	P	Purabi De
11	PALLABI BERA	5	2019041	P	P	P	P	P	P	P	P	P	P	P	P	Pallabi Bera
12	KRISHNENDU MAITY	5	2019023	P	P	P	P	P	P	P	P	P	P	P	P	Krishnendu Maity
13	JOYDIP PAL	5	2019044	P	P	P	P	P	P	P	P	P	P	P	P	Joydip Pal.
14	PRASENJIT MAHATA	3	2119064	P	P	P	P	P	P	P	P	P	P	P	P	Prasenjit Mahata
15	SURAJIT BISAL	3	2119064	P	P	P	P	P	P	P	P	P	P	P	P	Surajit Bisal.
16	SOMNATHI SANTRA	3	2119064	P	P	P	P	P	P	P	P	P	P	P	P	Somnathi Santra
17	SNEHASHIS SENAPATI	1	2219047	P	P	P	P	P	P	P	P	P	P	P	P	Snehashis Senapati.
18	SOUMYAJIT HAITI	5	2019058	P	P	P	P	P	P	P	P	P	P	P	P	Soumyajit Hait









# KHARAGPUR COLLEGE

## KHARAGPUR

ESTD. : 1949

P.O.– Inda, Kharagpur, Municipality– Kharagpur, Sub-Division– Kharagpur,  
P.S.– Kharagpur (T), Dist.– Paschim Medinipur, West Bengal, PIN– 721305.

### Geo- tagged Photos of Certificate Course on ‘Chemistry: A Subject with Multifarious Opportunities’ held from 16<sup>th</sup> December,2022 to 7<sup>th</sup> January 2023



ATTESTED  
  
Principal  
Kharagpur College



# Certificate Course, Department of Chemistry, Kharagpur College

**TITLE - CHEMISTRY: A SUBJECT WITH MULTIFARIOUS OPPORTUNITIES**

**Date of Commencement: 16<sup>th</sup> December, 2022**

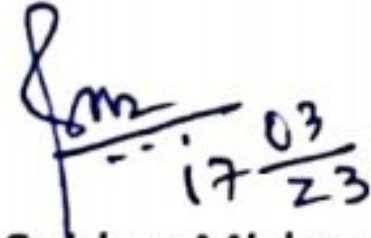
**Date of Completion: 7<sup>th</sup> January, 2023**

**Duration: 48 hrs**

Sl No	Topic		Resource person	Theory/Practical	Duration (Hours)	Date & Time
01	Safety measures in the laboratory		Dr. Forid Saikh, Asst. Prof. Chemistry	Theory	01	22.12.22 1.30pm
02	Fundamentals of computers	MS Words	Sri Alok Halder, Asst. Prof. Comp Science	Theory	01	17.12.22 12.00 noon
		MS Excel	Sri Kousik Bhattacharya, SACT Math	Practical	02	17.12.22
				Theory	01	05.01.23
		Practical	02	1.00 pm		
Prasetation in Power point, Google form	Dr. Indranil Chakraborty, Associate Prof. Chemistry	Theory	01	19.12.22		
03	Organocatalysis: New Methodologies for Sustainable Chemistry		Dr. Bidyut Kumar Senapati, Associate Professor, Midnapore College (Autonomous)	Practical	02	1.00 pm
				Theory	02	23.12.22 12.00 noon
04	Computational Chemistry		Molecular modeling, Dr. Subhra Mishra, Associate Prof. Chemistry	Theory	02	16.12.22 3.00pm
			Drawing of small molecules, Dr. Forid Saikh, Asst. Prof. Chemistry	Theory	02	22.12.22 1.00pm
05	Chemical waste & management		Smt. Kuheli Pramanik, Asstt Prof. Chemistry	Theory	02	05.01.23
06	Chemistry in a click		Dr. Jayanta Samanta, Post Doc Fellow, Dartmouth College, USA	Theory (Online mode through Google Meet)	02	27.12.22
07	Learn chemistry think differently _Lecture 1		Dr. Gagan Chandra Mandal, Associate Prof. Chemistry	Theory	02	16.12.22 2.00pm
08	Learn chemistry think differently _Lecture 2		Dr. Gagan Chandra Mandal, Associate Prof. Chemistry	Theory	01	07.01.23 12.00 noon
09	Learning e resources		Sri Amit Roy, Librarian	Theory	02	20.12.22



