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

CLASS: BE **SEMESTER : VII/ADD**
BRANCH: MECH/PROD **SESSION : MO/18**

SUBJECT: PE7009 ADVANCED WELDING TECHNOLOGY

TIME: 3 HRS. **FULL MARKS: 60**

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
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.

Q.1(a)	Discuss the principle of Friction welding.	[2]
Q.1(b)	Explain the working principle of Explosive Welding. Writes limitation of explosive welding.	[4]
Q.1(c)	Draw the setup for ultrasonic welding and explain the use of various component of the setup and mention its advantages and disadvantage over other welding process.	[6]
Q.2(a)	Discuss different type of EBW on the basis of vacuum.	[2]
Q.2(b)	Explain the principle behind generation of LASER and write its various applications.	[4]
Q.2(c)	Explain the working principle of electron gun in electron beam welding.	[6]
Q.3(a)	When, where and why underwater welding is important?	[2]
Q.3(b)	Explain the wet welding process. Write its advantage and disadvantage.	[4]
Q.3(c)	Discuss about the welding technique used in underwater welding?	[6]
Q.4(a)	What do you mean by residual stress in welding and how we measure it?	[6]
Q.4(b)	Write about the different methods for welding distortion mitigation.	[6]
Q.5(a)	Compare the weldability characteristics of austenitic, ferritic and martensitic stainless steels.	[6]
Q.5(b)	Explain the weldability of aluminum and cast iron.	[6]
Q.6(a)	A steel plate 120 mm wide and 12.5 mm thick is welded to another steel plate by mean of double parallel fillet weld. The plates are subjected to static tensile force of 50KN. Determine the required length of the welds, if the permissible shear stress in the weld is 125 N/mm^2.	[6]
Q.6(b)	A plate 70 mm wide and 10 mm thick is joined with another steel plate by mean of a single transverse and double parallel fillet welds. The joint is subjected to maximum tensile force of 65 kN. The permissible tensile and shear stress in the weld material are 72 and 55 N/mm^2 respectively. Determine the required length of each parallel fillet weld.	[6]
Q.7(a)	What is flexible automated welding?	[2]
Q.7(b)	What are the basic functions of a welder those can be automated?	[4]
Q.7(c)	Write common welding method and weld defect in shipping industry.	[6]

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