

Bangladesh Bank
Banker's Selection Committee Secretariate (BSCS)
Assistant Engineer (IT)/ Assistant Maintenance Engineer – Grade 9
Exam Date: 24/01/2026

There are **16 (sixteen) questions Answer ALL**. The symbols have their usual meanings. Marks of each question are written in brackets. Assume any reasonable value if required.

Write all your answers within the space provided in the separate answer script.

1.i. Why do modern processor designs favor multistage pipeline approach over single cycle implementation? Explain with appropriate reasoning.

ii. A system has a very fast CPU but slow main memory, explain how memory hierarchy helps reduce the performance gap between CPU and memory.

2.i. Explain packet switching. A packet passes through 4 routers with each router introducing 2 ms processing delay. Transmission delay per link is 5 ms. Calculate total end-to-end delay (ignore propagation).

ii. Differentiate between IPv4 and IPv6. Given the IP address 192.168.10.0/24, calculate. Number of subnets if borrowed bits = 3 and hosts per subnet.

3. i). Why is “Atomicity” specifically critical for an Inter-Bank Fund Transfer?

ii) A bank's ATM network experiences an average of 4 hours of downtime every 30 days due to server maintenance and network glitches. Calculate the System Availability percentage for the month. If the bank processes an average of 500 transactions per hour with an average fee of Taka 0.50 per transaction, calculate the total revenue loss during this downtime. (10)

iii. What are the four necessary conditions for a deadlock to occur? Briefly explain "Circular Wait."(10)

4. i. Differentiate between Logical Address and Physical Address in context of Operating System. (5)

ii. What is the main disadvantage of a fuse compared to a Circuit Breaker? (5)

iii. You need to protect a small heater rated at 2.4 kW connected to a 240 V single-phase supply. What is the minimum current rating of the fuse you should use? (10)

5.i. In web technology what do the following status code categories represent? Give some specific example for each.

i. 2xx

ii. 4xx

iii. 5xx

ii. What are HTTP Cookies? How can cookies be a security risk?

6. Simplify the following boolean expression using 4 variable K-map
 $F(A, B, C, D) = m(0, 3, 5, 7, 8, 10, 11, 12, 13, 14, 15)$.

7. An increasing number of organizations in industry and business sectors adopt "cloud computing". List 5 key enabling technologies of cloud computing. (5)

8. You have been hired as a Cloud Data Engineer to design a big data analytics pipeline for an e-commerce company. The company needs to:
Ingest millions of real-time web server logs,
Store and manage petabytes of raw and structured data,
Process data for batch and stream analytics,
Provide near real-time product recommendations,
Run machine learning models at scale,

9. From the following Hadoop ecosystem components:

MapReduce, HDFS, YARN, HBase, ZooKeeper, Pig, Hive, Mahout, Chukwa, Cassandra, Avro, Oozie, Flume, Sqoop
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Identify five components from the list that you would use to design this pipeline. Justify the role of each chosen component in this scenario, focusing on its functionality. (10)

10. Explain the role of CSS Media Queries and the Viewport Meta Tag in creating responsive applications. What is the "Mobile-First" approach? (10)

11. A bank's internal audit reveals that several employees share a single "Superuser" password to update customer accounts. Furthermore, the bank's policy

requires daily backups, but the audit shows backups are only being done weekly. (10)

- i. Identify the Policy violation regarding account access. the backup schedule.
- ii. Explain the Compliance failure regarding the backup schedule.

12. A machine produces defective items at a rate of 25% IT items are selected, what is the probability that at least one item is defective? (10)

13. At a bank's annual maintenance engineering conference, there are 10 engineers a room. If every engineer shakes hands with every other engineer exactly once what is the total number of handshakes that take place? (10)

14. Translate the following sentences into correct and meaningful English. (10)

- a) কঠোর নীতিমালার কারণে ক্ষুদ্র উদ্যোক্তারা প্রয়োজনীয় ঋণ সুবিধা থেকে বঞ্চিত হচ্ছে।
- b) গ্রাহকদের আস্থা অর্জনের জন্য স্বচ্ছতা এবং জবাবদিহিতা অপরিহার্য।
- c) দুর্নীতি দেশের উন্নয়নের অন্তরায়।
- d) সকাল থেকে গুঁড়ি গুঁড়ি বৃষ্টি হচ্ছে।
- e) উপদেশ দেওয়ার চেয়ে পালন করা কঠিন।

15. Translate the following sentences into correct and meaningful Bangla. (10)

- a) Empty vessels sound much.
- b) Customers are encouraged to use online banking services to reduce transaction time and operational costs.
- c) The bank has decided to waive the service charge.
- d) The project is still in its nascent stage
- e) True greatness lies not in power, but in humility and moral integrity.

16. "Data is the new compute in today's AI era." Critically analyze this statement in the context of modern AI applications. Your answer should demonstrate clarity of thought, coherence, and relevance to the topic.