EXAM NO._____

GANPAT UNIVERSITY

B. Tech. Semester: VI Mechatronics Engineering

Regular Examination May – June 2013

2MC601 / MC601 Metal Forming & Fabrication

Time: 3 Hours **Total Marks: 70**

Instruction:

1) Answer to the two sections must be written in separate answer books.
2) Figures to the right indicate full marks of the questions.
3) Draw neat sketch wherever necessary.

Section – I

Q.1 **[12]**

[A] What is the fundamental difference between fusion weld and solid state weld? Classify welding processes.

[B] Describe the procedure to be followed in an oxy-acetylene gas welding operation.

[C] Explain the following terms:

1. Puddle
2. Straight polarity
3. Duty Cycle
4. Penetration

OR

Q.1 **[12]**

[A] Enlist consumable electrode type welding processes. Explain one of them with neat sketch.

[B] Describe the principle of oxy-acetylene gas welding process with neat sketch.

[C] Name and sketch five different joint types. Also sketch various edge preparation carried out in weldments.

Q.2 **[11]**

[A] Explain the electrogas welding process with neat sketch. How it differs from electroslag welding process?

[B] Describe the various welding defects in detail. Also suggest remedies for those defects.

OR

Q.2 **[11]**

[A] Why isn't submerged arc welding an all position welding process? Explain SAW process with neat sketch.

[B] Explain the fundamental difference among brazing, soldering and braze welding.

Q.3 **[A]** **Answer the following: (Any three)** **[6]**

1. Can dissimilar metals be welded by resistance welding? If so, give necessary precautions.
2. What are the requirements of flux in brazing?
3. Discuss the need for edge preparation in welding.
4. What is the major difference between flux cored arc welding and gas metal arc welding?

[B] **Answer the following multiple:** **[6]**

1. Arc blow occurs in ---
   a) Gas welding
   b) Arc welding with AC
   c) Arc welding with DC
   d) Gas cutting
2. Weld spatter is
   a) Flux
   b) Welding test
   c) Electrode coating
   d) Welding defect
3. In which of the following welding techniques, the flame of the torch is directed against the complete weld?
   a) Overhead welding
   b) Horizontal welding
   c) Forehand welding
   d) Back hand welding

4. The flux in the submerged arc welding is in the form of---
   a) Cored wire
   b) Coating on electrode
   c) Granules
   d) Paste
5. Metals that are easiest to weld in resistance welding are ones that have low resistivities since low resistivity assists in the flow of electrical current:
   a) True
   b) False
6. Which one of the following is not a function of a flux in brazing or soldering:
   a) Chemically etch the surfaces to increase roughness for better adhesion of the filler metal
   b) Promote wetting of the surfaces
   c) Protect the faying surfaces during the process
   d) Remove or inhibit formation of oxide films

Section – II

Q.4 [12]

[A] Explain with neat sketch "Cold-Work-Anneal Cycle".

[B] What do you mean by Extrusion? Classify and explain any one with neat sketch in detail.

[C] Enlist various types of hammers used in forging process. Explain any one with neat sketch in detail.

OR

Q.4 [12]

[A] Explain elastic and plastic deformation process in respect to "Metal Forming" process.

[B] List the factors influencing rolling process. Explain the effect of metal friction and diameter of roller on rolling process.

[C] Explain with neat sketch the following in relation with forging in brief.
1. Flashless forging 2. Edging

Q.5

[A] Determine the maximum possible reduction for cold rolling a 400 mm thick slab when μ= 0.05 and the roll diameter is 800 mm. What is the maximum reduction on the same mill for hot rolling when μ=0.3? [4]

[B] Define the following term with neat sketch. [3]
1. Punching 2. Slitting 3. Trimming

[C] Describe Wire drawing process with neat sketch. Also state unique application. [4]

OR

Q.5

[A] Differentiate between drop-forging and press-forging processes with references to the process and products obtained. [4]

[B] What is the role of friction in extrusion process? [3]

[C] Enlist various types of dies used in sheet metal working. Explain progressive die with neat sketch. [4]

Q.6 Answer the following: (Any Three) [12]

[A] Explain how forging improves the mechanical properties of components.

[B] Explain in brief pressure forming and vacuum forming with neat sketch.

[C] Write a short note on shape rolling.

[D] Explain what you understand by the terms Slab, Bloom Billet and Sheet.

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