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	División - DICP		
	Poll Na; - 51		
	Kod Ivo. 51		
0	MPL Assignment:-01		
410-	Explain the Key features and advantages of		
	Flutter for mobile abb doubt to		
	Roll No:- 51 MPL Assignment:-01 Oh) Explain the Key features and advantages of using Flutter for mabile app development.		
Ans: -	Ken Factor of Chair		
	Key Features of Flutterio-		
	a design out the heat had		
(i)	Single Godebase: Weite One code for both Andried and case		
(ii)	Fast Responsance: - 1 kes Doet Paris -		
	myriage and a mgh - performance		
(iii)	Wat Roll 1 Indiana lingual		
	(netarity without restarting the		
	Single Godebase: Wente One code for both Android and EOS- Fast Performance: - Uses Dart language and a high-performance rendering engine: Hot Reload: - see changes instantly without restarting the app: Rich (1) Components: - Comes with customizable widgets for		
dos sonds	smooth OI design.		
(v)	Native - like Experience: - Provides high - quality animations		
	and last executions		
(,,	Cross-Platform Support: - Can be used for mobile, web and desktop apps.		
As	desktop apps		
	and destroyed		
	Advantages of Osing Flutler:		
(i)	Saves Time and Effort: - Single Code have for multiple blatlown.		
0 (ii)	High Sheet Development :- Hot ledand leature of the state		
(151)	Colored Parker Colored Spads up waing		
	Saves Time and Effort: Single Codebase for multiple platforms. High Speed Development: - Hot Reload feature speeds up coding. Cost Effective: Reduces development Cost and time.		
(10)	Attractive UT:- Provides beautiful and Customizable widgets. Good Performance:- Uses Dut and Skéa for fast and smooth		
(4)	Good Performance: - Uses Dut and Skea for fast and smooth		
	Rendering.		
(vi)	Gary Automation: - Supports third-boute bleaving and nature		
	and the state of t		
VELLE	Casy Integration: - Supports third-party plugins and nature		
Q23-	Opproaches and why it has gained popularity in the		
	approaches and why it has gained popularity in the		
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1/4	
	developer community.
	The state of the s
Ans.	How flutter differs from Traditional Approaches! - Isaditional material
(1)	Single Codebase! - Iraditional methods need separate code.
	(with Nietrie C)
(11)	Hot Reload: - Tradt: 1 ald
	The state of the s
(111)	Changes, but flutter updates instantly. UI Rendering: - Iradetional approvements.
	UI Rendering: - Iraditional apps use native Components, while flutter has its own rendering engine (Skia) or forter performance:
(101)	for facter performance.
(10)	lesformance: Thatler compiles directly to native machine code,
	Serformance: - Flutter compiles directly to native machine code making it faster than frameworks that uses a bridge. (e.g. Reart Native).
(v)	Clistonization: Kaditional UI design depends on platform
	Spleific Components , but flutter provides fully control
	Centomirable bidgets.
	India Forter to Pahala A
(1)	fact Development (- Hot Roland : and will
01	Why flutlu is Popular Annong Developers: - fast Development! - Hot Reload and single codebase saves - time
(1)	Cross-Platform Support! - Works en mobile, web and desktop. Blautiful U!:- Rich, Customizable widgets for modern designs:
(i)	Blacktiful VI:- Rich, Customizable Widgets for modern
	alsigns 1
CN	High Reformance: - Riens Smoothly without a bridge. like Reart Notive: Active Community and Google Support: Regular updates and strong Community help developers
N) Active Community and Google Support 1- Regular updates
	and strong community help developers
alak I	
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Q2: f	a) Descache II				
a bahari i	Caxplain how widget composition is used to build. Complex user interfaces:				
	Canala now widget composition is used to flutter.				
	templex user interfaces.				
A. 0 26					
111/2-4	e) Concept of Widget Iree in Flutlev! - In flutler, everything is a widget. Widgets are arranged in a				
	everything is a widget. Widget au				
-	tree structure called the widget tree. This tree				
	represents the UI of app, where bound is true				
disting	represents the UI of app, where parent widgets				
7 mil					
	for example, a Scaffold littlet Co.				
	bridget, Whileh Contains Text a la Column				
	Changes in widget librates the				
	for example; a Scaffold bridget Can have a column bridget, whilch contains Text and Button bridget. Changes in bridget updates the tree dynamically.				
	The factor of th				
	Instead of creating a single large UI block, developers. Combine multiple 8 mall widgets like forms, Columns, Containers and Buttons.				
	Containers and Buttons.				
	and parties				
	Gov aramblet is a live in				
	For example 1) A List View can contain multiple.				
	voregus colas				
(b)	Periode a 10 A				
(0)	Provide Examples of commenty used pridgets and Their rolls in creating a widget tree.				
	men rolls in creating a widget tree.				
N-11-					
Ansl-	(i) Scaffold! - Provides the basic layout structure - (is) AppBar! Dis plays the top nowigation bar with a title.				
	(1) Appour his plays the top nowigation bar with a title.				
	(111) Text! - Displays simple text on the screen				
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(V) Smage! - Show images from assets or URL's.

(V) Container! - Used for etyling (background color, padding, margin)

(vi) Row! - Arrange Child widgets horizontally.

(viii) Golumn! - Arrange child widgets Vertically.

(viii) List View! - Displays scrollable lists

(X) Elevated Button! - A clickable button with exevation.

(X) Textfield! - Used forminimput (typing text).

(Xi) Card! - Creates a styled box for displaying context.

