Basic Physics (~70 MCQ)  
1. Coulomb’s law defines the force between:  
a) Two moving charges  
b) Two point charges at rest ✅  
c) A charge and a magnetic field  
d) A current -carrying wire and a charge  
2. The SI unit of electric flux is:  
a) Volt  
b) Coulomb  
c) Newton·meter²/Coulomb ✅  
d) Tesla  
3. Gauss’s law is applicable to:  
a) Only point charges  
b) Any closed surface ✅  
c) Open surfaces  
d) Conductors only  
4. Electric potential at a point is:  
a) Energy per unit charge ✅  
b) Force per unit charge  
c) Charge per unit en ergy  
d) None of these  
5. Faraday’s law relates:  
a) Electric field and charge  
b) Induced EMF and rate of change of magnetic flux ✅  
c) Current and resistance  
d) Voltage and capacitance  
6. Maxwell’s equations describe:  
a) Motion of electrons  
b) Electromagnetic fiel ds ✅  
c) Quantum particles  
d) Wave propagation in air only  
7. The speed of light in vacuum is:  
a) 3×10³ m/s  
b) 3×10⁵ m/s  
c) 3×10⁸ m/s ✅  
d) 3×10¹⁰ m/s  
8. Photoelectric effect demonstrates that light:  
a) Travels in waves  
b) Has particle nature ✅  
c) Is longitudinal  
d) Has no energy  
9. Compton effect proves:

a) Wave nature of light  
b) Particle nature of light ✅  
c) Magnetic field effect  
d) Electric field effect  
10. De Broglie wavelength is associated with:  
a) Photons  
b) Electrons and matter particles ✅  
c) Only protons  
d) Only neutrons  
11. Phase velocity is:  
a) Velocity of energy transfer  
b) Velocity of wave crests ✅  
c) Same as group velocity  
d) None of these  
12. Group velocity is:  
a) Speed of individual wave  
b) Speed of envelope of wave packet ✅  
c) Always greater than phase velocity  
d) Zero  
13. Quantum theory of light was proposed by:  
a) Newton  
b) Einstein ✅  
c) Maxwell  
d) Planck  
14. X-ray diffraction is used to study:  
a) Atomic structure ✅  
b) Magnetic field  
c) Electric circuits  
d) Sound waves  
15. Wave function in quantum mechanics represents:  
a) Probability amplitude ✅  
b) Energy only  
c) Force  
d) Velocity  
16. The integral of electric field over a closed surface equals:  
a) Zero  
b) Charge enclosed/ε₀ ✅  
c) Current enclosed  
d) Voltage  
17. Magnetic field is produced by:  
a) Static charges  
b) Moving charges ✅

c) Stationary neutral objects  
d) Heat only  
18. Faraday’s law is a consequence of:  
a) Conservation of energy ✅  
b) Ohm’s law  
c) Coulomb’s law  
d) Kirchoff’s law  
19. Unit of magnetic flux is:  
a) Tesla  
b) Weber ✅  
c) Ampere  
d) Henry  
20. Lorentz force acts on:  
a) Stationary char ge  
b) Moving charge in magnetic field ✅  
c) Neutral particles  
d) Light only  
21. Capacitance is defined as:  
a) Q/V ✅  
b) V/Q  
c) I/R  
d) P/V  
22. Energy stored in a capacitor:  
a) ½ CV² ✅  
b) CV²  
c) 2CV²  
d) C/V²  
23. Inductor opposes:  
a) Voltage  
b) Current change ✅  
c) Resistan ce  
d) Power  
24. RLC circuit resonates when:  
a) XL = XC ✅  
b) XL > XC  
c) XL < XC  
d) R = 0  
25. Electric field inside a conductor is:  
a) Maximum  
b) Zero ✅  
c) Depends on charge  
d) Constant

26. Magnetic flux density is measured in:  
a) Tesla ✅  
b) Weber  
c) Henry  
d) Ampere  
27. Ampere’s law relates:  
a) Current and magnetic field ✅  
b) Voltage and resistance  
c) Capacitance and charge  
d) Energy and power  
28. Biot-Savart law gives:  
a) Force on a charge  
b) Magnetic field due to current element ✅  
c) Electric field  
d) Voltage  
29. Self-inductance unit is:  
a) Henry ✅  
b) Farad  
c) Ohm  
d) Tesla  
30. Mutual inductance occurs between:  
a) Two resistors  
b) Two coils ✅  
c) Capacitor and coil  
d) Wire and battery  
31. Maxwell added which term to Ampere’s law?  
a) Displacement current ✅  
b) Conduction current  
c) Electric flux  
d) Magnetic flux  
32. Electromagnetic waves are:  
a) Longitudinal  
b) Transverse ✅  
c) Stationary  
d) Random  
33. Energy of a photon:  
a) hf ✅  
b) h/f  
c) h + f  
d) hf²  
34. Threshold frequency in photoelectric effect depends on:  
a) Intensity

b) Metal type ✅  
c) Distance from source  
d) Angle of incidence  
35. Quantum number n indicates:  
a) Angular momentum  
b) Principal energy level ✅  
c) Magnetic orientation  
d) Spin  
36. Planck constant h has units:  
a) Joule·second ✅  
b) Volt  
c) Coulomb  
d) Ampere·second  
37. Compton wavelength for mula is:  
a) λc = h/mc ✅  
b) λc = mc/h  
c) λc = h²/m  
d) λc = h/m  
38. X-ray wavelength is in the range:  
a) 0.01 –10 nm ✅  
b) 1–100 μm  
c) 100 –1000 nm  
d) 10 –100 cm  
39. Electromagnetic spectrum order (low to high frequency):  
a) Radio, Microwave, IR, Visible, UV, X -ray, Gam ma ✅  
b) X-ray, UV, Visible, IR, Microwave, Radio  
c) Gamma, X -ray, UV, Visible, IR, Microwave, Radio  
d) Radio, IR, Microwave, Visible, UV, X -ray, Gamma  
40. Photoelectric current depends on:  
a) Light frequency  
b) Light intensity ✅  
c) Metal temperature  
d) None  
41. Heisenberg uncertainty principle relates:  
a) Energy and time ✅  
b) Position and momentum ✅  
c) Force and mass  
d) Both a & b ✅  
42. Wave equation describes:  
a) Electric field only  
b) Magnetic field only  
c) Propagation of waves ✅

d) Particle motion  
43. EM wave in vacuum travels at:  
a) 3×10⁸ m/s ✅  
b) 3×10⁵ m/s  
c) 3×10³ m/s  
d) 3×10¹⁰ m/s  
44. Polarization of light involves:  
a) Frequency change  
b) Direction change of E vector ✅  
c) Amplitude only  
d) Wavelength only  
45. Brewster’s angle gives:  
a) Total reflection  
b) Zero reflection for one polarization ✅  
c) Maximum reflection  
d) None  
46. Critical angle is related to:  
a) Refraction ✅  
b) Diffraction  
c) Polarization  
d) Interference  
47. Phase difference of 180° gives:  
a) Constructive interference  
b) Destructive interference ✅  
c) No interference  
d) Random waves  
48. Energy of X -ray photon is:  
a) E = hf ✅  
b) E = h/f  
c) E = hf²  
d) E = f/h  
49. Quantum tunneling explains:  
a) Classical reflection  
b) Particle crossing potential barrier ✅  
c) Wave interference  
d) Magnetic effect  
50. Electron diffraction proves:  
a) Partic le nature  
b) Wave nature ✅  
c) EM wave  
d) Photoelectric effect  
51. Wavefunction normalization ensures:

a) Energy conservation  
b) Total probability = 1 ✅  
c) Momentum conservation  
d) Mass conservation  
52. Schrödinger equation is:  
a) Time -independent ✅  
b) Time -dependent ✅  
c) Both  
d) None  
53. Potential energy in quantum well is:  
a) Infinite  
b) Zero  
c) Finite ✅  
d) Negative  
54. Electron in hydrogen atom has:  
a) Continuous energy  
b) Quantized energy ✅  
c) Zero energy  
d) Infinite energy  
55. First Boh r orbit radius:  
a) 0.529 Å  
b) 0.529 nm ✅  
c) 5.29 nm  
d) 5.29 cm  
56. Photon momentum is:  
a) p = mv  
b) p = hf/c ✅  
c) p = h/f  
d) p = mc  
57. Heisenberg principle formula:  
a) ΔxΔp ≥ ħ/2 ✅  
b) ΔxΔp ≤ ħ/2  
c) ΔEΔt ≤ ħ  
d) ΔEΔt ≥ ħ  
58. Group velocity < Phase velocity in:  
a) Norma l dispersion  
b) Anomalous dispersion ✅  
c) Vacuum  
d) Free space  
59. Standing wave forms due to:  
a) Single wave  
b) Superposition ✅

