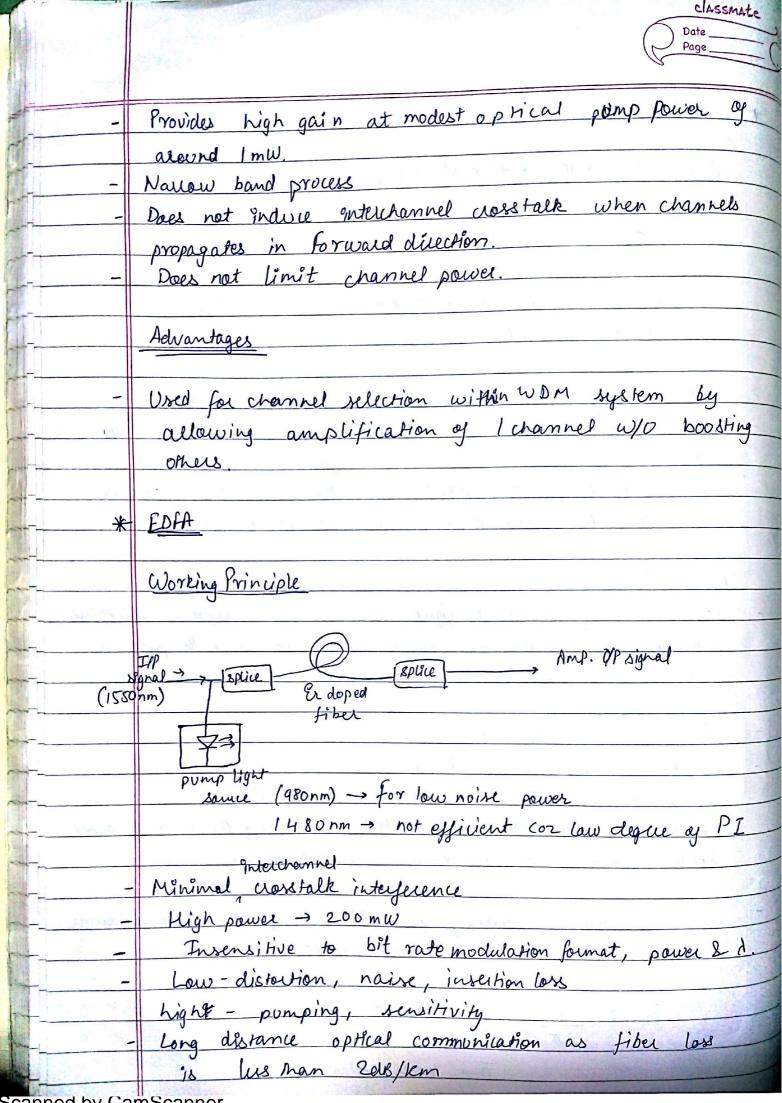
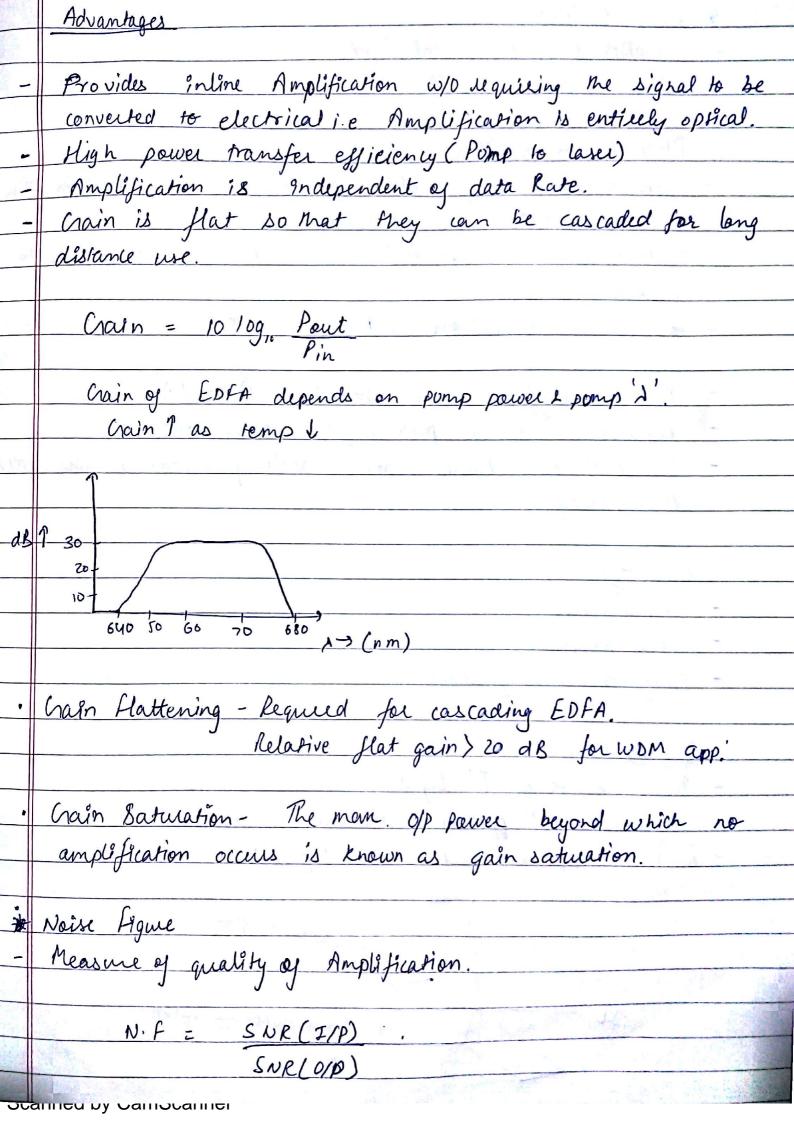
*	Raman Amplifiels
-	fiber based amplifier which uses stimulated raman scattering
9.54	in silica fiber when intende pump beam propagates then
	9t.
_	Diff blw SRS & SE: In SRS, the incident pump photon looses
	9ts energy to create another photon of reduced energy I low
	flequency.
	Basic component are: - 1) Pump larer 2) wavelength selective complex
	3) Fiber.
	→ WP The
	The way
1-	→ Ws Geber Coupler
	wp -> Pump frequency
Ž.	Ws -> signed frequency
	AN AN AND THE SHOP OF THE STATE
_	Energy is transferred from pump beam to signal beam via
	SRS.
_	Pump signal in RA are 500/cm higher in freque than the
_	Signal to be amplified. Pump signal can propagate in both forward/backward direction.
•	Raman Gain
	(re = crp [gr Pp Ley] gr > Ramain gain coefficient
	$C_{R} = c_{R} \int g_{R} P_{P} L_{eff} $ $G_{R} \rightarrow Ramain gain coefficient$ $C_{R} = c_{R} \int g_{R} P_{P} L_{eff} $
	Pp -> Pumping power
	Higher Coe, love losses, Agy - Area of Fiber cone
	Higher Cox, losses , Aeg → Arla of Fiber Core K → Numerical factor

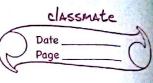
	classmate
	Date Page
	Advantages
1)	Self phase matching b/w pump & signal
2)	Kigh speed Response
3)	Low coupling Loss
4)	High gain
