

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 energy 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 fields c) Quantum particles d) Wave propagation in air only 7. The speed of light in vacuum is: a) 3×10^8 m/s b) 3×10^{10} m/s c) 3×10^8 m/s d) 3×10^{10} 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 / ϵ_0 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) Kirchhoff's law 19. Unit of magnetic flux is: a) Tesla b) Weber c) Ampere d) Henry 20. Lorentz force acts on: a) Stationary charge 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) $\frac{1}{2} CV^2$ b) CV^2 c) $2CV^2$ d) C/V^2 23. Inductor opposes: a) Voltage b) Current change c) Resistance 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) hf^2 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 formula is: a) $\lambda_c = h/mc$ b) $\lambda_c = mc/h$ c) $\lambda_c = h^2/m$ d) $\lambda_c = h/m$ 38. X-ray wavelength is in the range: a) $0.01 \text{ to } 10 \text{ nm}$ b) $1 \text{ to } 100 \text{ fm}$ c) $100 \text{ to } 1000 \text{ nm}$ d) $10 \text{ to } 100 \text{ cm}$ 39. Electromagnetic spectrum order (low to high frequency): a) Radio, Microwave, IR, Visible, UV, X-ray, Gamma 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) 3×10^8 m/s b) 3×10^{10} m/s c) 3×10^8 m/s d) 3×10^{10} 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) $E = hf^2$ 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) Particle 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 Bohr 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) $\Delta x \Delta p \geq \hbar/2$ b) $\Delta x \Delta p \geq \hbar/2$ c) $\Delta x \Delta p \geq \hbar/2$ d) $\Delta x \Delta p \geq \hbar/2$ 58. Group velocity < Phase velocity in: a) Normal 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. Antinode is point of: a) Maximum amplitude b) Zero amplitude c) Half amplitude d) Random amplitude 62. EM wave energy density: a) $u = \frac{1}{2} \epsilon_0 E^2$ b) $u = \frac{1}{4} \epsilon_0 E^2$ 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 \hat{E} ... b) Non-zero c) Depends on shape d) Depends on charge

68. Magnetic permeability of free space: a) $4\pi \times 10^{-7} \text{ H/m}$... b) $8.85 \times 10^{-12} \text{ F/m}$ c) 1 H/m d) 0 69. Magnetic flux $\hat{I}_1 = B \cdot A \cos \hat{I}$, \hat{I} 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) $f = 1/(2\pi \sqrt{LC})$... b) $f = 2\pi \sqrt{LC}$ c) $f = \sqrt{LC}$ d) $f = 1/(LC)$ Introduction 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 software 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 generation 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 logic 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) Multiple 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 \hat{I} to Analog b) Human data \hat{I} to Digital... c) Digital \hat{I} to Human readable d) None 47. Output devices convert: a) Digital \hat{I} to Analog b) Digital \hat{I} to Human readable... c) Analog \hat{I} to Digital d) None 48. Primary memory is:

a) Volatile... b) Non-volatile c) Permanent d) Secondary 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 \hat{I} ENIAC \hat{I} 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) Automatic 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 device 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) $P = IV$ c) $I = V/P$ d) $V = I^2 R$ 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) $P = V^2/R$... c) $P = I^2 R$... d) All of the above 7. Voltage divider formula: a) $V_x = V(R_x/R_{total})$... b) $V_x = IR$ c) $V_x = V/R$ d) $V_x = IR^2$ 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 source and series resistor c) Current source and series resistor d) Voltage source and parallel resistor 11. Maximum power transfer occurs when: a) Load $R = \text{Source } R$ b) Load $R > \text{Source } R$ c) Load $R < \text{Source } R$ 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) $1/C_{eq} = 1/C_1 + 1/C_2 + \dots$ b) $C_{eq} = 1/C_1 + 1/C_2 + \dots$ c) $C_{eq} = 1/C_1 C_2$ d) $C_{eq} = 1/(1/C_1 + 1/C_2)$ 19. Capacitors in parallel: a) $C_{eq} = 1/C_1 + 1/C_2 + \dots$ b) $1/C_{eq} = 1/C_1 + 1/C_2 + \dots$ c) $C_{eq} = 1/C_1 C_2$ d) $C_{eq} = \text{None}$ 20. Inductors in series: a) $L_{eq} = 1/L_1 + 1/L_2 + \dots$ b) $1/L_{eq} = 1/L_1 + 1/L_2 + \dots$ c) $L_{eq} = 1/L_1 L_2$ d) $L_{eq} = \text{None}$ 21. Inductors in parallel: a) $L_{eq} = 1/L_1 + 1/L_2 + \dots$ b) $1/L_{eq} = 1/L_1 + 1/L_2 + \dots$ c) $L_{eq} = 1/L_1 L_2$ d) $L_{eq} = \text{None}$

