MODEL PAPER 01

Marking Scheme

Model Paper 08 – MCQ Marking Scheme

1) 4	11) 1	21) 1	31) 1
2) 3	12) 2	22) 4	32) 1
3) 4	13) 2	23) 2	33) 2
4) 3	14) 4	24) 1	34) 3
5) 3	15) 2	25) 3	35) 3
6) 1	16) 1	26) 4	36) 2
7) 3	17) 1	27) 3	37) 3
8) 2	18) 3	28) 2	38) 1
9) 2	19) 1	29) 4	39) 4
10) 1	20) 1	30) 4	40) 3

Q1 - Answer: (4) An operating system

Formatting erases everything on the hard drive, including the **operating system (OS)**.
Without an OS (like Windows, Linux, etc.):

- The laptop cannot boot properly.
- You cannot install other software like MS PowerPoint, antivirus, or firewall.

So, the **first essential step** is to install the **operating system**.

Q2 - Answer: (3) Printer

Among the given options, only the **printer** is an output device suitable for giving out students' results in printed form.

Q3 - Answer: (4) USB Flash Drive

She needs something:

- **Fast**
- **Portable**
- **Durable**
- With **no moving parts**

So the **USB Flash Drive** is clearly the best match.

Q4 - Answer: (3) C2C – Consumer to Consumer

Here, **Nadeesha (a consumer)** is selling to **another student (also a consumer)** through an online platform.
That is **Consumer to Consumer (C2C)**.

Q5 - Answer: (3) Batch processing

Processing types:

- **Real-time processing** – each transaction is processed immediately as it happens (e.g., ATM withdrawal updating balance instantly).
- **Interactive processing** – user interacts and gets responses immediately (e.g., filling online forms).
- **Batch processing** – many transactions are collected and processed together at a later time.
- **Manual processing** – done by humans without computers.

The bank **waits until midnight** and processes **all day's transactions together**. That is the definition of **batch processing**.

Q6 - Answer: (1)

Option (1) says:

- **A: Processing millions of customer banking transactions**
- **B: Teaching students using Microsoft Office**
- **C: Controlling a smart air conditioner**

So option **(1)** correctly matches each computing device to its most suitable real-world use.

Q7 - Answer: (3) 106_8

Steps:

1. Remove the space:
   Binary number = **1000110_2**
2. For binary → octal, group bits in **sets of 3 from the right**:
   - Write: 1 0 0 0 1 1 0
   - Group from right: 1 | 000 | 110
   - To make the left group 3 bits, pad with zeros: 001 | 000 | 110
3. Convert each 3-bit group to octal (decimal):
   - $001_2 = 1$
   - $000_2 = 0$
   - $110_2 = 6$
4. Combine them: **1 0 6 → 106_8**

So, the octal equivalent of **1000110_2** is **106_8**, i.e. **option (3)**.

Q8 - Answer: (2) 132

Binary: **10000100_2**

Write with place values (from right to left):

- Bits: 1 0 0 0 0 1 0 0
- Positions:

Bit	Value	Place (2^n)
b7	1	$2^7 = 128$
b6	0	$2^6 = 64$
b5	0	$2^5 = 32$
b4	0	$2^4 = 16$
b3	0	$2^3 = 8$
b2	1	$2^2 = 4$
b1	0	$2^1 = 2$
b0	0	$2^0 = 1$

Only **b7** and **b2** are 1:

- Value = $2^7 + 2^2$
- = 128 + 4
- = **132**

So $10000100_2 = 132_{10}$, which is **option (2)**.

Q9 –

Files:

- `design.pptx` = 900 KB
- `research.pdf` = 500 MB
- `presentation.mp4` = 2 GB
- `log.txt` = 534 bytes

We'll convert everything to **MB** using binary multiples:

- 1 GB = 1024 MB
- 1 MB = 1024 KB
- 1 KB = 1024 bytes

Step 1: Convert each file

1. **presentation.mp4**:
   2 GB = 2 × 1024 MB = **2048 MB**
2. **research.pdf**:
   Already **500 MB**
3. **design.pptx**:
   900 KB = 900 / 1024 MB
   ≈ **0.88 MB** (approximately 0.879 MB)

