

147/2015

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. A cycle consists of two isothermal and two isentropic processes is known as :
(A) Otto cycle (B) Joule cycle
(C) Stirling cycle (D) Carnot cycle
2. In an isometric projection the radius of a sphere it is equal to :
(A) $0.82 R$ (B) R
(C) $1.22 R$ (D) $2 R$
3. The function of steam nozzle is to convert :
(A) heat energy steam into kinetic energy
(B) heat energy steam into rotational energy
(C) kinetic energy into heat energy of steam
(D) heat energy steam into pressure energy
4. Dryness fraction is the ratio of :
(A) mass of dry steam to the mass of water vapour in suspension
(B) mass of water vapour in suspension to the mass of water vapour and mass of dry steam
(C) mass of dry steam to the mass of dry steam and mass of water vapour in suspension
(D) mass of water vapour in suspension to the mass of dry steam
5. If the thermal efficiency of Carnot heat engine is 50 percent, then coefficient of performance of a refrigerator working within the same temperature limit would be :
(A) 1 (B) 2
(C) 3 (D) 4
6. During throttling process :
(A) internal energy does not change (B) pressure does not change
(C) volume does not change (D) enthalpy does not change
7. Which one of the following parameter is significant to ascertain chemical equilibrium of a system?
(A) Clapeyron of equation (B) Maxwell relation
(C) Gibb's function (D) Helmholtz function

8. The percentage of carbon in cast iron usually varies between :
 (A) 0.1 to 0.2% (B) 0.5 to 1.0%
 (C) 1.5 to 2.5% (D) 2.5 to 3.5%
9. Martensite is a supersaturated solution of carbon in :
 (A) Alpha iron (B) Beta iron
 (C) Gamma iron (D) Delta iron
10. Dislocation in materials is a _____ defect.
 (A) Point (B) Line
 (C) Plane (D) Volumetric
11. The head over a 90° V-notch increases from 0.15 to 0.3 m. The ratio of the new discharge to the original discharge is :
 (A) 1.414 (B) 2.25
 (C) 4.00 (D) 5.657
12. A floating body will remain in stable equilibrium so long as :
 (A) the metacentre M lies below the centre of gravity
 (B) the metacentre M lies above the centre of gravity
 (C) the metacentre and centre of gravity remain at the same position
 (D) None of these
13. The nominal thickness of boundary layer represents the distance from the surface to a point where :
 (A) the flow ceases to be laminar
 (B) velocity is 99 percent of its asymptotic limit
 (C) the shear stress becomes maximum
 (D) the flow behaves as if it were rotational
14. A pitot-tube is an instrument for measuring :
 (A) pressure of flow (B) discharge of fluid
 (C) velocity of flow (D) total energy
15. The specific speed $N_s = (N\sqrt{Q})/H^{3/4}$ for a double suction pump is to be evaluated. The discharge would be taken :
 (A) half the actual discharge (B) actual discharge
 (C) double the actual discharge (D) square of the actual discharge