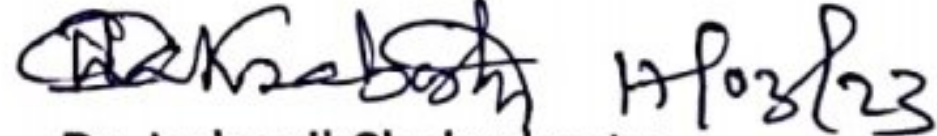
			mode through Google Meet)		3.00 pm
11	Determination of pKa of weak acid conductometrically	Prof. Prasanna Kumar Duley, Asstt Prof. Chemistry	Theory	01	03.01.23
			Practical	02	12 noon
12	Synthesis & application of polysaccharide functionalized metal nanoparticles	Dr. Ipsita Kumar Sen, Asstt Prof. Govt. General Degree College, Salboni.	Theory	02	23.12.22 1.30pm
13	Preparation of cosmetics Shampoo, Nail Polish remover, Vanishing cream etc....	Dr. Subhra Mishra, Associate Prof. Chemistry	Practical	02	03.01.21. 1.00pm
		Dr. Indranil Chakraborty, Associate Prof. Chemistry	Practical	02	04.01.23
		Dr. Forid Saikh, Asst. Prof. Chemistry	Practical	02	05.01.23
14	Chemistry in Everyday Life	Dr. Sumit Ray, Asst. Prof. Chemistry	Theory	02	04.01.22 12 noon
15	Instrumental biochemistry	Sri Subhajit Banerjee, SACT, Zoology	Theory	02	21.12.22 1.00pm
16	Bio fertilizers: A promising approach towards sustainable agriculture	Sri Kalyan Sur, SACT, Chemistry	Theory	02	03.01.23 1.00pm
17	Application of polysaccharides	Dr. Soumita Mondal, Associate Professor, Chemistry, Panskura Banamali College	Theory	02	21.12.22 1.30 pm
18	Career Opportunities in Chemistry	Dr. Sudipa Panigrahi, Director R&I Development, L'Oreal R&I USA	Theory(Online mode through Google Meet)	02	20.12.22 7.00pm

  
 Dr. Subhra Mishra  
 Associate Professor, Department of Chemistry  
 Kharagpur College  
 Jt. Coordinator



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 Dr. Indranil Chakraborty  
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 Jt. Coordinator



Notice  
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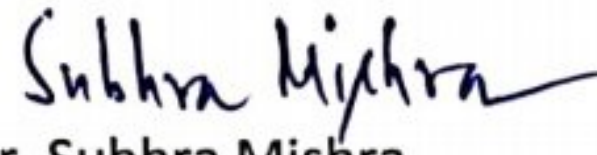
08.12.2022

**Notice for payment of registration fees for the certificate course on  
“Chemistry: A subject with multifarious opportunities”**

This is for information of all registered students of the Vidyasagar University approved certificate course (15 days) on “CHEMISTRY: A SUBJECT WITH MULTIFARIOUS OPPORTUNITIES” to submit the registration fees of Rs. 400.00 (Course fees Rs. 200/-, and application fees Rs.200/-) to the college office by 12.12.2022. The tentative date of commencement of the certificate course is 16<sup>th</sup> Dec 2022. The detailed course schedule will be intimated in due course of time.



