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 General Certificate of Education (A/L) Examination - Grade 13 : Term 1 - 2024

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 Information & Communication Technology I

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 Two Hours

1. Personal information of employee is input into the Employee Management Information System of ABC company. name, telephone number and DOB are mandatory to enter. Make sure age of all of employees are in between 25 -55 years and telephone number contains only digits.

Which of the followings are suitable data validation for the above system?

- 1) presence check, format check and data type check
- 2) presence check, range check and data type check
- 3) presence check, range check and code check
- 4) presence check, range check and uniqueness check
- 5) consistency check, range check and uniqueness check

2. Which of the following are consist in lifecycle of data?

- | | |
|--------------------|-----------------------------|
| A. Data Processing | D. Data Management |
| B. Data Creation | E. Data Validation |
| C. Data Storage | F. Removal of obsolete data |

- 1) A, B and F 2) B, C and E 3) A, C and E 4) B, D and F 5) B, D and E

3. Which one of the following is most efficient input device to use when working with cheques in the bank?

- | | |
|--------------------------------|-----------------------------|
| 1) Bar Code Reader | 4) Optical Mark Reader |
| 2) Optical Character Reader | 5) Magnetic Ink Card Reader |
| 3) Magnetic Stripe Card Reader | |

4. Listed below are some phrases about the technology used in three storage devices:

- A. Used of magnetic fields on a medium in order to record audio, video or other data.
- B. Data is written and read with a laser for archival or backup purposes.
- C. Used silicon microchips and stores data electronically.

Which of the following correctly matches memory cards, floppy disks, Blue rays?

- 1) A - Blue rays, B -floppy disk, C – memory cards
- 2) A - Blue rays, B - memory cards, C – floppy disk
- 3) A - floppy disk, B - Blue rays, C – memory cards
- 4) A - floppy disk, B - memory cards, C – Blue rays
- 5) A - memory cards, B - floppy disk, C – Blue rays

5. Which of the followings is a main use of EEPROM (Electrically Erasable PROM) of a personal computer?

- 1) Keeping inputs for processing
- 2) Holding instructions for operations
- 3) Providing space for loading operating system
- 4) Retaining information for output
- 5) Keeping Basic Input Output System settings for the booting procedure

6. In modern computers, multiple levels of cache memory is used to optimize the performance. Among them, the cache which is on/in is the fastest and most expensive cache memory. Which of the following terms are correct to fill the blanks respectively in the above statement?

- 1) Level 1 (L1), main memory
- 2) Level 3 (L3), motherboard
- 3) Level 1 (L1), microprocessor
- 4) Level 2 (L2), microprocessor
- 5) Level 3 (L3), microprocessor

7. Consider the following statements about memory Access methods.

- A. Starts at the beginning and read through in order in sequential access method
- B. Individual addresses identify directly and access the data immediately in Random Access method
- C. Applications of this random memory access are magnetic tapes, magnetic disk and optical memories.
- D. One of the applications of random memory access is ROM.
- E. RAM used sequential memory access method.

Which of the following is/are incorrect about memory access methods?

- 1) A only 2) C and E only 3) B and C only 4) E only 5) C only

8. What is the correct binary equivalent of decimal 27.625_{10} ?

- 1) 11011.101 2) 11001.010 3) 11011.011 4) 10111.101
- 5) 11011.010

9. Which of the following are equivalent to octal 765_8 ?

A. 111110101_2

B. $1F5_{16}$

C. 501_{10}

1) A only 2) A and C only 3) A and B only 4) B and C only

5) All A, B and C

10. What is the correct decimal equivalent of hexadecimal $37FD_{16}$?

1) 15332 2) 14233 3) 14323 4) 14333 5) 15335

11. What is the correct 2's complements binary representation of decimal -67_{10} using 8 bits?

1) 10110011 2) 10111101 3) 10110111 4) 10110010

5) 10110001

12. $6D_{16} + 10011_2$ equal to:

1) 80_{16} 2) 109_{10} 3) 19_{10} 4) 10001000_2 5) 1010000_2

13. Consider the two binary numbers $A=11011011$ and $B=01001101$. If $X=A \text{ OR } B$ and $Y=A \text{ AND } B$, what will be the values of X and Y respectively?

