Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

Seat No.	

[5459]-116

SE (Mechanical/Automobile) (II Semester) EXAMINATION, 2018

ENGINEERING METALLURGY

(2015 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*) Compare Steel and Cast Iron on the basis of composition, properties and application. [4]

(*b*) State whether the following statements are True *or* False and justify your choice correctly : [4]

(1) Retained Austanite is a useful phase

(2) Martensite is a soft phase.

(*c*) Differentiate between Tool Steel and Plain Carbon Steel on the basis of composition, properties, uses, cost and examples. [5]

Or

2. (*a*) Is etching essential every time ? Explain with suitable example. [4]

P.T.O.

(*b*) What is Austenite to Pearlite transformation ? Explain with suitable figure. [4]

(*c*) Explain how Microscopic and Macroscopic examinations are useful in investigating failure analysis in metals. [5]

3. (*a*) State whether the following statements are True *or* False and justify your choice correctly : [4]

(1) Pack carburising is most suitable for large scale of production.

(2) Tool steel requires preheating before austenitising.

(*b*) Define Hardenability and explain the test with suitable figure. [4]

(*c*) What is Spark Test ? Where is it applicable ? [4]

Or

4. (*a*) Draw Iron Carbon diagram showing all details, like Temperature, Composition, Phases, Critical lines and reactions. [5]

(*b*) Differentiate between the following : [7]

(1) Austempering and Martempering

(2) Annealing and Hardening

(On the basis of suitable figure, phases obtained, operating temperature, cooling medium and application.)

5. (*a*) Classify Cast Irons and explain why they are called as cast irons only ? [4]

(*b*) What is Malleabilising Heat Treatment ? Explain the test with suitable figure. [5]

(*c*) Write a short note on Quench Cracks in Hardening process. [4]

Or

6. (*a*) What is the importance of TTT diagrams in Heat Treatment processes ? [4]

(*b*) Differentiate between Gray C.I. and Nodular C.I. [4]

(*c*) What is Sub Zero Treatment and why is it necessary ? [5]

7. (*a*) What is HAZ ? Explain with suitable figure. [5]

(*b*) State merits and demerits of Non-Ferrous metals over Ferrous metals. [3]

(*c*) Why are Aluminium and Copper metals known as corrosion resistant ? [4]

Or

8. (*a*) What is IS, AISI, SAE and DIN ? Explain in detail. [6]

(*b*) What is Stellite 21 and Stellite 31 ? What are their advantages and disadvantages ? [6]