VIVEKANAND COLLEGE, KOLHAPUR

(An Empowered Autonomous Institute)

Department Of MCA

NOTICE

Date: 07/01/2025

All the students of **MCA-I** are here by informed that, our department has organized a Unit Test on the subject **Web Tecnology** on 7th January 2025 by 9.00am in Room no.405 of Engineering Building.

So, hereby we request to all the students to attend the Unit Test.

Mr. V. B. Pujari

HEAD
DEPARTMENT OF M. C. A.
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

"ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार" – शिवाजीराव डॉ. बाबुराव मानकुंबे

Shri Swami Vivekanand Shikshan Sanstha, Kolhapur.

VIVEKANAND COLLEGE, KOLHAPUR

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MCA DEPARTMENT – (UNIT TEST)

Date 07/07/2025

ROLL NO.	NAME	SIGN
1	AGLAVE AARTI HARIDAS	Aglave
2	*AMANE SALONI SATISH	
3	*APATE KOMAL ARVIND	KAApate
4	*BAVADEKAR MANASI PRAKASH	MBavadekar
5	*BHOI SHREYA SACHIN	Shreya
6	BHOSALE KARTIK KUMAR	KBhosale
7	*BHOSALE DEVIKA RAMCHANDRA	Bhosale
8	CHAVAN ABHISHEK RAJESH	Abhavan
9	*CHAVAN PRANALI SUHAS	Chavan
10	*CHECHAR ADITI UTTAM	Sidi
11	*SHIVANI DATTATRAY CHOPADE	SHIVANI
12	CHOPADE JAMES PRAVIN	
13	*CHORMARE PRERANA SANJAY	PChormare
14	*CHOUGALE NANDINI SHASHIKANT	
15	*JADHAV HARSHADA MOHAN	Hjadhav
16	JADHAV AKASH SURYAKANT	AB
17	*JADHAV RADHIKA NITIN	Radhika
18	*JADHAV NISHA GUNDOPANT	AB
19	KAKADE SIDDHESH VINIT	SKakade
20	*KALE SHRUTI SATISH	Shruti
21	*KAMAT SWATI SHRIKANT	KAle
22	KAMBALE SHREYASH RAJENDRA	Swati
23	KAMBLE RUTVIK MURALIDHAR	
24	KAMBLE VINAY KAKASO	
25	KHADRE JAY SANJAY	Khadre
26	*KHAMBE VAISHNAVI MADHUKAR	AB
27	*KHOT SAKSHI DATTATRAY	Sakshi
28	*KOKATE SANDHYA ARUN	
29	KORADE SIDDHESH RAMAKANT	Korade
30	*KOTAMIRE POURNIMA UJWAL	
31	KUMBHAR SOURABH RAJESH	AB
32	*KUMBHAR POOJA MARUTI	AB
33	*LOKHANDE ASHLESHA ANANDA	AB

34	LOTAKE OM RAHUL	
35	*MAGDUM JYOTI KUMAR	AB
36	MAHADIK SANGRAMSINH TATYASAHEB	AB
37	*MARALKAR PRATIKSHA VITTHAL	
38	NADAWADE PRASANNAJEET BHAGAVAN	
39	NIGADE SNEHAL RAMCHANDRA	SPNigade
40	*NILKANTH NIKITA NAMDEV	
41	PATEL MUHAFIJ GOUSMAHAMAD	
42	PATHAN AAKIBMATIN FIROZKHAN	
43	*PATIL SHIVALI SANDIP	
44	*PATIL SHRAVANI MALGOUNDA	SMP.
45	*PATIL SHREYA SHAMRAO	
46	*PATIL VAISHNAVI VISHWAS	VVP
47	*PATIL VAISHNAVI BALIRAM	VBP
48	*PATIL ROHINI DATTATRAY	RDP.
49	PRASAD VIVEK KALPNATH	
50	*SANGAR SHITAL RAVINDRA	SRS
51	*SHAIKH SUMAIYA AMAN	
52	SHELAKE PARTH PRABHAKAR	
53	*SHINDE ARATI ARUN	Shinde
54	SHIVASHARAN ADITYA RAMESH	
55	*THOMBARE SHRUTI VILAS	SVT.
56	*TUPE SHREYA MOHAN	
57	*VADD SHWETA YASHVANT	
58	*VARNE SAKSHI SUNIL	
59	*WAINGADE SAMRUDDHI SANJAY	SSW
60	YADAV AISHWARYA SANJAY	
61	*KHADE SHARVARI EKNATH	SEK

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Web Technology

"ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार" - शिक्षणमहर्षी डॉ. बापूजी साळुंखे

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MCA DEPARTMENT - UNIT TEST

Date-7/01/2025

ROLL NO.	NAME	MARKS out of 20
1	AGLAVE AARTI HARIDAS	17
2	*AMANE SALONI SATISH	17
3	*APATE KOMAL ARVIND	18
4	*BAVADEKAR MANASI PRAKASH	18
5	*BHOI SHREYA SACHIN	14
6	BHOSALE KARTIK KUMAR	15
7	*BHOSALE DEVIKA RAMCHANDRA	16
8	CHAVAN ABHISHEK RAJESH	16
9	*CHAVAN PRANALI SUHAS	17
10	*CHECHAR ADITI UTTAM	16
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12	CHOPADE JAMES PRAVIN	18
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15	*JADHAV HARSHADA MOHAN	17
16	JADHAV AKASH SURYAKANT	AB
17	*JADHAV RADHIKA NITIN	17
18	*JADHAV NISHA GUNDOPANT	AB
19	KAKADE SIDDHESH VINIT	12
20	*KALE SHRUTI SATISH	18
21	*KAMAT SWATI SHRIKANT	10
22	KAMBALE SHREYASH RAJENDRA	12
23	KAMBLE RUTVIK MURALIDHAR	14
24	KAMBLE VINAY KAKASO	15
25	KHADRE JAY SANJAY	15
26	*KHAMBE VAISHNAVI MADHUKAR	AB
27	*KHOT SAKSHI DATTATRAY	14
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29	KORADE SIDDHESH RAMAKANT	16
30	*KOTAMIRE POURNIMA UJWAL	17
31	KUMBHAR SOURABH RAJESH	AB
32	*KUMBHAR POOJA MARUTI	AB
33	*LOKHANDE ASHLESHA ANANDA	AB

34	LOTAKE OM RAHUL	15
35	*MAGDUM JYOTI KUMAR	AB
36	MAHADIK SANGRAMSINH TATYASAHEB	AB
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59	*WAINGADE SAMRUDDHI SANJAY	15
60	YADAV AISHWARYA SANJAY	18
61	*KHADE SHARVARI EKNATH	13

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– शिक्षणमहर्षी डॉ. बापूजी साळुंखे

(अधिकारप्रदत्त स्वायत्त)
कोल्हापूर

VIVEKANAND COLLEGE, KOLHAPUR.
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SUPPLIMENT

Jr. Supervisor's Sign. :	
Students Sign. :	Shivani
Seat No. :	11
Seat No. in words :	Eleven
Suppliment No. :	
	46130
Centre UCK	16/20

प्र. क्र.
Q. No.