22. RLC series circuit resonance condition: a) $X_L = X_C$ b) $X_L > X_C$ c) $X_L < X_C$ d) $R = 0$ 23. Reactance of inductor: a) $X_L = 2\pi f L$ b) $X_L = 1/(2\pi f L)$ c) $X_L = L/f$ d) $X_L = 1/L$ 24. Reactance of capacitor: a) $X_C = 1/(2\pi f C)$ b) $X_C = 2\pi f C$ c) $X_C = 1/C$ d) $X_C = 2C$ 25. Impedance of series RLC: a) $Z = \sqrt{R^2 + (X_L - X_C)^2}$ b) $Z = R + X_L + X_C$ c) $Z = R/(X_L - X_C)$ d) $Z = R^2 + L^2 + C^2$ 26. Power factor $\cos \phi$, ϕ is: a) Phase difference between voltage and current b) Voltage c) Current d) Resistance 27. Energy stored in inductor: a) $W = \frac{1}{2} L I^2$ b) $W = \frac{1}{2} C V^2$ c) $W = I^2 R$ d) $W = V I$ 28. Energy stored in capacitor: a) $W = \frac{1}{2} C V^2$ b) $W = \frac{1}{2} L I^2$ c) $W = V I$ d) $W = I^2 R$ 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 to Current source + parallel R b) Current source + parallel R to Voltage source + series R c) Both a & b d) None 32. Dependent source is: a) Independent voltage b) Controlled by another circuit variable c) Uncontrolled 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) $\tau = RC$ b) $\tau = L/R$ c) $\tau = R/L$ d) $\tau = 1/RC$ 36. Time constant of RL circuit: a) $\tau = RC$ b) $\tau = L/R$ c) $\tau = R/L$ d) $\tau = 1/L$ 37. For AC series RLC, resonance frequency: a) $f = 1/(2\pi\sqrt{LC})$ b) $f = \sqrt{LC}$ c) $f = 2\pi\sqrt{LC}$ 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) I_{max} b) $I_{max}/\sqrt{2}$ c) $I_{max}/2$ d) $\sqrt{2} I_{max}$ 41. RMS value of sinusoidal voltage: a) V_{max} b) $V_{max}/\sqrt{2}$ c) $V_{max}/2$ d) $\sqrt{2} V_{max}$ 42. Average power in AC circuit: a) $V_{rms} I_{rms} \cos \phi$ b) $V_{rms} I_{rms} \sin \phi$ c) $V_{rms} I_{rms}$ d) $I_{rms}^2 R$ 43. Impedance in series AC circuit: a) $Z = R + j(X_L - X_C)$ b) $Z = R + X_L + X_C$ c) $Z = R + 1/(X_L - X_C)$ d) $Z = R^2 + (X_L - X_C)^2$ 44. Admittance $Y =$ a) $1/Z$ b) Z/C c) R/Z d) Z/R 45. Phase angle $\phi =$ a) $\tan^{-1}((X_L - X_C)/R)$ b) $\tan^{-1}(R/(X_L - X_C))$ c) $\cos^{-1}((X_L - X_C)/R)$ d) $\sin^{-1}((X_L - X_C)/R)$ 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) $V_m/\sqrt{2}$ b) $V_m/\sqrt{3}$ c) $V_m/2$ d) V_m 49. In AC circuits, instantaneous power: a) $p = v i$ b) $p = i^2 R$ c) $p = v^2/R$ d) $p = V_{avg} I_{avg}$ 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) $I^2 R$ b) V^2/R c) $V I$ 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 circuit at resonance: a) Impedance minimum b) Impedance maximum c) Current maximum d) Voltage zero

55. Quality factor $Q =$ a) X_L/R b) X_C/R c) R/X_L d) R/X_C 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) $1 \rightarrow 0, 0 \rightarrow 1$ b) $1 \rightarrow 1, 0 \rightarrow 0$ c) $1 \rightarrow 1, 0 \rightarrow 1$ d) None 5. De Morgan's theorem states: a) $(A \cdot B)^c = A^c + B^c$ b) $(A + B)^c = A^c \cdot B^c$ c) $(A + B)^c = A^c B^c$ 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) Multiplexing 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. Demultiplexer converts: a) 1 input to many outputs b) Many inputs to 1 output c) OR operation d) AND operation 16. Decoder converts: a) n inputs to 2^n outputs b) 2^n inputs to n outputs c) n outputs to n inputs d) None 17. Encoder converts: a) 2^n inputs to n outputs b) n inputs to 2^n 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) Current 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 for: 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 circuit 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 count b) Power consumption c) Complexity d) All