(Xii) Stack! - Obulays widgets on top of each other. Example !- Widget Tree My App Material App My Home Page Scaffold Floating Action Button Appaar Kentin Text Tolumn guan Sundaram FOR EDUCATIONAL USE Text Flext

Q3169	Discus the importance of state management in
	flutter applications of state management in
And-	I controls how the app your update and
200	it controls how the about the
- Malera	displays data when the user interfaces it.
Ledical	
	Why State Management is Needed?
(i	appealed " consumer that the
195	reflects changes (e.g. button clicks, text inputs).
(1)	Improves Performance: Opdatus only necessary parts of the UI instead of reloading everything Manages Complex Dota (- Help user handle infants API
(31)	Manager Completer Ports (- 111)
	Manages Complex Dota (- Help user handle inputs, API
(iv)	Ensures Smooth Oser Carperience - Karper Hug all
	Cusures Smooth Oser Caperienas - Keeps the app responsive and interactive .
At the	Types of State in fluttus
0	Pypes of State in Fluttus- 1 Local State - Managed within a single widget using. Stateful Widget
(**	Hateful Widget
(1)	Global State & Shared across multiple screens using Browlder, Riverpood, Bloc or Redux.
	however, box or redux.
Q211h) Compare and Contrast the different state
)	management approaches avoilable in flutter such as
	Sitstate, brovider and Riserpod brovide Scenerios.
	Where each approach is suitable.
	the most the state of the same and
The Paris	And the state of t

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	Approach	How it Works	When to Use.
	Set State	Updates UI by calling	Best for Small upps
National Property of the Parket of the Parke	S. C. Calledon	Set State () in a State Widge	t or managing state
35.65	A STATE OF THE STA	V	a sige
	200000000000000000000000000000000000000	- 11	widget Example
			Toggling a button
	S CONTRACTOR OF THE STATE OF TH	Towns of the second	COLOX
	hovider	Uses Inherited Widget to	Suitable for 3
	Let Littleton -	Uses Inherited Widget to Share State across widgets efficiently:	medium-sized apps
		efficiently.	When data needs to
1218			be shared between -
	As 4-134 144-	A CONTRACTOR OF THE PARTY OF TH	multiple widgets
		The state of the s	Example - Managing -
			user authentication -
	Riverpod	An improved Version of Brovider with bellu berformance and Simple syntax	East for large apps -
The second	Marky Area	brovider with bellu	East for large apps - that need complex -
		Performance and	management -
		Si mpour syntax	with dependency injection
			Example - Mandling - API data and app
		all and the same	bide themes -
	Ch mi Dr.	444	
6	Choosing Right	t Approach!	alle si le
	Use Promid	for simple US updates -	-
-	User Riverpo	on for moderate state she	Cts when a pholip ! -
Frank			- records
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	,
Q4°-10	Explain the process of integrating a firebase
9 13 (4)	explain the process of integrating a first ase
	using Firebase and as backend solution
	discrete the second of the sec
Ans.	Peacer of Interesting Firebase with a flutter
711001	Procus of Integrating Firebase with a flutter application
i	l'alle a firebase broject - Go to (firebase Console)
	(https://console.firebase.google.com), create a new project
/ /	Marie Tolling The art of the art
	ios) and download the google. Services o json (Android) or Google Service - Info plist (ios), Justule firebase Packages! Add dependencies like firebase lore and firebase with in pubsec yam!" Juitialize firebase - Import firebase in main date and Call firebase. Initialize App ().
and the	or Google Service - Info plist (106).
(11	I Install Firebase Packagest Add dependencies like
(1)	lirebase love and firebase with in bubsec yard!
11/	Prifialia firebase - griport firebase in main dat
	and Call firebase. Initialize App ().
()	Osis firebase Curicis' Implement authentication, database. or cloud functions as needed.
La bard	or cloud functions as needed.
440	Benefits of Ving firebase as a Backend solution!
9	
\i	Real-Time Doctabasel-Syncs data instantly across durices- tuthentication (- Provides ready - to -use - sign - in options
(1)	pathentication - kovidus ready - to -use - sign - in options
and the same	/ latter Germanie , Ctc):
(11)	Cloud firestore! Stores structured data efficiently
(N	Horting and storage !- Hosts web a plas and stores '
	files Securely
()	Cloud firestore! Stores Structured data efficiently. Horting and Storage! Hosts web a plas and stores! Scalabelly: Hondles large user bases without managing Servers.
	Sewers -
()	i) fush Notification! Sends alests and update to users.
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QUI(b) Highlight the firebase sessicles community used in flutter development and provide a brief overviews of how data synchronization is achieved. Anst Common Frebase Service Used en flutter Development)i firebase Authentication? Brovides User Sign-in methods,

(400gle, Gmail, Facebook, etc).

(ii) Cloud Firestor! - A NOSQ L database that stores and

Syncs data in real time.

(iii) firebase Realtime Database! - Stores and updates data

instantly across all connected devices. (iv) firebase Cloud Storage: Vscd for Storing and
Setricing files like Images and videos.

(v) firebase Cloud Mesaging (FCM) / Sends push

Notifications to users.

(vi) firebase Mosterig & Deptoys web apps with fast and

secure hosting

vi) firebase Analytical Tracks user behaviour and app

performance. How Data Synchronization is Achieved! -PReal-time Opdates & Firstore and Realtime Database Syn data across devices instantly-(1) Listeners and Streamst - Wielgets listen for changes and update the UI autometically

Offline Support Firebase caches date, allowing apps to work offline and sync when online

This ensure smooth, fast and automatic date lepdates

in fluider, apps

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