Q2 What is JavaScript? Write the advantages. What is the difference between GET & POST meathods in JS.

→ 1) JavaScript is a highlevel, interpreated programming language.
2) It is mainly used for web development to create interactive webpages.
3). Runs in the browser & can also work on the server with Node.Js.
4) Follows the event driven, functional & object-oriented programming paradigms.

Advantages of JavaScript :-

1) Client-Side Execution : Runs directly in the browser reducing server load.
2) Fast & Efficient : Executes quickly without needing compilation.
3) Interactivity : Enables dynamic user interfaces, animation & real-time updates.
4) Cross-Platform Support : Works on web mobile, & desktop applications.

5) Versatility : Used for both frontend & backend development.
6) Easy to learn : Has a simple syntax compared to other programming languages.

Difference between GET & POST methods :

	Feature	GET	POST
1)	Purpose	Fetches data from server	Sends data to a server.
2)	Data visibility	Data is sent in URL	Data is sent in request body
3)	Security	Less secure, visible in URL	More secure, data is hidden.
4)	Data limit	Limited by URL length	No size limit
5)	Caching	can be cached by browsers	not cached by default
6)	use case	Fetching data, search queries	Form submissions, login authentication.

Q9 Write a note on web API.

-> 1) A web API is a special type of API available over the Internet, forming part of the world wide web.
2) It is also called as net web API. It is a resource that client applications use to interact with server applications.
3) When a web service offers functionality over the Internet, the API of that service is called a web API

Features of web API :-

1) Developer - friendly : Easy to use with just a few lines of code.
2) Flexible : clients can ask for specific data using path & header parameters
3) Scalable : Can handle thousand of request using load balancing, cashing & tools like Gravitee to gateway
4) Monitoring : Tools like Alert Engine monitor performance SLA breaches & suspecious activities in real time
5) Secure : Security is ensured using OAuth 2.0, OpenID multi-factor biometric authentication.

04	Section	Q. No.												
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प्र. क्र.
Q. No.

Request & Response –
To access a service, a client sends a message or request, to the API of the service the API routes the request to the server application, which executes the service & sends back a response.

Interface only –
- Web APIs are typically interfaces.
- They define the touchpoints between a client applicatio & a server application.

Why Web APIs are Popular –

1) Easy to use – lower time & effort for integration

2) Faster time to market – services can be used instantly by just reading API documentation & writing code.

3) API management platforms – Help with security, access, provisioning & maintenance.

Web API Technologies

1) SOAP (Simple Object Access Protocol) – uses strict XML-based format, which became heavy & complex.

08

2) REST (Representation State Transfer) – lightweight, flexible & now widely used.

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– शिक्षणमहर्षी डॉ. बापूजी साळुंखे

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SUPPLIMENT

Jr. Supervisor's Sign. :	
Students Sign. : A.yadav	
Seat No. : 60	
Seat No. in words : Six Zero	
Suppliment No. :	
46131	
Centre Vivekanand College Kop	

16/20

प्र. क्र. Q. No.

Q1 What is Javascript? Write the advantages of javascript. What is the difference between GET and POST methods in Javascript.

→ • Javascript is a high-level, interpreted programming language.
• It is mainly used for web development to create interactive web pages.
• It runs in the browser and can also work on the server with Node.js.
• Follows the event-driven, functional, & object oriented programing paradigms.

Advantages of Javascript:

1) Client-Side Execution – Runs directly in the browser, reducing server load.
2) Fast & efficient – Executes quickly without needing compilation.
3) Interactivity – Enables dynamic user interfaces, animations and real-time updates.
4) Versatility – Used for both frontend (React, Angular, Vue) and backend (Node.js) development.

प्र. क्र. Q. No.

5) Rich Ecosystem: A large number of libraries and frameworks simplify development.
6) Cross-platform support: Works on web, mobile, and desktop applications.
7) Easy to learn: Has a simple syntax compared to other programming language.

Difference between GET & POST Methods

	Feature	GET	POST
1.	Purpose	Fetches data from a server.	Sends data to a server.
2.	Data visibility	Data is sent in the URL (query parameters).	Data is sent in the request body.
3.	Security	Less secure; visible in the URL.	More secure, data is hidden.
4.	Data limit	Limited by URL length (~2048 chars)	No size limit.
5.	Caching	Can be cached by browsers	Not cached by default.
6.	Use case	Fetching data, search queries	Form submissions, login authentication

प्र. क्र. Q. No.

Q1 Write a note on Web API

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4. Monitoring – Tools like Alert Engine monitor performance SLA breaches, & suspicious activities in real time.
5. Secure – Security is ensured using OAuth 2.0, OpenID Connect, & even multi-factor (biometric authentication with tools like Gravitee Access Management.

Request & Response–

To access a service, a client sends a message or request, to the API of the service the API routes the request to the server application, which executes the service and sends back response.

04 Section	Q. No.												
	Marks												

प्र. क्र.
Q. No.

Interface only-

- Web API's are typically interfaces.
- They define the touchpoints between a client application & a server application.

Why web API's are popular-

1 Easy to use - lower time & effort for integration.
2 Faster time to market - Services can be used instantly by just reading API documentation and writing code.
3. Supports outsourcing - Firms can outsource services without complex contracts.
4. Opens new business channels - For eg an airline booking API can be used by hotel apps to reach more customers.
5. API management platforms - Helps with security, access, provisioning, & maintenance.

Web API Technologies - SOAP and REST.

- SOAP (Simple object Access protocol):
  Uses strict XML-based format, which became heavy and complex.

- REST (Representation State Transfer):
  Lightweight, flexible, and now widely used.

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Department Of MCA

NOTICE

Date: 20/01/2025

All the students of **MCA-I** are here by informed that, our department has organized a Unit Test on the subject **Cyber Security** on 21st January 2025 by 9.00am in Room no.405 of Engineering Building.

