Government General Degree College, Dantan-II

Internal Assessment/4th Semester/Session : 2019-2020

Core-8

Subject-**Mathematics**(Honours)

Full marks-30

1. Answer **any six** questions: $6 \times 5 = 30$
2. State and proof condition for integrability.
3. A function f: [a,b]→ R be integrability on [a,b]. Then show that f^2 is integrable on [a,b].
4. A function f: [a,b]→ R be continuous on [a,b]. The show that f is integrable on [a,b].
5. Proof another condition for integrability.
6. A function f is defined on [a,b] by f(x)=e^x. Find $\int_a^{-b} f$ and $\int_{-a}^{b} f$. Deduce that f is integrable on [a,b].
7. Let [a,b] be a closed and bounded interval c ∈ R. A function f: [a,b]→ R is defined by f(x)=c x ∈ [a,b]. Prove that f ∈ R[a,b].
8. (i) A function defined on [0,1] by f(x)=1 , if x is rational
   =0 , if x is irrational

   Show that f is not integrable on [0,1].

   (ii) Define upper and lower sum of a partition P.
9. (i) Define refinement of a partition.

   (ii) A function f: [a,b]→ R be bounded on [a,b] and P be a partition of [a,b] . If Q be a refinement of p then show that U(P,f)≥ U(Q,f).