

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV(NEW) – EXAMINATION – SUMMER 2019****Subject Code:2140907****Date:09/05/2019****Subject Name: Applied Thermal and Hydraulic Engineering****Time:02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

	MARKS
Q.1 (a) Define various modes of heat transfer.	03
(b) Explain in brief about significance of above subject in your discipline.	04
(c) Describe working of open cycle gas turbine.	07
Q.2 (a) Define psychometry and its application.	03
(b) Explain Rankine cycle with P-V and T-S diagram.	04
(c) State and explain methods of improving performance of open cycle gas turbine.	07
OR	
(c) With neat sketch explain simple vapour compression refrigeration (VCR) cycle. Plot the same cycle on T-s and p-h diagram also.	07
Q.3 (a) Define composite wall and its application.	03
(b) What is thermal conductivity and thermal resistance?	04
(c) Derive equation for Critical thickness of insulation.	07
OR	
Q.3 (a) Differentiate natural and forced convection.	03
(b) What is the function of fins in heat transfer? State applications of fins.	04
(c) State Kirchhoff's law and explain concept of black body and gray body.	07
Q.4 (a) Define (1) Viscosity (2) Surface tension (3) capillarity	03
(b) Explain Bourdon tube pressure gauge with a neat sketch.	04
(c) Derive Euler's momentum equation	07
OR	
Q.4 (a) Draw venturimeter and list its main components.	03
(b) What is Pitot tube? Explain pressure measurement with the help of Pitot tube.	04
(c) Derive equation for discharge through orifice meter.	07
Q.5 (a) Define (1) NPSH (2) Priming (3) reaction turbine	03
(b) Differentiate impulse and reaction turbine.	04
(c) Draw and explain Characteristic Curves of Centrifugal Pumps.	07
OR	
Q.5 (a) Classify different types of pumps.	03
(b) Explain need of multistaging for reciprocating compressor	04
(c) Draw Francis turbine and explain its working for power production.	07
