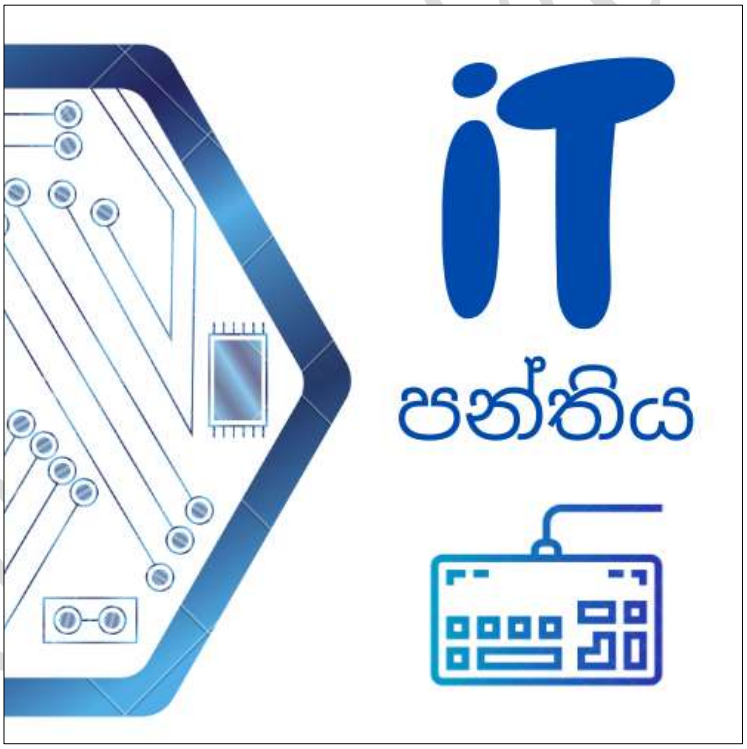
2025 MODEL PAPER 05

MCQ - Analyzation



Model Paper 05 – MCQ Marking Scheme

1) 1	11) 3	21) 3	31)	41)
2) 4	12) 2	22) 1	32)	42)
3) 1	13) 3	23) 4	33)	43)
4) 2	14) 3	24) 4	34)	44)
5) 1	15) 4	25) 3	35)	45)
6) 1	16) 3	26)	36)	46)
7) 3	17) 2	27)	37)	47)
8) 1	18) 1	28)	38)	48)
9) 4	19) 3	29)	39)	49)
10) 4	20) 1	30)	40)	50)

1. **Transistors (Option 1)** — Second-generation computers replaced first-generation **vacuum tubes** with **transistors**; integrated circuits arrive in the third generation, and VLSI/ULSI microprocessors are much later.

2. **Formula Translation (Option 4)** — FORTRAN is historically named from "**FORmula TRANslation**," reflecting its design to translate mathematical formulas into machine code.

3. **Electronic Numerical Integrator And Computer (Option 1)** — ENIAC's official expansion is "Electronic Numerical Integrator and Computer," the landmark 1940s general-purpose electronic computer.

5. **+47 (Option 1)** — In 8-bit signed two's complement, a leading 0 means positive; convert 0010 1111 to decimal:

- $0 \times 128 + 0 \times 64 + 1 \times 32 + 0 \times 16 + 1 \times 8 + 1 \times 4 + 1 \times 2 + 1 \times 1$
- $= 32 + 8 + 4 + 2 + 1 = 47.$

6. **10110010 (Option 1)** — Two's complement of 0100 1110 is bitwise invert then add 1:
    - Invert: 01001110 → 10110001
    - Add 1: 10110001 + 1 = **10110010**.

7. **2 bits and a carry-in (Option 3)** — A full adder sums inputs AA and BB **plus** the incoming carry CinC_{in}, producing a sum bit and a carry-out, so it effectively adds **two bits with a carry-in**.

8. **(1) 10111101** — To encode −67 in 8-bit two's-complement you take +67 and invert+add-1; the result 10111101 has a leading 1 (negative) and matches −67.

    - $67_{10} = 64 + 2 + 1 \rightarrow$ **01000011**
    - Invert bits → **10111100**
    - Add 1 → **10111101** (this is −67 in 8-bit two's complement)

9. **(4) All of the mentioned** — The OR operation obeys **commutative** (A+B=B+A), **associative** ((A+B)+C=A+(B+C)), and **distributive** (A+(B·C)=(A+B)·(A+C)) properties in Boolean algebra, so all apply.

