Application of Buck-boost, Boost:

Buck-boost:

→ Battery charger
→ Solar charger
→ power audio amplifier
→ point of load converter for PC & Laptop.

Boost:

→ Hybrid electric circuits
→ Solar power system
→ LED flash light
→ LED Driver.

Buck:

→ Battery charger
→ Quad-copter
→ Solar charger
→ power audio amplifier.

2] Load-flow analysis use এর কারণ:

→ To ensure that each generator runs at the optimum operating point.
→ To meet demand without overloading facilities.

3] Fault: fault in a circuit is the disturbance or failure which interfere the normal system operation.

3 types of fault:

1. L-G (Line to ground) → most common.
2. L-L (Line to line)
3. LL-G (Double line to ground)

(3L-G fault → most severe) (confused)

Reasons of faults:
- insulation failure.
- flash-over
- physical damage.

4| implied addressing:
→ instruction specifies the operand.
→ no register is declared.
ex: STC (set carry flag) → (CF = 1 set হবে)
CLC (clear carry flag)
STI (sets IF = 1)

5. Relative Addressing:
→ control transfer হবে,
JNZ, JMP.

6. Modulation: The process of ~~sending~~ converting data into radio waves by adding information to a carrier signal.

7. How does modulation improves signal power?
→ When the carrier signal and the modulating signal is ~~mix~~ added together the resultant frequency increases as the carrier & signal is of high fre.

8. Delta modulation: Delta modulation is an analog-to-digital and digital-to-analog signal conversion technique. This technique is used for voice transmission. This is an easy way of DPCM.

9. 8259, 8259 এর কাজ:

8259 → PIC (programmable interrupt controller) that increases the interrupt handling capability of microprocessors.

8259 → solves the timing control problem of microprocessor

interrupt → interrupt is a signal emitted by the peripheral devices. It stops the operating system or current process temporarily.

10. Digital & Analog electronics এর difference:

↳ deals with continuously varying signals.

↳ deals with two state (binary) signals.

11. power electronics : → the ~~application~~ branch of electronics that deals with the processing of high voltages and currents to deliver power that supports a variety of needs.

12. interrupt কাকে বলে service দিতে?

interrupt is a condition that halts the microprocessor temporarily to work on a different task and then return to its previous task. This halt allows peripheral devices to access the microprocessor.

13. Direction flag (DF) = 1 : string is processed from highest to lowest address. This mode is called auto-decrementing mode. (STD → set-direction-flag)

14. Microprocessor : programmable, clock-driven, multi-purpose device that reads binary function from a storage device called memory, performs the operation and gives the result.

15. Electronics: the branch of physics / electrical engineering that ~~def~~ deals with the emmission, behaviour and effects of electronics.

16. Demand factor: (less than 1)

$$\frac{\text{Max. Demand of a system}}{\text{total connected load on the system.}}$$

Load factor: (less than 1)

$$\frac{\text{Average demand}}{\text{Maximum demand}}$$

cyclo-converter: converts AC voltage of one fre. to another fre. without an intermediate DC link.
(AC-AC conversion - এ used হয়।)

Applications:
- AC motors having variable speed.
- induction heating.

17. BX কে কেন Base বলে?
→ কারণ indexed addressing - এ used হয়।

CX : count → কারণ loop count - এ used.

DX : data → কারণ I/O - এ used.

AX : accumulator → কারণ arithmetic instruction - এ used.

18. Microprocessor, Microcontroller এর পার্থক্য:

Microprocessor ↓ performs function of the CPU

Microcontroller ↓ brain of the circuit.

19. AM, FM এর Difference:

↳ carrier wave এর freq. is modified.

↳ carrier wave এর amp. is modified

AM	FM
- poor sound quality	- better sound quality. (high BW)
- longer distance এ transmit করা যায়	- ব্যবহার ↓
- 535 - 1705 kHz	- 88 - 108 MHz

20. PCM: - pulse code modulation.
- converts analog signal into digital form.

21. 8259 এর application:
- timing control in microcomputer system.
- generates accurate time delays.

22. How to create time delay:
- by using decrement loops
- by using NOP (No operation)
  - ↳ occupies 1 byte of memory space
  - ↳ spends 4 Machine cycles.

23. how to control speed of induction motor:
- Voltage control method
- frequency control method
- resistance control method
- pole changing method.

24. Nuclear powerplant এর establishment এ যেসব factor বিবেচনা করা লাগে:
- construction facility
- availability of power supply

- Availability of water
- Disposal of waste
- Distance from populated areas.
- Transportation facilities.

25. NOP → ৪ bit 1-clk cycle delay হয়।

26. Instruction queue: → a structure into which processor fetches instruction.

→ length: 6 bytes.

