(Time: $2\frac{1}{2}$ hours)

[Total Marks: 60]

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculator is **allowed**.

1. Attempt *any two* of the following: **12**

a. How does interservice communication take place in microservices architecture? Explain.
b. Explain the different programming models supported by service fabric.
c. What is service fabric cluster? What are the different system services offered by service fabric cluster?
d. How can Azure service fabric clusters be monitored? Explain.

2. Attempt *any two* of the following: **12**

a. What is Azure Kubernetes Service? What are its capabilities? What are different tools available for development of AKS?
b. How is Azure Kubernetes Service monitored? Explain.
c. What are the major challenges in microservices application? How does Azure help to overcome these challenges?
d. What are the services available on Azure stack in context of microservices application?

3. Attempt *any two* of the following: **12**

a. With the help of a neat diagram, explain the Onion DevOps architecture model for a complete DevOps environment.
b. State and explain the DevOps services provided by Azure.
c. How can we customize our process? Explain with example.
d. State and explain the relationship rules while designing Git repositories.

4. Attempt *any two* of the following: **12**

a. What are the different types of builds? Explain the structure of the builds.
b. List and explain the steps of continuous delivery.
c. What is observability? Write its principles.
d. How to define the bounds of a package?

5. Attempt *any two* of the following: **12**

a. List and explain the different types of API.
b. What is API value chain? Explain.
c. Discuss the different API standards.
d. State and explain the most common ways to strengthen API security.

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