Dr. Indranil Chakraborty  
Associate Professor & Head  
Department of Chemistry  
Jt. Course Coordinator



Dr. Subhra Mishra  
Associate Professor  
Department of Chemistry  
Jt. Course Coordinator

① 09/12/22

Dr. Bidyut Samanta  
Principal,  
Kharagpur College





## SUMMARY REPORT OF THE CERTIFICATE COURSE

**Topic of the Certificate Course: CHEMISTRY: A SUBJECT WITH MULTIFARIOUS OPPORTUNITIES**

**Organized by: Department of Chemistry, Kharagpur College.**

**Approved by: Centre for Continuing & Adult Education (CCAЕ), Vidyasagar University.**

**Duration: 16<sup>th</sup> December, 2022 to 7<sup>th</sup> January, 2023 (duration: 48 hrs).**

**Participants: Thirty six (36) students of B.Sc (Chemistry Honours), Kharagpur College.**

**Mode of delivery of course content: Hybrid mode.**

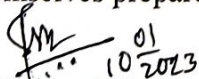
**Nature of delivery: Both theoretical and practical.**


**Resource Persons: Eighteen (18) Resource persons were involved in the course, out of which thirteen (11) faculty members were from Kharagpur College, four (04) from other colleges affiliated to Vidyasagar University, two from industry (ITC group, Bangalore & L'Oreal R&I USA), one from Dartmouth College, USA.**

**Co-ordinators: Dr. Indranil Chakraborty, Associate Professor, Department of Chemistry & Dr. Subhra Mishra, Associate Professor, Department of Chemistry.**

**Areas covered: Safety measures in the laboratory, Fundamentals of computers, Methodologies for Sustainable Chemistry, Computational Chemistry, Chemical waste & management, Chemistry in a click, Learn chemistry think differently, Learning e resources, Conductometry, Metal nanoparticles, Application of polysaccharide, Preparation of cosmetics Shampoo, Nail Polish remover, Vanishing cream etc, Chemistry in Everyday Life, Instrumental biochemistry, Bio fertilizers, Career Opportunities in Chemistry.**

**Course outcome: The course has been especially meant to make the students aware of the huge openings of the subject and also the challenges to be faced therein. During the tenure of the course discussions on different topics like fundamentals of computers, computational Chemistry, waste management, sustainability, nanochemistry, instrumental biochemistry etc helped the participating students to be acquainted with the mainstream chemistry of present days. They learned how to think differently after studying Chemistry. They have also been given hands on training on some interesting cosmetics preparation. During the interactive sessions with scientists from Industries the students came to know about job opportunities in various industries, and they have also been informed how to make themselves prepared for industries.**

  
(Dr. Subhra Mishra)  
Associate Professor, Department of  
Chemistry  
Kharagpur College  
Jt. Coordinator

 10.09.23  
(Dr. Indranil Chakraborty)  
Associate Professor, Department of  
Chemistry  
Kharagpur College  
Jt. Coordinator

**Question paper for final evaluation of  
Certificate Course on Chemistry: A Subject With Multifarious Opportunities  
Department of Chemistry, Kharagpur College**

**F.M. : 30**

**Time: 1 hour**

**Date: 07.01.2023**

**Answer any 15 questions (each question carries 02 marks)**

1. Name two stabilizers that can be used to prepare Ag nanoparticles.
2. What is the dimension of the metal nanoparticles?
3. What are the ingredients for preparation of shampoo?
4. What is the origin of "Click Chemistry"?
5. What is bio-fertilizer? Give two examples.
6. Name the main chemical ingredient present in toothpaste?
7. Write down the name of a proteomic tool used to generate secondary structure of a novel protein.
8. What are the ingredients for preparation of nail enamel?
9. Give two examples of green solvent.
10. Write down the structure of PVC.
11. Write down the structure of  $\beta$  glucan.
12. Give one example where AI is used in medical diagnosis?
13. Draw the curve for conductometric titrations of weak acid and weak base.
14. What will you do if concentrated Sulphuric acid spill on your hand?
15. What precaution you will take while handling with Bromine?
16. Why organocatalysts have advantage over conventional catalysts?
17. How will you manage chemical waste in your laboratory?
18. How will you use waste of your college hostel to produce fertilizer?
19. What are the two important applications of PPT?
20. What is earth overshoot day?