	Mole stability & insensitivity to the lylection.
-1-	
	A LV BD
2018	
gain (dB)	
-	152 A-> 164 cm
	in dp=0.2d8/km gain the Vs
	in dp=0.2d8/km gain & Vs fiber length.
J. J.	
	1 Fiber length (IKM)
~- <u>-</u>	A
100	- Land
h	
h-	
	0.5 1.0 Pump power (W)
	romp power (w)
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	SBS
_	PB= 4.4×10-3×d2×22×dB2 watts.
_	Aprel of the state
	d - coll diameter (um)
	λ → wavelingth (Um)
	de → attenuation in dB/km
	V → source B.W (CHZ).
	Modulation of light mough thermal molecular vibration in Aber.
	Incident photon in this scattering process produces apparen
-	of acoustic freq. optical
-	The incident photon produces an freq. shift which is
	man. In backward direction, & zero in forward.
	man. In backward rouge 1911, 2 coo 1
	Nastana de
	Mechanism Problem 1 inside the light is encuenced through stimulated
_	Power level of incident light is incleased through stimulated
-6-	emission. Mechanism is same for lever diode to produce
	population Inversion.
-	
_	OP is not a coherent light.
-	Enternal sauce is Pump.
_	Pump raises e to encited state for PI
	Incoming photon triggers encited e & bring them to a lower
	State thereby producing an amplified signal.
7	about the state of
1	SBS can transfer energy from higher freq Channel to a lower
	when channel spacing = Browlin Shift.