So, hereby we request to all the students to attend the Unit Test.

Mr. V. B. Pujari

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Cyber Security

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MCA DEPARTMENT – (UNIT TEST)

Date- 21/7 /2025

ROLL NO.	NAME	SIGN
1	AGLAVE AARTI HARIDAS	Aglave
2	*AMANE SALONI SATISH	
3	*APATE KOMAL ARVIND	KAApate
4	*BAVADEKAR MANASI PRAKASH	MBavadekar
5	*BHOI SHREYA SACHIN	S.S.B
6	BHOSALE KARTIK KUMAR	K.K.B
7	*BHOSALE DEVIKA RAMCHANDRA	Bhosale
8	CHAVAN ABHISHEK RAJESH	A.R.C.
9	*CHAVAN PRANALI SUHAS	P.S.C
10	*CHECHAR ADITI UTTAM	Aditi.
11	*SHIVANI DATTATRAY CHOPADE	Shivani
12	CHOPADE JAMES PRAVIN	Chopade.
13	*CHORMARE PRERANA SANJAY	P.S.C.
14	*CHOUGALE NANDINI SHASHIKANT	N.S.C.
15	*JADHAV HARSHADA MOHAN	H.M.J.
16	JADHAV AKASH SURYAKANT	A.S.J.
17	*JADHAV RADHIKA NITIN	R.N.J.
18	*JADHAV NISHA GUNDOPANT	AB
19	KAKADE SIDDHESH VINIT	AB
20	*KALE SHRUTI SATISH	Shruti.
21	*KAMAT SWATI SHRIKANT	SSK
22	KAMBALE SHREYASH RAJENDRA	Skambale
23	KAMBLE RUTVIK MURALIDHAR	Rkamble
24	KAMBLE VINAY KAKASO	AB
25	KHADRE JAY SANJAY	Khadre
26	*KHAMBE VAISHNAVI MADHUKAR	VMK
27	*KHOT SAKSHI DATTATRAY	Sakshi
28	*KOKATE SANDHYA ARUN	AB
29	KORADE SIDDHESH RAMAKANT	Korade
30	*KOTAMIRE POURNIMA UJWAL	P.U.K.
31	KUMBHAR SOURABH RAJESH	Skumbhar
32	*KUMBHAR POOJA MARUTI	AB
33	*LOKHANDE ASHLESHA ANANDA	AB

34	LOTAKE OM RAHUL	
35	*MAGDUM JYOTI KUMAR	J.K.M.
36	MAHADIK SANGRAMSINH TATYASAHEB	S.T.M
37	*MARALKAR PRATIKSHA VITTHAL	
38	NADAWADE PRASANNAJEET BHAGAVAN	
39	NIGADE SNEHAL RAMCHANDRA	
40	*NILKANTH NIKITA NAMDEV	N.N.N.
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43	*PATIL SHIVALI SANDIP	
44	*PATIL SHRAVANI MALGOUNDA	S.M.P.
45	*PATIL SHREYA SHAMRAO	
46	*PATIL VAISHNAVI VISHWAS	V.V.P.
47	*PATIL VAISHNAVI BALIRAM	V.B.P.
48	*PATIL ROHINI DATTATRAY	R.D.P.
49	PRASAD VIVEK KALPNATH	
50	*SANGAR SHITAL RAVINDRA	S.R.S.
51	*SHAIKH SUMAIYA AMAN	
52	SHELAKE PARTH PRABHAKAR	
53	*SHINDE ARATI ARUN	Shinde
54	SHIVASHARAN ADITYA RAMESH	
55	*THOMBARE SHRUTI VILAS	S.V.T.
56	*TUPE SHREYA MOHAN	
57	*VADD SHWETA YASHVANT	
58	*VARNE SAKSHI SUNIL	
59	*WAINGADE SAMRUDDHI SANJAY	S.S.W.
60	YADAV AISHWARYA SANJAY	
61	*KHADE SHARVARI EKNATH	S.E.K.

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Cyber Security

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MCA DEPARTMENT - UNIT TEST

Date-21/01/2025

ROLL NO.	NAME	MARKS
1	AGLAVE AARTI HARIDAS	14
2	*AMANE SALONI SATISH	13
3	*APATE KOMAL ARVIND	12
4	*BAVADEKAR MANASI PRAKASH	12
5	*BHOI SHREYA SACHIN	13
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11	*SHIVANI DATTATRAY CHOPADE	16
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15	*JADHAV HARSHADA MOHAN	12
16	JADHAV AKASH SURYAKANT	09
17	*JADHAV RADHIKA NITIN	14
18	*JADHAV NISHA GUNDOPANT	AB
19	KAKADE SIDDHESH VINIT	AB
20	*KALE SHRUTI SATISH	16
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22	KAMBALE SHREYASH RAJENDRA	12
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30	*KOTAMIRE POURNIMA UJWAL	12
31	KUMBHAR SOURABH RAJESH	09
32	*KUMBHAR POOJA MARUTI	AB
33	*LOKHANDE ASHLESHA ANANDA	AB

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49	PRASAD VIVEK KALPNATH	12
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VIVEKANAND COLLEGE, KOLHAPUR

Roll No - 01

Activity -

17/20

CYBER SECURITY..

Unit Test

Subject: [Web Technology] under Cyber Security.

Name: Aglave Aarti Haridas

Q.1 Critically comment on what is cyber security & explain the diff^t types of unauthorized threat in detail

→ Cybersecurity is the practice of protecting internet connected devices, networks, program & data from cyberattacks.
The goal of cybersecurity is to prevent cyber criminals from accessing altering or destroying sensitive information.

Cybersecurity is important because it protects against phishing schemes, ransomware attacks, identity theft, data breaches, & financial losses.

Cybersecurity is a critical issue for org^n & the general. Data protection regulation (GDPR) requires org^n to implement security measures to protect personal data.

UN AUTHORIZED THREAT -

- Phishing — A common method to trick users into giving up confidential info by using deceptive emails, messages or websites.

- Brute force attacks -
  Cybercriminals use automated tools to try many combinations of usernames & password until they find the right 1.

- Social engineering - Manipulating people through

psychological trick to gain unauthorized access

- Malware - malicious software that can perform malicious action such as stealing trade secrets displaying malicious ads or damaging infected machines.

- Ransomware - A type of malware that encrypts a user personal data & demand a ransom to give access back.

- Insider threats - When an employee or contractor leaks data either intentionally or accidental

- Unauthorized access attacks -
When a threat actor attempts to access systems or data using an authorized user account.