- ① polyvinylpyrrolidone and citrate are two stabilizers that can be used to prepare  $Ag$  nanoparticles.
- ② The dimension of the metal nanoparticles is 1 to 100 nm.
- ③ The ingredients for preparation of shampoo are -  
① sodium lauryl sulfate, silicones, xanthan gum, parabens, citric acid, fragrances, colourants, vitamins etc.
- ② Fluoride is the main chemical ingredients that present in the toothpaste.
- ③ Circular dichroism (CD) spectroscopy is the protocol for used to generate secondary str. of a novel protein.
- ④ Two examples of green chemistry (solvents):  
① Ethyl lactate  
② supercritical carbon dioxide.
- ⑩ The structure of PVC -  $\left[ \begin{array}{c} H & H \\ | & | \\ -C & -C- \\ | & | \\ H & H \end{array} \right]_n$
- ⑫ One example of AI in medical diagnosis is its application in analysing medical imaging, such as Minion CT scans.
- ⑤ Bio-fertilizer: A biofertilizer is a natural prod containing ~~it~~ live microorganisms that enhance soil fertility and plant growth by impouring natural nutrients availability and soil health.



Ex: (i) Rhizobium  
(ii) Mycorrhiza

(20)

Earth overshoot day marks the date when humanity's annual demand on ecological resources exceeds what the planet can regenerate in that year.

(1.5)

(19)

The two important application of ppt-

(i) creating engaging presentation

(ii) usual aids for meetings and educational purpose.

(2)

(5)

Use proper personal protective equipment including glove & a fume hood, to avoid exposure to its toxic fumes & corrosive properties.

(1.5)

(3)

the ingredients for nail enamel-

(2)

(i) ethyl acetate (ii) nitrocellulose (iii) camphor (iv) dye etc.

(4)

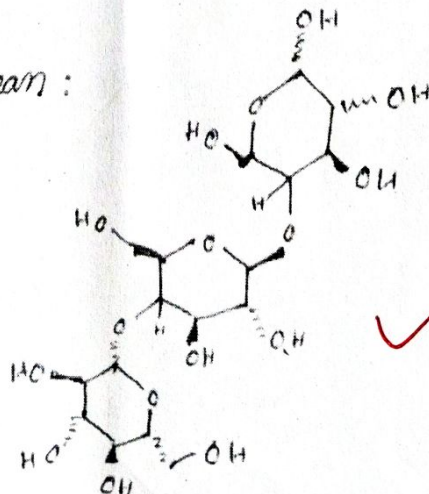
The origin of 'click chemistry' is to simple, efficient chemical reactions that are slow could be easily used for rapid reliable molecular assembly.

(2)

(ii)

str. of  $\beta$ -Glucan:

(2)

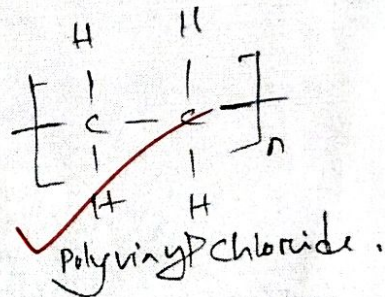




- (2) (1) Polyvinylpyrrolidone and citrate are two stabilizers that can be used to prepare  $10$  nm nanoparticles.
- (2) (2) The dimension of the metal nanoparticles is  $1$  to  $100$  nm.
- (2) (3) The ingredients for preparation of shampoo are — sodium lauryl sulfate, silicones, xanthan gum, parab. citric acid, fragrances, colorants, vitamins, etc.
- (2) (5) Fluoride is the main chemical ingredient that present in the toothpaste.
- (1.5) (7) Circular dichroism (CD) spectroscopy is the proteom for used to generate secondary structure of a novel protein.

