GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

R4A19001105

Registration No: | | | | | | | | | | |

Total Number of Pages : 2 **B.TECH**

4th Semester Regular Examination-April-May 2019

BCHPC4010 CHEMICAL PROCESS TECHNOLOGY

(Regulations 2017) CHEMICAL ENGG.

Time : 3 Hours Maximum : 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) 10 x 2=20 Mark

Q.1. Answer *All* Questions.

a Diaphragm electrolytic cell produces _____ % caustic soda solution. [CO2][PO1]
   i. 0.1 – 0.5 ii. 45 – 55 iii. 25 – 28 iv. 10 – 12

b For the production of sulfuric acid, vanadium pentoxide is generally dispersed on a porous carrier in which form ? [CO1][PO2]
   i. Granular ii. Powder iii. Pellet iv.gel

c Detergent manufacture by catalytic hydrogenation of coconut oil uses _____ salts as catalysts. [CO1][PO1]
   i. Iron ii. Copper iii. Nickel iv. cobalt

d Sulfite pulping process requires a temperature of _____ ^{0}C. [CO2][PO1]
   i. 120 – 150 ii. 170 – 180. Iii. 200 – 230 iv. 250 – 270

e For ethanol production, the pH maintained to support yeast growth is _____. [CO2][PO1]
   i. 3 – 4 ii. 4 – 5 iii. 5 – 6 iv. 7

f Cement is used for structural purposes because it has _____. [CO1][PO2]
   i. very high tensile strength ii. very high ductile strength
   iii. very poor tensile strength iv. very poor ductile strength

g Portland cement from tube milling the clinker is a powder of which 90 % passes through _____ mesh. [CO2][PO1]
   i. 800
   ii. 600
   iii. 400
   iv. 200

h Low-density polyethylene is manufactured by _____ process. [CO1][PO1]
   i. low pressure
   ii. intermediate pressure
   iii. high pressure
   iv. none of these

i In Novolac resin, the molar ratio of phenol to formaldehyde is _____. [CO2][PO1]
   i. 1 : 1.25
   ii. 1 : 0.8
   iii. 1 : 0.75
   iv. 1 : 0.6

j The digestion time for viscose rayon is _____ days. [CO2][PO1]
   i. 4 – 5
   ii. 5 – 6
   iii. 6 – 7
   iv. 7 – 8

PART – B: (Short Answer Questions)10x2 = 20 Marks

Q.2. Answer *ALL* questions

a	For the production of caustic soda, which process requires higher energy consumption ? Justify your answer.	[CO1][PO2]
b	Why Chamber process is virtually obsolete over Contact process ?	[CO1][PO2]
c	How rancidity in edible fat products can be avoided ?	[CO3][PO2]
d	How flocculation of impurities is achieved for sugar cane juice ?	[CO1][PO2]
e	Mention the composition of a typical exterior white paint.	[CO1][PO1]
f	Why locally available limestone is not directly used in cement manufacture ?	[CO1][PO2]
g	Mention the composition of glass.	[CO1][PO1]
h	Write the pertinent properties of polyvinylchloride.	[CO1][PO1]
i	Mention the temperatures at which hot and cold butadiene-styrene rubber are prepared.	[CO1][PO1]
j	What are polyesters ? Mention the monomers and the reactions involved during its production.	[CO1][PO1]

PART – C: (Long Answer Questions) 4x 15= 60 Marks

Answer *ALL* questions

Q.3

a	Classify various processes for the production of caustic soda.	3	[CO1][PO1]
b	Discuss the method of production of hydrochloric acid with a neat flow sheet. Also discuss the major engineering problems associated with its production.	12	[CO3][PO2]
	OR		
c	Critically compare the Modified-Solvay process with the Solvay process for the production of soda ash.	10	[CO4][PO2]
d	Discuss the major engineering problems associated with the production of sulfuric acid.	5	[CO3][PO2]

Q.4

a	Discuss the major engineering problems associated with the hydrogenation of oils.	7	[CO3][PO2]
b	Write briefly about the production of synthetic glycerin from propylene via allyl chloride along with the chemical reactions involved.	8	[CO2][PO1]
	OR		
c	Compare the Sulfate- and the Sulfite-pulping processes.	8	[CO1][PO1]
d	Discuss the manufacture of dextrin along with a neat flow sheet.	7	[CO2][PO1]

Q.5

a	Discuss in detail the manufacture of Portland cement with a neat flow sheet. Also, discuss the associated major engineering problems.	12	[CO3][PO2]
b	Write about the significance of settling and hardening of cement.	3	[CO1][PO1]
	OR		
c	With neat diagrams, briefly explain the pot and tank furnaces for glass manufacture. Also, discuss about the annealing of glass.	10	[CO1][PO1]
d	Briefly discuss about the manufacturing of porcelain.	5	[CO1][PO1]

Q.6

a	Critically compare low-density with high-density polyethylene.	8	[CO2][PO1]
b	With a neat flow diagram, discuss the production of phenol formaldehyde.	7	[CO1][PO1]
	OR		
c	Discuss the manufacturing of butadiene-styrene rubber (SBR) with a neat flow diagram.	10	[CO1][PO1]
d	What are the two popular types of nylon available ? Write their basic chemistry of formation.	5	[CO1][PO1]

==0==