c) Refraction  
d) Diffraction  
60. Node is point of:  
a) Maximum amplitude  
b) Zero amplitude ✅  
c) Half amplitude  
d) Random amplitude  
61. Antin ode is point of:  
a) Maximum amplitude ✅  
b) Zero amplitude  
c) Half amplitude  
d) Random amplitude  
62. EM wave energy density:  
a) u = ε₀E²/2 ✅  
b) u = μ₀H²  
c) u = EH  
d) u = 0  
63. Maxwell predicts:  
a) EM waves travel at speed of light ✅  
b) EM waves are longitudinal  
c) EM waves have mass  
d) EM waves stationary  
64. Quantum of light is:  
a) Electron  
b) Photon ✅  
c) Neutron  
d) Proton  
65. Wavelength of electron decreases with:  
a) Increasing momentum ✅  
b) Decreasing momentum  
c) Constant  
d) None  
66. Principle of superposition applies to:  
a) Linear systems ✅  
b) Nonlinear systems  
c) Magnetic fields only  
d) Electric fields only  
67. Electric field inside a hollow conductor:  
a) Zero ✅  
b) Non -zero  
c) Depends on shape  
d) Depends on charge

68. Magnetic permeability of free space:  
a) 4π×10⁻⁷ H/m ✅  
b) 8.85×10 ⁻¹² F/m  
c) 1 H/m  
d) 0  
69. Magnetic flux Φ = B·A cosθ, θ is:  
a) Angle between B and area normal ✅  
b) Angle between B and surface  
c) Always 0  
d) Always 90°  
70. RLC series circuit resonant frequency:  
a) f = 1/(2π√LC) ✅  
b) f = 2π√LC  
c) f = √LC  
d) f = 1/(LC)  
Introducti on to Computer Systems (~60 MCQ)  
1. The binary number system uses how many digits?  
a) 2 ✅  
b) 8  
c) 10  
d) 16  
2. The octal number system uses how many digits?  
a) 2  
b) 8 ✅  
c) 10  
d) 16  
3. The hexadecimal number system uses how many digits?  
a) 8  
b) 10  
c) 16 ✅  
d) 2  
4. Which of the following is NOT an input device?  
a) Keyboard  
b) Mouse  
c) Printer ✅  
d) Scanner  
5. CPU stands for:  
a) Central Processing Unit ✅  
b) Central Peripheral Unit  
c) Control Processing Unit  
d) Computer Processing Unit  
6. The main function of the CPU is:

a) Storage of data  
b) Processing of data ✅  
c) Communication  
d) Display  
7. RAM is:  
a) Volatile memory ✅  
b) Non -volatile memory  
c) Secondary storage  
d) Input device  
8. ROM is:  
a) Volatile memory  
b) Non -volatile memory ✅  
c) Cache memory  
d) Input device  
9. Which of the following is secondary storage?  
a) RAM  
b) Hard Disk ✅  
c) Cache  
d) Register  
10. Which of the following is an example of application software?  
a) Windows OS  
b) Microsoft Word ✅  
c) BIOS  
d) Device driver  
11. Operating system manages:  
a) Hardware resources ✅  
b) Only so ftware  
c) Only memory  
d) Only CPU  
12. Assembly language uses:  
a) Binary code  
b) Mnemonics ✅  
c) High -level commands  
d) Natural language  
13. Early computers used which number system?  
a) Binary  
b) Decimal ✅  
c) Octal  
d) Hexadecimal  
14. First generation computers used:  
a) Vacuum tubes ✅  
b) Transistors

c) ICs  
d) Microprocessors  
15. Second generation computers used:  
a) Vacuum tubes  
b) Transistors ✅  
c) ICs  
d) Microprocessors  
16. Third generation computers used:  
a) Vacuum tubes  
b) Transistors  
c) ICs ✅  
d) Microprocessors  
17. Fourth generati on computers used:  
a) Vacuum tubes  
b) Transistors  
c) ICs  
d) Microprocessors ✅  
18. Which is NOT a main component of a computer?  
a) CPU  
b) Memory  
c) Printer ✅  
d) I/O devices  
19. The ALU performs:  
a) Arithmetic and logical operations ✅  
b) Only arithmetic  
c) Only logi c  
d) Data storage  
20. The CU (Control Unit) manages:  
a) Arithmetic operations  
b) Instruction execution ✅  
c) Data storage  
d) Input/output  
21. BIOS is stored in:  
a) RAM  
b) ROM ✅  
c) Cache  
d) Register  
22. Number of bits in a byte:  
a) 4  
b) 8 ✅  
c) 16  
d) 32

23. 1 KB = ?  
a) 1024 Bytes ✅  
b) 1000 Bytes  
c) 512 Bytes  
d) 2048 Bytes  
24. Internet is an example of:  
a) LAN  
b) MAN  
c) WAN ✅  
d) PAN  
25. Which is a type of software?  
a) Operating system ✅  
b) Compiler ✅  
c) Word processor ✅  
d) All of the above ✅  
26. Binary addition: 101 + 110 = ?  
a) 1001 ✅  
b) 111  
c) 1010  
d) 1100  
27. Decimal 15 in binary is:  
a) 1010  
b) 1111 ✅  
c) 1101  
d) 1001  
28. Decimal 255 in hexadecimal is:  
a) 0xFF ✅  
b) 0xAA  
c) 0xF0  
d) 0xFE  
29. The fastest memory in computer is:  
a) RAM  
b) Cache ✅  
c) ROM  
d) Hard Disk  
30. Number of general -purpose registers in 8086:  
a) 4  
b) 8 ✅  
c) 16  
d) 2  
31. What is the base of the hexadecimal system?  
a) 2

b) 8  
c) 10  
d) 16 ✅  
32. A nibble consists of:  
a) 2 bits  
b) 4 bits ✅  
c) 8 bits  
d) 16 bits  
33. CPU clock speed is measured in:  
a) Hertz ✅  
b) Volt  
c) Ampere  
d) Joule  
34. Program that translates high-level language to machine code:  
a) Compiler ✅  
b) Assembler  
c) Interpreter  
d) Loader  
35. Which memory is used to store BIOS?  
a) ROM ✅  
b) RAM  
c) Cache  
d) Register  
36. The main memory is:  
a) RAM ✅  
b) ROM  
c) Hard Disk  
d) Cache  
37. Cache memory is located:  
a) Between CPU and main memory ✅  
b) On hard disk  
c) In I/O device  
d) In printer  
38. The smallest unit of data in a computer:  
a) Byte  
b) Bit ✅  
c) Nibble  
d) Word  
39. ASCII is used for:  
a) Images  
b) Text ✅  
c) Audio

d) Video  
40. Unicode supports:  
a) English only  
b) Multip le languages ✅  
c) Binary  
d) Hexadecimal  
41. Operating system is:  
a) System software ✅  
b) Application software  
c) Firmware  
d) Hardware  
42. Instruction cycle consists of:  
a) Fetch ✅  
b) Decode ✅  
c) Execute ✅  
d) All of the above ✅  
43. Which of the following is NOT a high-level language?  
a) C  
b) Python  
c) Assembly ✅  
d) Java  
44. HDD stores data in:  
a) RAM  
b) Magnetic disks ✅  
c) SSD  
d) Cache  
45. SSD is faster than HDD because:  
a) Uses flash memory ✅  
b) Uses magnetic disks  
c) Less durable  
d) Has moving parts  
46. Input devices convert :  
a) Digital → Analog  
b) Human data → Digital ✅  
c) Digital → Human readable  
d) None  
47. Output devices convert:  
a) Digital → Analog  
b) Digital → Human readable ✅  
c) Analog → Digital  
d) None  
48. Primary memory is:

