Seat No.: _____ Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma Engineering - SEMESTER–III • EXAMINATION – SUMMER • 2015

Subject Code: 3330502 Date: 02-05-2015

Subject Name: Mechanical Operation

Time: 02:30 pm - 05:00 pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make Suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Use of programmable & Communication aids are strictly prohibited.**
5. **Use of only simple calculator is permitted in Mathematics.**
6. **English version is authentic.**

Q.1		Answer any seven out of ten.	14
	1.	Define unit operation and unit process.	
	2.	What is ideal screen?	
	3.	Define particle density and bulk density.	
	4.	Define work index.	
	5.	What are the types of screen analysis?	
	6.	What do you mean by angle of nip?	
	7.	Define sedimentation.	
	8.	Classify filters.	
	9.	Define solid separation.	
	10.	Define agitation and mixing.	
Q.2	(a)	Differentiate Unit operation and Unit process.	03
		OR	
	(a)	Define sphericity, equivalent diameter, specific surface area.	03
	(b)	Classify size reduction equipments.	03
		OR	
	(b)	Classify equipments for liquid-solid separation.	03
	(c)	Derivation of equation of angle of nip.	04
		OR	
	(c)	Explain batch centrifuge.	04
	(d)	Derivation of formula for overall effectiveness of screen.	04
		OR	
	(d)	Differentiate constant rate and constant pressure filtration.	04
Q.3	(a)	Classify impellers and explain in brief.	03
		OR	
	(a)	Explain factors affecting agitation.	03
	(b)	Explain purpose of mixing	03
		OR	
	(b)	Explain rate of mixing and mixing index	03
	(c)	Derivation of equation for power consumption in agitation vessel .	04
		OR	
	(c)	Methods of Vortex prevention	04
	(d)	Explain Ribbon blender .	04
		OR	
	(d)	Discuss sink and float method.	04
Q.4	(a)	Filter media and its characteristics.	03

OR

	(a)	Draw the figure of Magnetic separator.	03
	(b)	Compare centrifuge and filter press.	04

OR

	(b)	Explain Banbury mixer.	04
	(c)	Explain construction & working of agitation vessel.	07
Q.5	(a)	States laws of size reduction.	04
	(b)	Draw the neat & clean figure of froth flotation cell.	04
	(c)	Factors affecting selection of equipment for solid separation.	03
	(d)	Define volume surface mean diameter, mass mean diameter, and shape factor.	03

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