4. **log.txt**:
   534 bytes = 534 / 1024 KB = 534 / (1024 × 1024) MB
   ≈ **0.0005 MB** (very small)

Step 2: Add them up

Total ≈
2048 MB

- 500 MB
- 0.88 MB
- 0.0005 MB
  = **2548.8805 MB** (≈ 2548.88 MB)

Step 3: Compare with USB sizes

- **2 GB** = 2 × 1024 = 2048 MB → **too small** (we need ~2549 MB).
- **4 GB** = 4 × 1024 = 4096 MB → **enough**.
- 8 GB & 16 GB are also enough, but question asks for **lowest capacity**.

So the **smallest** USB drive that can hold all files is **4 GB → option (2)**.

Q10 - Answer: (1) Both statements P and Q are correct and explain data representation.

Q11 - Answer: (1) Adobe Photoshop, LibreOffice, VLC Media Player, GIMP

Q12 - Answer: (2) Ctrl + S

Q13 - Answer: (2) I, II, and IV only

Q14 -Answer: (4) All I, II, and III

Q15 - Answer: (2) =(B3*C3)

Q16 - Answer: (1) Using consistent fonts, limiting text to key points, and adding relevant visuals

Reason:
Effective presentations are:

- **Clear** – short bullet points instead of long paragraphs
- **Visually appealing but not distracting** – consistent fonts and styles
- **Engaging** – images, charts, and diagrams that support what Priya is saying

Options (2), (3), and (4) either overload the slides with text, create visual clutter, or distract the audience with constant background music.

Q17 - Answer: (1) Order_ID

Q18 - Answer: (3) Restaurant_ID in the ORDER table

Q19 - Answer: (1) FOOD_ITEM only

Q20 - Answer: (1) A and B only

- **A.** *"The student_id in the Enrollment table is a foreign key referring to the Students table."*
  - o Correct. Each `student_id` in **Enrollment** points to a unique student in the **Students** table → that's exactly what a **foreign key** does.
- **B.** *"The combination of student_id and course_code can be used as a composite primary key for the Enrollment table."*
  - o Correct. Each student can enroll in a given course only once.
  - o So the pair (`student_id`, `course_code`) uniquely identifies each enrollment record → a valid **composite primary key**.
- **C.** *"The course_code in the Enrollment table is a primary key used to uniquely identify a course."*
  - o Incorrect **in the Enrollment table**.
  - o `course_code` repeats for every student enrolled in that course, so it **cannot** uniquely identify each row there.
  - o It **is** a primary key in the **Courses** table, not in Enrollment.

So only **A and B** are correct → **option (1)**.

Q21 - Answer: (1) A and B only

We want to compute the **total amount of wood** for square panels.

- **A – Number of tables to build** → needed ✔
- **B – Side length of one square table panel** → needed ✔
- **C – Width of the available wood plank** → not necessary just to estimate how much wood is needed in total; that's about cutting/layout, not total area.

Therefore the required inputs are **A and B only → option (1)**.

Q22 - Answer: (4) Showing a list of top 20 products with a discount over 30%

We need a task that uses:

- **Iteration** – looping through multiple items
- **Selection** – using a condition (`if`) to choose some of them

Check each option:

1. **Calculating total price of items in a shopping cart**
   - o You iterate through each cart item and sum prices → **iteration**.
   - o But it can be done without any condition (just sum), so **selection isn't required**.
2. **Checking if a coupon code is valid**
   - o Typically just checks **one** code against rules or database → **selection** (if valid/invalid), but no real iteration over a list.
3. **Displaying a welcome banner when the page loads**
   - o Just shows a fixed banner → generally no iteration, minimal or no selection.
4. **Showing a list of top 20 products with a discount over 30%**
   - o You must **loop (iterate)** through products.
   - o For each product, you **select** only those where `discount > 30%` (selection/if statement).
   - o Also stop once 20 qualifying products are found.

So option **(4)** clearly involves **both iteration and selection**.