	J. C.
	22 - 22 12
	$\frac{\nu_{g} = \Omega_{g}}{2\pi} = \frac{2\pi V_{A}}{\nu_{p}}$
7	n→ mode inden
SU	$h \to mode process$ annea by Cambranner



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** Beam Splitter - Splits beam of incident light - Using planar woweguide technology Delate beam splitter - Consists of thin flat glass plate quoted with thin film - layer of metallic or dielectric coathry Introduces a shift deviation sets light beam due to - thickness of plate For rounal deviation / Incidence = W Divides optical beam based on Power/N Reflected LT optical path length are different Designed for highest power handling & coating types determ - the strength. Advantages - Inexpensive - light weight - Early to many acture Disadu - Beam shift of T light Reflected & T poptical paths are different - R' & T' optical paths are different - R' & T' optical paths are different - L' & T' optical paths are different	-		
- Splits beam of incident light - Using planar waveguide technology Delate beam splitter. - Consists of thin flat glass plate quoted with thin film layer of metallic or dielectric coating. - Introduces a shift deviation "into light beam due to thickness ay plate. - For rounal deviation (Incidence = 45°.) - Divides optical beam based on Power/A. - Reflected LT optical forth length are different. - Designed for highest power handling & coating types determine the strength. - Advantages - Introduces - Light weight - Easy to manufacture - Disadu - Ream shift of T light. - Reflected L T optical paths are different - R' k T' optical paths are different - Respectively actual coated surface	1	*	Beam Splitter
Dising planar waveguide fechnology Delde beam splitter Consists of thin flat glass plate quoted with thin film layer of metallic or dielectric coating. Entroduces a shift deviation furto light beam due to thickness of plate For normal deviation / Incidence = 45°. Divides optical beam bared on Power/A. Reflected 17° optical form length are different. Designed for highest power handling & coating types determine the strength. Advantages Inerpensive Light weight Easy to many acture Disadu Beam shift of T' aptical paths are different Reflected & T' aptical paths are different			
Description of the plans plate quoted with thin film layer of metallic or dielectric coaffing. - Introduces a shift deviation gets light beam due to thickness ay plate. - Far rounal deviation / Incidence = 45°. - Divides optical beam bard on Power/A. - Reflected LT optical path length are different. - Designed for highest power handling & coaffing types determine the strungth. - Advantages. - Inerpensive - Light weight - Early to many acture - Disadu - Beam shift of T light. - Reflected & T optical paths are different - R'KT optical paths are different - L'KT optical paths are different	-		
Consists of thin flat glass plate quoted with thin film layer of metallic as dielectric coating. - Introduces a shift deviation into light beam due to thickness as plate. - For normal deviation / Incidence = 45°. - Divides optical beam bared on Power/N. - Reflected & Toptical forh length are different. - Designed for highest power handling & coating types determine the strength. Advantages - Inexpensive - Light weight - Easy to many acture - Disadu - Reflected & Ti poptical paths are different - Righted & Ti poptical paths are different	1	1	CONTRACTOR OF THE PROPERTY OF
Consists of thin flat glass plate quoted with thin film layer of metallic as dielectric coating. - Introduces a shift deviation into light beam due to thickness as plate. - For normal deviation / Incidence = 45°. - Divides optical beam bared on Power/N. - Reflected & Toptical forh length are different. - Designed for highest power handling & coating types determine the strength. Advantages - Inexpensive - Light weight - Easy to many acture - Disadu - Reflected & Ti poptical paths are different - Righted & Ti poptical paths are different	1		Plate beam splitter
layer of metallic or dielectric coating. - Introduces a shift deviation guto light beam due to thickness by plate - for normal deviation / Incidence = 45°. - Divides optical beam bared on Power/A. - Reflected 2 To optical form length are different. - Designed for highest power handling & coating types determing the strength. - Advantages - Inexpensive - Light weight - Easy to manufacture - Disadu - Beam shift of To light. - Reflected & To optical paths are different - Rolling of the paths are different - Ro			Consists of thin flat glass plate quoted with thin film
- Introduces a shift deviation into light beam due to thickness by plate - for volmal deviation (Incidence = 45°. - Divides optical beam based on Power/N. - Reflected et To optical forth length are different. - Designed for highest power handling & coating types determine the strength. Advantages Inexpensive - Light weight - Early to manufacture Disadu - Beam shift of To Eight. - Reflected & To optical paths are different - Rolling types determine the paths are different - Rolling types determine the paths are different - Rolling types determine the paths are different - Rolling types determined to the paths are different - Rolling types determine		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	layer of metallic or dielectric coating.