1) 01001110, 10110001

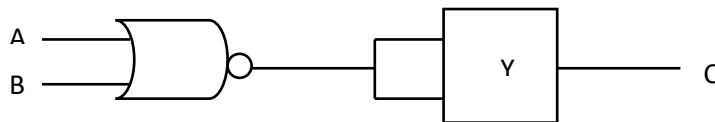
2) 10110001, 11111110

3) 11011111, 01001001

4) 11111110, 01010101

5) 11011011, 01011011

14. Consider the following logic circuit in which Y indicates a two-input logic gate.



Which of the following should Y be so that $A=1$ and $B=0$, the output C would be 1?

A. an XNOR gate

B. a NAND gate

C. a NOR gate

D. an XOR gate

1) A only 2) A, B and C only 3) B, C and D only

4) B and C only 5) all A, B, C and D

15. Which of the following is the simplified form of the Boolean Expression $C+(BC)'$?

1) C 2) B 3) BC 4) $B'+C'$ 5) 1

16. Consider the following statements on using universal gates over basic gates when constructing logic circuits:

- A. They make logic circuit design simpler.
- B. They help to construct logic circuits that consume less electricity.
- C. They make logic circuit construction more economical.

Which of the above statements is/ are correct?

- 1) A only
- 2) B only
- 3) A and B only
- 4) A and C only
- 5) B and C only

17. Consider the following statements about a process

- A. a process is a program in execution
- B. process is not a program
- C. a program may have many processes.

Which of the above statement/s is/are correct about a process?

- 1) A and B only 2) B only 3) B and C only 4) A and C only
- 5) All A, B and C

18. Which of the following is incorrect state transition sequence of a process?

- 1) New → Ready → Running → Exit
- 2) New → Ready/suspend → Ready → Running → Exit
- 3) New → Ready → Running → Blocked → Ready → Running → Exit
- 4) New → Ready → Running → Ready → Running → Exit
- 5) New → Ready → Running → Blocked → Blocked/Suspend → Ready → Running → Exit

19. Consider the following Statements related to the boot-up process in the computer.

- A. The Compiler is started.
- B. The BIOS copies Operating System (OS) files into memory and OS starts executing.
- C. The contents in memory are swapped to the hard disk.
- D. The BIOS looks to the CMOS chip to tell it where to find the OS.
- E. Triggered by a series of clock ticks, the CPU executes the startup program's instructions in the BIOS that involves the Power on Self -Test.
- F. The OS loads the device drivers that it needs to control the devices and gives a login interface to the user.

Which of the followings indicates correct sequence of the operations that take place during the booting process of a computer?

- 1) E, D, B and F 2) E, A, B and F 3) D, A, B and F 4) D, C, B and F
5) C, E, D and B

20. Which of the following situation is not a reason for the process termination?

- 1) When an execution error occurs.
2) When a resource requested is unavailable.
3) When alter the sequence of execution of process.
4) When a memory access violation.
5) When an Operating System or parent process request.

21. The *block size* of a disk is 4KB. A portion of its **File Allocation Table (FAT)** at a particular time is shown below. The portion shown gives the blocks of *helloworld.py* file as well.

FAT

100	101
101	104
102	100
103	106
104	103
105	
106	-1

Notes: 1. The last block of a file is indicated by -1.

2. the directory entry of a file contains the block number of the first block of the file.

Which of the following gives the directory entry for the *helloworld.py* file and the disk space allocated for the *helloworld.py* file respectively?

- 1) 102,24KB 2) 100, 24KB 3) 102, 20KB 4) 106, 24KB
5) 106, 20KB

22. Which of the following statement is incorrect?

- 1) *DHCP* used to assign IP addresses to arriving hosts.
2) *DNS* provides directory lookup service for given URLs and web addresses.
3) *NAT* is a method of remapping one IP address space into another.
4) *Proxy server* acts as an intermediary for requests from clients seeking resources from other servers.
5) *firewall* is a trap to set to detect attempts at unauthorized use of information systems.

23. Which of the following statement/s is/are correct?

- A. Encryption provides confidentiality of transmitting data through internet.
- B. In Symmetric Key Encryption, used different key pair for encrypting and decrypting the information.
- C. The digital signatures help to authenticate the sources of messages.
- D. For the digital signature uses asymmetric cryptography.

