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EAST POINT COLLEGE OF ENGINEERING & TECHNOLOGY
An Autonomous Institution Affiliated to Visvesvaraya Technological University (VTU) Belagavi

USN | | | | | | | | | | |

25CHC12/25CHC22

First/Second Semester B.E. Degree Examination, June/July 2026
APPLIED CHEMISTRY FOR SMART SYSTEMS

TIME:3 hrs. Max.Marks:100

Note: 1. Answer **any FIVE** full questions, choosing **ONE** question from **each MODULE.**
2. Formula Hand Books Permitted.
3. M: Marks, L: Bloom's level, C: Course outcomes.
4. Assume missing data suitably.

		Module-1	M	L	C
Q.1	a	What are nanomaterials? Explain the synthesis of TiO_2 by sol-gel method.	6	L3	CO1
	b	Distinguish between organic and inorganic semiconductors.	7	L2	CO1
	c	Outline the classification of liquid crystals with example.	7	L2	CO1
		OR			
Q.2	a	Explain the construction and working of pentacene semiconductor chip.	6	L2	CO1
	b	Describe the construction and working principle of QLED.	7	L3	CO1
	c	Write the differences between organic and inorganic semiconductors.	7	L2	CO1
		Module–2			
Q.3	a	Outline the synthesis and properties of Nylon-6,6. Mention any two applications.	6	L2	CO2
	b	What are quantum dots? Elaborate on any two size dependent properties of quantum dots.	7	L3	CO2
	c	Explain the construction and working of quantum dot sensitized solar cells.	7	L2	CO2
		OR			
Q.4	a	Define conducting polymers. Explain the mechanism of conduction in polyaniline.	6	L2	CO2
	b	Describe the synthesis of Cd-Se quantum dots by wet chemical method.	7	L2	CO2
	c	Explain the synthesis and properties of poly methyl methacrylate PMMA.	7	L3	CO2
		Module–3			
Q.5	a	Outline the construction and working of sodium-ion battery.	6	L3	CO3
	b	A Copper concentration cell is formed by dipping two copper electrodes in 0.1m and 0.01m $CUSO_4$ Calculate EMF.	7	L3	CO3
	c	Distinguish between fuel and battery.	7	L2	CO3
		OR			
Q.6	a	Explain the construction and working of Li-ion battery.	6	L2	CO3
	b	Describe the construction and working principle of ultra-small asymmetric supercapacitor.	7	L2	CO3
	c	Elaborate of production of green hydrogen by photocatalysis of water splitting using TiO2 catalyst.	7	L2	CO3

PROOF

		Module–4			
Q.7	**a**	Explain the estimation of acid mixture using conductometric sensor.	**6**	**L3**	**CO4**
	b	Outline the construction and working principle of electrochemical gas sensor in the estimation of NO_x	**7**	**L2**	**CO4**
	c	Describe the galvanization process with an example.	**7**	**L2**	**CO4**
		OR			
Q.8	**a**	Outline the principle and instrumentation of colorimetric sensor.	**6**	**L2**	**CO4**
	b	Explain the mechanism of corrosion by electrochemical theory.	**7**	**L2**	**CO4**
	c	What is biosensor? Explain the detection of glucose using biosensor.	**7**	**L3**	**CO4**
		Module–5			
Q.9	**a**	Mention any four properties and applications of green solvents.	**6**	**L2**	**CO5**
	b	Explain the synthesis of properties of poly lactic acid.	**7**	**L3**	**CO5**
	c	List out the sources of E-waste.	**7**	**L2**	**CO5**
		OR			
Q.10	**a**	Outline the green synthesis of ZnO nanomaterials. Mention its applications.	**6**	**L2**	**CO5**
	b	Explain the synthesis and properties of poly ethylene glycol.	**7**	**L2**	**CO5**
	c	Mention the effects of E-waste on environment and health.	**7**	**L2**	**CO5**

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