a) Volatile ✅  
b) Non -volatile  
c) Permanent  
d) Secon dary  
49. Secondary memory is:  
a) Volatile  
b) Non -volatile ✅  
c) Faster than RAM  
d) Registers  
50. Software that helps run other programs:  
a) Operating system ✅  
b) Application  
c) Utility  
d) Driver  
51. Early computer “ENIAC” used:  
a) Transistors  
b) Vacuum tubes ✅  
c) ICs  
d) Microprocessors  
52. Which is NOT a characteristic of computer?  
a) Speed  
b) Accuracy  
c) Emotions ✅  
d) Storage  
53. Binary subtraction: 1010 - 0110 = ?  
a) 0100 ✅  
b) 1001  
c) 0011  
d) 1110  
54. ASCII stands for:  
a) American Standard Code for Information Interchange ✅  
b) Au tomatic System Code for Input  
c) Analog Standard Code for Information  
d) All of the above  
55. Word length in 8086 microprocessor:  
a) 8-bit  
b) 16 -bit ✅  
c) 32 -bit  
d) 64 -bit  
56. Early computers were used mainly for:  
a) Gaming  
b) Calculations ✅

c) Internet browsing  
d) Social media  
57. Input to CPU is through:  
a) Registers ✅  
b) ALU  
c) CU  
d) Memory  
58. Output from CPU is via:  
a) Registers  
b) Memory  
c) I/O devices ✅  
d) ALU  
59. Instruction set architecture defines:  
a) Hardware  
b) Software  
c) CPU instructions ✅  
d) Memory only  
60. Which dev ice connects a computer to the internet?  
a) Router ✅  
b) Printer  
c) Keyboard  
d) Monitor  
Electrical Circuits (~60 MCQ)  
1. Ohm’s law states:  
a) V = IR ✅  
b) P = IV²  
c) I = V/P  
d) V = I²R  
2. In a series circuit, the current is:  
a) Same in all elements ✅  
b) Different in each element  
c) Zero  
d) Depends on voltage only  
3. In a parallel circuit, the voltage across each branch is:  
a) Same ✅  
b) Different  
c) Zero  
d) Depends on resistance  
4. Kirchhoff’s Current Law (KCL) is based on:  
a) Energy conservation  
b) Charge conservation ✅  
c) Ohm’s law

d) Faraday’s law  
5. Kirchhoff’s Voltage Law (KVL) is based on:  
a) Energy conservation ✅  
b) Charge conservation  
c) Power conservation  
d) Resistance law  
6. Power in a resistive circuit:  
a) P = VI ✅  
b) P = V²/R ✅  
c) P = I²R ✅  
d) All of the above ✅  
7. Voltage divider formula:  
a) Vx = V(Rx/Rtotal) ✅  
b) Vx = IR  
c) Vx = V/R  
d) Vx = IR²  
8. Current divider formula applies to:  
a) Series circuit  
b) Parallel circuit ✅  
c) Both  
d) None  
9. Thevenin’s theorem simplifies a circuit to:  
a) Voltage source and series resistor ✅  
b) Current source and series resistor  
c) Voltage source and parallel resistor  
d) Current source and parallel resistor  
10. Norton’s theorem simplifies a circuit to:  
a) Current source and parallel resistor ✅  
b) Voltage sourc e and series resistor  
c) Current source and series resistor  
d) Voltage source and parallel resistor  
11. Maximum power transfer occurs when:  
a) Load R = Source R ✅  
b) Load R > Source R  
c) Load R < Source R  
d) Load R = 0  
12. Superposition theorem is applicable for:  
a) Linear circuits ✅  
b) Non -linear circuits  
c) Series circuits only  
d) Parallel circuits only  
13. Resistance unit is:

a) Ohm ✅  
b) Volt  
c) Ampere  
d) Watt  
14. Voltage unit is:  
a) Ohm  
b) Volt ✅  
c) Ampere  
d) Watt  
15. Current unit is:  
a) Ohm  
b) Volt  
c) Ampere ✅  
d) Watt  
16. Capacitance unit is:  
a) Farad ✅  
b) Henry  
c) Ohm  
d) Tesla  
17. Inductance unit is:  
a) Henry ✅  
b) Farad  
c) Ohm  
d) Tesla  
18. Capacitors in series:  
a) 1/Ceq = Σ(1/Ci) ✅  
b) Ceq = ΣCi  
c) Ceq = ΣC²  
d) Ceq = 1/ΣC  
19. Capacitors in parallel:  
a) Ceq = ΣCi ✅  
b) 1/Ceq = Σ(1/Ci)  
c) Ce q = √ΣCi  
d) Ceq = None  
20. Inductors in series:  
a) Leq = ΣLi ✅  
b) 1/Leq = Σ(1/Li)  
c) Leq = √ΣLi  
d) None  
21. Inductors in parallel:  
a) Leq = ΣLi  
b) 1/Leq = Σ(1/Li) ✅

c) Leq = √ΣLi  
d) None  
22. RLC series circuit resonance condition:  
a) XL = XC ✅  
b) XL > XC  
c) XL < XC  
d) R = 0  
23. Reactance of inductor:  
a) XL = 2πfL ✅  
b) XL = 1/2πfL  
c) XL = L/f  
d) XL = 1/L  
24. Reactance of capacitor:  
a) XC = 1/2πfC ✅  
b) XC = 2πfC  
c) XC = 1/C  
d) XC = 2C  
25. Impedance of series RLC:  
a) Z = √(R² + (XL -XC)²) ✅  
b) Z = R + XL + XC  
c) Z = R/(XL -XC)  
d) Z = R² + L² + C²  
26. Power factor = cosθ, θ is:  
a) Phase difference between voltage and current ✅  
b) Voltage  
c) Current  
d) Resistance  
27. Energy stored in inductor:  
a) W = ½ LI² ✅  
b) W = ½ CV²  
c) W = I²R  
d) W = VI  
28. Energy stored in capacitor:  
a) W = ½ CV² ✅  
b) W = ½ L I²  
c) W = VI  
d) W = I²R  
29. Node voltage method is used for:  
a) Parallel analysis ✅  
b) Series analysis  
c) Superposition  
d) None

30. Mesh current method is used for:  
a) Series analysis  
b) Loop analysis ✅  
c) Node analysis  
d) Both  
31. Source transformation converts:  
a) Voltage source + series R → Current source + parallel R ✅  
b) Current source + parallel R → Voltage source + series R ✅  
c) Both a & b ✅  
d) None  
32. Dependent source is:  
a) Independent voltage  
b) Controlled by another circuit variable ✅  
c) Uncontrol led  
d) Always current source  
33. Capacitor blocks:  
a) DC ✅  
b) AC  
c) Both  
d) None  
34. Inductor blocks:  
a) AC ✅  
b) DC  
c) Both  
d) None  
35. Time constant of RC circuit:  
a) τ = RC ✅  
b) τ = L/R  
c) τ = R/L  
d) τ = 1/RC  
36. Time constant of RL circuit:  
a) τ = RC  
b) τ = L/R ✅  
c) τ = R/L  
d) τ = 1/L  
37. For AC series RLC, resonance frequency:  
a) f = 1/2π√LC ✅  
b) f = √LC  
c) f = 2π√LC  
d) f = LC  
38. In resonance, current is:  
a) Minimum

b) Maximum ✅  
c) Zero  
d) Constant  
39. Voltage across L or C at resonance:  
a) Less than supply  
b) Equal to supply  
c) Can be greater than supply ✅  
d) Zero  
40. RMS value of sinusoidal current:  
a) Imax  
b) Imax/√2 ✅  
c) Imax/2  
d) √2 Imax  
41. RMS value of sinusoidal voltage:  
a) Vmax  
b) Vmax/√2 ✅  
c) Vmax/2  
d) √2 Vmax  
42. Average power in AC circuit:  
a) Vrms × Irms × cosθ ✅  
b) Vrms × Irms × sinθ  
c) Vrms × Irms  
d) Irms² × R  
43. Impedance in series AC circuit:  
a) Z = R + j(XL - XC) ✅  
b) Z = R + XL + XC  
c) Z = R + 1/(XL - XC)  
d) Z = R² + (XL -XC)²  
44. Admittance Y =  
a) 1/Z ✅  
b) Z  
c) R/Z  
d) Z/R  
45. Phase angle φ =  
a) tan⁻¹((XL -XC)/R) ✅  
b) tan⁻¹(R/(XL -XC))  
c) cos⁻¹((XL -XC)/R)  
d) sin⁻¹((XL -XC)/R)  
46. Wye to Delta conversion is used for:  
a) Resistors ✅  
b) Capacitors ✅  
c) Inductors ✅