- 1) A only. 2) A and B only. 3) B and C only. 4) A, C and D only.
5) All A, B, C and D

24. Which of the following is considered as an erroneously received byte in an odd parity system?

- 1) 01101011 2) 01001011 3) 01101000 4) 01010111
5) 11101010

25. Which one of the following statements is incorrect about networking devices?

- 1) Router is a device that can connect two different networks together.
- 2) Hub and switch both can connect hosts together and form a network.
- 3) Hub, switch and router work on the basis of broadcasting, MAC address and IP address respectively.
- 4) Hubs and Switches are used in LANs while Routers are used in LANs, MANs and WANs.
- 5) Hubs and Switches are devices which are used in Layer 2 and Router is a Layer 3 device.

26. Select the answer containing the correct replacements for A, B and C in the following paragraph.

In the network each and every device can be identified uniquely by MAC address while the location of the device can be identified using IP address. A MAC consists ofA..... bits, Address of IPV4 version consists ofB.... bits and IPV6 address consist ofC.....bits.

- 1) A =48, B = 32, C = 48 2) A =128, B = 32, C = 48 3) A =48, B = 32, C = 128
4) A =48, B = 32, C = 132 5) A =128, B = 48, C = 132

27. Which of the following statement regarding the role of TCP and UDP in the internet is incorrect?

- 1) UDP is a connection-oriented protocol.
- 2) While TCP is more reliable, it transfers data more slowly.
- 3) UDP less reliable but works more quickly.
- 4) TCP best for email, file transfer and web browsing.
- 5) UDP can transmit live and real-time data.

28. Which one of the following statements is/are correct?
- A. Sub-netting is a technique used to overcome the problem of depletion of network address of a 32-bit addressing scheme.
 - B. Organizations can be allocated any number of IP addresses using CIDR scheme.
 - C. IPV4 can assign addresses up to 4 million devices.
 - D. IPV6 is proposed to fix the problem of the limited address space of IPV4.
- 1) A only 2) C only 3) A and B only 4) A, B and D only
- 5) All A, B, C and D
29. Bob would like to send an encrypted Message to Alice using Asymmetric encryption. What key should Alice use to decrypt the Message?
- 1) Bob's public key
 - 2) Bob's private key
 - 3) Alice's public key
 - 4) Alice's private key
 - 5) Both private and public keys of Alice.
30. Which one of the following statements regarding software development models is/are correct?
- A. The Waterfall model is suitable for systems where requirements are fixed or changing.
 - B. The Agile model breaks the development process into small parts called iterations or sprints.
 - C. The Prototype model involves creating a quick model to visualize and validate requirements.
- 1) A only 2) A and B only 3) C only 4) B and C only
- 5) All A, B and C
31. Which one of the following is not a module in SSADM?
- 1) Requirements Analysis
 - 2) Feasibility Study
 - 3) Requirement Specification
 - 4) Physical Design
 - 5) Strategy Planning
32. Which answer indicates the stages of SDLC covered by SSADM?
- A. Feasibility Study
 - B. System Analysis
 - C. System Design
 - D. Maintenance
 - E. Implementation
- 1) A only 2) A, B, C and D only 3) A, B, C only
- 4) A, B, C and E only 5) All A, B, C, D and E

33. Consider the following requirements for an ATM.

- A. Being able to view balance of the account.
- B. Being able to withdraw money.
- C. Being able to provide a touch sensitive GUI.
- D. Being able to provide accuracy of 98% on withdrawal.

Which of the above is/are non-functional requirements?

- 1) A and B only 2) A, B and C only 3) C and D only
- 4) A, B and D only 5) B only

34. A company with a large number of employees, during the feasibility study identified that the company may not have the resources to train all of its employees on how to use the new information system and they may need to provide online training or hire a consultant to help with training. Which component of the feasibility study would have helped to get that information?

- 1) Economic feasibility
- 2) Operational feasibility
- 3) Legal feasibility
- 4) Schedule feasibility
- 5) Technical feasibility

35. Choose the option containing most suitable deployment types for the following systems:

- A. A new system to replace an existing manual library system at school.
- B. A system for the citizens of the country to get the birth certificates online.
- C. A system for the guests to enter feedback regarding the service experienced by them at five-star hotel.

