Reg. No. :

# Question Paper Code : X20818

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020

Fourth/Seventh Semester

Mechanical Engineering

ME 6008 – WELDING TECHNOLOGY

(Common to Production Engineering)

(Regulations 2013)

(Also Common to : PTME 6008 – Welding Technology for B.E. (Part-Time) – Sixth Semester – Mechanical Engineering (Regulations – 2014))

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. What is the principle of Arc welding process ?
2. Mention the applications of TIG welding process.
3. What is proximity effect ?
4. Name the two cycles in resistance welding.
5. Define solid state welding.
6. List out the applications of ultrasonic welding.
7. Is it possible to make dissimilar welding of aluminium to steel in friction stir welding ? Justify.
8. State the reasons for implementing welding robots in aerospace industries.
9. List out the steps to be followed for improving joint design.
10. What are the factors that commonly affect weldability nature of the subjected materials ?

PART – B **(5×13=65 Marks)**

11. a) Write short notes on the following :

i) Shielded metal arc welding.

ii) Gas tungsten arc welding

iii) Gas metal arc welding

iv) Flux-cored arc welding.

(OR)

b) Draw a neat sketch and explain the working of Electro slag and Electro gas welding.

12. a) i) What is Percussion welding ? Explain it with neat sketch.

ii) Explain Resistance Seam welding process with neat sketches.

(OR)

b) Write short note on the following :

i) Spot welding

ii) Projection welding

iii) Flash butt welding

iv) Resistance butt welding.

13. a) i) Describe the following type of welding techniques.

1) Explosive welding. **(4)**

2) Forge welding. **(4)**

ii) Describe the commercial role of friction welding. **(5)**

(OR)

b) Enumerate in detail the influence of process parameters on the working equipment and materials of laser roll welding process.

14. a) i) Describe the welding process used for joining railway tracks. **(6)**

ii) Explain the construction and working of LASER beam welding process with neat sketch and state its merits, demerits and applications. **(7)**

(OR)

b) i) What is friction stir welding ? With neat sketch explain friction stir welding and discuss the process parameters involved in friction stir welding. **(7)**

ii) Draw the functional main units of multi-sensor automated robotic welding and discuss its various components. **(6)**

15. a) Explain the problems encountered during the welding to stainless steel and its remedies.

(OR)

b) Discuss the concept involved in the following with respect to welding.

i) Guide and root bend tests. **(7)**

ii) Magnetic particle testing. **(6)**

PART – C **(1×15=15 Marks)**

16. a) A steel plate strip of 150 mm width and 10 mm thickness is welded by a compound fillet weld to another plate. The strip is required to carry an axial load P such that P is equal to tensile load capacity of the strip with a factor of safety of 2.5 on ultimate tensile strength of strip. Calculate the length of the fillet weld and show on diagram. Ultimate tensile strength of strip material is 380 MPa. Find fillet length if $P_{min}$ = P/2 and $P_{max}$ = P.

(OR)

b) Explain the failure analysis of the longitudinal weld in submerged arc welding, during the manufacturing process.

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