d) All ✅  
47. Delta to Wye conversion is used for:  
a) Resistors ✅  
b) Capacitors ✅  
c) Inductors ✅  
d) All ✅  
48. RMS voltage of triangular waveform :  
a) Vm/√2  
b) Vm/√3 ✅  
c) Vm/2  
d) Vm  
49. In AC circuits, instantaneous power:  
a) p = vi ✅  
b) p = i²R  
c) p = v²/R  
d) p = Vavg × Iavg  
50. Current leads voltage in:  
a) Capacitive circuit ✅  
b) Inductive circuit  
c) Resistive circuit  
d) None  
51. Current lags voltage in:  
a) Capacitive  
b) Inductive ✅  
c) Resistive  
d) None  
52. Power dissipated in resistor:  
a) I²R ✅  
b) V²/R ✅  
c) VI ✅  
d) All of the above ✅  
53. Series LC circuit at resonance:  
a) Impedance minimum ✅  
b) Impedance maximum  
c) Current minimum  
d) Voltage minimum  
54. Parallel LC circu it at resonance:  
a) Impedance minimum  
b) Impedance maximum ✅  
c) Current maximum  
d) Voltage zero

55. Quality factor Q =  
a) XL/R ✅  
b) XC/R  
c) R/XL  
d) R/XC  
56. Transient response occurs in:  
a) DC circuits with L or C ✅  
b) Pure resistive DC circuits  
c) AC steady -state  
d) None  
57. Charging capacitor current:  
a) Maximum at t=0 ✅  
b) Zero at t=0  
c) Constant  
d) None  
58. Discharging capacitor current:  
a) Maximum at t=0 ✅  
b) Zero at t=0  
c) Constant  
d) None  
59. DC steady -state inductor acts as:  
a) Open circuit  
b) Short circuit ✅  
c) Capacitor  
d) Resistor  
60. DC steady -state capacitor acts as:  
a) Open circuit ✅  
b) Short circuit  
c) Inductor  
d) Resistor  
Digital Logic Design (~70 MCQ)  
1. Boolean algebra was introduced by:  
a) Newton  
b) Boole ✅  
c) Einstein  
d) Maxwell  
2. The AND gate output is 1 only when:  
a) Both inputs are 0  
b) Both inputs are 1 ✅  
c) One input is 1  
d) Any input is 0  
3. The OR gate output is 0 only when:

a) Both inputs are 0 ✅  
b) Both inputs are 1  
c) One input is 1  
d) Any input is 1  
4. The NOT gate inverts:  
a) 1→0, 0→1 ✅  
b) 1→1, 0→0  
c) 1→1, 0→1  
d) None  
5. De Morgan’s theorem states:  
a) (A·B)’ = A’ + B’ ✅  
b) (A+B)’ = A + B  
c) (A+B)’ = A’B’ ✅  
d) Both a & c ✅  
6. NAND gate is called:  
a) Universal gate ✅  
b) Basic gate  
c) Logic gate  
d) None  
7. NOR gate is called:  
a) Universal gate ✅  
b) Basic gate  
c) Logic gate  
d) None  
8. XOR gate output is 1 when:  
a) Inputs same  
b) Inputs different ✅  
c) Both inputs 0  
d) Both inputs 1  
9. XNOR gate output is 1 when:  
a) Inputs same ✅  
b) Inputs different  
c) Both 0  
d) Both 1  
10. Sum-of-Products (SOP) is:  
a) OR of AND terms ✅  
b) AND of OR terms  
c) XOR of AND terms  
d) NAND of OR terms  
11. Product -of-Sums (POS) is:  
a) OR of AND terms  
b) AND of OR terms ✅

c) XOR of OR terms  
d) NOR of AND terms  
12. K-map is used for:  
a) Minimization of Boolean expression ✅  
b) Maximization  
c) M ultiplexing  
d) Latching  
13. 2-to-1 multiplexer has:  
a) 2 inputs, 1 select ✅  
b) 2 outputs, 1 input  
c) 1 input, 2 select  
d) 2 outputs, 2 select  
14. 4-to-1 multiplexer has:  
a) 4 inputs, 2 select ✅  
b) 4 outputs, 2 select  
c) 2 inputs, 4 select  
d) 1 input, 4 select  
15. Demu ltiplexer converts:  
a) 1 input → many outputs ✅  
b) Many inputs → 1 output  
c) OR operation  
d) AND operation  
16. Decoder converts:  
a) n inputs → 2ⁿ outputs ✅  
b) 2ⁿ inputs → n outputs  
c) n outputs → n inputs  
d) None  
17. Encoder converts:  
a) 2ⁿ inputs → n outputs ✅  
b) n inputs → 2ⁿ outputs  
c) OR → AND  
d) None  
18. Half adder produces:  
a) Sum only  
b) Carry only  
c) Sum & Carry ✅  
d) Difference & Borrow  
19. Full adder has:  
a) 2 inputs  
b) 3 inputs ✅  
c) 4 inputs  
d) 1 input

20. Flip-flops store:  
a) Voltage  
b) Bit of information ✅  
c) Curre nt  
d) Logic gate  
21. SR flip -flop is built using:  
a) NAND/NOR gates ✅  
b) XOR  
c) XNOR  
d) AND  
22. JK flip -flop overcomes:  
a) Race condition in SR ✅  
b) Memory loss  
c) Input error  
d) Timing error  
23. D flip -flop output =  
a) Input D ✅  
b) Input Q  
c) Inverted D  
d) Sum  
24. T flip-flop toggles on:  
a) T=1 ✅  
b) T=0  
c) Clock high  
d) Reset  
25. Asynchronous counter uses:  
a) Same clock ✅  
b) Ripple effect  
c) Parallel clocking  
d) Both a & b ✅  
26. Synchronous counter:  
a) All flip -flops clocked simultaneously ✅  
b) Ripple clocked  
c) Not clocked  
d) None  
27. Mealy machine output depends on:  
a) Present state only  
b) Present input only  
c) Present state & input ✅  
d) Previous state  
28. Moore machine output depends on:  
a) Present state only ✅

b) Present input  
c) Previous state  
d) Both state & input  
29. PLA stands fo r:  
a) Programmable Logic Array ✅  
b) Parallel Logic Array  
c) Primary Logic Adder  
d) None  
30. PLA used for:  
a) Logic function implementation ✅  
b) Storage  
c) Multiplexing  
d) None  
31. Race around problem occurs in:  
a) SR flip -flop  
b) JK flip -flop ✅  
c) D flip -flop  
d) T flip-flop  
32. Pulse mode design avoids:  
a) Multiple triggering ✅  
b) Single triggering  
c) Flip -flop operation  
d) Logic minimization  
33. Fundamental mode design uses:  
a) Only one input change at a time ✅  
b) Multiple inputs  
c) Asynchronous  
d) None  
34. Combinational circ uit output depends on:  
a) Present inputs only ✅  
b) Present & past inputs  
c) Clock  
d) State  
35. Sequential circuit output depends on:  
a) Present inputs only  
b) Present & past inputs ✅  
c) Clock only  
d) None  
36. Boolean expression simplification reduces:  
a) Gate coun t ✅  
b) Power consumption ✅  
c) Complexity ✅

