

QP Code 

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 Register Number 

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**VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY**  
(An Autonomous Institution, Affiliated to Anna University, Chennai)

Semester Examinations – Apr / May 2017      Regulations-2016

Programme: Ph.D                      Semester: 2      Max. Marks: 100      Duration 3 Hrs  
Course Code & Title:    **16PCC02    CHARACTERIZATION OF MATERIALS**

Knowledge	K1 - Remembering	K3 - Applying	K5 – Evaluating
Levels (KL)	K2 - Understanding	K4 – Analyzing	K6 – Creating

**Part A - Answer ALL Questions.**

**10 x 2 = 20 Marks**

No.	Question	KL
1.	Write the role of cooling curve in differential thermal analysis.	K6
2.	Define Specific heat capacity.	K1
3.	Distinguish between bright field and dark field optical microscopy.	K5
4.	Define Holographic microscopy.	K1
5.	Define Photoluminescence.	K1
6.	Justify the role of EDAX in electron microscopy.	K5
7.	Write down the properties can be calculated using Van der Pauw method.	K3
8.	Classify the super capacitance.	K2
9.	State the principle of FT-IR spectroscopy.	K1
10.	Point out any two applications of Rutherford back scattering analysis.	K4

**Part B - Answer ALL Questions.**

**5 x 16 = 80 Marks**

No	Question	Marks	KL
11.	a i. Determine the procedure to indentify the weight loss and decomposition of products.	10	K3
	ii. Explain the working of thermogravimetric analysis.	6	K4
OR			
b	i. Explain the working principle of differential scanning calorimetry.	8	K4
	ii. Determine the different parameters of thermomechanical analysis.	8	K3
12.	a i. Explain dark field optical microscopic technique for the sample analysis.	10	K3
	ii. Distinguish between dispersion staining and phase contrast microscopy.	6	K4

OR

	b	Summarize the working of Atomic Force Microscope(AFM) and write down the method of analyze the given sample	16	K5
13.	a	Explain the working principle of Transmission Electron Microscopy and write down the limitations of TEM	16	K4
		OR		
	b	i. Draw the neat diagram and explain the working of SEM	10	K3
		ii. Distinguish between photoluminescence and Electroluminescence.	6	K4
14.	a	What is Hall effect? Determine the Hall Coefficient of the given sample and measure the hall voltage using the experimental setup of Hall probe method	16	K5
		OR		
	b	i. Explain Schottky barrier capacitance and give its importance.	12	K2
		ii. Summarize the role of impurity concentration for the sample analysis	4	K5
15.	a	Explain the principle and working of Raman Spectroscopy and write down the advantages and disadvantages of Raman spectroscopy	16	K2
		OR		
	b	i. Explain how the important parameters of the sample can be identified using SIMS photon induced X-ray emission spectrum.	10	K2
		ii. List the applications of Mossbauer spectroscopy.	6	K1

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