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B.TECH.
(SEM V) THEORY EXAMINATION 2022-23
ADVANCE WELDING

Time: 3 Hours**Total Marks: 100****Note:** Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2x10 = 20

- (a) Define welding.
- (b) Describe the difference between DCEP and DCEN.
- (c) Explain the function of flux in the welding.
- (d) List any two solid state welding processes.
- (e) Explain peak temperature.
- (f) Describe HAZ.
- (g) Describe surfacing in brief.
- (h) Define weldability.
- (i) Describe the meaning of NDT.
- (j) Explain the use of welding symbols in brief.

SECTION B

2. Attempt any *three* of the following: 10x3 = 30

- (a) Explain the classification of welding processes. Discuss the health and safety measures in welding.
- (b) Describe plasma arc welding and gas metal arc welding with neat sketches.
- (c) Illustrate:
 - (i) Weld thermal cycle
 - (ii) Residual stresses in welding
- (d) Explain welding of cast iron in details. Also explain the effects of alloying elements on weldability
- (e) Illustrate different types of weld defects with neat sketches. Also explain their causes and remedies.

SECTION C

3. Attempt any *one* part of the following: 10x1 = 10

- (a) Describe:
 - (i) Constant voltage power source characteristics
 - (ii) Constant current power source characteristics
- (b) The dc arc current has voltage – length characteristics as $V = (10+30L)$ volts. The characteristics of power source is $V = (60 - 0.07I)$ volts. Determine the optimum arc length and corresponding arc power.

4. Attempt any *one* part of the following: 10 x1 = 10

- (a) Explain the following with neat sketches:
 - (i) Electron beam welding
 - (ii) Explosive welding
- (b) Describe the following with neat sketches:
 - (i) Manual metal arc welding
 - (ii) Friction welding

5. Attempt any *one* part of the following: 10x1 = 10

- (a) Illustrate:
 - (i) Weld distortion
 - (ii) Peak temperature
- (b) Discuss the following in detail:
 - (i) Cooling rate in welding
 - (ii) solidification rate in welding.

6. Attempt any *one* part of the following: 10x1 = 10

- (a) Explain with neat sketches:
 - (i) Cladding
 - (ii) Hardfacing
- (b) Explain with neat sketches:
 - (i) Reclamation welding
 - (ii) Metallizing

7. Attempt any *one* part of the following: 10x1 = 10

- (a) Illustrate different type of weld joints with neat sketches. Also explain different types of welds.
- (b) Illustrate the difference between DT and NDT. Illustrate liquid penetrant test in detail with neat sketch.