Reg. No.															

Question Paper Code	13425

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Seventh Semester

Mechanical Engineering

20PROE907 - TESTING OF MATERIALS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	*K – Level*	*CO*
1.	Which of the following is an example of development of testing? (a) Development of mechanical testing (b) Development of static compression (c) Development of static shear and bending tests (d) All of the mentioned	*1*	*K1*	*CO1*
2.	ISO defines a standard as_____ (a) International Organization for Standardization (b) Indian Organization for Standardization (c) International Organ for Standardization (d) Indian Organ for Standardization	*1*	*K2*	*CO1*
3.	Fatigue curves are popularly known as _____ curves. (a) S (b) N (c) R (d) S-N	*1*	*K1*	*CO2*
4.	The direct shear test can also be called as _____ (a) Simple shear test (b) Stress test (c) Strain controlled shear box test (d) All of the mentioned	*1*	*K1*	*CO2*
5.	X-Ray tubes converts electrical energy into _____. (a) X-Rays only (b) X-Rays and light (c) X-Rays and heat (d) Magnetic energy	*1*	*K1*	*CO3*
6.	Which type of systems typically contain only one screen in Projection Radiography? (a) Low resolution systems (b) Medium-resolution systems (c) High resolution systems (d) All of the above	*1*	*K1*	*CO3*
7.	SEM are extensively used for ____ (a) fracture study (b) microstructural study (c) study of replicas (d) all of the mentioned	*1*	*K2*	*CO4*
8.	What type of beam is used in SEM? (a) X-ray beam (b) Laser beam (c) UV beam (d) Electron beam	*1*	*K1*	*CO4*
9.	Detectors used in Energy dispersive system is (a) Optical detector (b) Semiconductor detector (c) Thermistor (d) Bolometer	*1*	*K2*	*CO5*
10.	_____most commonly used source is X-ray tubes. (a) Transmission-anode X-ray tube (b) Secondary fluorescence target (c) Slit (d) Filters	*1*	*K1*	*CO5*

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	*K – Level*	*CO*
11.	Summarize the major types of materials.	*2*	*K2*	*CO1*
12.	Define prototype.	*2*	*K1*	*CO1*
13.	Summarize the various failure modes of materials.	*2*	*K2*	*CO2*
14.	How will you control the creep?	*2*	*K1*	*CO2*
15.	Outline the term NDT.	*2*	*K2*	*CO3*
16.	Define ultrasonic testing.	*2*	*K1*	*CO3*
17.	Explain the term magnification.	*2*	*K1*	*CO4*
18.	Define spectroscopy.	*2*	*K1*	*CO4*
19.	Define thermal analysis.	*2*	*K1*	*CO5*

20.		Define wet chemistry.	*2*	*K1*	*CO5*
21.		What is differential thermal analysis?	*2*	*K1*	*CO5*
22.		What is the use of thermistor?	*2*	*K1*	*CO5*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain the steps to be followed during selection of materials.	*11*	*K2*	*CO1*
		OR			
	b)	What is the purpose of development of testing? Explain with suitable examples.	*11*	*K2*	*CO1*
24.	a)	Summarize in detail about different types of material failures.	*11*	*K2*	*CO2*
		OR			
	b)	Explain the principle, working of Izod test with its advantages and disadvantages.	*11*	*K2*	*CO2*
25.	a)	Explain the penetration test with step process and its application. Also summarize the various advantages and disadvantages.	*11*	*K2*	*CO3*
		OR			
	b)	With suitable diagram explain the working of Acoustic emission testing.	*11*	*K2*	*CO3*
26.	a)	With suitable sketch, explain the principle and working of TEM analysis.	*11*	*K2*	*CO4*
		OR			
	b)	What are the different types of spectroscopy? Explain in detail about Mass Spectroscopy with its advantages and disadvantages.	*11*	*K2*	*CO4*
27.	a)	What are the major types of thermal testing? Explain in detail about Thermogravimetric Analysis.	*11*	*K2*	*CO5*
		OR			
	b)	Summarize the various components working in Inductively Coupled Plasma Optical Emission Spectroscopy.	*11*	*K2*	*CO5*
28.	a) (i)	Write short notes on various methods of specimen preparation in SEM & TEM.	*6*	*K2*	*CO4*
	(ii)	Write short notes on power compensation DSC.	*5*	*K2*	*CO5*
		OR			
	b) (i)	Differentiate optical and electron microscopy.	*6*	*K2*	*CO4*
	(ii)	Explain the various loading conditions in thermo mechanical analysis.	*5*	*K2*	*CO5*