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

Seat No.	

[5352]-518

S.E. (Mech./Automo.) (Second Semester) EXAMINATION, 2018

ENGINEERING METALLURGY

(2015 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. :— (*i*) Solve Question Nos. Q. **1** *or* Q. **2**, Q. **3** *or* Q. **4**, Q. **5** *or* Q. **6**, Q. **7** *or* Q. **8**.

(*ii*) Figures to the right indicate full marks.

(*iii*) Draw neat, 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 :

(1) Retained Austanite is a useful phase.

(2) Martensite is a soft phase. [4]

(*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 is essential every time ? Explain with suitable example. [4]

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

P.T.O.

(*c*) Explain how Microscopic and Macroscopic examinations are useful in investigations 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 austanitising.

(*b*) Define Hardanability, and explain the test with suitable figure. [5]

(*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. [6]

(*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 Malleabalising Heat Treatment ? Explain the test with suitable figure. [4]

(*c*) Write 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 ? [4]

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 Aluminium and Copper metals are 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]