**FACULTY: ENGINEERING**

**FIRST SEMESTER EXAMINATIONS**

**2016/ 2017 ACADEMIC SESSION**

HOD'S SIGNATURE

**COURSE CODE:** MEE 301

**COURSE TITLE:** MANUFACTURING TECHNOLOGY II – 3 UNITS

**DURATION:** 2 HOURS 30 MINUTES

**INSTRUCTIONS**

1. ATTEMPT ANY **FIVE** QUESTIONS OF YOUR CHOICE
2. SEVERE PENALTIES APPLY FOR MISCONDUCT, CHEATING, POSSESSION OF UNAUTHORIZED MATERIALS DURING EXAM
3. YOU ARE NOT ALLOWED TO BORROW CALCULATORS AND ANY OTHER WRITING MATERIALS

**Question One**

1. a (i) What is a metal?
   (ii) What is an alloy?
   b. With the aid of a suitable sketch, explain arrangement of atoms in metals.
   c. Write short notes on the following metals and alloy
   (i) Pig iron.
   (ii) Cast Iron.
   (iii) Malleable Cast Iron.
   (iv) Wrought iron; and
   (v) Steel.

**Question Two**

2. **a.** With the aid of a suitable sketch, describe,
   **(i)** The production of a pig iron in the blast furnace.
   **(ii)** The use of Bessemer Converter..
   **b.** With the aid of sketch, explain the following in relation to heat treatment processes
   (i) Gas-Fired Salt Bath Furnace.
   (ii) Electric furnace.
   (iii) Thermo-Electric Pyrometer.

**Question Three**

3. **a. (i)** Differentiate between permanent joint and temporary joint.
   **(ii)** Using 4 steps, enumerate soldering procedure.
   **(iii)** Write short note on hard soldering.
   **b.** With the aid of s sketch, explain brazing technique or method.
   **c.** Explain the following soldering operations
   (i) Tinning the bit.
   (ii) Sweat soldering.

**Question Four**

4. a. .(i) Define welding
   **(iii)** With the aid of sketch, describe oxy-acetylene welding,
   **(iv)** With the aid of sketch explain the three types of flames used in oxy-acetylene welding,
   b. With the aid of sketch, explain the block diagram of electric arc welding set-up,
   c. Write short notes on arc welding process,

**Question Five**

5. a. (i) What is casting?
   (ii) State five common materials used in the construction of pattern used in foundry work.
   (iii) State five factors considered when selecting a particular materials for pattern making.
   b. Using a typical example, state 5 steps to produce a casting object in a foundry workshop.
   c. Write short note on hard and soft wood used.

**Question Six**

6. a. (i) Define powder metallurgy.
   (ii) Explain the four basic procedures used in powder metallurgy.
   b. Explain the following methods used in the manufacturing of powders;
   (i) Electrolytic Process.
   (ii) Mechanical Pulverisation.
   (iii) Atomization.

c. State 4 properties of powders.

**Question Seven**

7. **a. (i)** Define interchangeability system of limits and fits.
   (ii) Write short note on the following raw materials used in plastics
   - Fillers.
   - Binder.
   - Plasticizers.
   - Catalyst.
   - Lubricant.

   b. Differentiate between thermoplastic and thermosetting materials.
   c. With the aid of sketch, show the micrometre screw gauge that is having 0.01mm accuracy having the dimension of 25.75 mm.