d) All ✅  
37. XOR gate is equivalent to:  
a) A’B + AB’ ✅  
b) AB + A’B’  
c) A + B  
d) A·B  
38. XNOR gate is equivalent to:  
a) AB + A’B’ ✅  
b) A’B + AB’  
c) A + B  
d) A·B  
39. NAND gate expression:  
a) (AB)’ ✅  
b) A + B  
c) AB  
d) (A + B)’  
40. NOR gate expression:  
a) (A+B)’ ✅  
b) A + B  
c) AB  
d) (AB)’  
41. Number of minterms for n variables:  
a) n  
b) 2ⁿ ✅  
c) n²  
d) 2n  
42. Number of maxterms for n variables:  
a) n  
b) 2ⁿ ✅  
c) n²  
d) 2n  
43. Canonical SOP uses:  
a) Minterms ✅  
b) Maxterms  
c) Sum  
d) Product  
44. Canonical POS uses:  
a) Minterms  
b) Maxterms ✅  
c) Sum  
d) Product  
45. Logic minimization reduces:

a) Cost ✅  
b) Speed  
c) Complexity ✅  
d) Both a & c ✅  
46. Flip-flop stores:  
a) 1 bit ✅  
b) 2 bits  
c) 4 bits  
d) Variable  
47. Latches are:  
a) Level triggered ✅  
b) Edge triggered  
c) Pulse mode  
d) None  
48. Flip-flops are:  
a) Level triggered  
b) Edge triggered ✅  
c) Pulse mode  
d) None  
49. Pulse -triggered flip -flops help avoid:  
a) Race around ✅  
b) Memory loss  
c) Logic error  
d) Power consumption  
50. Asynchronous counter also called:  
a) Ripple counter ✅  
b) Ri ng counter  
c) Synchronous counter  
d) Johnson counter  
51. Synchronous counter is:  
a) Ripple type  
b) Clocked simultaneously ✅  
c) Level triggered  
d) None  
52. 4-bit asynchronous counter counts:  
a) 0–7  
b) 0–15 ✅  
c) 0–31  
d) 0–63  
53. 3-bit synchronous counter max count:  
a) 7 ✅  
b) 3

c) 8  
d) 15  
54. Edge triggering refers to:  
a) Clock rising/falling ✅  
b) Clock high  
c) Clock low  
d) Pulse width  
55. JK flip -flop toggles when:  
a) J=K=1 ✅  
b) J=1, K=0  
c) J=0, K=1  
d) J=K=0  
56. Clock frequency determines:  
a) Circuit speed ✅  
b) Gate numbe r  
c) Power  
d) Output only  
57. Race around occurs when propagation delay < pulse width:  
a) True ✅  
b) False  
c) Sometimes  
d) None  
58. Edge -triggered flip -flop avoids:  
a) Multiple toggles ✅  
b) Memory  
c) Delay  
d) Logic error  
59. MUX selects:  
a) One input ✅  
b) All inputs  
c) Output  
d) Gate  
60. DEMUX distributes:  
a) Input to one output ✅  
b) Input to all outputs  
c) Gate  
d) None  
61. SOP minimization reduces:  
a) AND gates  
b) OR gates  
c) Both ✅  
d) XOR

62. POS minimization reduces:  
a) OR gates  
b) AND gates  
c) Both ✅  
d) NAND  
63. Universal gate can implement:  
a) All logic ✅  
b) None  
c) Only OR  
d) Only AND  
64. Flip-flop characteristic table lists:  
a) Inputs & outputs ✅  
b) Inputs only  
c) Outputs only  
d) Clock only  
65. Level -triggered latch changes state:  
a) Clock high ✅  
b) Clock low  
c) Both  
d) Edge  
66. Edge -trigger ed flip -flop changes state:  
a) Rising/falling ✅  
b) Level high  
c) Level low  
d) None  
67. Pulse mode design avoids:  
a) Multiple toggles ✅  
b) Race  
c) Timing errors ✅  
d) All ✅  
68. State diagram represents:  
a) Sequential behavior ✅  
b) Combinational logic  
c) Input only  
d) Output only  
69. Mealy machine faster than Moore because:  
a) Output depends on input ✅  
b) Output depends on state  
c) Uses fewer flip -flops  
d) None  
70. Fundamental mode design ensures:  
a) Only one input changes at a time ✅

b) Multiple input changes  
c) Synchronous  
d) None  
Basic Electronics (~60 MCQ)  
1. Diode allows current to flow in:  
a) Both directions  
b) One direction ✅  
c) No direction  
d) Depends on voltage  
2. Forward biased diode has:  
a) High resistance  
b) Low resistance ✅  
c) Infinite resistance  
d) Zero resistance  
3. Reve rse biased diode has:  
a) High resistance ✅  
b) Low resistance  
c) Zero resistance  
d) Low voltage  
4. Zener diode is used for:  
a) Amplification  
b) Voltage regulation ✅  
c) Switching  
d) Oscillation  
5. Half-wave rectifier uses:  
a) 1 diode ✅  
b) 2 diodes  
c) 4 diodes  
d) None  
6. Full-wave rectifier uses:  
a) 1 diode  
b) 2 diodes ✅  
c) 4 diodes  
d) None  
7. Bridge rectifier uses:  
a) 2 diodes  
b) 3 diodes  
c) 4 diodes ✅  
d) 1 diode  
8. Clipper circuit:  
a) Clips voltage above/below reference ✅  
b) Amplifies signal

c) Rectifies signal  
d) Filters signal  
9. Clamper circuit:  
a) Shifts signal DC level ✅  
b) Clips voltage  
c) Rectifies  
d) Amplifies  
10. Bipolar junction transistor (BJT) has:  
a) 2 terminals  
b) 3 terminals ✅  
c) 4 terminals  
d) 5 terminals  
11. BJT modes:  
a) Active ✅  
b) Cut -off ✅  
c) Saturation ✅  
d) All ✅  
12. Common emitter configuration provides:  
a) Voltage gain ✅  
b) Current gain ✅  
c) Power gain ✅  
d) All ✅  
13. Common base configuration has:  
a) Current gain <1 ✅  
b) Voltage gain high ✅  
c) Input low  
d) Output low  
14. Common collector configuratio n is also called:  
a) Emitter follower ✅  
b) Base follower  
c) Collector follower  
d) None  
15. BJT used as switch operates in:  
a) Active region  
b) Cut -off & saturation ✅  
c) Reverse bias  
d) None  
16. Load line represents:  
a) Relationship between V & I ✅  
b) Current only  
c) Voltage only

d) None  
17. Stability factor determines:  
a) BJT bias stability ✅  
b) Voltage  
c) Current  
d) Resistance  
18. Small signal model of BJT uses:  
a) h-parameters ✅  
b) Z-parameters  
c) Y-parameters  
d) None  
19. Voltage gain of CE amplifier:  
a) High ✅  
b) Low  
c) Zer o  
d) Negative  
20. Current gain of CE amplifier:  
a) High ✅  
b) Low  
c) Zero  
d) Negative  
21. Input impedance of CB amplifier:  
a) High  
b) Low ✅  
c) Medium  
d) Variable  
22. Output impedance of CE amplifier:  
a) Low  
b) High ✅  
c) Medium  
d) Variable  
23. Field effect transistor (FET) has:  
a) High input impedance ✅  
b) Low input impedance  
c) Medium  
d) Variable  
24. JFET gate is:  
a) Forward biased  
b) Reverse biased ✅  
c) Floating  
d) None  
25. MOSFET can be:

a) Depletion type ✅  
b) Enhancement type ✅  
c) Both ✅  
d) None  
26. FET operates on:  
a) Voltage contr ol ✅  
b) Current control  
c) Both  
d) None  
27. Diode’s knee voltage ~  
a) 0.7V for silicon ✅  
b) 0.3V for silicon  
c) 0.7V for germanium  
d) 0.3V for germanium  
28. Zener voltage is:  
a) Breakdown voltage ✅  
b) Forward voltage  
c) Knee voltage  
d) None  
29. Half-wave rectifier out put frequency =  
a) Input frequency  
b) Same as input ✅  
c) Twice input  
d) Half input  
30. Full-wave rectifier output frequency =  
a) Same as input  
b) Twice input ✅  
c) Half input  
d) None  
31. Capacitor filter removes:  
a) AC ripples ✅  
b) DC  
c) Voltage  
d) Current  
32. Diode re verse recovery time:  
a) Time to turn off ✅  
b) Time to turn on  
c) Forward voltage  
d) None  
33. Transistor as amplifier operates in:  
a) Cut -off  
b) Active ✅

c) Saturation  
d) Reverse  
34. Transistor as switch operates in:  
a) Active  
b) Cut -off & saturation ✅  
c) Reverse  
d) None  
35. BJT has:  
a) Base, emitter, collector ✅  
b) Gate, source, drain  
c) Emitter, collector  
d) None  
36. FET has:  
a) Base, collector, emitter  
b) Gate, source, drain ✅  
c) Input, output  
d) None  
37. MOSFET input impedance:  
a) Low  
b) Very high ✅  
c) Medium  
d) Variable  
38. Clipper removes:  
a) Part of waveform ✅  
b) Entire waveform  
c) DC  
d) AC  
39. Clamper shifts:  
a) DC level ✅  
b) AC level  
c) Both  
d) None  
40. Forward biased diode resistance:  
a) High  
b) Low ✅  
c) Infinite  
d) Zero  
41. Reverse biased diode leakage current:  
a) High  
b) Low ✅  
c) Zero  
d) Medium

