



RRB JE 2024 CBT-2 Electronics

Junior Engineer · Electronics Engineering · CEN 03/2024 · CBT-2 · Question Paper

English

All 3 Shifts (Sets) · Official Answer Key

About this Compilation

This booklet contains all **3 shift papers** of the **RRB JE 2024 CBT-2 (Electronics Engineering)** examination in **English**, with the correct option marked as per the official answer key.

✓ Correct option (highlighted green)

How to use

- Use the **Index** page to jump directly to any set (clickable).
- Questions appear section by section in the order of the paper, numbered 1 onward.
- Diagram and wide-table questions appear at full width at the end of their section.
- The correct answer is highlighted in green with a tick.

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Index — All Sets (click to open)

Set 1

22 Apr 2025
9:00 AM - 11:00 AM

Set 3

04 Jun 2025
9:00 AM - 11:00 AM

Set 2

22 Apr 2025
2:30 PM - 4:30 PM

General Abilities

50 Questions • Answer Key

Q1 General Abilities

The energy that is derived from the use of radioactive isotopes is termed as _____.

- A. geothermal energy
- B. solar energy
- C. thermal energy
- D. nuclear energy



Q2 General Abilities

Which of the following states is NOT covered under the Atal Bhujal Yojana?

- A. Rajasthan
- B. Jharkhand
- C. Maharashtra
- D. Uttar Pradesh



Q3 General Abilities

What was the main objective of the Extremists during the Indian National Movement?

- A. To promote British goods in India
- B. To attain complete independence (Swaraj)
- C. To expand the legislative councils
- D. To bring social reforms



Q4 General Abilities

Which of the following correctly explains why clothes dry faster on a windy day?

- A. Wind increases the humidity around the clothes.
- B. Wind removes the water vapour from the clothes' surroundings.
- C. Wind decreases the temperature of the water molecules.
- D. Wind reduces the surface area of the clothes.



Q5 General Abilities

The maximum sound is generated _____.

- A. from house chimneys
- B. by the take off of a jet plane
- C. from industrial smoke
- D. from vehicular emissions



Q6 General Abilities

The Rudra Veena is predominantly associated with which genre of Hindustani music?

- A. Thumri
- B. Khayal
- C. Dhrupad
- D. Ghazal



Q7 General Abilities

Which state of matter shows the highest expansion when temperature is increased?

- A. Liquids
- B. Plasma
- C. Gases
- D. Solids



Q8 General Abilities

Which of the following correctly represents the chemical formula of a compound formed by aluminium and sulphate ions?

- A. $\text{Al}_2(\text{SO}_4)_3$
- B. $\text{Al}(\text{SO}_4)_3$
- C. Al_2SO_4
- D. $\text{Al}_3(\text{SO}_4)_2$



Q9 General Abilities

If the absolute refractive index of a medium is less than 1, it means _____.

- A. the medium is a perfect reflector
- B. light travels slower in that medium than in vacuum
- C. the medium absorbs all light
- D. light travels faster in that medium than in vacuum



Q10 General Abilities

Which defect of vision occurs due to the weakening of ciliary muscles with age?

- A. Presbyopia
- B. Hypermetropia
- C. Astigmatism
- D. Myopia



Q11 General Abilities

The main use of chlorofluorocarbons is in _____.

- A. smog
- B. vehicles
- C. chimneys
- D. refrigerants

**Q12 General Abilities**

Which Article provides Ministers the right to participate in parliamentary proceedings but without voting rights?

- A. Article 78
- B. Article 53
- C. Article 88
- D. Article 77

**Q13 General Abilities**

What happens when a computer is put into Sleep mode?

- A. It stores data on the hard drive and powers off.
- B. It shuts down completely.
- C. It restarts automatically after a few minutes.
- D. It keeps the session active in RAM while using minimal power.

**Q14 General Abilities**

The Millennium Development Goals (MDGs) aimed to reduce extreme poverty by which year?

- A. 2014
- B. 2005
- C. 2008
- D. 2015

**Q15 General Abilities**

The practice of Jhum cultivation is prevalent in the _____.

- A. South west
- B. North west
- C. South east
- D. North east

**Q16 General Abilities**

Which of the following companies announced plans in February 2025 to construct the world's longest undersea cable, aiming to enhance internet connectivity across five continents, with landing points in India?

A. Meta



B. Google

C. Amazon

D. Microsoft

Q17 General Abilities

What is the primary purpose of using a firewall on a Personal Computer?

A. To block unauthorised access and protect the computer



B. To speed up internet connectivity

C. To increase storage space

D. To clean up temporary files

Q18 General Abilities

Inertia depends on which property of an object?

A. Velocity

B. Mass



C. Shape

D. Acceleration

Q19 General Abilities

What does PCB stand for?

A. Printed Circuit Board



B. Peripheral Connection Bus

C. Primary Control Board

D. Processing Circuit Board

Q20 General Abilities

Which of the following cities hosted the inaugural Kho Kho World Cup in January 2025?

A. Mumbai

B. New Delhi



C. Kolkata

D. Chennai



Q21 General Abilities

What happens when an acid reacts with a metal oxide?

- A. A salt and hydrogen gas are formed.
- B. Only water is formed.
- C. A salt and water are formed. ✓
- D. Only salt is formed.

Q22 General Abilities

Which of the following is a characteristic difference between colloids and true solutions?

- A. True solutions have a single-phase system, whereas colloids have a two-phase system. ✓
- B. True solutions have visible solute particles, whereas colloids have invisible dispersed particles.
- C. True solutions show the Tyndall effect, but colloids do not.
- D. True solutions exhibit Brownian motion, but colloids do not.

Q23 General Abilities

What is the approximate pH of a neutral salt solution?

- A. Equal to 7 ✓
- B. Less than 7
- C. Depends on the temperature
- D. More than 7

Q24 General Abilities

Which of the following is NOT toxic to non-target organisms in the soil?

- A. Pesticides
- B. Organic fertilisers ✓
- C. Herbicides
- D. Fungicides

Q25 General Abilities

Which of the following is the correct way to insert a new column in a spreadsheet?

- A. Go to Home > Insert > Insert Sheet Columns. ✓
- B. Use Ctrl + Z to insert a column.
- C. Press Ctrl + X and then Insert.
- D. Go to File > New > Column.

Q26 General Abilities

What is the first step to securing ones smartphone or tablet?

- A. Installing more apps
- B. Turning off mobile data
- C. Setting a password/PIN-protected lock screen ✓
- D. Using only free Wi-Fi networks

Q27 General Abilities

Which of the following is NOT a source of release of smokestacks?

- A. Thermal power plants
- B. Rivers ✓
- C. Industries
- D. Smelters

Q28 General Abilities

Which of the following CANNOT be considered as a measure to control global warming?

- A. Reduction in emission of greenhouse gases
- B. Cutting down use of fossil fuel
- C. Causing deforestation ✓
- D. Efficiently using energy

Q29 General Abilities

Which of the following is NOT a component of a CPU?

- A. Hard Disk ✓
- B. Cache Memory
- C. Arithmetic Logic Unit (ALU)
- D. Control Unit (CU)

Q30 General Abilities

The primary agent that helps in the decomposition of biodegradable matter in domestic sewage is _____.