- Man in the middle attacks - An attacker relays & possibly alters communication betn two parties who believe they are communicating directly.

- Password attacks - trying to guess or crack a user's password using various techniques.

05

- Identity theft - An individual access a computer to steal a user's personal information, which is then used to steal that person identity or access their accounts.

Q 2 Define diff^t types of cybersecurity with the help of ways to securing those attacks.

→ 1. Network security :

network Security is the practice of securing a computer network from unauthorized access or attacks. it includes the use of firewalls, intrusion detection & preventation systems (VPN) virtual private network. The primary goal of networks security is to protect network infrastructure routers, switches, & other network devices.

2. Application security -
Application security refers to the measures taken to secure software application from cyber-attacks. It includes testing the code, identifying vulnerabilities & ensuring that the appl^n is free from any security flaws.
- regular security testing & updates.

3 Information Security - information security involves the protection of digital information such as data stored in database files, or other repositories information security ensures the confidentially, integrity & availability of data by protecting it from unauthorized access disclosure, modification or destruction.

key - • regular backups of critical data
monitoring & logging of system & net^k activity

4 Cloud security - Cloud security refers to the protection of data & system hosted on cloud platforms, such as amazon web services (AWS) microsoft & google Cloud.
cloud security includes a combination of technical & administrative control that aim to secure data stored in the cloud as well as the cloud infrastructure itself.

---

5 Internet of things Security - The IOT refers to the network of connected devices, such as smartphone, smart homes, wearables IOT security involves securing the devices themselves as well as that connects them.
- regular software updates & patches
- use of strong authentication & access control mechanisms.

6 Identity Access management -
identity & access management (IAM) is the practice of managing user identities & controlling access to resources within an orgⁿ.
- regular security audits & compliance check
- implementation of password policies & regular password updates.

Preventing cyber attacks involves a combination of technical, administrative & educational measures.

⊙ Way to secure cyberattacks -

① use of Antivirus & malware software -
Antivirus & malware software are essential tool that can help protect your computer from various cyber threats such as viruses, spyware, ransom-ware.

② regular software updates :- Software updates often include security patches that fix known vulnerabilities. Ensure that you regularly update all software appl^n. include your operating system.

③ Strong passwords & multi-factor Authentication -
Strong passwords & multi-factor authentication can help prevent an authorized access to your accounts. Ensure that you use a upper & lower case letter, number, symbol in your password.

06

Q3 Analyze & comment on What is cyberspace define the Architecture of cyberspace.

→ Cyberspace can be defined as an intricate env^t that involves interaction bet^n people, software & services. It is maintained by the worldwide distribution of infor^n & communication technology devices & networks.

Architecture - refers to the structural framework & infrastructure that support the interconnected network of digital system

including the internet, data centers, cloud services & various communication net^k.

It encompasses a broad spectrum of component technologies & protocol that enable the seamless flow of information across the digital domain

- Key Components -

1] Network infrastructure - At the core of cyberspace architecture lies the network infrastructure which includes physical & virtual component such as routers, switches server & transmission lines.

2] Data centers - Data centers server as the centralized hubs for storing, processing & managing vast amount of digital info^n. They house servers storage systems & networking equipment, providing the necessary computing resource to support a wide range of online service application.

3] Protocol & standards -
Cyberspace architecture relies on a multitude of protocol & standards to ensure interoperability & seamless communication bet^n diff^t devices & platforms. e.g. TCP/IP for internet communication HTTP for web browsing & SMTP for email transmission.

4] Cloud Computing infrastructure -

The rise of cloud computing has significantly influenced cyberspace architecture with cloud providers offering scalable resources virtualized environment, & on-demand services to support diverse workload & applications.

Design principles of cyberspace Architecture –

Scalability –

Cyberspace architecture is designed to accommodate exponential growth in data traffic user interactions & digital services. Scalability ensures that the infrastructure can adapt to increasing demand without compromising performance or reliability.

Security – Protecting the integrity & confidentiality of data within cyberspace is paramount. The architecture incorporates robust security measures such as encryption access controls, firewalls.

Interoperability –

Cyberspace archit^c emphasize interoperability by adhering to open standards & protocols. This enables seamless communication & data exchange betn disparent system & devices

06

"ज्ञान, विज्ञान आणि सुसंस्कार यांतली शिक्षण प्रसार" - शिवाजीराव डॉ. बाबूजी साळुंखे

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MCA DEPARTMENT - (SURPRISE TEST)

Date-12/02/2025

ROLL NO.	NAME	SIGN
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5	*BHOI SHREYA SACHIN	
6	BHOSALE KARTIK KUMAR	
7	*BHOSALE DEVIKA RAMCHANDRA	AB
8	CHAVAN ABHISHEK RAJESH	
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10	*CHECHAR ADITI UTTAM	
11	*SHIVANI DATTATRAY CHOPADE	Shivani
12	CHOPADE JAMES PRAVIN	
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14	*CHOUGALE NANDINI SHASHIKANT	
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16	JADHAV AKASH SURYAKANT	AB
17	*JADHAV RADHIKA NITIN	
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19	KAKADE SIDDHESH VINIT	
20	*KALE SHRUTI SATISH	
21	*KAMAT SWATI SHRIKANT	AB
22	KAMBALE SHREYASH RAJENDRA	
23	KAMBLE RUTVIK MURALIDHAR	
24	KAMBLE VINAY KAKASO	
25	KHADRE JAY SANJAY	
26	*KHAMBE VAISHNAVI MADHUKAR	
27	*KHOT SAKSHI DATTATRAY	
28	*KOKATE SANDHYA ARUN	
29	KORADE SIDDHESH RAMAKANT	
30	*KOTAMIRE POURNIMA UJWAL	
31	KUMBHAR SOURABH RAJESH	
32	*KUMBHAR POOJA MARUTI	
33	*LOKHANDE ASHLESHA ANANDA	AB

34	LOTAKE OM RAHUL	
35	*MAGDUM JYOTI KUMAR	AB
36	MAHADIK SANGRAMSINH TATYASAHEB	AB
37	*MARALKAR PRATIKSHA VITTHAL	
38	NADAWADE PRASANNAJEET BHAGAVAN	
39	NIGADE SNEHAL RAMCHANDRA	
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46	*PATIL VAISHNAVI VISHWAS	
47	*PATIL VAISHNAVI BALIRAM	
48	*PATIL ROHINI DATTATRAY	
49	PRASAD VIVEK KALPNATH	
50	*SANGAR SHITAL RAVINDRA	
51	*SHAIKH SUMAIYA AMAN	
52	SHELAKE PARTH PRABHAKAR	
53	*SHINDE ARATI ARUN	
54	SHIVASHARAN ADITYA RAMESH	
55	*THOMBARE SHRUTI VILAS	
56	*TUPE SHREYA MOHAN	
57	*VADD SHWETA YASHVANT	
58	*VARNE SAKSHI SUNIL	
59	*WAINGADE SAMRUDDHI SANJAY	
60	YADAV AISHWARYA SANJAY	
61	*KHADE SHARVARI EKNATH	

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Surprise Test

"ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार" – शिवस्थापनी श्री. स्वामी स्वामुंचे

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Advanced Web Technology.

