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Seat No.	
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**[5057]-220**

**S.E. (Mechanical/Automobile) (Second Semester)**

**EXAMINATION, 2016**

**ENGINEERING METALLURGY**

**(2012 PATTERN)**

**Time : Two Hours**

**Maximum Marks : 50**

**N.B. :—** (i) Solve Question No. 1 or 2, Question No. 3 or 4, Question No. 5 or 6, Question No. 7 or 8.

(ii) Figures to the right indicate full marks.

(iii) Draw neat, well labelled sketch wherever necessary.

1. (a) Draw a neat, well labelled schematic TTT curve for medium carbon steel. [4]
- (b) What is meant by alloy steel ? State different types of stainless steel and give composition of 304SS. [4]
- (c) Explain different steel specifications, with suitable example. [5]

*Or*

2. (a) Differentiate between Microscopic and Macroscopic examination. [4]
- (b) Define etching and state etching reagents for ferrous and non-ferrous metals. [4]
- (c) Draw Iron-Iron Carbide equilibrium diagram, showing all details. [5]

P.T.O.

3. (a) Draw a schematic diagram showing all details of Metallurgical microscope. [4]
- (b) State the importance of hardnability of steel, it depends on high factors. [4]
- (c) Explain mechanism of corrosion with suitable figure. [4]

*Or*

4. (a) Classify surface hardening treatments and explain induction hardening. [4]
- (b) Explain Crevice corrosion method. How can it be prevented ? [4]
- (c) What is inter-granular corrosion, explain with figure. [4]
5. (a) What is 'malleabilising' heat treatment ? To which type of cast iron is it given ? [4]
- (b) Differentiate between white cast iron and nodular cast iron. [4]
- (c) Explain how modification in design will improve corrosion resistance. [5]

*Or*

6. (a) Draw the microstructure of Nodular Cast iron and state two applications of it. [4]
- (b) Why is Grey cast iron found commonly in columns but not in structural beams ? [4]
- (c) What is meant by 'inoculation' in context of cast irons ? Why is it done ? [5]

7. (a) Write a short note on bearing materials. State any *two* materials. [4]
- (b) Draw a necessary phase diagram for brass, showing all phases. [4]
- (c) Why is aluminium called as a corrosion resistance metal ? [4]

*Or*

8. (a) Differentiate between brass and bronze. [4]
- (b) Explain the heat treatment given in case of Aluminium alloys. [4]
- (c) Write a short note on double tempering. Where is it needed ? [4]