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	F	irst/Second Semester B.E. Degree E Engineering Ch			ember 2012
Tim	ne: 3	hrs.			Max. Marks:100
No	2	. Answer FIVE full questions choosing at led. Answer all objective type questions only in Answers to objective type questions on sheet	OM.	R sheet page 5 of	the Answer Booklet.
		PART -	A		
1	a.	Choose the correct answer: i) Which of the following is not a primary fuel.			(04 Marks)
		 i) Which of the following is not a primary fuel. A) Wood B) Crude petroleum oil ii) The following is used as antiknock agent 	C)	Natural gas	D) Kerosene
		A) Triethyl lead B) Biethyl lead iii) Photo voltaic cell is used to get	C)	Tetraethyl lead	D) Lead bromide
		A) Light energy B) Heat energy	C)	Electrical energy	D) None of these
	b. с.	iv) Specific heat of water is A) 2.5kJ kg ⁻¹ B) 3.0 kJ kg ⁻¹ Define gross and net calorific value of a fuel. What is photo voltaic cell? Explain the working of	Í	8 kJ kg ⁻¹ photo voltaic cell.	D) 4.2kJ kg ⁻¹ /K (04 Marks) (06 Marks)
	d.	Calculate the gross calorific value of a sample of Mass of coke = .006 kg; Water equivalent of			g data : :
		Mass of water = 1.3kg; Specific heat of war Rise in temperature = 1.5K.	ater =	= 4.187 kJ kg ⁻¹ k ⁻¹	(06 Marks)
2		•			(04 Marks)
2	a.	 a. Choose the correct answer: i) The conductance of an electrolytic solution depends on the conductance			n of
		ii) The primary reference electrode isA) Calomel electrode	B) F	łydrogen electrode	
		C) Standar hydrogen electrode iii) Glass electrode is	D) Z	Zinc electrode	
		A) ion – selective electrodeC) Membrane electrode	Ď) A	H ⁺ ion selective electro	ode
		iv) The element which is kept at the top of electr A) A _g B) C _u	C) 1		D) L _i
	b.	Define standard electrode potential and derive Ne	ernst	's equation for elec	
	c.	What is a reference electrode? Explain constructi	on a	nd working of calor	(05 Marks) nel electrode. (05 Marks)
	d.	Write the half – cell reactions and net – cell react	ion f	for the cell.	(60)
		$C_{d(s)} C_{d}^{2+}(0.01M) C_{u}^{2+}(0.5M) C_{u(s)}$.d. = =	0.40V	4 + 0 24 W
		The standard reduction potentials of cadmium and respectively. Calculate the e.m.f. of the cell.	u coj	oper are – 0.40 v an	0 + 0.34 V, (06 Marks)
3	a.	Choose the correct answer: i) Anode material used in lead – acid battery is			(04 Marks)

A) M_g

B) PbO₂

C) C_u

D) Spongy lead

		ii) The products produced in MeOH-O ₂ fuel A) CO ₂ + H ₂ O B) CO + H ₂ O	C) $CO_2 + N_2$	D) None o	f these			
		iii) Which of the following is a classical bate A) N _i - C _d B) L _i - M _n O ₂		D) N _i - MF	H			
		iv) L _i metal is used in L _i – M _n O ₂ battery bea A) Light B) Hard	O) TT	D) Non - C	Corrosive			
	b.	Explain the following battery characteristics i) Cycle life ii) Shelf life	:	ŕ				
	c.	Explain the construction of Pb – acid bat recharge.	, 0, ,	during discl	(06 Marks) harge and (06 Marks)			
	d.	What are fuel cells? Explain the construction	and working of $H_2 - O_2$		(04 Marks)			
4	a.	Choose the correct answer: i) When a metal is corroded			(04 Marks)			
		 A) Metal is converted into its compound C) Brightness of the metal increases ii) Which of the following metal gives every 	D) Hardness of the r	netal decrease	es.			
		ii) Which of the following metal gives sacri A) S _n B) C _a	C) K	against corros D) Z _n	ion			
		iii) Corrosion process involves reaction of r		- / -11				
		A) O ₂ B) H ₂ O	C) O ₂ and H ₂ O		f these			
		iv) If nuts and bolts are made up of differen						
		A) differential aerationC) caustic embittlement	B) differential meta D) None of these	11				
	b.	Define corrosion of a metal. Explain electron	•	osion taking i	iron as an			
	•	example.	or the state of th	-	(06 Marks)			
	c.	Explain the effect of the following factors on the rate of corrosion of a metal:						
		· · · · · · · · · · · · · · · · · · ·	node and cathode iii)	\mathbf{P}^{H} .	(06 Marks)			
	d.	Explain water – line corrosion with an examp	ple.	((04 Marks)			
		PART	$\Gamma - \mathbf{B}$					
5	a.	. Choose the correct answer:						
		 i) Use of HCHO in electroless plating of C_u A) Oxidation C_u 						
		C) Conversion of C_u^{++} into C_u	B) Reduction of co D) Both B and C	opper ions				
		ii) Use of levelers in electro plating is to	b) Both B and C					
		A) increase the thickness of coating	B) decrease the thic	kness of coat	ing			
		C) to make the deposit brighter	D) achieve uniform	thickness of	coating.			
		iii) To coat an irregular article uniformly, the						
		A) Acid bath	B) Alkaline bath					
		C) Neutral bath	D) of good throwin	g power				
		iv) During electro plating of an article, curre A) High B) Low	C) Optimum	D) None of	fthese			
	b.	What is electroless plating? Mention any two	· •	· ·	i inese (04 Marks)			
	c.	Discuss electroless plating of Copper.		_	(04 Marks) (08 Marks)			
	d.	Write a note on decomposition potential.			(04 Marks)			
6	a.	Choose the correct answer:		((04 Marks)			
		i) During titration of HCf against NaOH cond		-				
		A) HCl is a strong acid	B) NaOH is a strong b	ase				
		C) Highly mobile H+ ions are replaced by	iess mobile Na+ ions					

