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Section-4

Ans-1

GVF:

GVF stands for gradually varied flow. If the depth of flow in a channel changes gradually over a long length of the channel the flow is said to be gradually varied flow and is denoted by G.V.F.

RVF:

RVF stands for Rapidly varied flow If the depth of flow changes suddenly over a small length of channel then the flow is said to be rapidly varied flow.

Classification of flow Profiles

For a given channel with a known Q, n Normal depth y_o & critical depth y_c if S_o and n are also fixed then there are three possible relation between y_o & y_c

S.No.	Channel Category	Symbol	Characteristic Condition	Remark
1.	Mild slope	M	$y_o > y_c$	Subcritical flow at normal depth
2.	Steep slope	S	$y_c > y_o$	Supercritical flow at normal depth
3.	Critical slope	C	$y_c = y_o$	Critical flow at normal depth.
4.	Horizontal bed	H	& $S_o = 0$	Cannot sustain uniform flow
5.	Adverse slope	A	$S_o < 0$	Cannot sustain uniform flow.

Also there are two cases where y_o does not exist, i.e, when

a) the channel bed is horizontal, ($S_o = 0$),

Draft tube

(i) A tube or pipe of gradually increasing area is used for discharging water from exit of turbine to the tail race. This tube of increasing area is called draft tube.

(ii) The primary function of the draft tube is to minimize the velocity of discharge thus minimizing the loss of kinetic energy at the outlet.

Critical depth

Critical depth is defined as that depth of flow of water at which the specific energy is minimum. This is denoted by 'y_c'. Hence critical depth for rectangular channel is,

$$y_c = \left(\frac{q^2}{g}\right)^{1/3}$$