42. Power dissipation in transistor:  
a) VCE × IC ✅  
b) VBE × IB  
c) IC × IB  
d) None  
43. CE amplifier phase shift:  
a) 0°  
b) 180° ✅  
c) 90°  
d) None  
44. CB amplifier phase shift:  
a) 0° ✅  
b) 180°  
c) 90°  
d) None  
45. CC amplifier phase shift:  
a) 0° ✅  
b) 180 °  
c) 90°  
d) None  
46. Small signal model helps determine:  
a) Gain ✅  
b) Impedance ✅  
c) Both ✅  
d) None  
47. Junction diode symbol:  
a) Triangle → line ✅  
b) Line → triangle  
c) Circle  
d) Square  
48. Zener diode symbol:  
a) Line with bent bar ✅  
b) Triangle → line  
c) Circle  
d) Square  
49. Half-wave rectifier uses:  
a) Transformer ✅  
b) Diode ✅  
c) Capacitor ✅  
d) All ✅  
50. Full-wave rectifier bridge has:  
a) 2 diodes

b) 4 diodes ✅  
c) 3 diodes  
d) 1 diode  
51. Peak inverse voltage (PIV) in diode:  
a) Max reverse voltage ✅  
b) Forward voltage  
c) Average voltage  
d) None  
52. Transistor cutoff:  
a) IB=0 ✅  
b) IC=0  
c) VCE small  
d) Active  
53. Transistor saturation:  
a) VCE≈0 ✅  
b) IC≈0  
c) IB≈0  
d) Active  
54. JFET operates:  
a) Forward biased ✅  
b) Reverse biased  
c) Zero bias  
d) None  
55. MOSFET enhancement mode needs:  
a) Gate voltage ✅  
b) Gate current  
c) Source voltage  
d) Drain voltage  
56. MOSFET depletion mode:  
a) Naturally conducting ✅  
b) Needs gate voltage  
c) Switch off  
d) None  
57. Load line intersects:  
a) DC and AC curves ✅  
b) Input curve  
c) Output curve  
d) None  
58. Diode cut -in voltage:  
a) Minimum voltage to conduct ✅  
b) Maximum  
c) Zero

d) Infinite  
59. Voltage multiplier uses:  
a) Diodes & capacitors ✅  
b) Transistors  
c) Resistors  
d) Inductors  
60. Zener regulator provides:  
a) Constant voltage ✅  
b) Constant current  
c) Constant resistance  
d) None  
Microprocessor & Interfacing (~60 MCQ)  
1. Microprocessor is:  
a) A software  
b) Central processing unit on a single chip ✅  
c) Memory chip  
d) Input device  
2. Difference between microprocessor and microcontroller:  
a) Microprocessor lacks RAM/ROM ✅  
b) Microcontroller has built -in RAM/ROM ✅  
c) Both a & b ✅  
d) None  
3. 8086/8088 belongs to:  
a) 4-bit family  
b) 8-bit family  
c) 16 -bit family ✅  
d) 32 -bit family  
4. 8086 has:  
a) 8-bit data bus  
b) 16 -bit data bus ✅  
c) 32 -bit data bu s  
d) 64 -bit data bus  
5. Memory segmentation in 8086:  
a) Code, data, stack, extra ✅  
b) Input, output  
c) Registers only  
d) None  
6. Instruction set of 8086 contains:  
a) Data transfer ✅  
b) Arithmetic ✅  
c) Logical ✅  
d) All ✅

7. Addressing mode specifies:  
a) How to acces s operands ✅  
b) Data size  
c) Clock  
d) Power  
8. Immediate addressing uses:  
a) Constant value ✅  
b) Memory address  
c) Register  
d) Input  
9. Register addressing uses:  
a) CPU register ✅  
b) Memory  
c) Input  
d) Constant  
10. Direct addressing uses:  
a) Memory address ✅  
b) Regi ster  
c) Immediate  
d) Port  
11. Indirect addressing uses:  
a) Register contains address ✅  
b) Memory contains address  
c) Immediate  
d) Port  
12. Single -processor system has:  
a) One CPU ✅  
b) Multiple CPUs  
c) None  
d) All  
13. Multi -processor system:  
a) One CPU  
b) Multiple CPUs ✅  
c) None  
d) All  
14. Assembler converts:  
a) Assembly → Machine code ✅  
b) High -level → Assembly  
c) Machine → Assembly  
d) None  
15. Debugger is used for:  
a) Detecting errors ✅

b) Writing code  
c) Compiling  
d) Executing only  
16. 8255A is:  
a) Programmable Peripheral Interf ace ✅  
b) Timer  
c) DMA  
d) Memory  
17. 8254 is:  
a) Programmable interval timer ✅  
b) PPI  
c) Interrupt controller  
d) UART  
18. Keyboard interfacing can be done via:  
a) 8255 ✅  
b) 8254  
c) 8259  
d) DMA  
19. LCD interfacing uses:  
a) 8255 ✅  
b) 8254  
c) 8259  
d) None  
20. Printer interfac ing uses:  
a) Parallel ✅  
b) Serial  
c) Both ✅  
d) None  
21. Stepper motor interfacing:  
a) 8255 ✅  
b) 8259  
c) 8254  
d) None  
22. A/D converter converts:  
a) Analog → Digital ✅  
b) Digital → Analog  
c) Voltage  
d) Current  
23. D/A converter converts:  
a) Analog → Digital  
b) Digital → Analog ✅  
c) Both

d) None  
24. 8259A is:  
a) Programmable interrupt controller ✅  
b) Timer  
c) PPI  
d) DMA  
25. Interrupt vector table stores:  
a) Addresses of interrupt routines ✅  
b) Data  
c) Instructions  
d) None  
26. DMA stands for:  
a) Direct Memory Access ✅  
b) Dynamic Memory Access  
c) Dual Memory Access  
d) Data Memory Access  
27. Serial communication can be:  
a) Synchronous ✅  
b) Asynchronous ✅  
c) Both ✅  
d) None  
28. EIA RS232 is:  
a) Physical communication standard ✅  
b) Protocol  
c) Memory  
d) Timer  
29. Microprocessor clock controls:  
a) Instruction timing ✅  
b) Data  
c) Voltage  
d) Current  
30. Bus demultiplexer separates:  
a) Address & data lines ✅  
b) Input lines  
c) Output lines  
d) Power  
31. Bus controller manages:  
a) Data transfer ✅  
b) Instruction fetch  
c) Clock  
d) None  
32. Programmed I/O means:

a) CPU actively polls ✅  
b) CPU interrupts  
c) DMA  
d) None  
33. Interrupt driven I/O:  
a) CPU waits  
b) CPU responds to interrupt ✅  
c) CPU ignores  
d) None  
34. Parallel I/O port transfers:  
a) 1 bit  
b) Multiple bits simultaneously ✅  
c) Serially  
d) None  
35. SRAM stands for:  
a) Static RAM ✅  
b) Serial RAM  
c) Synchronous RAM  
d) None  
36. EEPROM stands for:  
a) Electrically Erasable Programmable ROM ✅  
b) RAM  
c) Flash  
d) None  
37. Clock generator produces:  
a) Timing pulses ✅  
b) Data  
c) Instructions  
d) None  
38. Stepper m otor moves in:  
a) Continuous rotation  
b) Steps ✅  
c) Random  
d) None  
39. Timer applications include:  
a) Delay ✅  
b) Event counting ✅  
c) Pulse generation ✅  
d) All ✅  
40. Asynchronous serial communication uses:  
a) Start & stop bits ✅  
b) Clock