10. **(4) Spiral** — A mission-critical banking system needs rigorous **risk assessment at multiple stages** and **prototyping** to mitigate failures; that is exactly the risk-driven, iterative nature of the Spiral model.

11. **(3) Agile** — The startup wants **quick releases**, **customer feedback each sprint**, and **embraces change even late**; these are core Agile values/practices.

12. **(2) Waterfall** — Requirements are **fixed upfront**, phases must be **completed before moving on**, and there's **no revisiting earlier stages**; that is the classic Waterfall approach.

13. **(3) Prototyping** — They need a **working demo** quickly that **doesn't include all functionality** but shows the product; the Prototyping model is designed for exactly this purpose.

14. **(3) RAD** — With evolving regulations they need **rapid delivery of functional modules** with a stress on **reusability and integration**; Rapid Application Development focuses on component reuse, quick iterations, and integration.

15. **(4) GIS** — Choosing shortest routes while considering **road networks, traffic, and weather** requires analyzing **spatial/geographic data**; that's what a Geographic Information System excels at.

16. **(3) ERP** — To **unify finance, supply chain, and HR** with a **single source of truth**, organizations implement an **Enterprise Resource Planning** system that integrates cross-functional data and processes.

17) TPS (Option 2). A hospital's check-ins, billing, and appointment scheduling are routine, high-volume, real-time transactions (insert/update records, print receipts, post charges), which is exactly what a **Transaction Processing System** is designed to capture, validate, and process reliably with quick response and data integrity.

18) DSS (Option 1). Recommending personalized products and discovering market trends require analyzing historical browsing/purchase data, building models, and producing decision reports; a **Decision Support System** provides analytics/data-mining and reporting to guide such decisions (not ERP/CMS/TPS/GIS).

19) CMS (Option 3). Managing lecture recordings, notes, and assignments—with upload, organize, retrieve, and version features—is the role of a **Content Management System**, which centralizes digital content and permissions for easy access and maintenance.

20) Robert Morris (Option 1). The 1988 Internet "Morris worm" that affected many UNIX systems was released by **Robert Tappan Morris**, causing widespread disruption and financial losses.

21) (3) It is an attempt to make a machine or network resource unavailable. A **Denial-of-Service (DoS)** attack's defining goal is to overwhelm resources so legitimate users cannot access a service; blocking traffic is just one method, and damaging HDD contents is not required, so the precise definition is option (3).

22) (1) We can stop DOS attack completely. In practice, DoS/DDoS can be **mitigated** (patching systems, rate-limiting, filtering at network/ISP level) and may last for hours, but they **cannot be guaranteed to be stopped completely**; hence (1) is the statement that is **not true**.

23) 172.16.18.255 255.255.252.0 (Option 4). Subnet 172.16.17.0/22 uses mask **255.255.252.0**, covering addresses **172.16.16.0–172.16.19.255**; **172.16.18.255** is inside this range and is **not** the /22 broadcast (which is 172.16.19.255), so it's a valid host.

- /22 mask → 255.255.252.0; block size in 3rd octet = **4**
- Network containing 172.16.17.x starts at **172.16.16.0**, broadcast **172.16.19.255**
- Valid host range: **172.16.16.1–172.16.19.254** → 172.16.18.255 is valid.

24) 172.16.45.12 (Option 4). With /30 (255.255.255.252) the block size is 4 in the last octet, so 172.16.45.14 belongs to the **12–15** block; the network address is **172.16.45.12**.

- /30 → mask **255.255.255.252**, block size **4**
- Subnet boundaries: …, **0–3**, **4–7**, **8–11**, **12–15**, **16–19**, …
- 14 ∈ **12–15** → network **172.16.45.12**, broadcast **172.16.45.15**.

25) 200.10.5.64 (Option 3). With /28 (255.255.255.240) the block size is 16 in the last octet; 200.10.5.68 falls in the **64–79** block, so the subnetwork address is **200.10.5.64**.

- /28 → mask **255.255.255.240**, block size **16**
- Subnet boundaries: **0, 16, 32, 48, 64, 80, …**
- 68 ∈ **64–79** → network **200.10.5.64**, broadcast **200.10.5.79**.