

Solutions



A2-1

Official (English)

EQ2: Acoustic black box marking Scheme

Section		Partwise marks	Total
A1	finding expression of $x(t)$ and $y(t)$		0.2
A2	Plotting graph of f_{\min} vs t		1.2
	Choice of scale (70% coverage)	0.2	
	Both axis labelled with proper units	0.2	
	More than 8 points labelled correctly	either 0.4	
	Atleast 5-7 points plotted	or 0.2	
	Less than 5 points plotted	No Credit	
	Data table		
	10 points reported correctly	either 0.4	
	6-9 points reported correctly	or 0.2	
	Less than 6 points reported	No Credit	
A3	Evaluating expression of eventual f_{\min} (No partial marking)		1
A4	Determination of source's coordinates		1.4
	idea of triangulation (i.e. getting the equations correctly)	1	
	correct value of Δt_{x1} and Δt_{x2}	0.1+0.1	
	Final calculation of X_A and Y_A	0.1+0.1	
A5	Calculating f_0, ω, R, v_s		2.1
	Logic asymptotic values	0.3	
	Getting the retarded time expression correctly	0.6	
	Value of ω	0.2	
	expression of f_{\max} and f_{\min} for source moving away	0.3	
	expression of f_{\max} and f_{\min} for source moving towards	0.3	
	Determination of correct f_{\max} and f_{\min} for calculation	0.2	
	If all values correct f_0, R, v_s	either 0.2	
	If only two or one value is correct	or 0.1	

Solutions



A2-2

Official (English)

ABB Marking Scheme

ABB Marking Scheme			
A6	Finding angle β		2
	Calculation of largest maximum frequency at some angle	0.6	
	Reporting data of extrema at various θ	0.4	
	Determination of the coordinates of D	0.4	
	Determination of Coordinates of E	0.4	
	Final calculation of β	0.2	
A7	Finding centre coordinates		2.1
	Expression of $f(t')$	1	
	If t' and t are same	-0.5	
	Determination of α	0.4	
	Determination of ϕ	0.4	
	coordinates of centre of circle	0.3	