



- Notes :
1. Same answer book must be used for each section.
 2. All questions carry marks as indicated.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.
 5. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) An experiment is done using a Cu-Cn thermocouple with cold junction at 0°C , the emf obtained at boiling point of water is 10mv. Also, the emf obtained at the boiling point of Sulphur (440°C) is 25mv. Calculate the constants 'a', and 'b', if the emf relationship is a combination of the Seebeck and the Peltier effect. **8**
- b) List different types of thermocouples with its material of construction and temperature range. Enlist the typical applications of each one. **8**

OR

2. a) Describe with principle, construction, and working of Resistance Temperature Detector. **8**
- b) Compare RTD, thermistor and thermocouple in detail. **8**
3. a) Enlist which liquids can be used as manometric liquid along with their characteristics. Draw and explain working of inclined tube manometer. **8**
- b) Explain the McLeod gauge used in the low-pressure measurement along with derivations. **8**

OR

4. a) Write a short note on Dead Weight Tester. **8**
- b) Explain the scheme for measurement of pressure using strain gauge. **8**
5. a) A submarine moves horizontally in the sea and has its axis much below the surface of sea water. A pitot tube properly placed just in front of the submarine is connected to a differential pressure gauge. The pressure differential between the pitot pressure and static pressure was found to be 20 kN/m^2 . Find the speed of submarine if the density of sea water is 1026 kg/m^3 . **8**
- b) Explain Rotamer as a flowmeter. Also explain its applications. **8**

OR

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| 6. | a) | List different differential pressure type flow meters. Describe Orifice meter in detail. | 8 |
| | b) | Explain construction and working principle of Electromagnetic flow meter with suitable diagram. | 8 |
| 7. | a) | Explain principle, construction working of radioactive type level sensor. List advantages and disadvantages. | 8 |
| | b) | Write a short note on Air purge method. List its applications. | 8 |

OR

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| 8. | a) | Write a short note on Smart Sensors. | 8 |
| | b) | Explain principle, construction working of ultrasonic type level sensor. Give advantages and disadvantages. | 8 |
| 9. | a) | Describe the dry bulb and wet bulb psychrometer. | 8 |
| | b) | Explain the techniques for measurement of moisture in air. Explain any one method with suitable diagram. | 8 |

OR

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| 10. | a) | Define: | 8 |
| | | i) Absolute humidity. | |
| | | ii) Specific humidity. | |
| | | iii) Relative humidity. | |
| | | iv) Dew point. | |
| | b) | Draw and explain working of Hair Hygrometer. | 8 |