- A. chloride
- B. phosphate
- C. bacterium ✓
- D. nitrate



Q31 General Abilities

In an electric circuit, what is the correct way to connect an ammeter?

- A. In either series or parallel
- B. In parallel with the source
- C. In parallel with the component
- D. In series with the component ✓

Q32 General Abilities

Dr. BR Ambedkar described which part of the Indian Constitution as its 'novel features', while Granville Austin referred to it as the 'Conscience of the Constitution'?

- A. Fundamental Rights
- B. Directive Principles of State Policy ✓
- C. Fundamental Duties
- D. Preamble

Q33 General Abilities

According to the Tendulkar methodology, what was the estimated percentage of people below the poverty line in rural areas in 2011-12?

- A. 27.5%
- B. 20%
- C. 25.7% ✓
- D. 15.5%

Q34 General Abilities

In which of the following regions the Himalayas has the greatest width?

- A. Himachal Pradesh
- B. Kashmir ✓
- C. Arunachal Pradesh
- D. Sikkim

Q35 General Abilities

What is the maximum number of Ministers allowed in the Council of Ministers, including the Prime Minister, as per the 91st Amendment Act?

- A. 12% of Lok Sabha strength
- B. 20% of Lok Sabha strength
- C. 15% of Lok Sabha strength ✓
- D. 10% of Lok Sabha strength

Q36 General Abilities

The Industrial Policy Resolution of 1956 categorised industries into how many groups?

- A. Three ✓
- B. Five
- C. Nine
- D. Seven

Q37 General Abilities

Who among the following inaugurated the 38th National Games held in Dehradun in January 2025?

- A. Droupadi Murmu
- B. Pushkar Singh Dhami
- C. Narendra Modi ✓
- D. Anurag Thakur

Q38 General Abilities

What is the purpose of the Collation option in the Print settings?

- A. To select a custom print range
- B. To change the printer selection
- C. To print all the pages of a document as a set ✓
- D. To adjust the page orientation

Q39 General Abilities

Why does a bee sting cause pain and irritation?

- A. The sting releases carbon dioxide gas.
- B. The sting injects methanoic acid. ✓
- C. The sting injects a mild sugar solution.
- D. The sting contains a strong base.

Q40 General Abilities

What is the net force acting on an object if balanced forces are applied?

- A. Infinite
- B. Equal to the mass of the object
- C. Equal to acceleration
- D. Zero ✓



Q41 General Abilities

What is India's global military ranking in the 2025 Global Firepower (GFP) index?

- A. 5th
- B. 3rd
- C. 2nd
- D. 4th

**Q42 General Abilities**

What is the primary function of the F4 key in MS Excel when editing a cell reference in a formula?

- A. Refreshes the worksheet
- B. Repeats the last action
- C. Opens the Find and Replace dialog
- D. Toggles between absolute and relative references

**Q43 General Abilities**

The fine powder that is obtained from the modified and recycled form of plastic is called _____.

- A. polyblend
- B. polystyrene
- C. polythene
- D. polyethylene

**Q44 General Abilities**

What is the shortcut key to start a slideshow from the beginning?

- A. Shift + F5
- B. F5
- C. Ctrl + P
- D. Alt + Tab

**Q45 General Abilities**

The phenomenon of multiple echoes due to repeated reflections is called _____.

- A. refraction
- B. resonance
- C. diffraction
- D. reverberation

**Q46 General Abilities**

The glass panel used in greenhouses is known to retain _____.

- A. pH
- B. rainfall
- C. heat
- D. humidity

**Q47 General Abilities**

Which official in the Gupta administration was responsible for peace and war matters?

- A. Vishayapati
- B. Sandhi-Vigrahika
- C. Mahapratihara
- D. Mahadandanayaka

**Q48 General Abilities**

If you want the primary recipient to see that others have received a copy of an email, you should enter their email addresses in the _____ field.

- A. Cc
- B. Bcc
- C. To
- D. Subject

**Q49 General Abilities**

If an object is dropped from rest, what will be its velocity after 15 seconds? ($g = 9.8 \text{ m/s}^2$)

- A. 147 m/s
- B. 143 m/s
- C. 145 m/s
- D. 149 m/s

**Q50 General Abilities**

Identify the correct formula for the compound formed between Mg^{2+} and PO_4^{3-} ions.

- A. $\text{Mg}(\text{PO}_4)_3$
- B. $\text{Mg}_2(\text{PO}_4)_3$
- C. MgPO_4
- D. $\text{Mg}_3(\text{PO}_4)_2$



Q51 Technical Abilities

What is the primary effect of the annealing process on conducting materials such as copper and aluminium?

- A. It increases tensile strength and hardness.
- B. It increases the material's brittleness.
- C. It causes oxidation of the material's surface.
- D. It reduces electrical resistance by decreasing the number of dislocations. ✓

Q52 Technical Abilities

The function of a low pass filter in phase locked loop is _____.

- A. to increase the frequency of the input signal
- B. to demodulate the output signal
- C. to remove the dc component from the signal
- D. to remove the high frequency noise present ✓

Q53 Technical Abilities

In a series magnetic circuit, if the reluctance of one path increases, what will happen to the total magnetic flux in the circuit?

- A. The total flux will remain unchanged.
- B. The total flux will decrease. ✓
- C. The total flux will increase.
- D. The flux will divide equally between paths.

Q54 Technical Abilities

Which of the following statements about a Hartley oscillator is correct?

- A. An RL network is used in the design of Hartley oscillators.
- B. The Hartley oscillator is commonly used to generate signals below 50 Hz
- C. An RC network is used in the design of Hartley oscillators.
- D. It operates on the principle of parallel resonance. ✓

Q55 Technical Abilities

In the 8085 microprocessor, _____ instruction is used to identify pending interrupts.

- A. LXI
- B. SIM
- C. RIM ✓
- D. ANI

Q56 Technical Abilities

Which Boolean expression correctly represents the Difference (D) output of a Full Subtractor?

- A. $D = A \oplus B \oplus \text{Bin}$ ✓
- B. $D = A \text{ AND } B$
- C. $D = A \oplus B \oplus \text{Cout}$
- D. $D = A \oplus B$

Q57 Technical Abilities

Which modulation technique is used to avoid phase ambiguity in BPSK?

- A. FSK (Frequency Shift Keying)
- B. ASK (Amplitude Shift Keying)
- C. DPSK (Differential Phase Shift Keying) ✓
- D. QPSK (Quadrature Phase Shift Keying)

Q58 Technical Abilities

For a diode operating in forward bias, which of the following statements is INCORRECT?

- A. The reduction in the width of the depletion region is due to the recombination of charge carriers and immobile ions near the junction.
- B. The reduction in the depletion region allows a majority carrier flow across the junction.
- C. The reduction in the depletion region causes a heavy flow of minority carriers across the junction. ✓
- D. The reduction in the potential barrier occurs due to the narrowing of the depletion region.

Q59 Technical Abilities

Which of the following is NOT a type of loop in C?