c) Both  
d) None  
41. Microproces sor I/O address decoding ensures:  
a) Correct device access ✅  
b) Timing  
c) Speed  
d) None  
42. Interrupt vector points to:  
a) Interrupt routine ✅  
b) Main program  
c) Data  
d) Timer  
43. Single -step execution helps in:  
a) Debugging ✅  
b) Speeding  
c) Storage  
d) Communicati on  
44. Flag registers store:  
a) Status ✅  
b) Data  
c) Address  
d) Control  
45. Carry flag is set when:  
a) Addition exceeds limit ✅  
b) Subtraction negative  
c) Overflow  
d) Zero  
46. Zero flag is set when:  
a) Result = 0 ✅  
b) Result > 0  
c) Carry occurs  
d) None  
47. Sign flag indica tes:  
a) Positive/negative ✅  
b) Zero  
c) Carry  
d) Overflow  
48. Parity flag checks:  
a) Even/odd bits ✅  
b) Zero  
c) Carry  
d) Sign

49. Program counter stores:  
a) Next instruction address ✅  
b) Current instruction  
c) Data  
d) Stack pointer  
50. Stack pointer points to:  
a) Top o f stack ✅  
b) Bottom  
c) Memory  
d) None  
51. PUSH instruction:  
a) Store in stack ✅  
b) Retrieve from stack  
c) Clear stack  
d) None  
52. POP instruction:  
a) Store  
b) Retrieve ✅  
c) Clear  
d) None  
53. Software interrupt generated by:  
a) Instruction ✅  
b) External device  
c) Timer  
d) DMA  
54. Hardware interrupt generated by:  
a) Device ✅  
b) Instruction  
c) Program  
d) Memory  
55. Instruction cycle includes:  
a) Fetch ✅  
b) Decode ✅  
c) Execute ✅  
d) All ✅  
56. Data bus width determines:  
a) Data size per transfer ✅  
b) Address  
c) Instruction  
d) Clock  
57. Address bus width determines:  
a) Maximum memory accessible ✅

b) Data size  
c) Instruction size  
d) Clock  
58. Control signals include:  
a) RD, WR ✅  
b) ALE ✅  
c) INTA ✅  
d) All ✅  
59. Microprocessor interfacing requires:  
a) Address decoding ✅  
b) Timing  
c) Data bus  
d) All ✅  
60. Multi -processor system advantage:  
a) High speed ✅  
b) Parallel processing ✅  
c) Reliability ✅  
d) All ✅  
Communication Theory (~50 MCQ)  
1. Fourier series represents:  
a) Continuous signals ✅  
b) Discrete signals  
c) Both  
d) None  
2. Fourier transform converts:  
a) Time → Frequency ✅  
b) Frequency → Time  
c) Voltage → Current  
d) None  
3. Convolution in time domain equals:  
a) Multiplication in frequency domain ✅  
b) Addition  
c) Subtraction  
d) Division  
4. Parseval’s theorem relates:  
a) Energy in time & frequency ✅  
b) Power  
c) Voltage  
d) Current  
5. Entropy in information theory measures:  
a) Uncertainty ✅

b) Speed  
c) Bandwidth  
d) Amplitude  
6. Shannon’s theorem gives:  
a) Maximum channel capacity ✅  
b) Minimum noise  
c) Maximum power  
d) None  
7. Channel capacity depends on:  
a) Bandwidth ✅  
b) Signal -to-noise ratio ✅  
c) Both ✅  
d) None  
8. Analog modulation includes:  
a) AM ✅  
b) FM ✅  
c) PM ✅  
d) All ✅  
9. AM stands for:  
a) Amplitude Modulation ✅  
b) Angular Modulation  
c) Analog Modulation  
d) None  
10. FM stands for:  
a) Frequency Modulation ✅  
b) Phase Modulation  
c) Amplitude Modulation  
d) None  
11. PM stands for:  
a) Phase Modulation ✅  
b) Frequency Modulation  
c) Amplitude Modulation  
d) None  
12. Modulation purpose:  
a) Efficient transmission ✅  
b) Amplification  
c) Rectification  
d) None  
13. Demodulation recovers:  
a) Original signal ✅  
b) Noise  
c) Carrier

d) None  
14. Pulse Amplitude Modulation (PAM) uses:  
a) Amplitude of pulses ✅  
b) Frequency  
c) Phase  
d) None  
15. Pulse Code Modulation (PCM) is:  
a) Digital modulation ✅  
b) Analog modulation  
c) Hybrid  
d) None  
16. Delta modulation (DM) encodes:  
a) Di fference between samples ✅  
b) Absolute value  
c) Average  
d) None  
17. Adaptive delta modulation (ADM) adjusts:  
a) Step size ✅  
b) Frequency  
c) Phase  
d) None  
18. Time -Division Multiplexing (TDM) divides:  
a) Time slots ✅  
b) Frequency  
c) Phase  
d) None  
19. Frequency -Division Multiplexing (FDM) divides:  
a) Frequency ✅  
b) Time  
c) Phase  
d) None  
20. TDMA is:  
a) Time -division multiple access ✅  
b) Frequency -division  
c) Code -division  
d) None  
21. FDMA is:  
a) Time -division  
b) Frequency -division multiple access ✅  
c) Code -division  
d) None  
22. CDMA uses:

a) Codes to separate users ✅  
b) Time slots  
c) Frequency bands  
d) None  
23. Nyquist sampling theorem states:  
a) Fs ≥ 2 × fmax ✅  
b) Fs < fmax  
c) Fs = fmax  
d) None  
24. Aliasing occurs if:  
a) Fs < 2 × fmax ✅  
b) Fs ≥ 2 × fmax  
c) Fs = 2 × fmax  
d) None  
25. SNR stands for:  
a) Signal -to-Noise Ratio ✅  
b) Signal -to-Number  
c) Sound -to-Noise  
d) None  
26. Power spectrum represents:  
a) Distribution of power over frequency ✅  
b) Time  
c) Amplitude  
d) None  
27. Baseband signal is:  
a) Original signal ✅  
b) Modulated signal  
c) Carrier  
d) None  
28. Bandpass signal is:  
a) Centered around carrier ✅  
b) Original signal  
c) Noise  
d) None  
29. AM modulated signal has:  
a) Carrier + sidebands ✅  
b) Carrier only  
c) Sidebands only  
d) None  
30. FM bandwidth depends on:  
a) Frequency deviation ✅  
b) Amplitude

c) Phase  
d) None  
31. PM bandwidth depends on:  
a) Phase deviation ✅  
b) Frequency  
c) Amplitude  
d) None  
32. Coherent detection used for:  
a) AM demodulation ✅  
b) FM  
c) PM  
d) None  
33. Envelope detection used for:  
a) AM ✅  
b) FM  
c) PM  
d) None  
34. Multiplexing purpose:  
a) Efficient utiliz ation ✅  
b) Amplification  
c) Modulation  
d) None  
35. Information rate formula:  
a) R = H × symbols/sec ✅  
b) R = H × f  
c) R = P × t  
d) None  
36. Signal bandwidth affects:  
a) Data rate ✅  
b) Power  
c) Voltage  
d) None  
37. Noise degrades:  
a) SNR ✅  
b) Bandwidth  
c) Time  
d) None  
38. Shannon capacity formula:  
a) C = B log2(1 + S/N) ✅  
b) C = B × S/N  
c) C = B / S/N  
d) None