Q23 - true, true, true → (2)

Q24 - (1) 20

Q25 - Output 11 → (3)

Q26 - Prints even `i`: 2 4 6 8 10 → written as 246810 → (4)

Q27 - So Warm, Chilly → (3)

Q28 - First reading in temp[0..23] is index 0 → temp[0] → (2)

Q29 - Correct answer: (4) All A, B and C

- **A** – Kotlin apps are **compiled** (to bytecode or native), not purely interpreted. ✔
- **B** – In microcontroller work, assembly code is turned into machine code by an **assembler**. ✔
- **C** – Many Python scripts (including web automation) are **interpreted at runtime** by the Python interpreter. ✔

So all three statements match real-world practice.

Q30 - Correct answer: (4) Skipping the testing phase…

- (1) Talking to customers in **requirements analysis** is correct.
- (2) Planning for different screen sizes in **design** is correct.
- (3) Coding frontend with HTML/CSS/JS and backend with SQL/Python is a normal **implementation** step.
- (4) Saying you can **skip testing** because browsers "validate" code is wrong. Testing is essential (functional tests, usability, security, etc.), and browsers do **not** replace that.

So (4) is the **incorrect** activity.

Q31 - `https://university.edu/login` has domain + path → **(1)**

Q32 - Correct answer: (1)

When you visit an online shop:

- The **DNS** server translates the name `www.shopnow.com` into a numeric **IP address** so your computer knows where to connect.
- The **web server** at that IP address then sends back the HTML/CSS/JS that show product pages.

The other options give DNS jobs it doesn't actually do (like hosting files or encrypting traffic).

Q33 - Correct extensions:
Spreadsheet: .ods, .xlsx; Audio: .mp3, .wav; Video: .mp4, .avi → (2)

Q34 –

Original image: **300 × 400** pixels

New image: **600 × 800** pixels

1. Original pixel count:

   $300 \times 400 = 120{,}000$ pixels

2. Enlarged pixel count:

   $600 \times 800 = 480{,}000$ pixels

3. Ratio (how many times more):

   $$\frac{480{,}000}{120{,}000} = 4$$

So the enlarged image has **4 times** as many pixels → **answer (3)**.

Q35 - Correct answer: (3) Deciding on the programming language

During **requirements analysis**, you:

- Talk to stakeholders (e.g., restaurant owners) → (1) ✔
- Gather and list **functional & non-functional requirements** → (2) ✔
- Observe real workflows → (4) ✔

Choosing the **programming language** is part of **design/implementation**, not requirements analysis. So (3) is **not** typically part of that phase.

Q36 - Correct answer: (2) A location of a webpage along with a specific query

`https://www.shoponline.com/products/shoes?id=1234` contains:

- The **protocol**: `https://`
- The **domain**: `www.shoponline.com`
- The **path**: `/products/shoes` (specific page or section)
- A **query parameter**: `?id=1234` (extra data, e.g., which shoe)

Q37 - Correct answer: (3) Enlarging a vector image reduces image sharpness

- (1) Raster for photos – correct: pixel-based detail is great for photos.
- (2) Vector for logos – correct: they can be scaled infinitely without losing quality.
- (3) **Incorrect**: enlarging a vector **does not** reduce sharpness; that's their big advantage.
- (4) Illustrator is indeed used for vector design – correct.

Q38 - Browser sends HTTP request to **web server**, which responds back to the **browser**, domain from a **domain provider** → (1)

Q39 - Correct answer: (4) A and B and not C

To **reduce e-waste**:

- **A** – Discounts for returning old devices → encourages **recycling** ✔
- **B** – Teaching people how to **extend device life** reduces waste ✔
- **C** – Encouraging frequent upgrades does the opposite: it **increases** e-waste ✗

Q40 - (3) Q = [(A + B)' . C']'

Model Paper 08 – Part II Marking Scheme

(Q1)

i.   (a) **False**   (b) **True**   (c) **False**   (d) **True**

ii.   Identify the ports A–D

Port	Description	Name
A	A standard port for connecting wired keyboards and mice	**PS/2 port**
B	A common audio port used to connect headphones and speakers	**3.5 mm audio jack (audio port)**
C	A high-speed interface used for video output to external displays	**HDMI port**
D	A universal connector used for devices like flash drives and printers	**USB port (USB Type-A)**

A. PS/2 port   **B. 3.5 mm audio jack / audio port**
C. HDMI port   **D. USB port**

iii.

