```
request.onsuccess = (event) =>
  let db = event.target.re
  let transaction = db.trans
  db.transaction('users', 'readw
  let store = transaction.obje
  Store('users');
  store.put({id: 1, name: 'J
  Doe', 31);
});
```

By combining Indexed DB wi
Service workers, PWA's can
store and retrieve data e
when offline.

Comparison of Web Design Approaches

Approach - Responsive

Description - Uses CSS media queries and flexible grides to adjust layout dynamically.

Pros - Works on all devices, single codebase

Cons - May not provide pixel perfect control.

Approach - Fluid

Description - Uses percentage-based layouts that scale with screen size

Pros - Smooth scaling, better readibil

Cons - Can break at extreme screen sizes

iii) Adaptive - Approach

Description - Uses predefined layouts for specific screen sizes.

Pros - Optimized experience per device

Teacher's Sign.:

Teacher's Sign.:

	via web	via app
Performance	Faster loading due to caching	Generally faster for intensive tasks but requires de
Offline Functionality	Available through service workers	Requires explicit offline su

Ans2.) Responsive Web Design and its Importance in PWA's :-
Responsive Web Design (RWD) is a web development approach that ensures a website adapts different screen sizes and devices using flexible layouts, & fluid grids & media queries.

Importance in PWA's

- Ensures PWA's provide a seamless experience across various devices.
- Helps achieve a native-like experience on mobile, without requiring seperate designs.
- Improves accessibility and usability making PWA's more user friendly

Roll No -33 Div -D15B

MPL Assignment 2

Date
Page

Progressive Web App and Its Significance

A Progressive Web App is a type of web application that provides a native-app like experience using modern web technologies. PWAs are designed to be reliable, fast and engaging by leveraging features as service workers, caching and push notifications.

Significance :-

Cross-Platform Compatibility : PWA's work on any device with a web browser.

Offline Support - Uses service workers for caching, enabling offline access.

Performance Improvement - Faster load times due to caching and efficient asset management.

App-Like Experience : Provides home screen installation, push notifications and background updates

Feature	PWA	Traditional
Install	No App Store required	Installed via App Store
Platform Dependency	Works across all platforms with a browser	Requires platform-specific development.
Updates	Auto-updates via	Manual updates

~~Comparison~~ sons - Requires multi versions increasing complexity.

Q3.) Service Workers Lifecycle :-
Ans Services workers are background scripts that run independently of web pages and enable caching, push notifications and offline functionality. Their lifecycle consits of 3 phases:

1.) Registration
- The service worker is registered in the browser using JavaScript (navigator.serviceWorker.register()).

2.) Installation
- The browser installs the service worker and caches necessary assets.
- If successful, it moves to the activation phase, otherwise, it is discarded.

3.) Activation
- The service worker takes control of all pages in its scope.
- Old caches are cleaned up and

Teacher's Sign.: _____

new ones are initialized.
Once activated it listens for fetch events and other background tasks.

4) IndexedDB in Service Workers for Data Storage
IndexedDB is a low-level NoSQL database in the browser, allowing structured data storage.

Usage in Service Workers
Stores large data sets offline, enabling seamless user experience without an internet connection.
Works asynchronously preventing UI blocking.
Allows read/write operations even when a page is closed

Example
```
const request = indexedDB.open("PWA_DB", 1);

request.onupgradeneeded = (event) => {
  let db = event.target.result;
  db.createObjectStore("users", { keyPath: "id" });
};
```