- A. do-while loop
- B. foreach loop ✓
- C. for loop
- D. while loop

Q60 Technical Abilities

The Time Setting Multiplier (TSM) of a relay is used to:

- A. modify the time delay based on fault severity ✓
- B. increase the current setting of the relay
- C. adjust the operating current threshold of the relay
- D. decrease the time delay of the relay



Q61 Technical Abilities

What type of distortion occurs if a signal that contains frequency components up to 15 kHz is sampled using 20 kHz?

- A. No distortion
- B. Aliasing
- C. Slope Overload
- D. Quantization error

Q62 Technical Abilities

Which of the following is a major advantage of Unshielded Twisted Pair (UTP) cables compared to Shielded Twisted Pair (STP)?

- A. Lower cost and easier installation
- B. Complete resistance to EMI
- C. Better performance in industrial environments
- D. Higher durability

Q63 Technical Abilities

Which function is used to read a single character from the console in C?

- A. getchar()
- B. scanf()
- C. puts()
- D. printf()

Q64 Technical Abilities

A radio receiver is tuned to 560 kHz, and its local oscillator frequency is 1,000 kHz. At the output, another signal is also received along with the desired signal. What is the frequency of the other station?

- A. 440 kHz
- B. 1,440 kHz
- C. 560 kHz
- D. 2,440 kHz

Q65 Technical Abilities

What is the purpose of fscanf() in C?

- A. Writes formatted data to a file
- B. Reads formatted data from a file
- C. Closes a file
- D. Reads a single character from a file

Q66 Technical Abilities

According to Laplace's Law of Magnetic Circuits, the magnetic field strength H in a core is directly proportional to the magnetomotive force (MMF) and inversely proportional to the length of the magnetic path. If the MMF is increased by a factor of 2, and the length of the magnetic path is halved, what will be the change in the magnetic field strength H ?

- A. It will increase by a factor of 2.
- B. It will increase by a factor of 4.
- C. It will remain the same.
- D. It will double.

Q67 Technical Abilities

Which of the following is the correct definition of the capacity of a battery?

- A. The maximum voltage a battery can generate
- B. The total energy a battery can deliver over a period of time
- C. The maximum current a battery can provide
- D. The amount of charge a battery can store and deliver over a specific time period

Q68 Technical Abilities

The magnetic field inside a solenoid is:

- A. zero
- B. uniform and parallel
- C. circular and varying with distance
- D. non-uniform and divergent

Q69 Technical Abilities

One of the main advantages of AAAC (All Aluminium Alloy Conductor) over AAC (All Aluminium Conductor) is:

- A. lower conductivity
- B. higher corrosion resistance
- C. increased weight for better mechanical strength
- D. reduced cost of production



Q70 Technical Abilities

In a Common Emitter (CE) BJT amplifier, which of the following options is correct?

- A. The CE amplifier has the lowest input impedance among all the configurations.
- B. If the magnitude of the output voltage increases, the input current decreases. ✓
- C. Its input impedance is lower than CB configuration but higher than CC configuration.
- D. The input characteristics are plotted between the input current (I_B) and input voltage (V_{BE}) at a constant I_C .

Q71 Technical Abilities

The magnetic field outside a toroidal coil:

- A. is uniform and points radially outward
- B. is zero ✓
- C. is uniform and points radially inward
- D. is in a circular pattern around the toroid

Q72 Technical Abilities

Manganin is a copper-manganese alloy that is widely used in precision resistors and temperature-sensitive applications. Which of the following properties makes manganin particularly useful in these applications?

- A. Low temperature coefficient of resistance ✓
- B. High electrical conductivity
- C. High tensile strength and ductility
- D. High thermal coefficient of resistance

Q73 Technical Abilities

Which of the following best defines the sensitivity of a protective relay?

- A. The time it takes for the relay to react after detecting a fault.
- B. The ability of the relay to detect and respond to very small fault currents. ✓
- C. The ability of the relay to discriminate between different types of faults.
- D. The capacity of the relay to handle high fault currents without damage.

Q74 Technical Abilities

How is a multi-dimensional array stored in the memory?

- A. Row-wise (Row-major order) ✓
- B. Depends on the compiler
- C. Column-wise (Column-major order)
- D. Randomly

Q75 Technical Abilities

Which of the following is a characteristic of serial binary adders?

- A. They perform addition in parallel.
- B. The carry propagation delay is minimised.
- C. Each full adder waits for the carry from the previous full adder. ✓
- D. They use a carry lookahead mechanism.

Q76 Technical Abilities

Which of the following is the main purpose of SNMP?

- A. Encrypting network data
- B. Facilitating file transfers
- C. Providing authentication for web servers
- D. Monitoring and managing network devices ✓

Q77 Technical Abilities

What will happen if a break statement is omitted in a switch case?

- A. The next case will continue to be executed. ✓
- B. The compiler will show an error.
- C. The program will stop execution.
- D. The program will exit.

Q78 Technical Abilities

Which of the following statements is FALSE for a common-base (CB) amplifier using a BJT?

- A. It has lower input impedance and higher output impedance.
- B. The input characteristics is a plot of input current (I_E) vs. input voltage (V_{EB}).
- C. The output characteristics is a plot of output current (I_C) vs. output voltage (V_{CB}).
- D. The output impedance is lower than that of a common-emitter amplifier. ✓

Q79 Technical Abilities

How do you declare a pointer to an integer?

- A. `int ptr;`
- B. `int *ptr;` ✓
- C. `int ptr*;`
- D. `pointer int ptr;`

Q80 Technical Abilities

Which of the following is/are an example of guided transmission media?

- A. Satellite communication
- B. Radio waves
- C. Optical fibre ✓
- D. Infrared signals

Q81 Technical Abilities

What is the primary goal of simplifying a Boolean expression before implementing it with gates?

- A. To increase power consumption
- B. To increase the number of gates
- C. To make the circuit slower
- D. To reduce the number of gates and interconnections ✓

Q82 Technical Abilities

The function of pin 18 and 19 (XTAL1 and XTAL2) in 8051 Microcontroller is _____.

- A. serial data transmission
- B. oscillator connection for clock generation ✓
- C. to control external interrupt
- D. address and data bus decoding

Q83 Technical Abilities

In which of the following electrical applications is a glass insulating material commonly used?

- A. Electrical wires for home appliances
- B. High-voltage switchgear and transformers ✓
- C. Power cables and conductors
- D. Low-voltage electronic circuits

Q84 Technical Abilities

Which of the following options is correct regarding the open-loop differential amplifier?

- A. Inputs are applied at both the inverting and non-inverting terminals. ✓
- B. Input is applied at non-inverting terminal only.
- C. Input is applied at inverting terminal only.
- D. Output is always zero irrespective of the input applied at terminals.

Q85 Technical Abilities

What is the primary purpose of the metallic shield in a co-axial cable?

- A. To provide structural support
- B. To reduce signal attenuation
- C. To increase bandwidth capacity
- D. To protect against electromagnetic interference (EMI) ✓

Q86 Technical Abilities

Which of the following defines accuracy in measurement?

- A. The ability to repeat the same measurement
- B. The variation in measurements due to environmental factors
- C. The smallest change that can be detected by an instrument
- D. The closeness of a measured value to the true value ✓

Q87 Technical Abilities

Co-axial cables are most commonly used in which of the following applications?