(a) Convert $B9_{16}$ to octal.

1. Convert hex to decimal:

B_{16} = 11_{10} → $11 \times 16 = 176$

$176 + 9 = 185$ → $B9_{16} = 185_{10}$

2. Convert decimal 185_{10} to octal:

185_{10} = **271_8**

Answer: $B9_{16} = 271_8$

(b) Convert 36_{10} to binary.

36_{10} = 32 + 4
$32 \rightarrow 2^5, 4 \rightarrow 2^2$

So bits: 1 0 0 1 0 0

Answer: $36_{10} = 100100_2$

v.   **Recommended device: USB flash drive (pen drive)**
   - Small and easy to carry.
   - Files can be added, modified, and deleted many times.
   - Works with most computers and many other devices via USB ports.
   - Enough space for documents, presentations, and videos.

vi.   Three commonly used email folders
       Any three of the following (name + function):
     1. **Inbox**
        Stores all **received emails**.
     2. **Sent (or Sent Items)**
        Stores **emails that you have sent** to others.
     3. **Drafts**
        Stores **unfinished emails** that are saved to be completed or sent later.
     4. **Trash / Deleted Items**
        Stores emails that have been **deleted**, usually for a limited time.
     5. **Spam / Junk**
        Holds **unwanted or suspicious emails** automatically filtered as spam.

vii.   **(a)** Suitable fields for the primary key:
       → **Month** and **EmployeeID** (a **composite primary key**: (Month, EmployeeID)).

       (b) Data types:
       Month field:
       → **Text / String** (e.g., "March", "April")
       (If year was included as an actual date, then Date, but here names only → Text.)

       Salary field:
       → **Numeric / Number / Currency**

viii. Technologies used in 3rd and 5th generation computers
     • **3rd Generation:**
       Used **Integrated Circuits (ICs)**.
     • **5th Generation:**
       Based on **Artificial Intelligence (AI)** and **very advanced VLSI/ULSI technology** (massively parallel
       processing, knowledge-based systems, etc.).

ix.   Fill in the blanks (A–D)
       A – A type of computer memory that retains data even when the power is turned off is called **ROM**.
       B – In **Raster** graphics, images are stored as individual pixels, affecting scalability.
       C – **Lossy** compression removes some data permanently to reduce file size.
       D – **Hard Disk Drive** is an example of a secondary storage device.

x.   Two ways e-waste can affect the environment
       Any two valid points such as:

       Soil and water pollution:
       Toxic substances (like lead, mercury, cadmium) can **leach into the soil and groundwater**,
       contaminating drinking water and harming plants and animals.

       Air pollution:
       Burning e-waste releases **harmful gases and fine particles** into the air, which can cause respiratory
       problems and contribute to environmental damage.

       (Other acceptable: bioaccumulation in the food chain, harm to wildlife, etc.)   *(2*10=20 marks)*

(Q2)

(i) (a)

- **A** – **USB Hub (2)**
- **B** – **Bluetooth Adapter (4)**
- **C** – **Portable Power Bank (3)**
- **D** – **External Hard Drive (1)**   *(0.5*4=2 marks)*

(i) (b)

- **E** – The performance of a computer processor is determined by its **clock speed**.
- **F** – The **RAW** image format is preferred by professional photographers for high-quality captures.
- **G** – Video streaming platforms use **buffering** to ensure smooth playback of media files.
- **H** – **SSD** storage devices offer faster data access speeds and improved durability.   *(0.5*4=2 marks)*

(ii) (a)

- **I** – **Social Engineering (1)**
- **J** – **Digital Forensics Tampering (2)**
- **K** – **SQL Injection (3)**
- **L** – **Malware Attack (4)**   *(0.5*4=2 marks)*

(iii) Shortlisted candidate: Ethan   *(2 marks)*

(iv) Example answer (any one sensible point is fine): **Implement strong password policies and multi-factor authentication (MFA) for all employee accounts.**   *(2 marks)*