- 1) A – direct B – pilot C – parallel
- 2) A – pilot B – direct C - parallel
- 3) A – parallel B – direct C – parallel
- 4) A – parallel B – pilot C – direct
- 5) A – parallel B – parallel C – direct

36. During which of the following is an application tested by developers or users to ensure software can handle real-world tasks and perform up to development specifications.

- 1) Integration testing 2) Acceptance testing 3) System testing
- 4) Unit testing 5) Parallel testing

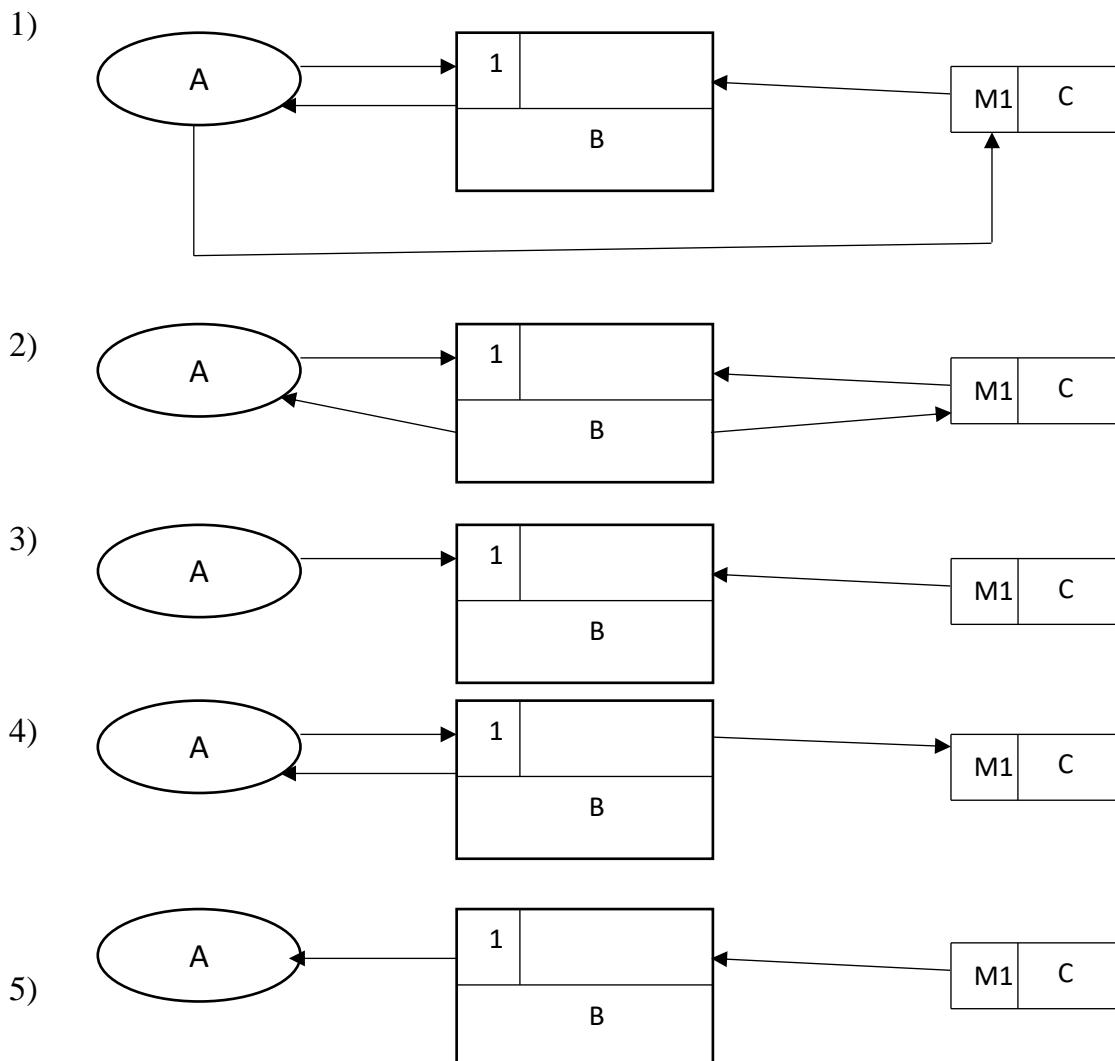
37. Consider the following statements regarding COTS (Commercial Off-The-Shelf software).