MCA DEPARTMENT- SURPRISE TEST

Date -12/02/2025

ROLL NO.	NAME	MARKS
1	AGLAVE AARTI HARIDAS	14
2	*AMANE SALONI SATISH	13
3	*APATE KOMAL ARVIND	15
4	*BAVADEKAR MANASI PRAKASH	13
5	*BHOI SHREYA SACHIN	12
6	BHOSALE KARTIK KUMAR	12
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34	LOTAKE OM RAHUL	12
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61	*KHADE SHARVARI EKNATH	15

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16/20

प्र. क्र.
Q. No.

Test - AWT

Q1 Write Note on web API

→ Web API are those API that are part of the world wide web - the global network of resources that comprise the internet A web API also known as a net web API is therefore a resource of a special kind - that is available over the internet.
Over the last decade this network of inter connected API or API web has rapidly evolved to become an exciting driver of the technological innovation & business growth, why have web API become the engines of growth that they are today

The main characteristics of web APIs that influence their consumption
Concern such as web API tha influence their consumption.
concern such as web API security & Management

02	Section	Q. No.												
		Marks												

प्र. क्र.
Q. No.

that API designers must address Architectural frameworks like SOAP & REST that prescribe rules governing the operation of modern web API as well as implementations of these framework such as ASP.NET core web API & Nodejs

when an application offers a services to client over the internet the service is known as web service An API of such a services is known as web API.

- How to use web API :— Web API receives request from different type of client device like mobile, laptop etc then sends those request to the server browser to process those request & return the desired output to the client.

- Server side — A serverside web API is a programmatic interface. It consists of one or more publicly exposed endpoint.

- Client side — client side web API target standardized javascript bindings. google created their native client architecture designed to replace native plug-ins with secure native sandboxed extension & application.

- Ex — Google maps APIs — google Maps on webpage using a javascript or flash interface.

Section	Q. No.													03
	Marks													

प्र. क्र.
Q. No.

What are the datatype supported by php write difference betn Javascript & PHP.

Q4

→ Datatypes of PHP :— Variables can store data of different types and different datatypes can do different things.

① STRING — string is a sequence of character, like "Hello world" A string can be any text inside quotes. you can use single or double quotes.

Ex —
```
$x = "Hello world";
Var_dump($x)
echo "<br>";
```

② Integer — An integer data type is non-decimal number betn - 2, 14, 7, 483, 648 and 2, 147, 483, 647

- integer must have at least one digit, integer not have a decimal point., An integer can be either positive or Negati

Ex —
```
$x=5985;
Var_dump($x);
```

③ float — A float (floating point number) is a number with a decimal point or number in exponential form.

Ex —
```
$x =10.365
Var_dump($x);
```

④ Boolean — A Boolean represent two possible states True or False

Ex —
```
$= true;
Var-dump($x);
```

04	Section	Q. No.													
		Marks													

प्र. क्र.
Q. No.

(5) Object- Classes & object are two main aspect of object oriented programing. A class is a template for object and object is instance of a class. each object will have different values for the properties.

fx-
```
Class car { public $color;
            public $model; public fun_cost($color,
                                $model)
  { $this -> color = $color;
    $this -> model = $model; }
  public function message() { return "My car is a".
        $this -> color . " " . $this -> model "!"; }
  } $mycar = new Car ("red", "volvo");
    var_dump ($mycar);
```

	Javascript	PHP
(I)	Javascript is a high level language	PHP is a popular scripting language mostly used perform server-side function
(II)	It is used front-end development	It is used backend language.
(III)	The code can be viewed even after output is interpreted	The code can only be viewed after it is interpreted by the server.
(V)	It can be combined with HTML, AJAX & ~~m~~ XML	It can be embeded only with HTML

॥ ज्ञान, विज्ञान आणि सुंसस्कार यासाठी शिक्षण प्रसार ॥
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15/20

प्र. क्र.
Q. No.

A.W.T.

① Write a note of Web API

→ Web API are those API.s that are Part of the world wide - the global network of resources that comprise the internet. A web API also known as a net API is therefore a resources - of a special kind - that is available over the inter-net.

over the last decate, this network of inter connected APIs or API web - has rapidly evolved to become an exiciting driver of techno-logical innovation & business growth.

The main characteristics of web APIs that influence their consumption.
Concern such as web APIs that influence their consumplemtion.
concern's such as web API security & manage-ment that API designers like SOAP & REST that prescribe rules governing the operation of moder. web APIs as well as implemtations

02 Section	Q. No.												
	Marks												

प्र. क्र.
Q. No.

of these frameworks, such as ASP.NET core web API & Nodes.

When an application offers a service to client over the internet the service is known as a web service An API of such a services is known as web API.

- How to use web API :- web API receives request from different type of client device like mobile, laptop etc. then sends those request to the server to process those request & return the desired output to the client.

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- client side - client side web API target standard Javascript bindings - google created their native client architecture designed to replace native plug-ins with server native sandboxed extension & application.

- Ex - Google maps API's - google maps on web page using Javascript or Flash interface.

Section	Q. No.													03
	Marks													

प्र. क्र.
Q. No.

What are the datatype supported by PHP write difference betn Java script and PHP

Q. 4]

→ Datatype of PHP :- Variables can store data of different type and different datatype can do differents things :-

① String - A strings is a sequence of characters like "Hello world". A string can be any text inside quotes. You can use single or double quotes

Ex - $x = "Hello World";
var_dump ($x)
echo "<br>";

② Integer - An integer data type is a non-decimal number - 2,147,483,648 and 2,147,483,647.
· Integer must have at least one digit. An integer can be ether positive or negative

Ex - $x = 5985;
var_dump ($x);

③ Float - A Float (Folating Point number) is a number with a decimal Point or a number in exponential from.