37. XOR gate is equivalent to: a) $A \oplus B$ b) $AB + A\bar{B}$ c) $A + B$ d) $A \cdot B$ 38. XNOR gate is equivalent to: a) $AB + A\bar{B}$ b) $A\bar{B} + AB$ c) $A + B$ d) $A \cdot B$ 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) 2^n c) n^2 d) $2n$ 42. Number of maxterms for n variables: a) n b) 2^n c) n^2 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) Ring 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 to 7 b) 0 to 15 c) 0 to 31 d) 0 to 63 53. 3-bit synchronous counter max count: a) 7 b) 8 c) 15 d) 16 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 number 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-triggered 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. Reverse 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 configuration 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) Zero 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 control b) Current control c) Both d) None 27. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 28.

29. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 30. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 31. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 32. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 33. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 34. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 35. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 36. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 37. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 38. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 39. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 40. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 41. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 42. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 43. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 44. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 45. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 46. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 47. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 48. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 49. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 50. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 51. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 52. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 53. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 54. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 55. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 56. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 57. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 58. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 59. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 60. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 61. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 62. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 63. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 64. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 65. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 66. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 67. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 68. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 69. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 70. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 71. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 72. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 73. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 74. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 75. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 76. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 77. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 78. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 79. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 80. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 81. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 82. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 83. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 84. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 85. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 86. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 87. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 88. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 89. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 90. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 91. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 92. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 93. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 94. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 95. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 96. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 97. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 98. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 99. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium 100. Diode knee voltage ~ a) 0.7V for silicon b) 0.3V for silicon c) 0.7V for germanium d) 0.3V for germanium

Zener voltage is: a) Breakdown voltage â€¦ b) Forward voltage c) Knee voltage d) None 29. Half-wave rectifier out put frequency = a) Input frequency b) Same as input â€¦ c) Twice input d) Half input 30. Full-wave rectifier output frequency = a) Same as input b) Twice input â€¦ c) Half input d) None 31. Capacitor filter removes: a) AC ripples â€¦ b) DC c) Voltage d) Current 32. Diode reverse recovery time: a) Time to turn off â€¦ b) Time to turn on c) Forward voltage d) None 33. Transistor as amplifier operates in: a) Cut -off b) Active â€¦ c) Saturation d) Reverse 34. Transistor as switch operates in: a) Active b) Cut -off & saturation â€¦ c) Reverse d) None 35. BJT has: a) Base, emitter, collector â€¦ b) Gate, source, drain c) Emitter, collector d) None 36. FET has: a) Base, collector, emitter b) Gate, source, drain â€¦ c) Input, output d) None 37. MOSFET input impedance: a) Low b) Very high â€¦ c) Medium d) Variable 38. Clipper removes: a) Part of waveform â€¦ b) Entire waveform c) DC d) AC 39. Clamper shifts: a) DC level â€¦ b) AC level c) Both d) None 40. Forward biased diode resistance: a) High b) Low â€¦ c) Infinite d) Zero 41. Reverse biased diode leakage current: a) High b) Low â€¦ c) Zero d) Medium