- A. Wireless communication networks
- B. Underwater communication
- C. Satellite communication
- D. Cable television (CATV) systems ✓

Q88 Technical Abilities

Which of the following is a key feature of a microprocessor-based overcurrent relay that enhances its performance in fault detection?

- A. It does not require a power supply for operation.
- B. It uses analogue components to process current signals.
- C. It only protects against short-circuit faults.
- D. It incorporates fault analysis algorithms to identify fault types. ✓

Q89 Technical Abilities

What does 'PROM' stand for?

- A. Processing Read-Only Memory
- B. Peripheral Read-Only Memory
- C. Programmable Read-Only Memory ✓
- D. Primary Read-Only Memory



Q90 Technical Abilities

The output voltage of an IC 7905 is _____.

- A. 5 V
- B. 15 V
- C. -15 V
- D. -5 V

**Q91 Technical Abilities**

In a PLL-based FM demodulator, the output of the phase detector is proportional to _____.

- A. the phase difference between the FM signal and the VCO output
- B. the frequency deviation of the FM signal
- C. the amplitude of the FM signal
- D. the carrier frequency of the FM signal

**Q92 Technical Abilities**

Which factor is primarily responsible for distortion in a transmitted signal?

- A. Variations in the propagation speed of different frequencies
- B. External electromagnetic interference
- C. Excessive bandwidth usage
- D. Signal attenuation

**Q93 Technical Abilities**

According to Carson's Rule, what is the approximate bandwidth required for a VHF/UHF two-way radio signal using FM with a 5 kHz maximum frequency deviation and a maximum audio frequency of 3 kHz?

- A. 20 kHz
- B. 10 kHz
- C. 16 kHz
- D. 30 kHz

**Q94 Technical Abilities**

Which of the following is a primary characteristic of low resistivity materials used in electrical conductors?

- A. High cost and low flexibility
- B. High insulation properties and poor conductivity
- C. High conductivity and low resistivity
- D. High thermal resistance and poor conductivity

**Q95 Technical Abilities**

Which of the following statements is correct regarding the ripple factor of different rectifiers?

- A. A rectifier with a higher ripple factor is more preferable for DC power supply than one with a lower ripple factor.
- B. A half-wave rectifier has more than twice the ripple factor of a full-wave rectifier.
- C. A full-wave rectifier has a higher ripple factor than a half-wave rectifier.
- D. A bridge rectifier has a better ripple factor than a centre-tapped rectifier.

**Q96 Technical Abilities**

The 8051 microcontroller has _____ I/O pins.

- A. 40
- B. 26
- C. 32
- D. 24

**Q97 Technical Abilities**

Which of the following gases is commonly used as an insulating material in electrical equipment due to its non-flammable nature and good dielectric strength?

- A. Oxygen
- B. Nitrogen
- C. Carbon dioxide
- D. Hydrogen

**Q98 Technical Abilities**

Which of the following are Pulse Time Modulation (PTM) techniques?

- A. PDM and PCM
- B. PAM and PCM
- C. PPM and PAM
- D. PWM and PPM

**Q99 Technical Abilities**

If the input $I = 1$ and the select lines are $S_1 = 1$, and $S_0 = 0$, what will be the values of the four outputs in a 1-to-4 Demultiplexer?

- A. Output 0 = 0, Output 1 = 1, Output 2 = 0, Output 3 = 0
- B. Output 0 = 0, Output 1 = 0, Output 2 = 0, Output 3 = 0
- C. Output 0 = 0, Output 1 = 0, Output 2 = 1, Output 3 = 0
- D. Output 0 = 0, Output 1 = 0, Output 2 = 0, Output 3 = 1



Q100 Technical Abilities

A special diode with $0\ \Omega$ forward resistance and $1\text{ k}\Omega$ reverse resistance is connected in series with a $1\text{ k}\Omega$ load resistor. A square wave input is applied with:

- Maximum voltage ($V_{\max}$) = 4 V
- Minimum voltage ($V_{\min}$) = -4 V

What is the output voltage across the load when the diode is in reverse bias?

- A. -4 V
- B. $+2\text{ V}$
- C. 0 V
- D. -2 V ✓

Q101 Technical Abilities

Which of the following factors is directly proportional to the eddy current loss in magnetic materials?

- A. Thickness of the material ✓
- B. Temperature of the material
- C. Magnetic field frequency
- D. Permeability of the material

Q102 Technical Abilities

Which of the following statements is/are NOT correct regarding an IC 723?

S1: The output voltage ranges from 2 to 37 volts.
S2: The output current is up to 150 mA.

- A. Neither S1 nor S2 ✓
- B. Only S1
- C. Both S1 and S2
- D. Only S2

Q103 Technical Abilities

In a Cathode Ray Oscilloscope (CRO), how is a time delay measured?

- A. By using the time base control and measuring the horizontal shift ✓
- B. By changing the vertical deflection voltage
- C. By varying the intensity of the electron beam
- D. By adjusting the brightness of the display

Q104 Technical Abilities

What does the format specifier `%10d` in `printf("%10d", num);` do?

- A. Prints the number left-aligned in a field of 10 columns
- B. Prints the number in a field of 10 columns ✓
- C. Prints only the number without any extra spaces
- D. Prints the number with leading zeros in a field of 10 columns

Q105 Technical Abilities

In the case of a 360° phase shift between two signals, the time delay will be equal to:

- A. twice the period of the signal
- B. a quarter of the period of the signal
- C. one period of the signal ✓
- D. half the period of the signal

Q106 Technical Abilities

In circuit switching, a dedicated communication path is established between the sender and the receiver. This technique is primarily used in which of the following networks?

- A. Cellular networks
- B. Internet
- C. Public Switched Telephone Network (PSTN) ✓
- D. Wireless Local Area Networks (WLANs)

Q107 Technical Abilities

A Zener diode has a breakdown voltage of $V_z = 7\text{ V}$ at 300 K , with a temperature coefficient of $2.3\text{ mV}/^\circ\text{C}$. What is the new breakdown voltage V_z at 400 K ?

- A. 6.77 V
- B. 7 V
- C. 7.23 V ✓
- D. 6.977 V

Q108 Technical Abilities

In a circuit, if the voltage across a resistor is doubled and the resistance remains constant, what happens to the current?

- A. The current is halved.
- B. The current doubles. ✓
- C. The current quadruples.
- D. The current remains the same.



Q109 Technical Abilities

What is the primary function of the cathode ray tube (CRT) in an oscilloscope?

- A. To convert the electrical signals into sound
- B. To amplify the electrical signals
- C. To display waveforms of the electrical signals ✓
- D. To measure the frequency of the signals

Q110 Technical Abilities

What type of error occurs due to unpredictable variations in measurement conditions?

- A. Calibration error
- B. Systematic error
- C. Random error ✓
- D. Gross error

Q111 Technical Abilities

Which of the following characteristics does a piezoelectric transducer exhibit when subjected to mechanical stress?

- A. Change in temperature
- B. Voltage generation ✓
- C. Resistance change
- D. Change in frequency

Q112 Technical Abilities

Which port of the 8051 microcontroller functions as a bidirectional I/O and simultaneously acts as an address/data bus for external memory access?