39. Analog vs digital communication:  
a) Analog continuous ✅  
b) Digital discrete ✅  
c) Both correct ✅  
d) None  
40. Multiplexing reduces:  
a) Number of channels ✅  
b) Bandwidth  
c) Noise  
d) None  
41. Demultiplexer separates:  
a) Combined signals ✅  
b) Carrier  
c) Modulation  
d) None  
42. Fourier series uses:  
a) Sin & cos ✅  
b) Exponential only  
c) Step function  
d) None  
43. Power spectrum integral =  
a) Signal energy ✅  
b) Noise  
c) Bandwidth  
d) None  
44. Pulse duration affects:  
a) Bandwidth ✅  
b) Power  
c) Noise  
d) None  
45. PCM uses:  
a) Sampling ✅  
b) Quantization ✅  
c) Encoding ✅  
d) All ✅  
46. Delta modulation advantage:  
a) Simple ✅  
b) Requires low bandwidth ✅  
c) Adaptive possible ✅  
d) All ✅  
47. CDMA allows:

a) Multiple use rs ✅  
b) Single user  
c) Only one channel  
d) None  
48. Nyquist rate =  
a) 2 × fmax ✅  
b) fmax  
c) fmax / 2  
d) None  
49. Pulse shaping reduces:  
a) Inter -symbol interference ✅  
b) Noise  
c) Bandwidth  
d) None  
50. Communication system goal:  
a) Reliable data transfer ✅  
b) Maximum n oise  
c) Minimum bandwidth  
d) None  
Computer Networking & Security (~60 MCQ)  
1. Protocol hierarchy defines:  
a) Layered communication ✅  
b) Hardware only  
c) Software only  
d) None  
2. Data link layer provides:  
a) Reliable link ✅  
b) Routing  
c) Application  
d) Transport  
3. HLDC stands for:  
a) High -Level Data Link Control ✅  
b) High -Level Device Control  
c) Hardware Link Device Control  
d) None  
4. LAN protocols include:  
a) IEEE 802.3 ✅  
b) IEEE 802.11 ✅  
c) Both ✅  
d) None  
5. Hub operates at:  
a) Physical layer ✅

b) Data link  
c) Network  
d) Transport  
6. Switch operates at:  
a) Physical  
b) Data link ✅  
c) Network  
d) Transport  
7. Bridge connects:  
a) Two LANs ✅  
b) Two computers  
c) Router  
d) None  
8. FDDI uses:  
a) Fiber optic ✅  
b) Copper  
c) Wireless  
d) None  
9. Fast Ethernet speed:  
a) 10 Mbps  
b) 100 Mbps ✅  
c) 1 Gbps  
d) 10 Gbps  
10. Routing algorithm decides:  
a) Path selection ✅  
b) Bandwidth  
c) Speed  
d) None  
11. Congestion control prevents:  
a) Network overload ✅  
b) Data loss  
c) Security  
d) None  
12. Internetworking involves:  
a) Connecting LANs/WANs ✅  
b) Hardware onl y  
c) Software only  
d) None  
13. Fragmentation occurs when:  
a) Packet > MTU ✅  
b) Packet < MTU  
c) Router fails

d) None  
14. Firewall purpose:  
a) Network security ✅  
b) Routing  
c) Switching  
d) None  
15. IPV4 address length:  
a) 32 bits ✅  
b) 64 bits  
c) 128 bits  
d) 16 bits  
16. IPV6 address length:  
a) 32 bits  
b) 64 bits  
c) 128 bits ✅  
d) 16 bits  
17. ARP resolves:  
a) IP → MAC ✅  
b) MAC → IP  
c) Port → IP  
d) None  
18. RARP resolves:  
a) MAC → IP ✅  
b) IP → MAC  
c) Port → IP  
d) None  
19. Mobile IP enables:  
a) Device mobility ✅  
b) Routing  
c) Switching  
d) None  
20. Transport protocol for reliable communication:  
a) TCP ✅  
b) UDP  
c) ICMP  
d) None  
21. TCP provides:  
a) Connection -oriented ✅  
b) Error checking ✅  
c) Flow control ✅  
d) All ✅  
22. UDP provides:

a) Connectionless ✅  
b) No guarantee ✅  
c) Both ✅  
d) None  
23. AAL of ATM:  
a) Adaptation layer ✅  
b) Application layer  
c) Transport layer  
d) None  
24. Network security includes:  
a) Cryptography ✅  
b) Authentication ✅  
c) Digital signatures ✅  
d) All ✅  
25. DES stands for:  
a) Data Encryption Standard ✅  
b) Digital Encryption Standard  
c) Data Encoding System  
d) None  
26. IDEA stands for:  
a) International Data Encryption Algorithm ✅  
b) Data Encryption Algorithm  
c) Information Encoding  
d) None  
27. Public key algorithm uses:  
a) Two keys ✅  
b) One key  
c) Both  
d) None  
28. Authentication ensures:  
a) Identity verification ✅  
b) Data transfer  
c) Speed  
d) None  
29. Digital signature ensures:  
a) Authentication ✅  
b) Integrity ✅  
c) Both ✅  
d) None  
30. Gigabit Ethernet speed:  
a) 100 Mbps

b) 1 Gbps ✅  
c) 10 Gbps  
d) None  
31. DNS resolves:  
a) Domain → IP ✅  
b) IP → Domain  
c) MAC → IP  
d) None  
32. Name servers store:  
a) Domain name info ✅  
b) IP only  
c) MAC only  
d) None  
33. Email privacy is ensured by:  
a) Encryption ✅  
b) Routing  
c) Firewall  
d) None  
34. SNMP stands for:  
a) Simple Network Management Protocol ✅  
b) Secure Network  
c) Standard Ne twork  
d) None  
35. HTTP operates at:  
a) Application layer ✅  
b) Transport  
c) Network  
d) Data link  
36. HTTPS ensures:  
a) Secure HTTP ✅  
b) Fast HTTP  
c) Normal HTTP  
d) None  
37. LAN uses:  
a) Ethernet ✅  
b) FDDI ✅  
c) Both ✅  
d) None  
38. WAN connects:  
a) Large area networks ✅  
b) Si ngle computer  
c) Router only

d) None  
39. Fragmentation handled by:  
a) Network layer ✅  
b) Transport  
c) Data link  
d) None  
40. IPV4 provides:  
a) 4 billion addresses ✅  
b) 1 billion  
c) 128 bit  
d) None  
41. IPV6 provides:  
a) 128 -bit address ✅  
b) 32 -bit  
c) 64 -bit  
d) None  
42. TCP uses:  
a) Three -way handshake ✅  
b) UDP  
c) ICMP  
d) None  
43. UDP uses:  
a) No handshake ✅  
b) Handshake  
c) Connection -oriented  
d) None  
44. Firewalls can be:  
a) Packet filtering ✅  
b) Proxy ✅  
c) Both ✅  
d) None  
45. Cryptography converts:  
a) Plaintext → Ciphertext ✅  
b) Ciphert ext → Plaintext  
c) Data only  
d) None  
46. VPN ensures:  
a) Secure private network ✅  
b) Open network  
c) LAN only  
d) None  
47. Transport layer manages:

a) End -to-end communication ✅  
b) Node -to-node  
c) Data link  
d) Physical  
48. ARP used in:  
a) Local network ✅  
b) Internet  
c) WAN  
d) None  
49. RARP used to:  
a) Assign IP from MAC ✅  
b) Assign MAC  
c) DNS  
d) None  
50. ICMP used for:  
a) Error reporting ✅  
b) Data transfer  
c) Encryption  
d) None  
51. SMTP used for:  
a) Sending emails ✅  
b) Receiving emails  
c) Browsing  
d) None  
52. POP3 used for:  
a) Receiving emails ✅  
b) Sending emails  
c) Browsing  
d) None  
53. IMAP used for:  
a) Receiving emails ✅  
b) Sending  
c) Browsing  
d) None  
54. VPN tunnel provides:  
a) Encrypted path ✅  
b) Open path  
c) Wireless path  
d) None  
55. Network congestion occurs due to:  
a) Excessive tr affic ✅  
b) Low traffic

c) Short cable  
d) None  
56. Routing algorithms include:  
a) Distance vector ✅  
b) Link state ✅  
c) Both ✅  
d) None  
57. MAC address is:  
a) Hardware address ✅  
b) IP address  
c) Domain name  
d) None  
58. IPv4 address written in:  
a) Dot -decimal ✅  
b) Hex  
c) Binary only  
d) None  
59. IPv6 address written in:  
a) Hexadecimal ✅  
b) Decimal  
c) Binary  
d) None  
60. Network layer provides:  
a) Logical addressing ✅  
b) Physical addressing  
c) Transport  
d) Application