(Q3)

i. **a. DepartmentID**
    b. StudentID (Each student has a unique ID, so this is the natural primary key.) *(2 marks)*

ii. **a. New student Emma Watson (S006, D001, GPA 3.7, joins in 2023)**
    → Only the **Student** table needs a new record.   *(1 mark)*

    b. Nisha Fernando enrolls in a new course C006 in 2024
    → The **Course_Enrollment** table needs a new record.   *(1 mark)*

iii. Using the required format `tablename → (field1, field2, …)`:
    1. **For the new student:**
       `Student → (StudentID, FirstName, LastName, DepartmentID, GPA)`
       `Student → ('S006', 'Emma', 'Watson', 'D001', 3.7)`   *(2 marks)*

    2. **For Nisha's new course enrollment:**
       `Course_Enrollment → (CourseID, StudentID, Role, YearEnrolled)`
       `Course_Enrollment → ('C006', 'S002', 'Student', 2024)`   *(2 marks)*

iv. You need to join:
    - **Department** table
    - **Student** table
    (Join on `Department.HeadID = Student.StudentID`, and select the record where
    `DepartmentName = 'Computer Science'`.)   *(2 marks)*

(Q4)

  i. label → term format:
   - **P → Encryption**
   - **Q → Domain Name**
   - **R → IMAP**
   - **S → DNS**   *(0.5*4=2 marks)*

  ii. label → example format:
   - **A → Microsoft Outlook**
   - **B → Ubuntu**
   - **C → LinkedIn**
   - **D → Git**
   - **E → Google Cloud**
   - **F → Python**
   - **G → Slack**   *(0.5*7=3.5 marks)*

  iii. 1 – title   2 – h1   3 – p   4 – h2   5 – ul
        6 – li   7 – ol   8 – li   9 – b   *(0.5*9=4.5 marks)*

(Q5)

i. **a. Formula in N3 for USA**   *(1 mark)*
    `=M3-B3`

   b. After copying down, the formula that appears in N12 for India   *(1 mark)*
    `=M12-B12`

ii. **a. Lowest percentage increase in O15**   *(1 mark)*
    `=MIN(O3:O14)`

   b. Highest percentage increase in O16   *(1 mark)*
    `=MAX(O3:O14)`

iii. Formula to enter in **P3**:   *(2 marks)*
    `=(O3/$O$16)*100`
    Then copy P3 down to P4:P14.

iv. A **line chart** is more suitable, because:
   - It shows how renewable energy production **changes over time** (2010–2021) for each country.
   - Trends and growth patterns are easier to compare across years, whereas a bar chart with many years and countries would be cluttered and harder to read.   *(4 marks)*

(Q6)

i. Match each SDLC phase with the correct task: *(all correct - 3 marks)*

   - Requirements Gathering – **A: R (Understanding user needs and system constraints)**
   - Design – **B: S (Creating system architecture and UI designs)**
   - Development – **C: P (Writing code for system functionalities)**
   - Testing – **D: T (Checking for bugs and fixing errors)**
   - Deployment – **E: Q (Deploying the software to users)**

ii.   (a) **One input:** Customer order details (items, quantity, etc.)   *(3 marks)*
       (b) **One process:** Processing the payment / recording the order.
       (c) **One output:** Generated invoice / order confirmation.

iii.   Deployment strategies   *(2 marks)*

- Scenario **A** – **S: Rolling Deployment**
- Scenario **B** – **R: Big Bang Deployment**
- Scenario **C** – **Q: Incremental Deployment**
- Scenario **D** – **P: Blue-Green Deployment**

iv.   Any two advantages of an online order processing system: *(2 marks)*

- Faster order processing / greater efficiency.
- Fewer human errors (improved accuracy).

(Other valid answers: 24/7 availability, easier tracking and reporting, automatic records, etc.)

(Q7)

i.   output is: **28**   *(2 marks)*

ii.   The program compares Y with 20, so: *(4 marks)*

- **P:** DISPLAY "Y is less than 20"
- **Q:** DISPLAY "Y is equal to 20"
- **R:** DISPLAY "Y is greater than 20"

(Any equivalent text is fine, as long as it matches the three cases.)

iii. Conditions to test if a number N is positive, negative or zero: *(4 marks)*

- **P:** N > 0
- **Q:** N < 0
- **R:** (implied else case) N = 0 – this is the "Zero" situation handled by the final ELSE.