- A. Port 0 ✓
- B. Port 1
- C. Port 4
- D. Port 3

Q113 Technical Abilities

To increase the word size of a memory system, which of the following techniques is typically used?

- A. Parallel memory modules
- B. Memory interleaving
- C. Memory mapping
- D. Address decoding ✓

Q114 Technical Abilities

The high-frequency gain of a common-emitter amplifier is mainly affected by:

- A. coupling capacitor and collector-base junction capacitance
- B. coupling capacitor and bypass capacitor
- C. collector-base junction capacitance and bypass capacitor
- D. collector-base junction capacitance and emitter-base capacitance ✓

Q115 Technical Abilities

Which of the following is an example of a Wide Area Network (WAN)?

- A. A Bluetooth connection
- B. The internet ✓
- C. A local office network
- D. A home Wi-Fi network

Q116 Technical Abilities

In Frequency Modulation (FM), the carrier wave's _____ varies according to the message signal.

- A. frequency ✓
- B. phase
- C. wavelength
- D. amplitude

Q117 Technical Abilities

What is the main role of Port 2 in the 8051 microcontroller during external memory access?

- A. It acts as a general-purpose I/O port.
- B. It provides the high-order address byte. ✓
- C. It serves as a control signal for serial communication.
- D. It functions as a data register.

Q118 Technical Abilities

What is a recursive function?

- A. A function without parameters
- B. A function that calls itself ✓
- C. A function that calls other functions
- D. A function without a return type



Q119 Technical Abilities

Which of the following characteristics is true for ferromagnetic materials?

- A. They are strongly attracted to a magnetic field but do not exhibit hysteresis.
- B. They show no effect in a magnetic field and are considered neutral.
- C. They retain their magnetisation even after the external magnetic field is removed. ✓
- D. They are weakly repelled by a magnetic field and have negative magnetic susceptibility.

Q120 Technical Abilities

How does DDR RAM achieve double the data transfer rate compared to SDRAM?

- A. By increasing the clock frequency
- B. By using a wider data bus
- C. By reducing the refresh rate
- D. By transferring data on both the rising and falling edges of the clock signal ✓

Q121 Technical Abilities

Which of the following statements w.r.t. FSK demodulation using PLL circuit is/are correct?

S1: If the input signal frequency changes, the PLL adjusts its frequency output to match the input frequency.
S2: The phase-locked loop is used to track the changes in the frequency of the modulated signal.

- A. Only S1
- B. Neither S1 nor S2
- C. Only S2
- D. Both S1 and S2 ✓

Q122 Technical Abilities

Which of the following factors primarily affects the insulation resistance of a material?

- A. The temperature of the material ✓
- B. The colour of the insulation
- C. The frequency of the applied voltage
- D. The thickness of the conductor

Q123 Technical Abilities

What is the primary purpose of the graticule in an oscilloscope screen?

- A. To provide a scale for measuring waveform amplitude and time ✓
- B. To convert electrical signals into light
- C. To focus the electron beam
- D. To display the frequency of the signal

Q124 Technical Abilities

DSB-SC, VSB and SSB modulation are types of:

- A. Frequency Modulation (FM)
- B. Phase Modulation (PM)
- C. Amplitude Modulation (AM) ✓
- D. Digital Modulation

Q125 Technical Abilities

The Multiplexed address and Data lines in the 8085 microprocessor are ____.

- A. AD8- AD1
- B. AD9 - AD16
- C. AD8- AD15
- D. AD7 - AD0 ✓

Q126 Technical Abilities

Which of the following statements is NOT true about if-else statement in C?

- A. An if need not always be associated with an else. However, an else must always be associated with an if.
- B. The default scope of if and else statement is only the next statement. So, to execute multiple statements they must be written in a pair of braces.
- C. An if-else statement cannot be nested inside another if-else statement. ✓
- D. If a condition is true, it is replaced by 1, if it false, it is replaced by 0.

Q127 Technical Abilities

If the open-loop gain of an op-amp is 105 and the input voltage is 100 mV, the value of output voltage is _____ assuming a supply of ± 15 V.

- A. 0 V
- B. 15 V ✓
- C. 100 V
- D. 10^4 V



Q128 Technical Abilities

What are the input and output impedances of a voltage-series feedback amplifier?

Given:

Input impedance without feedback: $R_i = 5 \text{ k}\Omega$

Output impedance without feedback: $R_o = 10 \text{ k}\Omega$

Feedback factor: $A\beta = 19$

A. 100 k Ω , 0.5 k Ω ✓

B. 0.25 k Ω , 0.5 k Ω

C. 0.25 k Ω , 200 k Ω

D. 100 k Ω , 200 k Ω

Q129 Technical Abilities

Which of the following is the correct octal representation of the hexadecimal number 1A3?

A. 643 ✓

B. 634

C. 346

D. 124

Q130 Technical Abilities

Which of the following statements are true regarding the eye diagram in the communication system?

- a) An eye diagram is used to investigate Intersymbol interference.
- b) The width of the eye-opening indicates an interval where the wave can be sampled without ISI.
- c) Eye diagram is observed in Digital storage oscilloscope.

A. Only a and c

B. Only b and c

C. a, b and c ✓

D. Only a and b

Q131 Technical Abilities

_____ is a DMA controller which has four independent channels, CH0 to CH3.

A. 8086

B. 8237 ✓

C. 8088

D. 8051

Q132 Technical Abilities

A bridge-rectifier is connected to a $24 \sin(\omega t) \text{ V}$ supply. What is the peak inverse voltage (PIV) across the diode?

A. 12 V

B. 24 V ✓

C. $24/\pi \text{ V}$

D. $48/\pi \text{ V}$

Q133 Technical Abilities

Sinc pulse shaping is derived from the Fourier Transform of a _____ function.

A. sawtooth

B. sine

C. rectangular ✓

D. triangular

Q134 Technical Abilities

A memory chip has a capacity of 4 kB. How many address lines are required?

A. 14

B. 10

C. 16

D. 12 ✓

Q135 Technical Abilities

Which of the following statements is/are correct?

S1: Filter controls the lock range of the PLL.

S2: Filter controls the capture range of the PLL.

A. Both S1 and S2

B. Only S2 ✓

C. Only S1

D. Neither S1 nor S2

Q136 Technical Abilities

In Digital Electronics, what does 'EE' in EEPROM stand for?

A. Electrically Erasable ✓

B. Extended Execution

C. Enhanced Encryption

D. External Enable



Q137 Technical Abilities

In common collector configuration of BJT, which of the following options is correct?

- A. If the emitter resistance is bypassed with a capacitor, the input impedance increases.
- B. It has very high input impedance due to the presence of emitter resistance. ✓
- C. It has a lower input impedance than a common-emitter amplifier.
- D. The input characteristics are a plot of input current (IB) vs. input voltage (VBE) for a constant IE.

Q138 Technical Abilities

Which of the following is NOT correct for a voltage-series feedback amplifier?

- A. Also known as a voltage-controlled voltage source.
- B. Increases input impedance and decreases output impedance.
- C. Also known as a transconductance amplifier. ✓
- D. A non-inverting op-amp is an example of a voltage-series feedback amplifier.