- A. COTS software systems can be highly complex.
- B. COTS are easy to modify as per the organization's requirements.
- C. For an organization, it is very difficult to gain any competitive advantage using COTS.

Which statement/s is/are correct about COTS software?

- 1) A only 2) B only 3) A and C only 4) A and B only
- 5) All A, B and C

38. Which of the following dataflow diagrams is correct with respect to rules of dataflow modeling?



39. Which of the following database model is widely used in computer applications to hold audio, video and graphic files?

- 1) Flat file
- 2) Hierarchical
- 3) Network
- 4) Relational
- 5) Object oriented

40. Which of the following statements are incorrect with respect to a properly designed computerized database?

- 1) Data can be used simultaneously by multiple users
- 2) Can reduced data duplication.
- 3) Data is stored in a common format for all applications to use.
- 4) Retrieval of data is efficient.
- 5) Need more space to store data.

41. Which one of the following statements is incorrect regarding ER diagram?

- 1) An ER diagram has entities and relationships.
- 2) Cardinality of all relationships should always be one-to-one.
- 3) Entities may have attributes.
- 4) There could be binary and tertiary relationships.
- 5) EER is the extensions to the original ER model.

42. Which of the following statements is correct about relational databases?

- 1) The primary key of a table is selected from alternate keys.
- 2) Duplicate values are not allowed in a foreign key field of a table.
- 3) A table cannot be created without a primary key.
- 4) A foreign key of a table should be the primary key of another table.
- 5) A table should have alternate keys.

43. Consider the given SQL statements to create two database tables named Person and Order:

```
CREATE TABLE Person (  
  PersonID varchar (10) NOT NULL,  
  LastName varchar (255) NOT NULL,  
  FirstName varchar (255),  
  Birthday date,  
  PRIMARY KEY (PersonID));
```

```
CREATE TABLE Order (  
  OrderID int NOT NULL,  
  OrderNumber int NOT NULL,  
  Orderdate date NOT NULL,  
  PRIMARY KEY (OrderID));
```

Which of the following statements are incorrect?

- A. PersonID is a foreign key in the Order table.
- B. It is compulsory to input data to the DATE data type fields in both tables.
- C. PersonID can contain only ten English letters.

- 1) A only 2) A and B only 3) A and C only 4) B and C only
5) All A, B and C

44. Which of the following relations is in the 3rd normal form?

- 1) Student(stu_No, name, parentName)
2) Sport(sportId, sportName, teacherName, teacherId)
3) Teacher(teacherId, teacherName, telephoneNumber, subjectName, subjectId)
4) Book(ISBN, title)
5) Patient(patientId, patientName, ward, wardId)

Consider the following three tables in a relational database to answer the following three questions. Assume that each employee can work for more than one department and an employee has joined the department on that start date.

Employee

EmpID	EmpName	EmpAddress	EmpTel
Emp001	Nimesh	Gampaha	0333929479
Emp002	Nikil	Kadawatha	0333929478
Emp003	Muditha	Ganemulla	0333929477

