Q.1 If Hc(O) and Hc(T) are critical fields at zero temperature and at a temperature T, then which of the following best describe the magnetic phase diagram

a) $Hc(T)=Hc(O)[T^2/Tc^2]$
b) $Hc(T)=Hc(O)[1+T^2/Tc^2]$
c) $Hc(T)=Hc(O)[1-T^2/Tc^2]$
d) $Hc(T)=Hc(O)[T^4/Tc^4-1]$

Q.2 The total magnetic moment for an ion in $^2S_{1/2}$ state is

a) 1.605×10^{-23}J/T
b) 1.60×10^{23} J/T
c) 9.53×10^{-11} J/T
d) 9.53×10^{11} J/T

Q.3 The ripple factor for a half wave rectifier and full wave rectifier are given respectively by

a) 1,2
b) 1.21, 1.48
c) 0.48, 1.21
d) 1.21, 0.48

Q.4 The trans-conductance of a JFET with an amplification factor of 80 and a drain resistance of 400 Kilo-ohm is

a) 200 Micro seconds
b) 200 Nano seconds
c) 2×10^4 Seconds
d) 2×10^{-4} Micro seconds

Q.5 Which of the following represents a pair of mirror nuclei

a) $_1H^3$, $_1H^2$
b) $_1H^3$, $_2He^3$
c) $_6C^{13}$, $_6C^{12}$
d) $_3Li^7$, $_1H^2$

Q.6 If n is the index of refraction the minimum speed a particle must have in order to emit Cerenkov radiation is

a) Cn
b) Cn^2
c) c/n
d) c/n^2

Q.7 Average energy of the free electrons in silver at 0 K, if Fermi energy is 5.51eV, is

a) 3.31eV
b) 0eV
c) 0.33eV
d) None of the above

Q.8 At the same temperature

a) A gas of classical molecules will exert the greatest pressure
b) A gas of fermions will exert the greatest pressure
c) A gas of bosons will exert the greatest pressure
d) all the three will exert the equal pressure

Q.9 which element has a K-alpha X-ray line whose wavelength is 0.180nm

a) Nickel
b) Cobalt
c) Tungsten
d) None of the above

Q.10 The average value of 1/r for a 1S electron in hydrogen atom is

a) $1/a_0$
b) $1/a_0^2$
c) $2/a_0$
d) $3/a_0^2$

Q.11 The expectation value of the position of the particle trapped in a box of length L is

a) L/2
b) 3L/2
c) $L^2/2$
d) None of the above