

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA
SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
SECOND SEMESTER EXAMINATION 2018/2019

COURSE TITLE: MATERIALS AND FOUNDRY TECHNOLOGY
COURSECODE: ITE382/MWT322

INSTRUCTIONS: Attempt Two Questions from Each Section.

SECTION A: MATERIAL TECHNOLOGY

- 1a. Explain comprehensively how the blast furnace functions in operation
- 1b. Write notes on the following: (a). Pig iron, (b). Iron ore, (c). Limestone, (d). Coke, (e). Pre-smelting treatment of ore
- 2a. Utilizing heating and cooling curve diagram, describe the internal changes that takes place in steel
- 2b. Discuss details the following: (i). Annealing, (ii). Low Critical Point, (iii). Upper Critical Point, (iv). Critical Range (v). Annealing and (vi). Normalizing.
- 3a. Using carbon-tensile strength graph, explain how gradual increase in carbon affects the following properties of steel: (i). hardness, (ii). Strength, (iii). Malleability and (iv). Ductility.
- 3b. Write brief notes on the following (i). Ferrite, (ii). Pearlite, (iii). Martensite, (iv). Austenite and (v). Cementite.

SECTION B: FOUNDRY TECHNOLOGY

- 4a. Write short note on the following: (i) Patterns (ii) Cores (iii) Gating (iv) Molds and (v) Cope and Drag
- 4b. Discuss four method of sand testing in Foundry Technology
- 5a. Identify six properties of molding sand and comprehensively discuss five of them.
- 5b. Identify and discuss basic considerations in constructing patterns.
- 6a. Discuss the importance and types of foundry sand in casting
- 6b. Discuss extensively safety precaution in the foundry laboratory.