Ex - $x = 10.365
var_dump ($x);

④ Boleadn :- A Boleadn represents two Possiable states True or Flase.

Ex- $ = true;
var_dump($x);

04 Section	Q. No.												
	Marks												

प्र. क्र.
Q. No.

(5) object - classes and objects are the two main aspects of object-oriented Programming.
A class is a template for objects, and an object is an ~~intan~~ instance of a class.

```
EX -  class car {
          Public $ color;
          Public $ model;
          Public function __construct ($color
              $this -> color = $ color;
              $ this -> model = $ model; }
Public function message () { return "My car is a ",
                $ this -> color " " $ this -> model ";
} $ Mycar = new car ("red", "Valva");
      var_dump ($Mycar);
```

Javascript	PHP
Javascript is a high-level programming language that is synchronous with client-side scripting.	PHP is a Propular scripting language mostly used to Perform server-side functions.
It is used for front-end development and is extemely versatile.	It is a back-end langu which is capable of most anything when used with the right framework.

08

॥ ज्ञान, विज्ञान आणि सुंसस्कार यासाठी शिक्षण प्रसार ॥
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15/20

प्र. क्र.
Q. No.

Q ① Write a note of Web API.

→ Web API are the API that are part of the World Wide Web the global network of resource that comprise the internet.

A Web API, also known a net Web API, is therefore a resource of a special kind that is available over the internet.

over the last decade, this network of interconnected API or APIs Web has rapidly evolved to become an exiciting driver of technologies innovation + business growth. Wh have Web API become the engineers of growth that they are today?

★ Defining the Rules :-

A Web API or service is a Component that defines the rule that client application need to follows to access the service.

02	Section	Q. No.													
		Marks													

प्र. क्र.
Q. No.

★ The API Web :-

Being part of the World Wide Web API are identifiable by what are called uniform resource identifiers (URI).

This collection of URI across the globe is known as the API Web, or web of API.

★ Request And Response :-

To access a service, a client a message or request, to the API of the service, the API routes the a request of the server application, which executed the service and send back a response.

★ Interface only :-

Web API interface typically are API. they define the touchpoint a client application and a server application.

clients do not need to know the internal working whether a service is written in ASP. NET or Node.js or Python.

As a result, firms are free build their API + service with language that make stratigic

प्र. क्र.
Q. No.

Q 2) What is Javascript? Write the advantages of Java.Script. What is the different between GET and Post methods in Java-Script.

→ Javascript (JS) is a versatile lightweight, interpreted programming language primarily used to add interactivity and dynamic content to web pages, but also for server-side development and more.

★ Advantages of Javascript :-

1) Simple a Javascript is simple to comprehend and pick up. both users and developers will find the structure to be straightforward. Additionally, it is very doable to implement. saving web developers to tonne of money when developers a tonne of money when creating dynamic content.

2) Speed a Javascript is a "interpreted" language it cuts down on the time needed for compilation in other programming language like Java.

3) Introperability a beause Javascript seamlessly integrates with other programming languages.

04 Section	Q. No.												
	Marks												

प्र. क्र.
Q. No.

4) Server load a data validation can be done within the browser itself rather than being forwarded to the server because Javascript is client side.

GET	POST
1) Can be bookmarked	1) Cannot be bookmarked
2) Parameters remain in browser history	2) Parameters are not saved in browser history
3) only ASCII characters allowed	3) No restriction Binary data is also allowed
4) Data is visible to everyone in the URL	4) Data not displayed in the URL.

07

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13/20

प्र. क्र.
Q. No.

1 Write a short note on web API

→ web APIs are those APIs that are part of the world wide web - the global network of resources that comprise the Internet. A web API, also known as a net web API, is therefore a resource of a special kind - that is available over the Internet.

When an application offers a service to clients over the Internet the service is known as web service. An API of such a service is known as a web API.

• Defining The Rules

A web API of a service is a component that defines the rules that client applications need to follow to access the service. These rules include underlying protocols, output formats, Input data formats and access and authentication mechanisms.

02	Section	Q. No.													
		Marks													

प्र. क्र.
Q. No.

- The API web

Being part of the world wide web APIs are identifiable by what are called uniform Resource Identifiers (URIs). This collection of URIs across the globe is known as the web of APIs

- Request and Response

To access a service, a client sends a message or request to the API of the service, the API routes the request to the server application, which ~~mes~~ executes the service and sends back a response. Since API ~~to~~ resources are on the web, the messages are usually sent using the HTTP protocol.

- Interface Only

Web APIs are typically interfaces. They define the touchpoints between a client application and a server application. Clients do not need to know the internal workings - whether a service's written in ASP.Net or Node.js or python. As a result firms are free to build their APIs and services with languages that makes strategic sense to them and benefit from this abstracted language agnostic interface - the API

Section	Q. No.													03
	Marks													

प्र. क्र.
Q. No.

2 What is Javascript? write the advantages of Javascript. What is the difference between GET and POST methods in Javascript?

→ Javascript (JS) is a versatile, lightweight, interpreted programming language primarily used to add interactivity and dynamic content to web pages, but also used for server-side development and more

Advantages of Javascript

- Simple - A javascript is simple to comprehend and pick up. Both users and developers will find the structure to be straightforward. Additionally, it is very do-able to implement, saving web developers a ton of money when creating dynamic content.

- Speed - A javascript is a interpreted language. It cuts down on the time needed for compilation in other programming languages like Java. Another client side script is Javascript, which accelerates programme execution by eliminating the wait time for server connections.

- Interoperability - Javascript seamlessly integrates with other programming languages. many developers favour using it to create a variety of applications. Any webpage or the script of another programming language can contain it -

04	Section	Q. No.												
		Marks												

प्र. क्र.
Q. No.

- Serverload - Data validation can be done within the browser itself rather than being forwarded to the server because Javascript is client-side. The entire website does not found need to be reloaded in the event of any discrepancy

Differences Between GET and POST

GET	POST
Can be bookmarked	Cannot be bookmarked
Can be cached	Not cached
Parameters remain in browser history	Parameters are not saved in browser history
Only ASCII characters allowed	No restrictions. Binary data is also allowed
Data is visible to everyone in the URL	Data is not displayed in the URL

॥ ज्ञान, विज्ञान आणि सुंसस्कार यासाठी शिक्षण प्रसार ॥
– शिक्षणमहर्षी डॉ. बापूजी साळुंखे

(अधिकारप्रदत्त स्वायत्त)
कोल्हापूर

VIVEKANAND COLLEGE, KOLHAPUR.
(Empowered Autonomous)

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	46892
Centre	

15/20

प्र. क्र. Q. No. 1.

