1- $f(x)=\begin{cases}-\pi & 0<x<\pi \\ (x-\pi) & \pi<x<2\pi\end{cases}$ and $f(x+2\pi)=f(x)$. Fourier series of $f(x)$ is represented by $\frac{a_0}{2}+\sum(a_n\cos nx+b_n\sin nx)$ then a_0 is

A- $\frac{3\pi}{2}$ B- $\frac{\pi}{2}$ C- $-\frac{\pi}{2}$ D- π

2- $f(x)=\begin{cases}0 & -5<x<0 \\ 3 & 0<x<5\end{cases}$, *period* 10 and Fourier series of $f(x)$ is represented by $\frac{a_0}{2}+\sum(a_n\cos\frac{n\pi x}{l}+b_n\sin\frac{n\pi x}{l})$ then a_0 is

A- (1) B- (5) C- (4) D- (3)

3- According to problem (2), b_n *is*

A- $\frac{3(1+\cos n\pi)}{n\pi}$ B- $\frac{3(1-\cos n\pi)}{n\pi}$ C- $\frac{3(1-\sin n\pi)}{n\pi}$ D- $\frac{3(1+\sin n\pi)}{n\pi}$

4- According to problem (2), a_n *is*

A- (0) B- (1) C- (2) D- (3)

5- $f(x)=\begin{cases}0 & -\pi<x<0 \\ \cos x & 0<x<\pi\end{cases}$ and $f(x+2\pi)=f(x)$. Fourier series of $f(x)$ is represented by $\frac{a_0}{2}+\sum(a_n\cos nx+b_n\sin nx)$ then b_1 is

A- (-1) B- (1) C-(0) D- (2)

6- The Fourier series of an odd periodic function, contains only

A- odd harmonics B- even harmonics C- cosine terms D- sine terms

7- The Fourier Transform of $f(x)=\begin{cases}1, & |x|<1 \\ 0, & |x|>1\end{cases}$ is

A- $\sqrt{\frac{2}{\pi}}\frac{\cos(\alpha)}{\alpha}$ B- $\sqrt{\frac{2}{\pi}}\frac{\sin(\alpha)}{\alpha}$ C- $\sqrt{\frac{1}{\pi}}\frac{\cos(\alpha)}{\alpha}$ D- $\sqrt{\frac{1}{\pi}}\frac{\sin(\alpha)}{\alpha}$

8- A "periodic function" is given by a function which

A- has a period $T=2\pi$, C- satisfies $f(t+T)=t$,

B- satisfies $f(t+T)=-t$, D- has a period $T=2\pi$

9- The constant function is …..

A- an odd function C. an even function

B- neither even nor odd D. none of these

10- If $f(x)$ is an even function, then its graph is symmetric about

A- y – axis, B- x – axis, C- opposite quadrants, D- none of these

with my best wishes, Prof. Dr. Khaled S.A. Hassaneen