D) Reaction takes place slowly.

		ii) During estimation of FAS potentio metriA) Platinum electrode	cally the indicator electrode used B) Calomel electrode	is				
		C) Glass electrode	D) Ag/AgC£ electrode.					
		iii) In Colorimetric determination of copper						
		A) NH ₄ Cℓ B) NH ₄ NO ₃		NH₄ OH				
		iv) Colorimetry involves measurement of ab						
		A) Visible range B) 1 R range	-	Small range				
	b.	Distinguish between thermotropic and lyotropic		•				
	c.	Define specific conductance and explain the						
		conducto metrically using standard solution of What are instrumental methods of analysis? I	of Na OH.	(06 Marks)				
		what are moralinemar memous of analysis.	material and advantages over conv	(04 Marks)				
7	a.							
		i) An example for natural polymer is						
		A) Resin B) Plastic	C) Polyester D)	Silk				
		ii) Bakelite is						
		A) Thermoplastic	B) Thermosetting plastic					
		C) Homo polymer	D) Addition polymer					
		iii) Nylon is made up of						
		A) Adipic acid	B) Hexamethylene diamine					
		C) Both A and B	D) Phenol formaldehyde					
		iv) Teflon is	D) El 1 1					
		A) Hydro carbon polymer	B) Fluro carbon polymer					
	1	C) Hetero polymer	D) Thermo setting polymer	,				
	b.							
	c.	Explain synthesis and uses of i) Teflon ii)	(06 Marks) (06 Marks)					
	d.	Write a note on thermoplastics and thermoset	(04 Marks)					
	u.	write a note on thermopiastics and thermoset	ting plastics.	(U4 Maiks)				
8	a.	Choose the correct answer:		(04 Marks)				
		i) Temporary hardness in water is caused by	<i>(</i>					
		A) $Ca(HCO_3)_2$ B) $CaC\ell_2$	C) $CaSO_4$ D)	$MgC\ell_2$				
		ii) During the preparation of FAS solution in	n COD experiment dilute H ₂ SO ₄	is added to FAS.				
		Crystals to						
		A) make the solution acidic	B) speed up the process of o	dissolution				
		C) prevent hydrolysis	D) Both A & C					
		iii) During the determination of total hardnes	s of water by EDTA NH3 – NH4	Ct buffer is used				
		to						
		A) Increase PH	B) To decrease PH					
		C) To maintain PH at 10	D) None of these					
		iv) In reverse osmosis, a semi permeable me						
		A) Suspended impurities	B) Colloidal impurities					
		C) Bacteria	D) Dissolved salts					
	b.	Explain the determination of total hardness o	•	(06 Marks)				
	c.	c. In a COD experiment 28.1 ml and 14.0 ml of 0.05 M FAS solution were required for sample titration respectively. The volume of test sample used was 25ml. Calculate the						
d		• • • • • • • • • • • • • • • • • • • •						
	d.	How is sulphate in water determined graving	netrically?	(04 Marks) (06 Marks)				
	u.	- 110 W is suiphate in water determined gravit	nou rouny :	(CATRIAL OD)				

