

BACHELOR OF INSTRUMENTATION & ELECTRONICS ENGINEERING EXAMINATION, 2021
(3rd Year, 1st Semester)

Signal Transmission and Communication Systems (Course code: IEE/PC/B/T/316)

Time : Two hours

Full Marks: 30

Answer all questions

Module-1:CO1

1) Define:

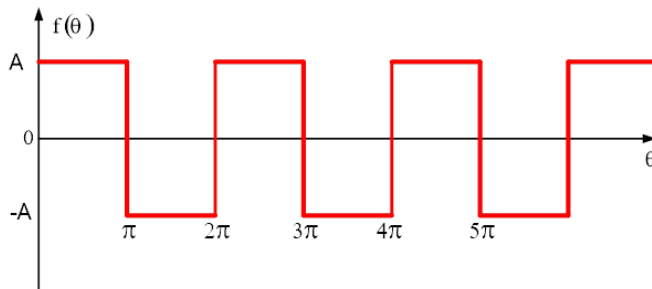
1+1=2

- a) Energy and Power Signal
- b) Odd and Even Signal

2) Find the Fourier series of the following periodic function.

$$x(t) = \begin{cases} A & \text{when } 0 < \theta < \pi \\ -A & \text{when } \pi < \theta < 2\pi \end{cases}$$

4



3. Prove the following properties of the Fourier Transformation

2+2

- a) Convolution
- b) Time scaling

Find the Fourier transformation of the below signal

4

$$x(t) = e^{-at^2}, a > 0$$

Module 2: CO2

3. A carrier signal $A_c \cos \omega_c t$ is amplitude modulated by a message signal $A_m \cos \omega_m t$, where, $A_m < A_c$.

(i) Write down the expression for the modulated signal. (ii) Write down the expression for the carrier component and the side-frequency components.

(2+2)=4

4. Calculate the total transmission power required for AM, also calculate transmission efficiency of the AM signal.

(2+2)=4

5. Discuss the square low modulator of AM signal generation. 2

Module 3: CO3

6. What is the image frequency in super heterodyne AM receiver? 2

7. Calculate the image frequency for the station carrier frequency 300 kHz. 2

8. Write the functionality of RF amplifier in super heterodyne AM receiver. 2

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