Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY
Winter Examination-2019

Subject Name: Advanced Material Technology
Subject Code: 5TE01AMT1 **Branch: M.Tech Mechanical (CAD/CAM)**
Semester : 1 **Date : 25/11/2019** **Time : 02:30 To 05:30** **Marks : 70**

Instructions:
(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

SECTION-I

Q-1	(a)	Draw the stress – strain diagram for brittle and ductile materials.	**02**
	(b)	Define metallic bond with example.	**02**
	(c)	What do you mean by inelastic deformation also give its significance.	**02**
	(d)	Write the full form of ASTM.	**01**
Q-2	(a)	Explain ionic bonding and write the characteristics of ionic bonding.	**07**
	(b)	Prove the equation $\tau_r = \frac{\sigma_x}{2}\sin 2\phi \cos\theta$	**07**

OR

Q-2	(a)	Derive the quantized oscillator model.	**07**
	(b)	Discuss the bonding forces and energies with neat sketches.	**07**
Q-3	(a)	Derive the equation for Debye's temperature.	**07**
	(b)	What do you mean by delayed fracture? Discuss the cyclic fatigue behavior and its characteristics.	**07**

OR

Q-3	(a)	Discuss only the assumptions made by Debye for specific heat concept of solids	**07**
	(b)	Explain detailed structure and applications of super nonferrous alloys.	**07**

SECTION-II

Q-4		**Attempt the following questions:**	
	(a)	Give electron configuration for the elements: (i)Chromium (ii) Copper	**02**
	(b)	Define anisotropy.	**02**
	(c)	Write few characteristics of aluminium super alloys.	**02**
	(d)	Write full form of BHN.	**01**
Q-5	(a)	Draw and explain the bohr atomic models.	**07**
	(b)	Define the term "thermal expansion". Derive the equation for the Wiedemann-Franz ratio.	**07**

OR

Q-5	(a)	Draw neat sketch of standard tensile specimen with circular cross. Explain the	**07**

procedure to conduct tensile stress–strain test.

(b) Enlist some important advanced polymeric materials and write its uses. **07**

Q-6 (a) Write a short note on radiation damage and recovery. **07**

(b) Describe role of strength to density and modulus to density ratio on material selection process. **07**

OR

Q-6 (a) Write a short note on advanced engineering materials. **07**

(b) How the role of computer can be justified and use of Ashby charts in selection of materials. **07**