42. Power dissipation in transistor: a) $V_{CE} \times I_C$ â€¦ b) $V_{BE} \times I_B$ c) $I_C \times I_B$ d) None 43. CE amplifier phase shift: a) 0° b) 180° â€¦ c) 90° d) None 44. CB amplifier phase shift: a) 0° â€¦ b) 180° c) 90° d) None 45. CC amplifier phase shift: a) 0° â€¦ b) 180° c) 90° d) None 46. Small signal model helps determine: a) Gain â€¦ b) Impedance â€¦ c) Both â€¦ d) None 47. Junction diode symbol: a) Triangle â†’ line â€¦ b) Line â†’ triangle c) Circle d) Square 48. Zener diode symbol: a) Line with bent bar â€¦ b) Triangle â†’ line c) Circle d) Square 49. Half-wave rectifier uses: a) Transformer â€¦ b) Diode â€¦ c) Capacitor â€¦ d) All â€¦ 50. Full-wave rectifier bridge has: a) 2 diodes b) 4 diodes â€¦ c) 3 diodes d) 1 diode 51. Peak inverse voltage (PIV) in diode: a) Max reverse voltage â€¦ b) Forward voltage c) Average voltage d) None 52. Transistor cutoff: a) $I_B=0$ â€¦ b) $I_C=0$ c) V_{CE} small d) Active 53. Transistor saturation: a) $V_{CE} \approx 0$ â€¦ b) $I_C \approx 0$ c) $I_B \approx 0$ d) Active 54. JFET operates: a) Forward biased â€¦ b) Reverse biased c) Zero bias d) None 55. MOSFET enhancement mode needs: a) Gate voltage â€¦ b) Gate current c) Source voltage d) Drain voltage 56. MOSFET depletion mode: a) Naturally conducting â€¦ b) Needs gate voltage c) Switch off d) None 57. Load line intersects: a) DC and AC curves â€¦ b) Input curve c) Output curve d) None 58. Diode cut -in voltage: a) Minimum voltage to conduct â€¦ b) Maximum c) Zero d) Infinite 59. Voltage multiplier uses: a) Diodes & capacitors â€¦ b) Transistors c) Resistors d) Inductors 60. Zener regulator provides: a) Constant voltage â€¦ 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 â€¦ c) Memory chip d) Input device 2. Difference between microprocessor and microcontroller: a) Microprocessor lacks RAM/ROM â€¦ b) Microcontroller has built -in RAM/ROM â€¦ c) Both a & b â€¦ d) None 3. 8086/8088 belongs to: a) 4-bit family b) 8-bit family c) 16 -bit family â€¦ d) 32 -bit family 4. 8086 has: a) 8-bit data bus b) 16 -bit data bus â€¦ c) 32 -bit data bus d) 64 -bit data bus 5. Memory segmentation in 8086: a) Code, data, stack, extra â€¦ b) Input, output c) Registers only d) None 6. Instruction set of 8086 contains: a) Data transfer â€¦ b) Arithmetic â€¦ c) Logical â€¦ d) All â€¦

7. Addressing mode specifies: a) How to access operands â€¦ b) Data size c) Clock d) Power 8. Immediate addressing uses: a) Constant value â€¦ b) Memory address c) Register d) Input 9. Register addressing uses: a) CPU register â€¦ b) Memory c) Input d) Constant 10. Direct addressing uses: a) Memory address â€¦ b) Register c) Immediate d) Port 11. Indirect addressing uses: a) Register contains address â€¦ b) Memory contains address c) Immediate d) Port 12. Single -processor system has: a) One CPU â€¦ b) Multiple CPUs c) None d) All 13. Multi -processor system: a) One CPU b) Multiple CPUs â€¦ c) None d) All 14. Assembler converts: a) Assembly â†’ Machine code â€¦ b) High -level â†’ Assembly c) Machine â†’ Assembly d) None 15. Debugger is used for: a) Detecting errors â€¦ b) Writing code c) Compiling d) Executing only 16. 8255A is: a) Programmable Peripheral Interface â€¦ b) Timer c) DMA d) Memory 17. 8254 is: a) Programmable interval timer â€¦ b) PPI c) Interrupt controller d) UART 18. Keyboard interfacing can be done via: a) 8255 â€¦ b) 8254 c) 8259 d) DMA 19. LCD interfacing uses: a) 8255 â€¦ b) 8254 c) 8259 d) None 20. Printer interfacing uses: a) Parallel â€¦ b) Serial c) Both â€¦ d) None 21. Stepper motor interfacing: a) 8255 â€¦ b) 8259 c) 8254 d) None 22. A/D converter converts: a) Analog â†’ Digital â€¦ b) Digital â†’ Analog c) Voltage d) Current 23. D/A converter converts: a) Analog â†’ Digital b) Digital â†’ Analog â€¦ c) Both d) None 24. 8259A is: a) Programmable interrupt controller â€¦ b) Timer c) PPI d) DMA 25. Interrupt vector table stores: a) Addresses of interrupt routines â€¦ b) Data c) Instructions d) None 26. DMA stands for: a) Direct Memory Access â€¦ b) Dynamic Memory Access c) Dual Memory Access d) Data Memory Access 27. Serial communication can be: a) Synchronous â€¦ b) Asynchronous â€¦ c) Both â€¦ d) None 28. EIA RS232 is: a) Physical communication standard â€¦ b) Protocol c) Memory d) Timer 29. Microprocessor clock controls: a) Instruction timing â€¦ b) Data c) Voltage d) Current 30. Bus demultiplexer separates: a) Address & data lines â€¦ b) Input lines c) Output lines d) Power 31. Bus controller manages: a) Data transfer â€¦ b) Instruction fetch c) Clock d) None 32. Programmed I/O means: a) CPU actively polls â€¦ b) CPU interrupts c) DMA d) None 33. Interrupt driven I/O: a) CPU waits b) CPU responds to interrupt â€¦ c) CPU ignores d) None 34. Parallel I/O port transfers: a) 1 bit b) Multiple bits simultaneously â€¦ c) Serially d) None 35. SRAM stands for: a) Static RAM â€¦ b) Serial RAM c) Synchronous RAM d) None 36. EEPROM stands for: a) Electrically Erasable Programmable ROM â€¦ b) RAM c) Flash d) None 37. Clock generator produces: a) Timing pulses â€¦ b) Data c) Instructions d) None 38. Stepper motor moves in: a) Continuous rotation b) Steps â€¦ c) Random d) None 39. Timer applications include: a) Delay â€¦ b) Event counting â€¦ c) Pulse generation â€¦ d) All â€¦ 40. Asynchronous serial communication uses: a) Start & stop bits â€¦ b) Clock c) Both d) None 41. Microprocessor I/O address decoding ensures: a) Correct device access â€¦ b) Timing c) Speed d) None 42. Interrupt vector points to: a) Interrupt routine â€¦ b) Main program c) Data d) Timer 43. Single -step execution helps in: a) Debugging â€¦ b) Speeding c) Storage d) Communication 44. Flag registers store: a) Status â€¦ b) Data c) Address d) Control 45. Carry flag is set when: a) Addition exceeds limit â€¦ b) Subtraction negative c) Overflow d) Zero 46. Zero flag is set when: a) Result = 0 â€¦ b) Result > 0 c) Carry occurs d) None 47. Sign flag indicates: a) Positive/negative â€¦ b) Zero c) Carry d) Overflow 48. Parity flag checks: a) Even/odd bits â€¦ b) Zero c) Carry d) Sign