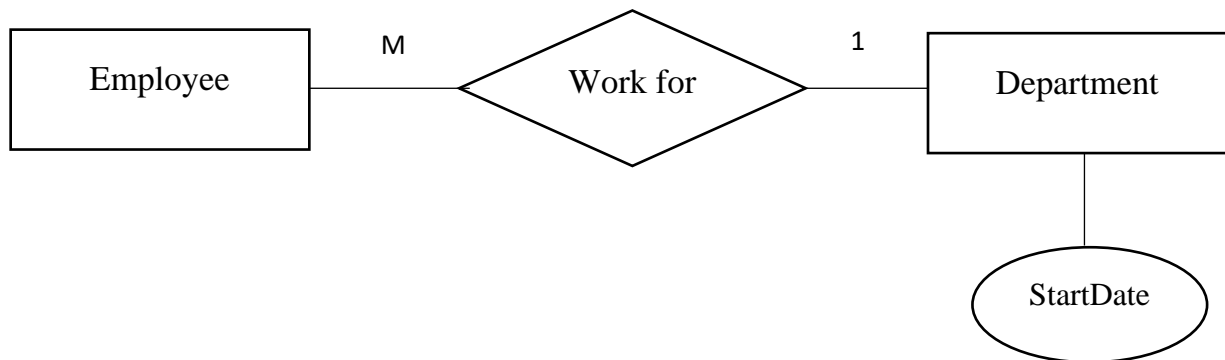
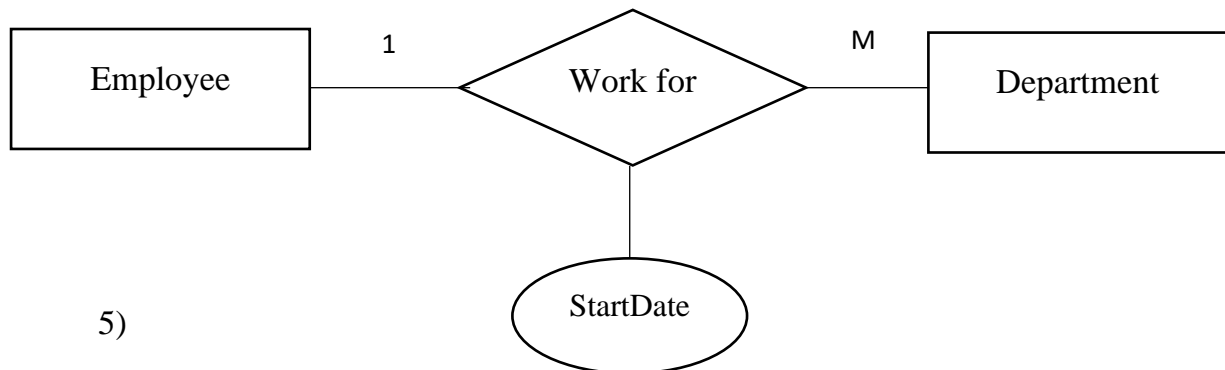
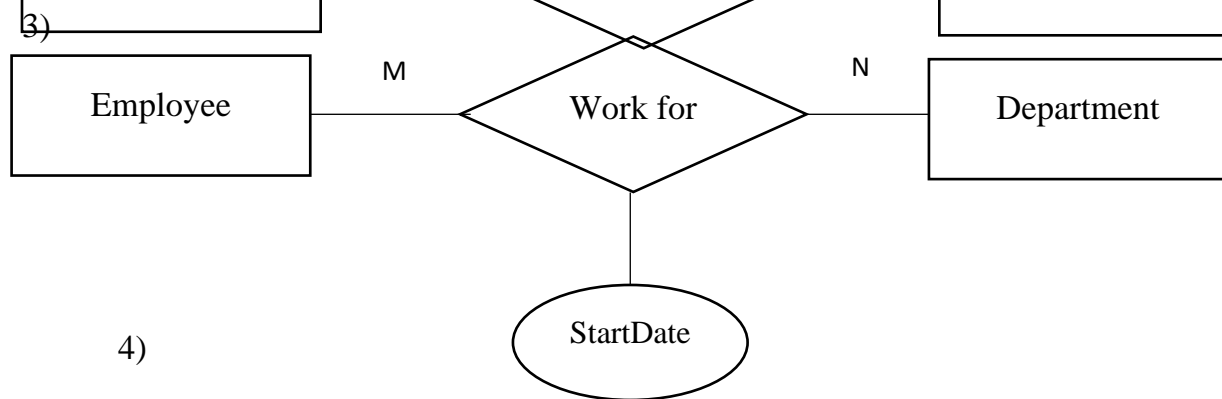
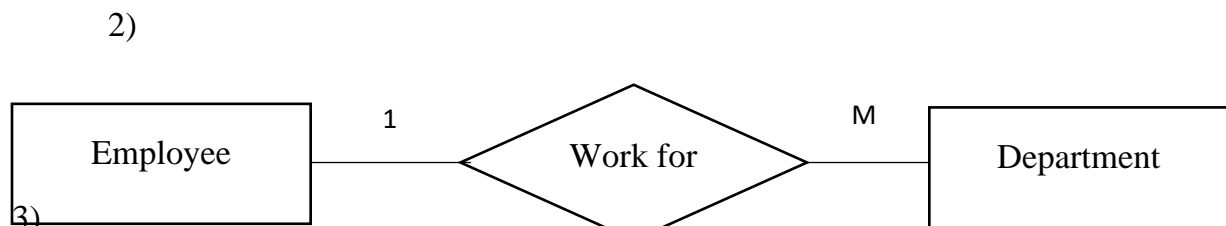
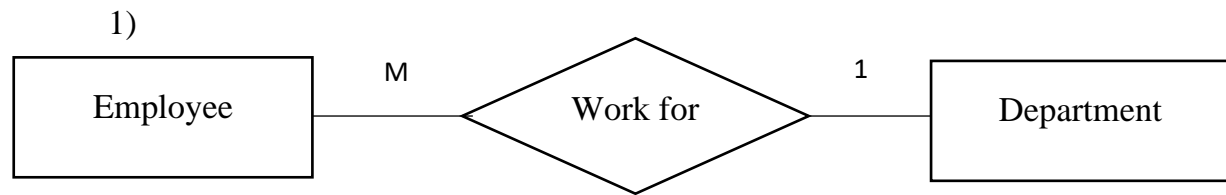
Department

