


3

	Acad. Year:	2018/2019	Menoufia University			
	Semester:	2 <sup>nd</sup>	Faculty of Electronic Engineering			
	Year:	second	General			
	Time of part one :	1.5 H	Course Title:	Communications Engineering		
	Examiners:	Prof..Abd-Elnaser A. Mohamed	Date:	13 /6/ 2019	Course Code:	Part ONE
Final Term Exam						
Answer The Following Questions			No. of questions: 3			

### Question 1

(10 Marks)

- a) Derive the expression of  $y(t) = x(3t+2)$ , assuming  $x(t) = \Pi(t/2)$
- b) From :  $f_1(t) = \frac{1}{a} \Pi\left[\frac{t-(a/2)}{a}\right]$  and  $f_2(t) = \frac{1}{b} \Pi\left[\frac{t-(b/2)}{b}\right]$ . Find the following:
- Drive the expression for the convolution of two functions
  - The F.T of the convolution of two functions
- c) Find the F.T of the following Figs.(1,2)

### Question 2

(10 Marks)

- a) Find the F.T of the following Fig.(3)
- b) Evaluate the following integral for the cases:
- $x = 0, y = 4,$
  - $x = -10, y = 5$

$$A = \int_x^y (t-1)(t+5)\delta(2t+5)dt$$

- c) From the Fig.(4). Find the following:
- $F(\omega),$
  - $\lim_{T_2 \rightarrow T_1} F(\omega),$
  - $\lim_{T_1 \rightarrow 0} F(\omega)$

### Question 3

(10 Marks)

- a) Express the function interms of a sum of sine functions and draw the amplitude spectrum and phase spectrum:
- $$x(t) = -A_0 + A_1 \cos(\omega_1 t + \theta_1) - A_2 \cos(\omega_2 t) - A_3 \sin(\omega_3 t + \theta_3), \quad A_i > 0$$
- b) Draw the rectangular pulse functions:  $\Pi(t), \Pi(2t),$  and  $\Pi(t/2)$
- c) Find the F.T of the following:
- Unit step,  $u(t)$
  - Unit impulse,  $\delta(t)$
  - Unit ramp,  $r(t),$
  - Signum function,  $\text{sgn}(t)$



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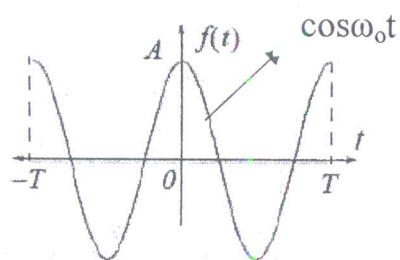


Fig.1

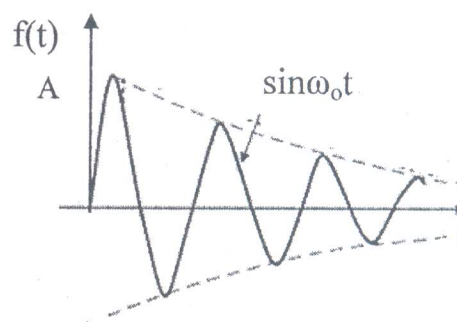


Fig.2

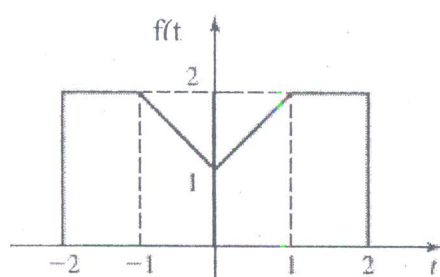


Fig.3

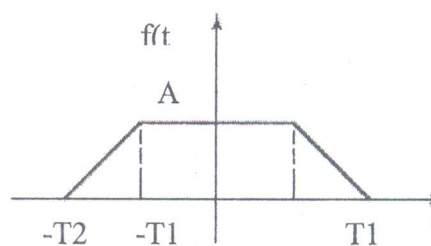


Fig.4

Total marks: 30

With my best wishes and regards