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

b) Data size c) Instruction size d) Clock 58. Control signals include: a) RD, WR â€¦ b) ALE â€¦ c) INTA â€¦ d) All â€¦ 59.

Microprocessor interfacing requires: a) Address decoding â€¦ b) Timing c) Data bus d) All â€¦ 60. Multi-processor system advantage: a) High speed â€¦ b) Parallel processing â€¦ c) Reliability â€¦ d) All â€¦ Communication Theory (~50 MCQ) 1. Fourier series represents: a) Continuous signals â€¦ b) Discrete signals c) Both d) None 2. Fourier transform converts: a) Time \hat{t} Frequency â€¦ b) Frequency \hat{f} Time c) Voltage \hat{V} Current d) None 3. Convolution in time domain equals: a) Multiplication in frequency domain â€¦ b) Addition c) Subtraction d) Division 4. Parseval's theorem relates: a) Energy in time & frequency â€¦ b) Power c) Voltage d) Current 5. Entropy in information theory measures: a) Uncertainty â€¦

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

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

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

c) Phase d) None 31. PM bandwidth depends on: a) Phase deviation â€¦ b) Frequency c) Amplitude d) None 32. Coherent detection used for: a) AM demodulation â€¦ b) FM c) PM d) None 33. Envelope detection used for: a) AM â€¦ b) FM c) PM d) None 34. Multiplexing purpose: a) Efficient utilization â€¦ b) Amplification c) Modulation d) None 35. Information rate formula: a) $R = H \times \text{symbols/sec}$ â€¦ b) $R = H \times f$ c) $R = P \times t$ d) None 36. Signal bandwidth affects: a) Data rate â€¦ b) Power c) Voltage d) None 37. Noise degrades: a) SNR â€¦ b) Bandwidth c) Time d) None 38. Shannon capacity formula: a) $C = B \log_2(1 + S/N)$ â€¦ b) $C = B \times S/N$ c) $C = B / S/N$ d) None

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

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

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

d) None 14. Firewall purpose: a) Network security â€¦ b) Routing c) Switching d) None 15. IPV4 address length: a) 32 bits â€¦ b) 64 bits c) 128 bits d) 16 bits 16. IPV6 address length: a) 32 bits b) 64 bits c) 128 bits â€¦ d) 16 bits 17. ARP resolves: a) IP \hat{t} MAC â€¦ b) MAC

a) Port b) IP c) None 18. RARP resolves: a) MAC b) IP c) Port 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 b) IP c) MAC 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 Network 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) Single 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 b) Ciphertext c) Ciphertext d) Plaintext 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 traffic 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