

(PHY N – 5302B1)

B.SC Degree (CBCS) Examinations- 3 MAR 2023
SEMESTER-V (REGULAR)

LOW TEMPERATURE PHYSICS & REFRIGERATION

TIME: 3 Hrs

Max Marks:60

Section – A

(Short answer type)

Answer any Five out of 10 questions

Marks: 5 x 4 M = 20 M

1. Write a brief note on Joule-Thomson effect.
2. Calculate conductivity of a superconductor, if the superconductor material has its area of cross section is 20 m^2 , resistance is $15 \text{ k}\Omega$ and length of the specimen is 25 m .
3. Mention the advantages and drawbacks of each type of thermometers.
4. A thermocouple having an internal resistance of 40Ω and lead resistance of 10Ω produces a voltage of 100 mV . If the output is read by a voltmeter having an internal resistance of 150Ω , what will be the voltage indicated by the voltmeter?
5. Explain the stages of refrigeration.
6. Write a note on artificial refrigeration.
7. Explain briefly about different types of condensers.
8. Explain the tons of refrigeration (TR) and energy efficiency ratio (EER).
9. Give a brief account on water coolers and cold storages.
10. Explain about food freezing.

Section – B

(Essay type)

Answer All questions

Marks: 5 x 8 M = 40 M

11. With the help of neat diagram explain the liquefaction of helium – kapitza method.

(OR)

12. Explain how to get low temperatures using adiabatic demagnetization method.
13. With the help of neat diagram explain in detail about the construction and working of a constant volume gas thermometer.

(OR)

14. Explain in detail about vapour pressure thermometers with its related diagram.

15. Define refrigeration cycle. Draw the block diagram of refrigeration cycle and explain in detail about it.

(OR)

16. Explain in detail about the vapour compression refrigeration system with a neat diagram.

17. with the help of diagram explain in detail about the construction and working of refrigerator.

(OR)

18. Explain in detail about refrigerant leakage and detection.

19. Discuss in detail about the cryogenic rocket propulsion system and mention the uses of liquid nitrogen in medical field.

(OR)

20. Describe about preservation of biological material and domestic refrigerators.

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