

**International Islamic University Chittagong**  
**Department of Electrical and Electronic Engineering**

Final Examination Spring-2020		Program: B.Sc. Engg. (EEE)		
Course Code: <b>ME-2301</b>		Course Title: <b>Fundamental of Mechanical Engineering</b>		
Time: <b>5 hours</b> (Writing <b>4 hours 30 minutes</b> + <b>30 minutes</b> submission time)		Full Marks: <b>50</b> (Written 30 + Viva/Viva-Quiz-20)		
[Answer each of the questions (1-5) from the followings; Figures in the right margin indicate full marks.]				
<b>SET-C</b>				
<b>1(a).</b>	Explain the following terms: Isolated system, Open system and Closed system and give example where ever possible.	<b>CO1</b>	<b>Ap</b>	<b>02</b>
<b>1(b).</b>	How important are the following: safety, rules, and procedures when dealing with nuclear energy?	<b>CO2</b>	<b>U</b>	<b>02</b>
<b>1(c).</b>	Deduce relation between thermodynamic process & cycle.	<b>CO2</b>	<b>An</b>	<b>02</b>
<b>2(a).</b>	Why boiler blow-down is required?	<b>CO2</b>	<b>An</b>	<b>02</b>
<b>2(b).</b>	How can advanced nuclear energy systems research help the world reach its goal of reducing carbon emissions?	<b>CO3</b>	<b>An</b>	<b>02</b>
<b>2(c).</b>	Demonstrate the advantage and disadvantage of renewable energy.	<b>CO3</b>	<b>U</b>	<b>02</b>
<b>3(a).</b>	How can one get the optimum bleeding point in a steam turbine for regeneration?	<b>CO2</b>	<b>An</b>	<b>01</b>
<b>3(b).</b>	How to increase the Rankin cycle efficiencies with proper T-S diagram.	<b>CO3</b>	<b>C</b>	<b>03</b>
<b>3(c).</b>	Draw the schematic diagram of Hg-water Binary Vapor cycle.	<b>CO1</b>	<b>Ap</b>	<b>02</b>
<b>4(a).</b>	Develop a relation of refrigeration and heat pump with block diagram.	<b>CO2</b>	<b>C</b>	<b>03</b>
<b>4(b).</b>	A refrigeration system has got temperature of 50 <sup>0</sup> C and -20 <sup>0</sup> C for the compressor and the evaporator sides respectively. Find its COP. If compressor work is 8X KW, find the refrigeration capacity in ton. [X=Last digit of your matric ID]	<b>CO3</b>	<b>Ap</b>	<b>03</b>
<b>5(a).</b>	‘The development of effective temperature control, refrigeration has revolutionized almost every aspect of industry’ Explain it on your own view.	<b>CO2</b>	<b>An,R</b>	<b>02</b>
<b>5(b).</b>	The roof of an electrically heated home is .6x m long, .8x m wide, and 0.25 m thick, and is made of a flat layer of concrete whose thermal conductivity is k 0.8 W/m°C The temperatures of the inner and the outer surfaces of the roof one night are measured to be 25°C and 0°C, respectively, for a period of 10 hours. [X=Last digit of your matric ID] Determine: (a) The rate of heat loss through the roof that night and (b) The cost of that heat loss to the home owner if the cost of electricity is \$0.2/kWh.	<b>CO3</b>	<b>Ap</b>	<b>03</b>

<b>5(c).</b>	Can air conditioning facilitates contribute in spreading coronavirus?	<b>CO1</b>	<b>R</b>	<b>01</b>
<b>6.</b>	Viva/Viva-Quiz: The time of viva/viva-quiz will be declared in google classroom.	<b>CO4</b>	<b>R</b>	<b>20</b>