- (2) (9) Two example of green solvent —  
(i) super critical carbon dioxide.  
(ii) Ethyl Lactate.

- (2) (10) The structure of PVC —



- (1.5) (12) One example of AI in medical diagnosis is it's application in analyzing medical imaging, such as MRI or CT scans.

- (2) (5) Bio-fertilizer: A bio-fertilizer is a natural product containing live microorganisms that enhance soil fertility and plant-growth by improving nutrient availability and soil health.  
ex! - (i) Rhizobium  
(ii) mycorrhiza.

- (2) (20) Earth overshoot day marks the date when humanity's annual demand on ecological resources exceeds what the planet can regenerate in that year.



19) The two important application of PPT =

(i) Creating engaging presentations

(ii) Visual aids for meetings and educational purposes

1.5) 5) Use proper personal protective equipment, including gloves and a fume hood, to avoid exposure to its toxic fumes and corrosive properties.

8) The ingredients for nail enamel =

(i) ethyl acetate or butyl acetate, (ii) nitrocellulose

(iii) camphor (iv) dyes or pigments etc.

1.5) 4) The origin of 'click chemistry' is to simple, efficient chemical reactions that could be easily used for rapid, reliable molecular assembly.



NAME - Shreya Roy SEMESTER - 3rd.

1. Two common stabilizers used to prepare Ag nanoparticles are:

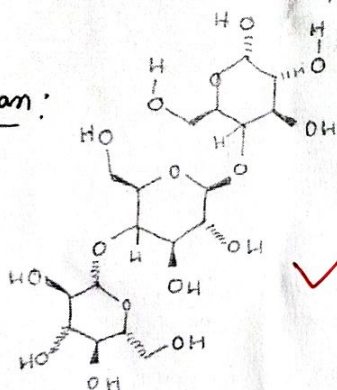
- ① Sodium citrate      ② Polyvinylpyrrolidone

2. The dimension of metal nanoparticles typically ranges from 1 to 100 nanometers. They are characterised by their small size, which imparts unique physical & chemical properties compared to bulk materials.

3. Two examples of green solvents are: ① Ethyl Lactate  
② supercritical carbon dioxide.

6. The main chemical ingredient in toothpaste is fluoride. It helps to strengthen tooth enamel and prevent cavities.

11. Str. of  $\beta$ -Glucan:



12. one example of AI in medical diagnosis is its application in analysing medical imaging, such as MRI or CT scan. AI algorithms can assist radiologists by identifying patterns and anomalies in the images, such as tumors or fractures.

14. If concentrated sulfuric acid spills on your hand, immediately rinse the affected area with plenty of water for at least 15 minutes to dilute and wash away the acid. Remove any contaminated clothing and seek medical attention right away, even if the damage seems minor.



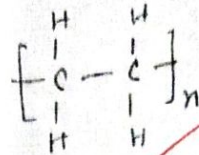
3. The ingredients for preparation of shampoo are - sodium lauryl sulfate, silicones, xanthan gum, parabenes, citric acid, fragrance, colorants, vitamins etc.

(2)

7. Circular dichroism (CD) spectroscopy is the technique used to generate secondary str. of a novel protein.

(1.5)

10. The str. of PVC -



polyvinyl chloride.

(2)

5. Bio fertilizer:

A bio-fertilizer is a natural product containing live microorganisms that enhance soil fertility and plant growth by improving nutrient availability and soil health.

(2)

- Ex: i) Rhizobium  
ii) mycorrhiza

20. Earth overshoot day marks the date when humanity's annual demand on ecological resources exceeds what the planet can regenerate in that year.

(1.5)

14. The two important applications of ppt - (i) creating engaging presentations. (ii) usual acids for meetings and educational purpose.