Q139 Technical Abilities

The vertical deflection of the CRT oscilloscope is proportional to the:

- A. frequency of the input signal
- B. horizontal sweep rate
- C. amplitude of the input signal ✓
- D. phosphor intensity

Q140 Technical Abilities

Which of the options is correct for a non-inverting OP-AMP?

- A. Output is in phase with input. ✓
- B. Input is applied at the inverting terminal of OP-AMP.
- C. Non-inverting terminal of OP-AMP is grounded.
- D. For an negative input, output is positive.

Q141 Technical Abilities

What material is primarily used as the core in fiber optic cables?

- A. Copper
- B. Plastic
- C. Glass ✓
- D. Aluminium

Q142 Technical Abilities

Narrowband FM is used in which of the following applications?

- A. Two-way mobile radio communication ✓
- B. FM radio broadcasting
- C. Television transmission
- D. High-fidelity audio systems

Q143 Technical Abilities

Which Boolean expression correctly represents the Difference (D) output of a Full Subtractor?

- A. $D = A \oplus B \oplus \text{Cout}$
- B. $D = A \oplus B$
- C. $D = A \oplus B \oplus \text{Bin}$ ✓
- D. $D = A \text{ AND } B$

Q144 Technical Abilities

Which of the following statements best describes the operation of a bridge rectifier?

- A. The bridge rectifier is a full-wave rectifier that does not require a center-tapped transformer, improving transformer efficiency. ✓
- B. In a bridge rectifier, current flows through two diodes during both positive and negative half cycles, leading to very high-power loss.
- C. The peak inverse voltage (PIV) of diode in a bridge rectifier is the same as in a center-tapped rectifier.
- D. The output voltage of a bridge rectifier consists of only DC components with no AC ripples.

Q145 Technical Abilities

The IO/M' signal in the 8085 microprocessor specifies _____.

- A. whether the operation is memory or I/O related ✓
- B. whether an interrupt has occurred
- C. whether the operation is read or write
- D. whether the data is valid

Q146 Technical Abilities

What happens to the carry-out bit when subtracting two n-bit numbers using 2's complement and the result is positive?

- A. The carry-out bit is inverted
- B. The carry-out bit indicates an overflow
- C. The carry-out bit is added to the result
- D. The carry-out bit is ignored ✓



Q147 Technical Abilities

The bandwidth of a raised cosine filter with roll-off factor β (0 to 1) and symbol rate R_s is given by:

A. $BW = \frac{R_s}{2}(\beta^2 + 1)$

B. $BW = R_s(\beta + 1)$

C. $BW = \frac{R_s}{2}(\beta + 1)$ ✓

D. $BW = R_s(2\beta + 1)$

Q148 Technical Abilities

What is the result of applying the complement law $A + A'$ in Boolean algebra?

A. 0

B. 1 ✓

C. A

D. $\overline{A}$

Q149 Technical Abilities

How many distinct states are there are in an n-bit ring counter?

A. n ✓

B. $\frac{n}{2}$

C. 2^n

D. 2n

Q150 Technical Abilities

For an RC phase shift oscillator, which of the following statements is INCORRECT?

A. The oscillation frequency of the oscillator is $\frac{1}{2\pi RC\sqrt{6}}$.

B. The magnitude of gain of the amplifier must be ≥ 29 .

C. The magnitude of the gain of the RC network is $> 1/29$. ✓

D. The total phase shift of the RC network is 180° .



General Abilities

50 Questions • Answer Key

Q1 General Abilities

The wavelength of ultraviolet radiations which is most powerful and causes damage to the DNA is ____.

- A. UV-D
- B. UV-A
- C. UV-B
- D. UV-C



Q2 General Abilities

The people of _____ were famously involved in execution of the Chipko movement.

- A. Garhwal Himalayas
- B. Delhi
- C. Gujarat
- D. Assam



Q3 General Abilities

The power to issue an ordinance when Parliament is NOT in session is given to the President under which Article?

- A. Article 72
- B. Article 110
- C. Article 356
- D. Article 123



Q4 General Abilities

A concave lens has a focal length of -2 cm. What is its power?

- A. 0.5 D
- B. 25 D
- C. -50 D
- D. -0.5 D



Q5 General Abilities

Which of the following is NOT toxic to non-target organisms in the soil?

- A. Organic fertilisers
- B. Herbicides
- C. Pesticides
- D. Fungicides



Q6 General Abilities

Which of the following bridges is constructed over the Brahmaputra River in India?

- A. Dhol-Sadiya Bridge
- B. Mahatma Gandhi Setu
- C. Howrah Bridge
- D. Pamban Bridge



Q7 General Abilities

Why do covalent compounds generally have low melting and boiling points?

- A. They contain metallic bonds.
- B. They have weak intermolecular forces.
- C. They have strong electrostatic forces.
- D. They have a rigid lattice structure.



Q8 General Abilities

Which function key is used to move text or graphics in a document?

- A. F12
- B. F1
- C. F5
- D. F2



Q9 General Abilities

What happens when you click on the 'Forward' button in an email?

- A. The email is permanently deleted.
- B. The email is automatically sent to all contacts.
- C. The original message is copied into a new email draft.
- D. A blank email opens.



Q10 General Abilities

Who among the following Indian female cricketers won the Best International Cricketer Award (Women) at the BCCI Naman Awards 2025?

- A. Smriti Mandhana
- B. Jhulan Goswami
- C. Harmanpreet Kaur
- D. Mithali Raj



Q11 General Abilities

Who among the following referred to the Directive Principles as the 'life-giving provisions' of the Constitution of India?

- A. BR Ambedkar
- B. HM Seervai
- C. LM Singhvi
- D. Ivor Jennings

Q12 General Abilities

Which type of RAM is faster and DOES NOT require refreshing?

- A. SRAM
- B. DRAM
- C. ROM
- D. Flash Memory

Q13 General Abilities

In which of the following events did Deepthi Jeevanji set a world record at the 2024 World Para Athletics Championships?

- A. 100 metres T20
- B. 400 metres T20
- C. 200 metres T20
- D. 600 metres T20

Q14 General Abilities

The main reason for which we are dependent on air is our _____.

- A. respiration
- B. excretion
- C. osmoregulation
- D. digestion

Q15 General Abilities

What is the primary function of a computer firewall?

- A. To prevent unauthorised access to a private network
- B. To store user passwords securely
- C. To speed up internet connectivity
- D. To detect and remove computer viruses

Q16 General Abilities

The kinetic energy of an object is derived using which of the following equations of motion?

- A. $v = u + at$
- B. $a = (v - u) / t$
- C. $v^2 - u^2 = 2as$
- D. $s = ut + \frac{1}{2}at^2$

Q17 General Abilities

Radiations that are emitted from nuclear wastes are known to cause _____ at a high rate.

- A. syndromes
- B. diseases
- C. mutations
- D. emotional defects

Q18 General Abilities

Which of the following elements has an atomic number of 8?

- A. Nitrogen
- B. Carbon
- C. Oxygen
- D. Hydrogen

Q19 General Abilities

Electricity production is categorised under which of the following economic sectors?

