PAPER ID-310226

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VII) THEORY EXAMINATION 2024-25
SERVICE ORIENTED ARCHITECTURE

TIME: 3 HRS **M.MARKS: 100**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question	CO	Level
a.	In a system with five services communicating over SOAP, each having a 150 ms response time, calculate the total latency if orchestration overhead is 10%.	1	K_1, K_2
b.	Compare WSDL, SOAP, and UDDI as SOA standards.	1	K_1, K_2
c.	If availability is 99.9%, calculate the allowable downtime per year.	2	K_3
d.	Explain the design process of client services in SOA.	2	K_3
e.	Describe technologies for service integration.	3	K_4
f.	If orchestration adds 20 ms overhead to a 5-service workflow, calculate the total latency.	3	K_4
g.	If implementation costs $1.5 million and annual savings are $500,000, calculate the payback period.	4	K_2
h.	Discuss the role of service orientation in Big Data analytics.	4	K_2
i.	Propose best practices for an SOA strategy.	5	K_1
j.	If best practices reduce defect rates from 10% to 2%, calculate the defect reduction for 10,000 transactions.	5	K_1

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 20**

Q no.	Question	CO	Level
a.	Explain the evolution of SOA and MSA. How have the drivers for each architecture shaped modern enterprise solutions?	1	K_1, K_2
b.	Explain the role of composite applications in SOA. Calculate the latency in an application integrating three services with response times of 120 ms, 100 ms, and 80 ms.	2	K_3
c.	Explain strategic architecture governance. How does governance reduce service downtime?	3	K_4
d.	Predict future trends in Big Data integration with SOA. Discuss their potential impacts.	4	K_2
e.	Define governance best practices. Analyze their role in ensuring compliance.	5	K_1

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

Q no.	Question	CO	Level
a.	Discuss the challenges in adopting SOA in a legacy system. Propose solutions and analyze their financial impact.	1	K_1, K_2
b.	Why is MSA emerging as a preferred architecture? Compare its fault isolation capabilities with SOA in a distributed setup.	1	K_1, K_2

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4. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	Discuss the methodology for developing service-oriented applications. Analyze the advantages of iterative development for a logistics system.	2	K_3
b.	What are the principles of service design? Propose a scenario and discuss how adherence improves maintainability and scalability.	2	K_3

5. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	How does governance enhance SOA? Propose a governance framework for a retail system.	3	K_4
b.	What technologies enable services in SOA? Discuss their application in integrating legacy systems.	3	K_4

6. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	Propose a service-oriented architecture for Big Data orchestration. If it improves processing speed by 20%, calculate the yearly gain for a system handling 1 TB/day.	4	K_2
b.	Define Big Data characteristics and discuss their implications for SOA-based solutions.	4	K_2

7. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	Develop a framework aligning business processes with SOA. Analyze its scalability.	5	K_1
b.	How does SOA improve IT efficiency? Provide a hypothetical case study with quantitative analysis.	5	K_1