(2)

15. Use proper personal protective equipment, including glove & a fume hood to avoid exposure to its toxic fumes & corrosive properties.

(2)

8. The ingredients for nail enamel - (i) ethyl acetate or butyl acetate (ii) nitrocellulose (iii) camphor (iv) dye or pigments etc.

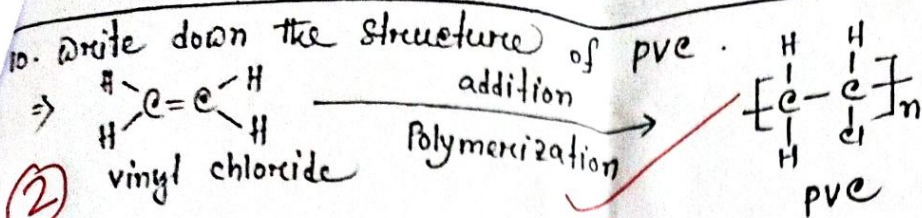
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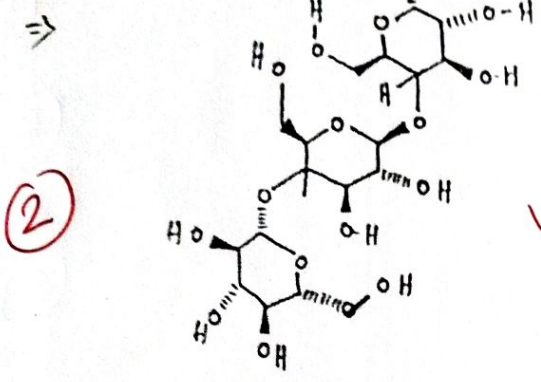
Certificate course on chemistry: A Subject with multifarious application  
Department of chemistry, Kharagpur college

1. Name two stabilizers that can be used to prepare Ag-nanoparticles?  
② ⇒ Polyvinyl chloride (PVC), Polyvinyl alcohol (PVA), ~~oligo chitosan~~ etc.
2. What is the dimension of metal nanoparticles?  
② ⇒ The dimension of metal nanoparticle ranges from 1 to 100 nm.
3. What are the ingredients for preparation of shampoo?  
② ⇒ Surfactants, conditioning agent, Thickeners, preservatives, pH adjusters, fragrances, colorants, Active ingredients.
4. What is the origin of "click chemistry"?  
② ⇒ "Click chemistry" originated from the work of K. Barry in 1998. The term are highly efficient, selective and produce minimal byproducts making them ideal constructing complex.
5. What is biofertilizer? Give two example.  
② ⇒ A biofertilizer is a natural product containing live microorganisms that enhance soil fertility by providing nutrients.  
Example: Rhizobium, Mycorrhiza
6. Name the main chemical ingredient present in toothpaste?  
② ⇒ The main chemical ingredient in toothpaste is fluoride.
7. Write down the name of a proteomic tool used to generate Secondary structure of a novel protein?  
①.5 ⇒ One proteomic tool used to generate and analyze the Secondary structure of a novel protein is circular Dichroism (CD) spectroscopy.
8. What are the ingredients for preparation of nail enamel?  
② ⇒ Ethyl acetate, Isopropanol, Nitrocellulose, Triphenyl-phosphate, Diacetone alcohol, Butylated hydroxyanisole.
9. Give two examples of green solvent?  
② ⇒ Ethyl Lactate, Supercritical carbon-di-oxide.





11. Write down the structure of  $\beta$ -glucan.



12. Give an example where AI is used in medical diagnosis?

② 15) ⇒ Its application in analyzing medical imaging such as MRI or CT scans. It is mostly used in radiology.

17. How will you manage chemical waste in your laboratory?

② ⇒ To manage chemical waste in the laboratory, segregate waste by type, label containers clearly and use appropriate, sealed container for disposal. Follow local regulations for storage handling. Regularly dispose of waste through licensed waste disposal service.

