MPL assignment-2.

05/6

Q1.) Define progressive web app (PWA) and explain the significance in modern web dev, differentiate PWAs from traditional mobile apps.

→ A PWA is a web application that combines both the web and mobile apps to deliver a seamless experience. PWA works offline, loads quickly and provide an app like experience in mobile.

features :-
i) platform independence
ii) Improved performance.
iii) offline functionality.
iv) No app store dependencies.
v) Engaging user experience.

Key characteristics :-
i) installation :- Installed from browser, traditional mobile apps downloaded from mobile apps.
ii) offline support.
iii) updates and performance.

PWAs are faster due to caching and lightweight assets.

Q2) Define responsive web design and explain its importance in context of PWA. Compare responsive; fluid and adaptive web design approach.

→ It's an approach that ensures web pages adapt to different screen signs and orientations using flexible grids.

- Ensures a consistent user experience across different devices.
- Eliminates need for multiple codebases for different devices.
- Enhances usability by making content reachable on screen.

	Responsive	Fluid	Adaptive
Definition	uses CSS media queries to adjust layout	uses % for elements to scale.	uses predefined layout for different screens.
Flexibility	Highly flexible	Completely flexible	fixed at specific breakouts.
Performance	Efficient but requires more CSS adjustment	Smooth Scaling	may cause layout shifts.
Best use Case	website and PWAs	App requires seamless Scaling	website with predefined layout.

Describe the lifecycle of service workers, including
installation and activation phases.

lifecycle Phases :-

i) registration.

```
if ('service worker' in navigator) {
    navigator.serviceworker. register ('/sw.js')
    then (1) => console.log ('service worker
                            registered')
}
```

ii) Installation

occurs when the service worker is first
downloaded.
```
e.g :- self. addeventlisteners ('install',
                        event => {
    event. waituntill (
        caches open ('v') then cache => {
            return cache & All
        });
```

iii) Activation
Runs after installation and ensures old
cached cleared if necessary

```
e.g => self. add EventListener ('activate', Event=> {
           event wait until (
              cackes keys (), then (keys=> {
                return promise. all {keys. filter (key=>
                                      key ('= 'v')}
```
});
}

v) fetching and updates

The service worker intercepts network require

e.g   self. addEventListener ('fetch', event=> {
              event respond with (
                 cacht.match (event. request),
```
});
});
```

(84) Given the use of indexed database in the service worker for data storage.

→ Indexed DB is a low level NOSQL database, in the browser allows web pages to store and retrieve.

i) offline storage :- serves users when offline.

ii) persistent data :- unlike local storage, indexed DB is asynchronous.

iii) Background Sync :- Service workers can use indexed to store data and sync it later.