Web API

A web API is an Interface that allows communica-tion between computer or software systems over the internet. It provides a way for web-based applications to interact with other applications, systems or services using standard web protocols such as HTTP/HTTPS.

API act as a bridge between the client and the server.

Key features of Web API

1] Platform Independence:

Web APIs can be accessed by any client capable of sending HTTP requests, making them plaform-independent.

2] Use of HTTP methods:

Web APIs commonly use HTTP methods like:

GET - To fetch data
POST - To send new data
PUT - To update existing data
DELETE - To remove data.

02	Section	Q. No.													
		Marks													

प्र. क्र.
Q. No.

3] Data Formats:
The most commonly used formats for data exchange are JSON and XML.
4] Statelessness:
Most web APIs follows REST principles, which means each request from client contains all the information needed to process the request, & the server does not store any client session.
5] Scalability and Flexibility
Web APIs allow easy scaling and flexible integration with various services like payment gateways, cloud services, or third party tools.

Types of Web APIs:
1] REST API (Representational State Transfer)
2] SOAP API (Simple Object Access Protocol)
3] GraphQL API

Advantages of API:

1] Ease of Integration with different platforms and services.
2] Improves over user experience by enabling real-time data communication.
3] Promotes code reusability and modular design
4] supports mobile and Web Applications development with a common backend.

Applications:- Social media, E-Commerce Websites

Section	Q. No.													03
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प्र. क्र.
Q. No. 3.4.

what are the data types supported by php write a Explain Document object model with suitable example and code.

The document object model (DOM) is a programming interface for web documents. It represents the structure of an HTML or XML document as a tree of objects, where each node corresponds to a part of the document. The DOM allows programs and scripts to interact with the content, structure, and style of web pages dynamically.

Key Features of the DOM:

1] Hierarchical structure: The DOM represents the HTML document as a hierarchical tree structure where each HTML element is node in this tree.

2] Access and Manipulation: Javascript can access and manipulate the DOM to change the content, structure and style of a webpages dynamically without reloading the page.

3] Cross - language Interface: The DOM is not tied to a specific programming language. It can be accessed using diff. languages, but Javascript is the most common language used to interact with the DOM on the web.

04	Section	Q. No.													
		Marks													

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Q. No.
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HTML Code:

```
<html>
<head>
    <title> DOM Example </title>
</head>
<body>
    <h1> Welcome </h1>
    <P> This is a paragraph. </P>
    <button id = "myButton"> Click Me </button>
</body>
</html>
```

```
<html>
<head>
<title> DOM Example X/title>
<script>
    Window . onload = function() {
        var heading =
document. queryselect ('h1');
            heading. textContent =
        " Hello Javascript DOM!";
        };
</script>
</head>
<body>
    <h1> Welcome </h1>
    <P> This is a paragraph. </P>
</body>
</html>
```

08

Shri Swami Vivekanand Shikshan Sanstha, Kolhapur.

VIVEKANAND COLLEGE, KOLHAPUR

(Empowered Autonomous)

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MCA DEPARTMENT - (OPEN BOOK TEST)

Date- / /2025

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60	YADAV AISHWARYA SANJAY	
61	*KHADE SHARVARI EKNATH	

Mr. V. B. Pujari
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(EMPOWERED AUTONOMOUS)

Book Review

Rajdhani
DATE / /

Title - Modern Operating Systems

Author - Andrew S. Tanenbaum and Herbert Bos

Publication - 4th Edition, 2014

* Introduction -

Modern Operating Systems by Andrew S. Tanenbaum and Herbert Bos is a foundational textbook that offers deep exploration of the principles and working of operating systems.

Published by person, this book combines technical detail with a clear narrative style making it a favorite among students and proffessionals alike. It's focus on both theoretical concepts and practical application sets it apart as a resource for understanding modern operating system.

* Summary -

The book covers the fundamental concepts of operating system while emphasizing modern trends and developments. It is divided into several comprehensive sections.

- Introduction and Overview -

Explains the history, purpose,

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and types of operating systems.

- Processes and Threads -
Disscusses process management, threading inter-process communication and synchronization.

- Memory Management -
Covers paging, segmentation, virtual memory and advanced memory management techniques.

- File System and Storage -
Explores file system organization, storage devices, and Rald systems.

- Security and Protection -
Focuses on threats, authentication cryptography and access control mechanisms.

- Distributed System -
Distributed operating systems - cloud computing and virtulization.

Key themes included the balance between theoretical underpinning and their real-world implementation in systems like Linux, Windows and MacOS.

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* Analysis -

- Strengths -

Engaging Writing Style -
Tanenbaum's ability to explain complex topics with clarity and humor keeps the reader engaged.

Practical Insights -
Real-world examples and comparisions between operating systems make the book relevant and relatable.

Comphrensive Content -
The inclusion of advanced topics like virtulizations, security, and distrubuted systems ensures broad coverage.

Pedagogical Features -
Each chapter includes exercises case studies and summaries to reinforce learning.

- Weaknesses -

Depth in Certain Topic -
While the book is broad some advanced topic such as real-time operating systems are covered less extensively compared to specialized

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texts.

Outdated Examples -

In the 4th edition certain examples may not fully align with the latest advancements in operating systems.

The book effectively conveys it's themes balancing therotical concepts with practical Insights. It's modular structure makes it easy to focus on specific areas of interest.

* Critique -

One of the books standout features is it's real-world focus. Tanenbaum integrates practical examples, such as the design and operation of UNIX, Linux and windows to help readers understands the practical implications of the concepts.

However the writing occasionally assumes a higher level of prior knowledge which might challenge beginners Additionally the book lacks the depth of hands-on exercisees found In other text such as operating systems. Three easy pieces by Remzi H. Arpaci-Dusseau and andrea C. Arpaci-Dusseau.

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Despite these minor shortcomings, modern operating system remains a top-tier resource for understanding both the foundation and modern advancement in the field.

* Conclusion -

Modern operating system is a comprensive and engaging textbook that bridges the gap between theory and practice. It's detailed coverage of core concepts and advanced topic makes it an invaluble resource for student and proffessionals in computer science. While beginners might need additional resources for deeper understanding this book offers a solid foundation for anyone aiming to master operating system. Highly recommended for those seeking a clear and practical approach to the subject.

Page No.
Date

Name : kartik kumar Bhosale

Class : MCA-I

Subject : Advance Concepts in Operation System.