18. What are the two important applications of PPT?

- ② ⇒
1. Presentation: used for creating and delivering visual presentations in meeting, conferences.
  2. Educational tools: Employed for designing teaching materials.

20. What is earth overshoot day?

② ⇒ Earth overshoot day marks the date when humanity's demand on natural resources and ecological services exceeds what the Earth can regenerate in that year.



Sem:- 3rd

1. What is the dimension of metal nanoparticles?

→ The dimension of metal nanoparticle ranges from 1 to 100 nm.

2. What is biofertilizer? Give two examples.

→ A biofertilizer is a natural product containing live microorganisms that enhance soil fertility by providing nutrients.

Example:- Rhizobium, Mycorrhiza

3. What are the ingredients for preparation of nail enamel?

→ Ethyl acetate, Isopropanol, Nitrocellulose, Triphenyl phosphate, Diacetone alcohol, Butylated hydroxyanisole.

4. Give two examples of green solvent?

→ Ethyl Lactate, Supercritical carbon-dioxide

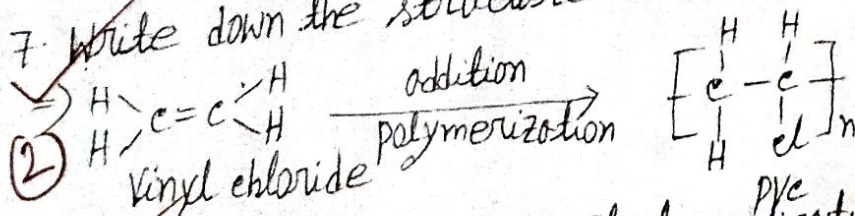
5. Name the main chemical ingredient present in toothpaste?

→ The main chemical ingredient in toothpaste is fluoride.

6. Give an example where AI is used in medical diagnosis?

→ Its application in analyzing medical imaging such as MRI or CT scans. It is mostly used in radiology.

7. Write down the structure of PVC.



8. What are the two important applications of PPT?

→ 1. Presentation:- used for creating and delivering visual presentation in meeting, conferences.

2. Educational tools:- Employed for designing teaching materials.



9. What is the origin of "click chemistry"?

→ The origin of 'click chemistry' is to ~~simple~~ efficient chemical reactions that could be ~~easily~~ used for rapid reliable molecular assembly.

10. What are the ingredients for preparation of shampoo?

→ Sodium lauryl sulfate, silicones, xanthan gum, parabens, citric acid, fragrances, colorants, vitamins etc.

11. Write down the name of a proteomic tool used to generate secondary structure of a novel protein.

→ Circular dichroism (CD) spectroscopy is the protein for used to generate secondary structure of a novel protein.

12. Name two stabilizers that can be used to prepare Ag-nanoparticles?

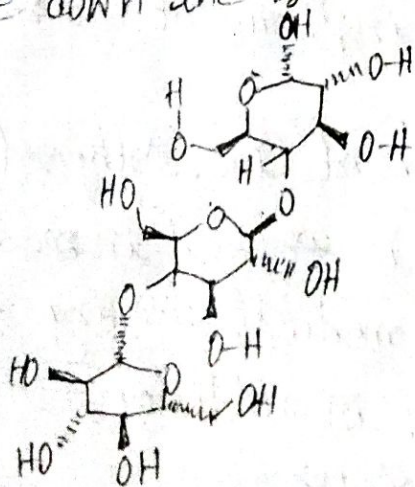
→ Polyvinyl chloride (PVC), polyvinyl alcohol (PVA), oligochitosan etc.

13. What is earth overshoot day?

→ Earth overshoot day marks the date when humanity's demand on natural resources and ecological services exceeds what the earth can regenerate in that year.

14. Write down the structure of  $\beta$ -glucan

②





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