1	Name: Harsh F	ramod Padyal	DISBUO			
1	Lebs traigh	1 -5.	Page No.			
(1.0	Define Progressive	Web ARD (PWA	1) and explain			
	Define Progressive Web App (PWA) and explain its significance in modern web development					
	Discuss the key characknitics that differentiate					
	PWAS from traditional mobile apps.					
An						
1	A progressive web App (AMA) is a type of					
	web application that works like a mobile					
	app but ning.	th a browser	4 6760			
-	C) PA		to block and			
	Significance of	PWH	4 .97			
12000						
	1. Cross-Platform Compatibility					
	2. Offline Support.					
	4. No App Store Required.					
	5. Lower Development out.					
	The state of the s					
	Key Differences	betwo PWA ar	id Traditional			
-	mobile Apps:					
4-400	Marish hosten 14	on mir boot				
	Feature	PWA	Traditional Mobile			
	Installation		App			
	Installation	Direct from	Download from			
		promoter				
	Internet Required	works offline	Usually requires internet			
	0 0	with caching				
	Performance	Fast with service				
		workers.	installation.			
	Updates	store approval	Manual updats			
		Diose Alliera de L	The state of the s			

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	Date				
	Perelonal PWA Traditional mobile Am				
	Cost (codebase for for each platform)				
	(all)				
(0.2)	Define mis				
	Define responsive web design and explain				
	its importance in the context of Progressive web App. Compare and contrast responsive, fluid, and adaptive web design approach				
Fluid and adaptive and contrast responsive,					
Ans-	gr. stefaraling				
	Detination of Responds				
	makes web pages adjust automatically to different screen sizes and devices.				
	different screen sizes and devices				
	TmaxAu				
	Importance of Responsive Design in PWAs:  1. Better user Experience - PWAs work smoothly  on any device.				
	on any device. PWAs work smoothly				
	2. Faster Load Time - Optimized don				
Mala and	2. Faster Load Time - Optimized design improved Speed:				
133 073	3. SEO Benikits - croogle ranks responsive ilter				
	higher.				
	4. Cost - Effective - No need to build multiple				
	Versions for different screeny.				
	A PARTY AND				

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Comparison	7 5	weh	Delian	"Aromacha"	
			Doign	, toloaches -	

-	Carried Malley			
	Approach	Howitworks	Pros	Con.
-	Reponing	Uses flexible	works on	can be
	,	grids and css	all devices,	complex to
	and Lake	media queries	improves	design.
	and the salest	to adjust layout		0
	0 4411-4		Stabus in	
	Fluid	Uses percent	works well	Less control
		-based widths	on different	over layout
		instead of fixa	Screen Jizes	on large
			early 10	Screen.
	1 Brising ?	element raire	implement	
		Smoothly	vot passis	
	Adaptive	uses fixed	Optimized	Mare
	3 Crostne	layouts that	for known	effort require
	1 60 X Doct 1 see	change at	Screen Sizer.	to design
	Tarabasi Asive	Specifi C	(J) Fall .	for each
	Phattert (1984)	breakpoints	7 d s to 3 = 1	Screen
				Size.

Key differences:

Responsive adapts dynamically to all
screen

· Fluid resizes smoothly but may not be fully optimized

· Adaptive loads different layouts based on device types.

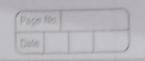
a.3) Describe the lifecycle of services workers, including registration, installation, and activation phases. Lifecycle of services workens
A service workers is a script that new in the background and helps a web send push notifications, Its lifecycle him three main phary 1. Registration Phare:

The brower registers the Service worker Using Javascript code Frample:

¡ P ( Service Worker 'in navigator) { navigator. Service Worker. register ('/sw.js')

then (() > console. log ('service worker Registered')

(atch (error => console. log ('Registration Failet' error)). 2. Installation Phase: The Service workers downloads necessary files
(HTML, CSS, JS) and stores them in cache code Example.



Self. add Event Listerer ("install" event of event wastUndil (asches open ('app-cache'), then (cache ){ return (ache. add All ([1/1, 1 Index. html), 1/3/y les (35 )]).

3. Activation Phase :-

· The old Service worker is replaced with

the new one.

Unused cache fils from the previous version are deleted.

code frample: Self. add Event Listerer ('a chivate', event of event . wait Until (

dches (keys). Hen (key => {

return Promise. all (keys. map(lay => {

if (key !== app-cache') {

return caches delete (key);

}

## Final step: Fetch and sync

Once activated, the Service worker intercepts network requests, serves (ached files, and syncs data when the internet available.

O.4) Explain the use of IndepalDB in the Service worker for data storage.

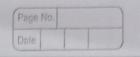
Use of IndexedDB in Service worker for Data Storage:

IndexedDB is a browser database that story
large amounts of structured data like

JSON objects.

Why use IndexedDB in Service workey?:

- 1. Offline Support Stones data when
  offline and syncs it later.
- 2. Efficient Storage Saver structured data like user settings, cart items, or form inputs
- 3. Faster Access: Retrieves data quickly without needing a network request.
- 4. Persistent Duta: Duta remain savel even after the browser 's xlosed.



How Service workers Use Indexed DB9

Opeaning the Database!

let db; let request = indexedDB. open ('myDatabane', 1);

request. onsucess = function (event) {
 db = event. target. result.

Creating a store and Adding Dates:

request. onungradenceded = function (evr nt) {

let db = event.target. result.

let store = db. create Object Store ('Users' & Key Path: 'id's)

Store. add ({id:1, name: 'John Due', age: 253);

3;

Fetching Data in Service Worker:

let transaction = db. transaction ('Users', 'readonly'); let Store = transaction object Store ('Users'); let getUser= Store get(1);

get User on Eucess = Function () {

Console log (get User result);

3;