

**MONTHLY EXAMINATION, 2014**  
**BTECH (TERM- 01)**  
**EME : ELEMENTS OF MECHANICAL ENGINEERING**

Time : 1:00 Hours

Maximum Marks: 25

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**SECTION A**

**Total: 8 Marks**  
**Marks / Q: 2**

**Q1 Answer All.**

- (I) What is isobaric process
- (II) Set up an expression for the displacement work done during an arbitrary process.
- (III) State the conditions for a process to be reversible.
- (IV) What do you understand by Quasi Static process

**SECTION B**

**Total: 12 Marks**  
**Marks / Q: 3**

**Q2 Answer All.**

- (I) An insulated vessel containing 5 kg of liquid water at 38°C, 1 kg of ice at 0°C is placed. Calculate the temperature of the water when the ice is completely melted. Take the latent heat of fusion of ice as 335 kJ/kg and specific heat of water as 4.19 kJ/kg °C.
- (II) Define work. Show that work done  $w = \int p dV$

**Q3 Answer All.**

**Marks / Q: 3**

- (I) The pressure volume correlation for a non reversible process is given by  $p = (84/V)$  bar, where V is in m<sup>3</sup>. If 150 kJ work is supplied to the system. Determine the final pressure and volume take initial volume 0.6 m<sup>3</sup>
- (II) Differentiate between reversible and irreversible processes.

**SECTION C**

**Total: 5 Marks**  
**Marks / Q: 5**

**Q4 Answer All.**

- (I) A substance is initially at 0.5 MPa pressure and 0.25 m<sup>3</sup>. It is compressed by an isentropic process so that the final pressure is 3 MPa. Find, (i) changes in enthalpy, internal energy and entropy, (ii) heat and work interactions during the process.