27. Modulation

28. FM এর range → 88-108 MHz

29. Why FM is better?

- Better sound quality due to higher BW.
- changes in amplitude can be neglected

30. Broadcasting & Multi-casting এর difference:

Broadcasting	Multi-casting
1. one sender, multiple receiver	1. one/more sender, multiple receiver.
2. Works well across large network.	2. doesn't work well across large network.

31. Energy source:

32. Application of cuk regulator: (it's a boost converter)

→ used in hybrid solar-wind energy system.

→ DC application systems.

(যেহেতু input voltage wind এর sun-এর speed-এর উপর depend করে যেহেতু output voltage constant থাকতে cuk regulator use করা হয়।)

34. generation and demand of power-plant :

↳ facility designed to produce electrical energy

demand : max. amount of electrical power that's being consumed at a given time.

35. Disadvantages of transmission lines :

- noise effects
- equipment failure
- Access issues.
- Avoidance behaviour of electric & magnetic field.

36. THD : (total harmonic Distortion)

→ ratio of the sum of the power of all harmonic components to the fundamental frequency.

37.

38. DS. 1234H valid या नहीं ?

39. 8259 interval timer applications :

→ timing control application in microcomputer systems
→ generates accurate time delays.

40. Newton-Raphson method is best because :

→ most common technique
→ efficiently generalised to find solutions.

92. ASK

- Amplitude shift keying.
- Variation in amplitude
- poor noise immunity
- More power is needed

FSK

- frequency shift keying.
- in fre.
- better noise immunity
- less power.

93. Data Bus

- the computer bus that is used to transmit data.

Address Bus

- the computer bus that is used to specify a physical address in the memory.

94. Why inductor is used in boost converter?

→ switch on থাকলে inductor charged হয়, switch close হলে, source থেকে inductor, energy release করে যা source -এর সাথে add হয়ে resultant voltage দেয় (Boost করে) ∴ Inductor is where the boosted energy comes from.

95. ALE : Address Latch Enable.

ALE = 1 : Address bus is enabled

ALE = 0 : Data bus is enable.

ALE → positive going pulse.

96. Course Names :

47. Diode recovery current : forward current flow করে এবং diode - এর across - এ reverse voltage দেয়া হলে, instantly diode - এর across - এ reverse current flow করে। এটি diode recovery current.

48. Addressing Modes of 8254 : Mode 0
Mode 1 (not sure)
Mode 2

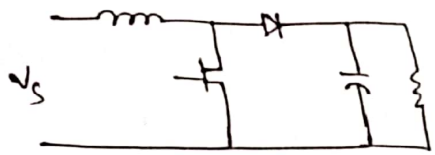
49. QAM : Quadrature Amplitude Modulation.

→ Here phase / amplitude of the carrier is changed to create the modulated message.

PSK : (Phase - Shift - Keying)

→ conveys data by changing the phase of the carrier.

50. Boost converter :



51. Multiplexing

→ Multiple analog / digital signals are combined into one signal over a shared medium.

Multi-access

→ several terminals are connected to the same transmission medium to transmit over a shared medium.

53. Stack :→ Last-in-first-out data structure that is implemented in the RAM area and used to store data and addresses

54. TTLD :

55. **Free-wheeling diode:**

→ The diode that is connected across an inductor to eliminate the sudden voltage spike (that occurs across an inductive load due to interruption of supply current). Free-wheeling diodes protect the switches present in the circuit from damage.

56. **Control rods are used** to control chain reaction.

57. **Moderator** – controls the speed of neutron.

58. **Cache memory** – parallel processing -এ হেল্প করে।
main memory ~~তে~~ যে data গুলো stored থাকে. এর ফলে execution easy হয়।

59. **How does microprocessor work?**

– through BIU (Bus Interface Unit) & Execution Uni
the instruction is fetched through BIU and carrie
to the execution unit, that carries out the instr

60. **Skin-effect:** the tendency of AC current to bec
distributed within a conductor such that the curr
density is largest near the surface of the cond

61. **Virtual port:** A data object that represents an Internal port on the NIC switch of a network adapter.

কোথায় virtual port use হয়? → জানিনা।

62.

electric bus	vehicle bus

63. AC Voltage Controller: → controls the rms value of an AC voltage. Application:
- speed control of induction motor.
- varies the supply voltage.

64. GTO: (gate turn-off thyristor)
- special type of thyristor
- high power semi-conductor device
- fully controllable switches.

65. Voltage sensor: voltage monitoring device

66. Corona-effect: the phenomenon of ionisation of air surrounding a conductor due to which luminous glow and hissing noise is rised is known as corona-effect

69. Tariff: rate at which electrical energy is sold to a consumer.

70. Variable port addressing:
→ Allows data transfer between AL or AX and a 16 bit port address.

Fixed-port addressing	Variable port addressing
→ 8-bit	→ 16-bit
→ only AL is used	→ AX is used