Roll No.												

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

SUMMER TERM / MAKE UP END TERM EXAMINATION

Semester: Summer Term 2019 | **Date**: 26 July 2019

Course Code: ECE 202 | **Time**: 2 Hours

Course Name: Signals and Systems | **Max Marks**: 80

Program & Sem: B.Tech & III Sem (2016 & 2017 Batch) | **Weightage**: 40%

Instructions:

(i) Read the questions very carefully.
(ii) Use only non-programmable scientific calculators.
(iii) Question numbers should be written clearly on the answer script to the left of the margin.
(iv) Make necessary assumptions wherever required and should be mentioned.
(v) All the variables you use should be clearly mentioned/labelled.

Part A

Answer **all** the Questions. **Each** question carries **four** marks. (4Qx6M=24)

1. Find the z-transform of $x[n] = -a^n u[-n]$ and sketch the waveform
2. Find the z-transform of $x[n] = (\frac{1}{2})^n u[n]$.
3. Find the DTFT of the signal given in question number 2.
4. Given $x[n] = \cos \omega n \, u[n]$. Evaluate its z-transform.

Part B

Answer **both** the Questions. **Each** question carries **sixteen** marks. (2Qx16M=32)

5. Prove the following properties of z-transform:
   a. $x[n - n_0] = z^{-n_0} X[z]$
   b. $x[-n] = X[z^{-1}]$
6. Find the z-transform of $x[n] = a^n \sin \omega n \, u[n]$

Part C

Answer **all** the Questions. **Each** question carries **eight** marks. (3Qx8M=24)

7. Find the z-transform of $x[n] = a^n u[n]$ and also its DTFT, given that 0<a<1.
8. Prove multiplication by an exponential and convolution in time domain property of z-transform.
9. $x[n] = e^{-j\omega_0 n} u[n]$. Find the z-transform of this signal.