Roll No. : 06.

Page No.
Date

1) The title of the book:
"Advance Concepts in Operating Systems".
The title of the book encapsulates the focus of the book, which delves into intricate topics of operating systems with an emphasis on distributed systems, multiprocessor systems & their advanced concepts.

2) Author:
The author of this book are "Mukesh Singhal and Niranja G. shivaratri.". Both authors are reowned researchers and academicians in the field of computer science. Their extensive expertise in OS, distributed computing and Synchronization protocols gives the book academic credibility and technical depth.

3) Publication:
Publisher: McGraw Hill Education.
This book is a part of McGraw Hill's Computer science series and has been widely adopted in academic institutions for post-graduate lvl coursework.

4) Introduction to the book:
In this book, it provides advance topic in OS, focus on distributed and multiprocessor systems. It bridges the gap between theory and practice, providing detail insights into the design and implementation of modern operating systems. Through a combination of theoretical frameworks and practical examples, the book lays the

solid foundation for designing distributed systems, emphasizing their challanges and solutions. It also discusses real-world implementations, help to us (reader) relate the theoratical concepts to actual applications.

5] Main theme and Premise :
The primary theme of the book revolves around advanced O.S. design and the complexities of distributed and multiprocessor systems. The book also addresses fault-tolerant systems, emphasizing reliability and security in real-world computing scenarios.

6] Overview of the Content :
The book is divided into several sections that comphrensively cover the following topics:
i) Introduction to Advance Operating Systems : A brief overview of traditional and Advance OS concepts.

ii) Distributed OS: In this book the key concepts in distributed computing, including communication protocols its file systems & synchronization algorithms.

iii) Multiprocessor OS : In this book author helps us for focus on multiprocessor sheduling, memory consistency and process synchronization in multiprocessor systems.

iv) Case studies: One of my interesting part to read this

book for the author gives us a case study part on real-world examples of distributed systems, including file systems, database systems & also provides architectures.

7] Character Development:
In metaphorical sense, the book develops the "character" of its readers by starting with foundational concepts and gradually moving to intricate algorithms and their implementations. By the end, reader are equipped to understand and design distributed operating systems and tackel challenges such as synchronization & fault tolerance.

8] Weakness:
- Complexity: The dense and technical content may overhelm readers who lack a solid foundation in OS & Algo.
- Limited practical Examples: Although the case studies are helpful more practical examples or exercises could have been included to enhance hands-on-learning.
- Focus on Distributed System: While its strength, the heavy focus on distributed systems may limit its utility for readers interested in other advanced OS areas.

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9] Conclusion :

"Advance Concepts in operating System" is specialized book tailored for those with a strong intrest in distributed and multiprocessor systems. It excels in its regorous treatement of advanced topics, offering both theoretical and practical insights.

However, it is best suited for readers with prior knowledge of basic operating system.

It specialized focus and technical depth make a demanding read, best suited for those who was already have a strong grasp of basic operating systems concepts For beginners, the book's name dense materials & complex algorithms might pose a challange.

10] Recomandations :

"The book is highly recommended for MCA students, particularly those studying advance operating systems distributed computing, or preparing forresearchers roles. It is equally valuable for professionals & researchers looking to strengthen their knowledge in these areas.

Sooz
25/11/24

Name :- Shreya Mohan Tupe
Roll no :- 57

Rajdhani
DATE / /

Book Review

- Title :- Operating Sytem
- Author :- Rohit Khurana
- Publication :- Operating system published by VIKAS publishing House PVT LTD at 2013.
- Introduction :- Rohit Khurana is the founder and CEO of ITL Education Solution Limited (ITLESL) and has authored more than thirty-five best selling textbooks. ITLESL is a part of the ITL group which has operations all over the world with a significant presence in education and IT-enabled services.

The topics covered include :-
- Organization of the computer system.
- Communication between processes.
- Threads and multithreading models.
- Scheduling criteria and algorithms.
- Synchronization among cooperating processes.
- Deadlock situation.
- Memory management
- Virtual Memory
- I/O system
- disk scheduling algorithms
- disk management.
- Swap - Space management and RAID
- file types, attributes and access methods
- Managing files, directories and disc space.

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- Summary :-

The book operating system is published at 2013 by Rohit khurana.

In operating system books their are 17 chapters.

1. Operating system chapter introduces operating system, its services, and structure. Also, it provides an insight into organization of computer system
2. Process Management chapter deals essentially with the basic concepts of processes such as process scheduling, operations on processes and communication between process.
3. Threads chapter helps to understand the need and advantages of threads, various multithreading models as well as threading issues.
4. Scheduling chapter spells out the scheduling criteria and different types of scheduling algorithms.
5. Interprocess communication chapter throws light on several methods used for achieving synchronizat^{n} among cooperating process.
6. Deadlock chapter describes the deadlock situation and the conditions that lead to deadlock.
7. Memory management chapter familiarises the reader with the diff. memory management strategies used for contiguous and non-contiguous memory.
8. Virtual memory chapter introduces the concept of virtual memory.
9. Input Output Management chapter discusses system I/O in detail, including the I/O system design, interfaces and functions.

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10. Disks chapter explains disk scheduling algorithms disk management, swap-space management and RAID.
11. File system chapter acquaints the readers with the basic concepts of files including file types, attributes and access methods.
12. File system Implementation chapter explorers how the files and directories are implemented The management of free space on the disk is explained as well.
13. Security chapter dissemainates to the reader the need of security and protection in computer system.
14. Unix operating system chapter covers Unix operating system in detail including its development, structure, system calls and system administration.
15. Case study : LINUX chapter presents an in depth examination of the Linux operating system. It describe how thereotical concept of operating system relate to one another and to practice.
16. Case study :- Windows 2000 chapter expounds on implementation of various operating system in windows 2000 operating system.
17. Introduction to multiprocessor and Distributed operating system chapter sheds light on multiprocessor and distributed system including their types, architecture and benefits.

- Analysis : The book caters to undergraduate students of most Indian universities, who would find the introductory and advanced discussions highly informative and enriching.
Key features of books.
- Crystal clear explanation of concepts through solved examples.
- Relevant illustrations to facilitate understanding and retention.

- Conclusion :-
An essential part of every computer system is the operating system, which provides a platform for the proper use of computer resources during the operation of a computer.
Therefore, it is any belef that the operating system must be understood by everyone who uses the computer.
This book is an insightful work elaborating on fundamentals as well as advanced topics in the discipline.

02/12/24