DeptID	DeptName	DeptTel
Dept001	Finance	0333929471
Dept002	IT	0333929472
Dept003	Admin	0333929473

EmpDept

EmpID	DeptID	StartDate
Emp001	Dept001	2019.04.02
Emp002	Dept001	2019.05.01
Emp003	Dept002	2019.06.05

45. Which one of the following is the most suitable ER diagram to represent the above relational database tables?



46. Which of the following is the correct primary key for EmpDept table?

- 1) EmpId
- 2) DeptId
- 3) EmpId, StartDate
- 4) DeptId, StartDate
- 5) EmpId, DeptId

47. Which of the following is the correct SQL statement to retrieve DeptName, EmpName, and StartDate of all Employees?

- 1) select ED. StartDate, E. EmpName, D.DeptName from EmpDept ED, Employee E, Department D where ED. EmpID= E. EmpID and ED. DeptId = D. DeptId
- 2) Select StartDate, EmpName, DeptName from EmpDept ED, Employee E, Department D where ED.EmpID= E. EmpID
- 3) Select StartDate and EmpName and DeptName from EmpDept ED and Employee E and Department D where ED.EmpID= D. DeptID
- 4) Select * from EmpDept ED, Employee E, Department D where ED. EmpID= E. EmpID and ED. DeptId = D. DeptId
- 5) Select * from EmpDept ED, Employee E, Department D where ED. EmpID= E. EmpID

48. Which of the following SQL statements changes only the StartDate of Nikil who works at Finance department to “2019.05.03”?

- 1) Update EmpDept set StartDate = ' 2019.05.03' where EmpID ='Emp002' or 'Dept001'
- 2) Update EmpDept set StartDate = ' 2019.05.03' where EmpID ='emp002' or 'Emp002'
- 3) Update EmpDept set StartDate = ' 2019.05.03' where EmpID ='Emp002' and DeptId = 'Dept001'
- 4) Update EmpDept set StartDate = ' 2019.05.03' where StartDate = '2019.05.01'
- 5) Update EmpDept set StartDate ='2019.05.03' where e EmpID ='Emp002' or DeptId = 'Dept001' or StartDate = ' 2019.05.01'

49. Which of the following actions is taken by a database management system when the SQL statement “delete from Employee” is executed?

- 1) It will ask the user to select records for deletion.
- 2) It may delete all the records from the “Employee” table.
- 3) It will drop the “Employee” table.
- 4) It will not delete any record from the “Employee” table.
- 5) The SQL statement will not be executed since it has errors.

50. What are the integrity constraints used in the following DDL statement?

CREATE TABLE Order (

OrderID int NOT NULL,

OrderNumber int NOT NULL,

PersonID int,

PRIMARY KEY (OrderID),

FOREIGN KEY (PersonID) REFERENCES Person (PersonID));

- 1) NOT NULL, PRIMARY KEY, UNIQUE
- 2) NOT NULL, PRIMARY KEY, FOREIGN KEY
- 3) UNIQUE, FOREIGN KEY, CHECK
- 4) NOT NULL, PRIMARY KEY, DEFAULT
- 5) UNIQUE, FOREIGN KEY, CREATE INDEX