

# HTMS Test # 1

Name: \_\_\_\_\_

Roll No: \_\_\_\_\_

Standard bearing steels are used up to intend for normal service conditions (maximum temperatures are of the order of 120 to 150°C)

- a) **True**
- b) False

RTV stands for

- a) Room temperature vaporization
- b) Room temperature vulcanization
- c) **Room temperature vulcanization silicon adhesive**
- d) None of the above

For high performance turbine blades \_\_\_\_\_ are used.

- a) Superalloys
- b) Improved cooling flow designs
- c) Thermal barrier coatings
- d) **All of the above**

The major engine subsystem consist of the fan, the high-pressure compressor (HPC), the combustor, the high- and low-pressure turbines (HPT and LPT), and the exhaust nozzle.

- a) **True**
- b) False

In space shuttle hotter regions such as nose tip and wing leading edges we use

- a) **Reinforced carbon-carbon composite**
- b) Superalloys
- c) Titanium
- d) None of the above

Platinum has been used in some small special laboratory furnaces up to 1480°C in air. Because of the high cost of platinum

- a) **True**
- b) False

Primary requirements of materials used for heating element are

- a) **High melting point**
- b) Average oxidation resistance
- c) Presence of volatile components
- d) Both a and b

High temperature alloys broadly refer to materials that provide strength, environmental resistance, and stability within the 260 to 1200°C temperature range.

- a) **True**
- b) False

Superalloys are generally based on

- a) Iron-nickel alloys
- b) cobalt-base alloys
- c) Magnesium-base alloys
- d) **Both a and b**

JP type thermocouple based on

- a) **Fe**
- b) Pt
- c) 44Ni-55Cu
- d) 90Ni-9Cr

Q1. Plot the following processes on temperature/entropy curve.

1. Isochoric
2. Isobaric
3. Isothermal
4. Adiabatic
5. Isentropic compression and expansion.

Q2. What are the desirable characteristics of high temperature materials?

Q3. Explain Brayton cycle with the help of constant pressure cycle curve. Also mention the factors on which efficiency of Brayton cycle depend. What techniques are used to increase its efficiency?

Q4. Write short note on any two.

1. Heat treating furnace parts and fixtures for high temperature application
2. Thermocouple materials for high temperature application
3. Superalloys
4. Structural Intermetallics