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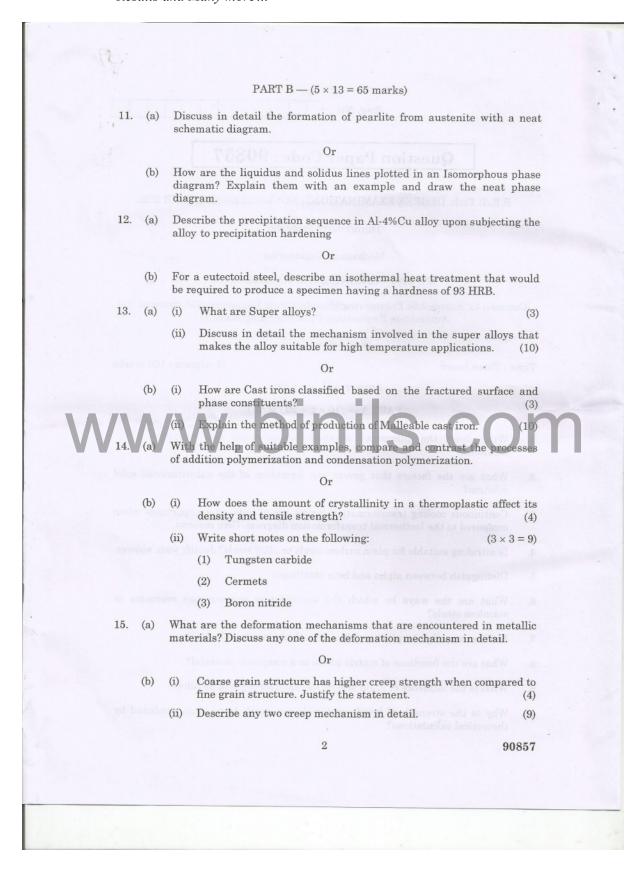
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	Reg. No.:
	Question Paper Code: 90857
	B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.
	Third/Fourth Semester
	Mechanical Engineering
	ME 8491 – ENGINEERING METALLURGY
(0	Common to: Automobile Engineering/Manufacturing Engineering/Mechanical and Automation Engineering/Production Engineering)
	(Regulations 2017)
Tir	ne: Three hours Maximum: 100 marks
	Answer ALL questions.
1. 2.	Write down the differences between substitutional and interstitial solid solutions. What are the factors that govern the formation of the substitutional solid
	solution?
3.	Continuous cooling transformation curves are of industrial importance when compared to the Isothermal transformation diagram. Give reasons.
4.	Is nitriding suitable for plain carbon steels or alloy steels? Justify your answer.
5.	Distinguish between alpha and beta stabilizers
6.	What are the ways by which the sensitization problem can overcome in stainless steels?
7.	In What way thermo plastics differ from thermosetting plastics?
8.	What are the functions of matrix phase in a composite material?
9.	What is the influence of grain size on the yield strength of an alloy?
10.	Why is the strength of brittle materials are much lower than predicted by theoretical calculations?

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PART C — $(1 \times 15 = 15 \text{ marks})$

- 16. (a) (i) An Fe-C alloy of eutectoid composition (0.76 wt% C) is subjected to equilibrium cooling from austenitic region to room temperature.

 Discuss on the microstructural changes that take place during cooling. (8)
 - (ii) Draw an illustrative eutectic phase diagram and write down the eutectic reaction (with respect to the figure). What is a typical microstructure obtained, when a eutectic composition is slowly cooled?

 (7)

Or

(b) Two metals A & B have melting points 750° C and 500° C respectively. They form an eutectic at 75% B which melts at 400° C. Their solubilities at eutectic temperature are, 20%B in A and 10%A in B and at 0°C, 5% B in A and 10% A in B. From the above information, draw the equilibrium diagram for the system clearly labelling all the phases present. From the diagram, determine what structures would be obtained in slowly cooled alloys of the following compositions 10%B, 40%B, 75%B and 95%B and explain the microstructural changes on slow cooling.

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