- A. Tertiary sector
- B. Primary sector
- C. Quaternary sector
- D. Secondary sector

Q20 General Abilities

An alloy is considered a homogeneous mixture because:

- A. it exhibits uniform composition throughout
- B. its components are chemically combined in fixed proportions
- C. its components can be separated by filtration
- D. it contains two or more phases



Q21 General Abilities

What happens to the pH of pure water when a few drops of lemon juice are added?

- A. The pH decreases ✓
- B. The pH becomes neutral
- C. The pH remains the same
- D. The pH increases

Q22 General Abilities

The President has the power to dissolve which house of Parliament?

- A. Rajya Sabha only
- B. Both Rajya Sabha and Lok Sabha
- C. Legislative Assembly
- D. Lok Sabha only ✓

Q23 General Abilities

Which of the following correctly differentiates mixtures and compounds?

Feature

- A. Option C (Properties) is correct
- B. Option A (Separation) is correct ✓
- C. Option B (Composition) is correct
- D. Option D (Formation) is correct

Q24 General Abilities

The atomic mass of sulphur is 32 u, and sulphur exists as S_8 molecules. What is the molecular mass of sulphur?

- A. 64 u
- B. 256 u ✓
- C. 32 u
- D. 128 u

Q25 General Abilities

Which operating system is known for its open-source nature and community-driven development for desktops and laptops?

- A. Windows
- B. Linux ✓
- C. iOS
- D. macOS

Q26 General Abilities

An object is placed 15 cm in front of a convex lens of focal length 25 cm. The image distance will be _____.

- A. 17.5 cm
- B. -10.0 cm
- C. -9.37 cm
- D. -37.5 cm ✓

Q27 General Abilities

Who is known as the leader of the Green Revolution in India?

- A. Prof. MS Swaminathan ✓
- B. Dr. Rajendra Prasad
- C. C Subramaniam
- D. Tribhuvandas Kishibhai Patel

Q28 General Abilities

Due to global warming, the temperature of the earth has increased by _____

- A. 0.5°C
- B. 0.7°C
- C. 0.8°C
- D. 0.6°C ✓

Q29 General Abilities

What is the primary function of a firewall tool in a computer network?

- A. To monitor and control incoming and outgoing network traffic ✓
- B. To store data securely
- C. To speed up internet connections
- D. To detect and remove viruses

Q30 General Abilities

In January 2025, India launched the NVS-02 satellite to strengthen which of the following navigation systems?

- A. Galileo
- B. Navigation with Indian Constellation (NavIC) ✓
- C. Global Navigation Satellite System (GLONASS)
- D. Global Positioning System (GPS)



Q31 General Abilities

What does LAN stand for?

- A. Large Area Network
- B. Local Area Network ✓
- C. Limited Access Node
- D. Linked Access Network

Q32 General Abilities

Which of the following will increase the heat produced by a heating element?

- A. Increasing the current flowing through the wire ✓
- B. Using a wire of lower resistance
- C. Using a material with high conductivity
- D. Decreasing the applied voltage

Q33 General Abilities

Which formula should be entered in cell C2 to multiply the values of cells A2 and B2 in Excel?

- A. =A2+B2
- B. =MULTIPLY(A2,B2)
- C. =A2*B2 ✓
- D. =A2-B2

Q34 General Abilities

In an aquatic ecosystem, the phenomenon of biomagnification can best be studied in the case of _____.

- A. organochlorine
- B. chlorine
- C. DDT ✓
- D. phosphates

Q35 General Abilities

Who among the following developed the notation system for Hindustani classical music?

- A. Pandit Vishnu Narayan Bhatkhande ✓
- B. Ustad Bismillah Khan
- C. Pandit Ravi Shankar
- D. Ustad Amjad Ali Khan

Q36 General Abilities

What is the general orientation of the Himalayan ranges in the northwestern part of India?

- A. East-South
- B. South-North
- C. Northeast to Southwest
- D. Northwest to Southeast ✓

Q37 General Abilities

A solution is prepared by dissolving 40 g of NaCl in 200 g of water. What is the mass per cent of NaCl in the solution?

- A. 20%
- B. 45%
- C. 16.67% ✓
- D. 25%

Q38 General Abilities

A metal wire is stretched, but it does not break easily. This property is known as:

- A. brittleness
- B. hardness
- C. malleability
- D. ductility ✓

Q39 General Abilities

Which country proposed the idea of holding a United Nations conference on human interactions with the environment in 1968?

- A. France
- B. Canada
- C. Sweden ✓
- D. United States

Q40 General Abilities

For the protection and improvement of the environmental quality, the Environment Protection Act came into force in the year _____.

- A. 1984
- B. 1986 ✓
- C. 1992
- D. 1972



Q41 General Abilities

Where can one find the option to change a PowerPoint template?

A. Design → Themes



B. View → Slide Master

C. Home → Layout

D. Insert → Themes

Q42 General Abilities

A ball of mass 50 grams is moving with a velocity of 15 m/s. What is its kinetic energy?

A. 7.500 J

B. 5.625 J



C. 3.750 J

D. 1.875 J

Q43 General Abilities

A sound wave with a low frequency will have _____.

A. a low pitch



B. a high pitch

C. a short wavelength

D. a low amplitude

Q44 General Abilities

A car moving at a constant speed of 123 km/hr along a straight road is an example of _____.

A. random motion

B. rotational motion

C. non-uniform motion

D. uniform motion

**Q45 General Abilities**

Which German optical technology firm inaugurated its first Global Capability Centre in Bengaluru in November 2024, with plans to double its workforce within three years?

A. Jenoptik

B. Carl Zeiss AG



C. Schneider Kreuznach

D. Leica

Q46 General Abilities

Which of the following options is NOT a greenhouse gas?

A. Carbon tetrachloride



B. Nitrous oxide

C. Carbon dioxide

D. Methane

Q47 General Abilities

Who among the following established the Bengal Chemical Swadeshi Stores?

A. Acharya PC Ray



B. BG Tilak

C. Dadabhai Naoroji

D. Surendranath Banerjee

Q48 General Abilities

Which of the following was NOT an artisan guild during the Mauryan period?

A. Bankers and Merchants

B. Astrologers



C. Potters

D. Carpenters

Q49 General Abilities

Which of the following MS Excel functions is used to convert a numeric value into a text with a specific format?

A. TEXT()



B. NUMBERTOTEXT()

C. VALUE()

D. FORMAT()

Q50 General Abilities

Which of the following is NOT a source of collection of municipal solid waste?

A. Waste from schools

B. Waste from homes

C. Waste from hospitals

D. Radioactive waste



Q51 Technical Abilities

Which of the following describes the effect of hardening in conducting materials such as copper and aluminium?

- A. It increases hardness and tensile strength, but reduces ductility.
- B. It has no effect on the material's electrical properties.
- C. It reduces electrical conductivity and increases brittleness. ✓
- D. It increases ductility and reduces resistance.

Q52 Technical Abilities

Which of the following statements is FALSE for a negative feedback amplifier?

- A. It reduces the effect of temperature on the output.
- B. It reduces nonlinear distortion in the output of the circuit.
- C. It reduces unwanted electrical signals at the output generated in the circuit.
- D. It reduces the bandwidth of the amplifier. ✓

Q53 Technical Abilities

The IC 723 is primarily used as a _____.

