LNCT UNIVERSITY

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Enrolment No..... Class Roll No.....

Second Mid Semester Examination, January 2024

(CS-204) Mechanical Engineering

Branch- CSE, II Semester

Time 1:30 Hrs ***Max. Marks 20***

Note: Attempt <u>All</u> questions. All questions carry equal marks.

Q.1 What is the principle of working of a vernier scale? *(5marks)*

OR

A carnot cycle operates between source and sink temperature of 250°C and -15°C. If the system receives 90 kJ from the source, find i) Efficiency (ii) The net work transfer (iii) Heat rejected to sink.

Q.2 What are the limitations of first law of thermodynamics. State and Explain the second law of thermodynamic. *(5marks)*

OR

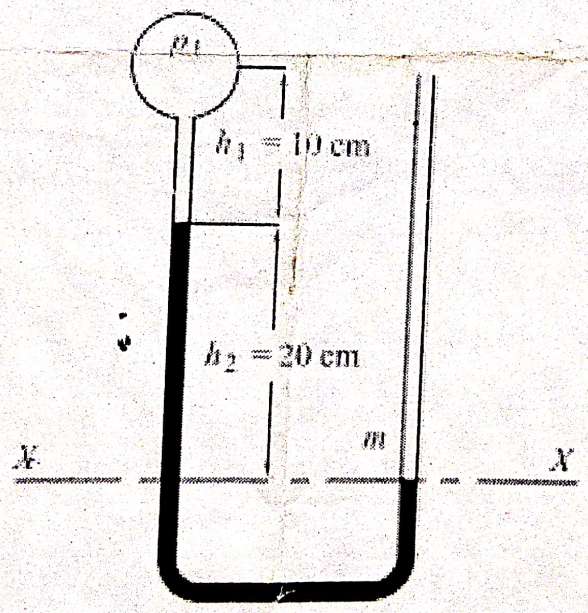
Determine the amount of heat required to generate 5 kg of steam at a pressure of 10 bar and temperature 250° C from water at 25° C. Assume specific heat of superheated stem 2.1 kJ/kgK.
At 10 bar, hg = 2776.2 kJ/kg, ts= 179.88° C.

Q.3 State and Derive the Bernoulli's equation. *(5marks)*

OR

A square plate of side 1.0 m weighing 390 N i
sliding down an inclined plane with a uniform spee
of 1.5 m/s. The gradient of the inclined plane is 5/1
(5 units vertical to 12 units horizontal). An oil film o
1.0mm thickness is kept between the plate and a
inclined plane. Determine the dynamic viscosity o
oil.

Q.4 One end of a U-tube manometer containing mercury is open to atmosphere, while the other end of the tube is connected to a pipe in which a fluid of specific gravity 0.85, and having vacuum is flowing. Find the vacuum pressure of the fluid flowing in the pipe if the difference in the mercury level of the two limbs is 20 cm and the height of the mercury column in the left limb is 10 cm below the centre of pipe.



OR

What are the different types of errors encountered in measurement? Explain with suitable example.