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B.Tech. (Sem. - 3rd)
MANUFACTURING PROCESSES,- I
SUBJECT CODE : PE - 209 (2K3 & Onwards)
Paper ID : [A0806]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1) (10 x 2 = 20)

- a) What is shrinkage allowance?
- b) What is a core print?
- c) What do you understand by braze welding?
- d) Explain the importance of permeability of moulding sands.
- e) What is pin hole porosity?
- f) Briefly explain flash welding.
- g) What is fettling?
- h) Give some applications of TIG welding.
- i) Differentiate between cold shut and mis-run.
- j) List down the materials used in thermit welding.

- Q2) Explain the NRL method for calculating riser dimensions with the help of a suitable example.
- Q3) Explain the basic elements of a good gating system with the help of a neat sketch. What is a whirl gate?
- Q4) What are the special requirements of casting copper alloys?
- Q5) Describe the principle, advantages and applications of oxy-acetylene welding.
- Q6) What is GMAW process? Explain the relationship between the shielding gas used and the type of metal transfer occurring in this process.

Section - C

(2 x 10 = 20)

- Q7) A foundry engineer is required to produce castings with 3.10 to 3.50% carbon, 2.00 to 2.40% silicon, 0.60 to 1.00% manganese and a maximum of 0.08% sulphur. The pick-up in cupola is carbon 0.15%, and sulphur 0.04%. The losses in the cupola are 10% silicon and 20% manganese. If he has the following raw materials at his disposal, what should be the best charge composition?

	<u>Carbon %</u>	<u>Silicon %</u>	<u>Manganese %</u>	<u>Sulphur%</u>
<u>Pig Iron 1</u>	3.20	1.70	0.80	0.03
<u>Pig Iron 2</u>	3.20	1.85	0.60	0.01
<u>Pig Iron 3</u>	3.50	2.10	0.70	0.02
<u>Scrap 1</u>	3.25	2.30	0.65	0.08
<u>Scrap 2</u>	3.30	2.10	0.80	0.10
<u>Ferro silicon</u>	—	50.00	—	—

- Q8) Explain the die casting process. Compare cold chamber die casting process with hot chamber process. Why is aluminium preferred to be produced by the cold chamber process?
- Q9) Distinguish between brazing and soldering from the point of view of the filler metals used, applications and strength of the joint obtained. What is silver brazing?