**Assn-6 solutions:**

**1(i)- converges and value is 3.**

**(ii)- diverges**

**(iii)- converges and value is 0.**

**2.(i) diverges**

**(ii) converges and value is (-3)^(5/3)**

**(iii) diverges**

**(iv) converges and value is -1.**

**(v)- integral does not exist. So, diverges .**

**3. limits do not exist. Hence diverges.**

**4.(i) converges by comparison test with g(x)=1/(x^3) .**

**(ii) diverges by comparison test with g(x)=1/(2x) .**

**(iii) diverges by comparison test with g(x)=1/(log x)**

**(iv) convergent**

**5. converges by comparison test with g(x)=1/(x^3)**

**6 . divergent by limit comparison test (LCT) where g(x)=1/√x**

**7. (i) convergent by comparison test with g(x)=1/(x ^n)**

**(ii )divergent**

**8. (i) divergent by LCT where g(x)=1/(x-2)**

**(ii) divergent by LCT where g(x)=1/(x ln x)**

**9. use LCT in intervals (0,1/2) and (1/2,1)**

**10. convergent and value is π/2**

**11. convergent by µ-test with µ=1/2.**

**12. convergent (hint: use absolute convergence)**

**13. 0 is point of discontinuity if m<1 and ∞ also is pt. of discontinuity. So check at both the pts. Use LCT with g(x)=1/(x^(1-m)) in interval (0,1) and g(x)=1/x^2 in (1,∞).**

**14. log(2)-1**

**15.π/2 log(1/2)**

**18.(i)(4/3)+2t^{3}+t^{6}**

**21.tan^{-1}(a/b) and π/2**

**22.(i) (1/2)log(a^{2}+b^{2})/b^{2}**

**(ii) πlog{1+√(1-x^2)}-πlog2**

**(iii)log{(a^2+b^2)/(p^2+q^2)}**

**(iv)(√π/2)exp(-a^2)**