



Sanjay Ghodawat University, Kolhapur

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2018-19

EXM/P/09/01

Year and Program: 2018-19

School of Technology

Department of SY B. Tech

Course Code: MET203

Course Title: Material Science  
and Metallurgy

Semester – III

Day and Date: Thursday

29-Nov-2018

End Semester Examination  
(ESE)

Time: Max Marks: 100

**Instructions:**

- 1) All questions are compulsory.
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks.

Q.1	Solve <del>any two</del> the following	Marks	Bloom's Level	CO
a)	Give Classification of engineering materials.	05	L <sub>3</sub>	CO1
	OR			
a)	What are Ceramics? Explain properties and applications of various types of Ceramics.	05	L <sub>2</sub>	CO1
b)	Explain Ceramic-matrix composites (CMCs) with properties and applications.	05	L <sub>2</sub>	CO1
	OR			
b)	Write comparison between thermosetting and thermoplastic polymers.	05	L <sub>4</sub>	CO1
Q.2	Solve <del>any two</del> the following			
a)	Draw Iron-Iron Carbide equilibrium diagram indicating compositions, various phases and temperatures on it.	05	L <sub>3</sub>	CO2
	OR			
a)	Define cooling curve. Draw cooling curves for pure metal, binary alloys.	05	L <sub>3</sub>	CO2
b)	Define Solid solution. Explain Interstitial and Substitutional solid solution with neat sketches.		L <sub>3</sub>	CO2
	OR			
b)	What is stainless steel? Explain properties and applications of types of stainless steels	05	L <sub>3</sub>	CO2
Q.3	Solve any Two			
a)	What is Gray cast iron? Write composition, properties & applications of it.	05	L <sub>2</sub>	CO3
b)	Explain heat treatment cycle to produce Malleable cast iron. Draw microstructure.	05	L <sub>2</sub>	CO3

	c)	Explain in brief the effect of various factors on the properties and microstructure of cast irons	05	L <sub>2</sub>	CO3
	d)	Write comparison between Steel and Cast iron.	05	L <sub>4</sub>	CO3
<b>Q.4</b>		<b>Solve any Two</b>			
	a)	Explain mechanism of transformation of austenite to pearlite with neat diagrams	08	L <sub>2</sub>	CO4
	b)	Draw continuous cooling transformation (CCT) diagram showing different cooling rates on it. What is critical cooling rate? How CCT differs from TTT diagram	08	L <sub>3</sub>	CO4
	c)	What is surface or case hardening? Define Carburizing and explain any one type of Carburizing in detail with applications	08	L <sub>2</sub>	CO4
<b>Q.5</b>		<b>Solve any Three</b>			
	a)	Explain Magnetic particle test with neat sketch	09	L <sub>2</sub>	CO5
	b)	Explain in brief Impact test with neat sketches	09	L <sub>2</sub>	CO5
	c)	Explain Tensile testing on mild steel specimen with neat sketches.	09	L <sub>2</sub>	CO5
	d)	Explain Ultrasonic testing with neat sketch.	09	L <sub>2</sub>	CO5
<b>Q.6</b>		<b>Solve any Three</b>			
	a)	What is powder metallurgy technique? Discuss its advantages & disadvantages over other methods of manufacturing	09	L <sub>2</sub>	CO6
	b)	Explain various mechanical methods in production of powders	09	L <sub>2</sub>	CO6
	c)	Explain manufacture of self-lubricating bearings using P/M technique	09	L <sub>2</sub>	CO6
	d)	Explain manufacture of diamond impregnated tools using P/M technique	09	L <sub>2</sub>	CO6

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