BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH. **SEMESTER : IV**
BRANCH: PIE **SESSION : SP/2023**

SUBJECT: PE216 FOUNDRY, FORMING & WELDING TECHNOLOGIES

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	What are the man ingredients of a moulding sand? How do you measure the permeability of a moulding sand? Explain in detail.	[5]	1	3
Q.1(b)	A riser in the shape of a sphere is to be designed for a sand-casting mold. The casting is a rectangular plate, with length = 200 mm, width = 100 mm, and thickness = 18 mm. If the total solidification time of the casting itself is known to be 3.5 min, determine the diameter of the riser so that it will take 25% longer for the riser to solidify.	[5]	1	5
Q.2(a)	Make a brief outline describing the entire process of Shell moulding. Enlist its advantages over sand casting process.	[5]	2	3
Q.2(b)	Differentiate between the semi centrifugal casting and centrifuging casting methods.	[5]	2	3
Q.3(a)	How different types of flames can be obtained in oxy-acetylene gas welding? Also mention the applications of these flames.	[5]	3	2
Q.3(b)	Discuss the working principles of GMAW with neat schematic diagram. Also enlist the advantages and limitations of this welding process.	[5]	3	2
Q.4(a)	Explain how an electron beam can be used for welding? State the limitations of this welding process.	[5]	4	2
Q.4(b)	Discuss the advantages and disadvantages of Non-Destructive Testing over the Destructive Testing in welding? And explain the liquid dye penetrant tests?	[5]	4	2
Q.5(a)	Name the different types of rolling mills used for rolling. A strip of thickness 40 mm is to be rolled to a thickness of 20 mm using a two-high mill having rolls of diameter 200 mm. Find the Coefficient of friction and the arc length.	[5]	5	3
Q.5(b)	A drawing operation is performed on 3 mm stock. The part is a cylindrical cup with height is 50 mm and inside diameter is 70 mm. Assume the corner radius on the punch is zero. (a) Find the required starting blank size. (b) Is the sheet metal drawing operation feasible?	[5]	5	5

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