thickness by plate. - For normal deviation / Incidence = 45°. - Divides optical beam based on Power/N. - Reflected & Toptical forth length are different. - Designed for highest power handling & coating types determine the strength. - Advantages - Inexpensive - Light weight - Easy to manufacture - Disadu - Reflected & Toptical paths are different - Roy I Toptical paths are different - Roy I Toptical paths are different - Low I Toptica	1		Introduces a shift deviation into light beam due to
- for normal deviation (Incidence = 45°). - Divides optical beam based on Power/N. - Reflected & Toptical fath length are different. - Designed for highest power handling & coaling types determined the strength. - Advantages. - Inexpensive - Light weight - Easy to many acture - Disadu - Reflected & Toptical paths are different - R' & T' optical paths are different - R' & T' optical paths are different - Replaced & Toptical paths are different - R' & T' optical paths are different			thickness of plate.
- Divides optical beam bared on Power/N. - Reflected 2 Tx optical fath length are different. - Designed for highest power handling & coating types determine the strength. Advantages - Inexpensive - Light weight - Easy to many acture Disadu - Beam shift of Tx Light. - Reflected & Tx optical paths are different - Rx k Tx optical paths are different - xx k Tx optical paths are different	-		For normal deviation / Incidence = 45°.
- Reflected & Toptical fast length are different. - Designed for highest power handling & coating types determined the strength. Advantages - Inexpensive - Light weight - Easy to manufacture Disadu - Beam shift of T' Light Reflected & T' potical paths are different - R' & T' optical paths are different - R' & T' optical paths are different - Coated surface The seem shift devication The seem shift devication	1		
- Reflected & Toptical fast length are different. - Designed for highest power handling & coating types determined the strength. Advantages - Inexpensive - Light weight - Easy to manufacture Disadu - Beam shift of T' Light Reflected & T' potical paths are different - R' & T' optical paths are different - R' & T' optical paths are different - Coated surface The seem shift devication The seem shift devication			Divides optical beam based on Power/i.
- Designed for highest power handling & coating types determined the strength. Advantages - Inexpensive - Light weight - Easy to manufacture Disadu - Beam shift of T' Light Reflected & T' applical paths are different - L' & T' optical paths are different - L' & T' optical paths are different - L' & T' optical paths are different - L' & T' optical paths are different - L' & T' optical paths are different - L' & T' optical paths are different - L' & T' optical paths are different - L' & T' optical paths are different - L' & T' optical paths are different - L' & T' optical paths are different - L' & T' optical paths are different - L' & T' optical paths are different - L' & T' optical paths are different	7	_	Reflected & Tx optical path length are different.
Advantages Inerpensive - Light weight - Easy to manufacture Disadu - Beam shift of T* Light. - Reflected & T* optical paths are different - R* & T* optical paths are different putered The second surface	1		Designed for highest power handling & coating types determine
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- light weight - Easy to manufacture Disadu - Beam shift of T* Light Reflected & T* applical paths are different - R* k T* applical paths are different The second surface The secon	L+		· · · · · · · · · · · · · · · · · · ·
- light weight - Easy to manufacture Disadu - Beam shift of T* Light Reflected & T* applical paths are different - R* k T* applical paths are different The second surface The secon	1		Advantages
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Disadu - Beam shift of T" light. - Reflected & T" optical paths are different - L" k T" optical paths are different reputed The seem swift of the seem swift of the seem of the seem swift of the seem of the seem swift of the seem	1	_	light weight
- Beam shift of T* Light. - Reflected & T* optical paths are different - R* k T* optical paths are different reputed The seem shift obviorion The The seem shift obviorion	1	_	
- Beam shift of T* Light. - Reflected & T* optical paths are different - R* k T* optical paths are different reputed The seem shift obviorion The The seem shift obviorion	-		A CONTRACTOR OF THE PROPERTY O
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It use I d = Beam shift deviation The			L. Lord
It use I d = Beam shift deviation The			A ged surface
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	7		IL us' I d = Beam shift devication
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2)	Cube Beam Splitter
-	Consists of two triangular glass prison joined together
_	at base by using polyster epony.
-	Used to split incident light into separate polarised components
	S-polarised 2 p-polarised
-	Divides optical beam on power/polarization.
_	S-polarized light is I to Incident light & P-polarized light
	92 // to incident light
વ્ય	O The state of the
	Advantages
-	No beam shift
-	Rx & Tx optical parts are equal
_	Easy integlation
-	Stable & compact.
	Disadu.
_	
	Meavy solid glass constant. Difficult to manufacture in larger sizes
1	Enpensive,
-	
-	