- A. rectifier
- B. clipper
- C. voltage regulator ✓
- D. clamper

Q54 Technical Abilities

How many clock pulses are required to load n bits into an n -bit SIPO shift register?

- A. n ✓
- B. 2^n
- C. n^2
- D. $2n$

Q55 Technical Abilities

If a C program contains only one function, it must be _____.

- A. major()
- B. void()
- C. main() ✓
- D. primary()

Q56 Technical Abilities

The ternary operator can be used as a replacement for which loop/statement?

- A. Switch-case statement
- B. For loop
- C. If-else statement ✓
- D. While loop

Q57 Technical Abilities

Which application commonly uses mineral insulating materials due to their mechanical strength and electrical insulating properties?

- A. Low-voltage electronic devices
- B. Electrical insulators for high-voltage transmission lines ✓
- C. Electrical wires for household use
- D. Batteries and electrodes

Q58 Technical Abilities

Which of the following is NOT true about Unshielded Twisted Pair (UTP) cables?

- A. They have a higher resistance to EMI than STP cables. ✓
- B. They are lighter and more flexible than STP cables.
- C. They are cost-effective for short-distance communication.
- D. They are commonly used in local area networks (LANs).

Q59 Technical Abilities

In a PNP transistor, when the emitter junction is forward biased and the collector junction is reverse biased, which of the following statements is correct?

- A. The depletion width of the N-type base is smaller than that of the P-type collector.
- B. The depletion region of the emitter junction increases as the applied voltage increases.
- C. The collector current is the sum of the majority and minority currents. ✓
- D. In a PNP transistor, current mainly flows due to electrons in the N-type base.



Q60 Technical Abilities

Which operator is used for bitwise OR in C?

- A. ~
- B. ||
- C. &&
- D. |

**Q61 Technical Abilities**

Which of the following is true about microwaves in unguided media?

- A. They are slower than radio waves.
- B. They require line-of-sight transmission.
- C. They are not affected by obstacles like buildings or hills.
- D. They use fiber optics for data transmission.

**Q62 Technical Abilities**

In a magnetic circuit, the total magnetic flux is 2 Wb (Weber). The reluctance of the magnetic circuit is 5 AT/Wb. What is the magnetomotive force (MMF) required to establish this flux?

- A. 10 AT
- B. 1 A
- C. 12 A
- D. 14 A

**Q63 Technical Abilities**

What is a key difference between a modem and a network interface card (NIC)?

- A. A modem provides internet access, while a NIC manages local area network (LAN) traffic.
- B. A modem connects to the network, while a NIC connects individual devices.
- C. A NIC connects to wireless networks, while a modem only supports wired connections.
- D. A NIC is used to modulate signals, while a modem is used to demodulate signals.

**Q64 Technical Abilities**

Which topology is most suitable for small networks or temporary setups?

- A. Ring topology
- B. Bus topology
- C. Mesh topology
- D. Star topology

**Q65 Technical Abilities**

What is the output of a EX-OR gate when both inputs are '1'?

- A. Z
- B. 1
- C. Undefined
- D. 0

**Q66 Technical Abilities**

A BJT is configured as a common-base amplifier; which of the following statements is INCORRECT?

- A. It is suitable for high-frequency applications.
- B. It works as an off switch if both junctions are reverse biased.
- C. The CB configuration operates as an amplifier when the transistor is in the saturation region.
- D. The voltage gain in a CB configuration is very high.

**Q67 Technical Abilities**

The Fourier Transform of an real and even function results in:

- A. a purely real and odd function
- B. a purely imaginary and even function
- C. a purely real and even function
- D. an imaginary and odd function

**Q68 Technical Abilities**

The roll-off factor (β :beta) in raised cosine filter represents the ratio of:

- A. excess bandwidth to the Nyquist bandwidth
- B. additional bandwidth to total system bandwidth
- C. total available bandwidth to the Nyquist bandwidth
- D. excess power of system to the minimum Nyquist bandwidth

**Q69 Technical Abilities**

A positive edge-triggered T Flip-Flop has $T = 1$. If the current output Q is 0, what will be the output Q after 3 clock pulses?

- A. 0
- B. Toggles
- C. Unchanged
- D. 1



Q70 Technical Abilities

An ideal diode is connected in series with a 1 kΩ load resistor and the input voltage is given as $V(t) = \sin^2(t) + \cos^2(t)$ V. What is the average output voltage across the load resistor?

- A. Average voltage cannot be determined
- B. +1 V
- C. +1/2 V
- D. 0 V

Q71 Technical Abilities

What is the 2's complement of the binary number 101110?

- A. 110001
- B. 010010
- C. 010011
- D. 010001

Q72 Technical Abilities

What is the primary function of a voltage differential relay in an electrical protection system?

- A. It detects the difference in voltage between two or more points and trips the system if the voltage difference exceeds a set threshold.
- B. It compares the current entering and leaving the protected zone to detect faults.
- C. It detects phase angle differences between the currents and trips the system if the angle exceeds a set limit.
- D. It measures the impedance across the circuit and operates when a fault is detected.

Q73 Technical Abilities

What is the Boolean expression for the Carry-out (C) output of a Half Adder?

- A. $C = A \text{ AND } B \oplus C_{in}$
- B. $C = A \text{ OR } B$
- C. $C = A \oplus B$
- D. $C = A \text{ AND } B$

Q74 Technical Abilities

In a CRT oscilloscope, the horizontal deflection plates are used to:

- A. display the vertical signal
- B. control the electron gun
- C. focus the beam on the phosphor screen
- D. create a sweeping movement of the beam from left to right

Q75 Technical Abilities

What is the hexadecimal equivalent of the binary number 110101?

- A. 2B
- B. 35
- C. 38
- D. 6A

Q76 Technical Abilities

Why is a delay line used in an oscilloscope?

- A. To reduce noise in the signal
- B. To enhance signal resolution
- C. To increase signal amplitude
- D. To synchronise the input signal with the electron beam

Q77 Technical Abilities

Selectivity in a protection relay system refers to:

- A. the ability of the relay to clear faults without affecting the rest of the system
- B. the ability of the relay to discriminate between fault and normal conditions
- C. the ability of the relay to operate with a minimal time delay for all fault conditions
- D. the ability of the relay to operate only for specific fault types

Q78 Technical Abilities

The Port ____ in the 8051 microcontroller has no dual functions.

- A. 2
- B. 0
- C. 3
- D. 1



Q79 Technical Abilities

What is another name for PWM in communication engineering?

- A. Pulse Position Modulation (PPM)
- B. Pulse Code Modulation (PCM)
- C. Pulse Amplitude Modulation (PAM)
- D. Pulse Duration Modulation (PDM) ✓

Q80 Technical Abilities

In Frequency Shift Keying (FSK) modulation, the carrier frequency is switched between two frequencies based on _____.

- A. whether a binary 1 or 0 is sent ✓
- B. frequency variation
- C. amplitude variation
- D. phase variation

Q81 Technical Abilities

Why does magnetic fringing occur at the ends of a magnetic circuit?

- A. The magnetic poles are not well-defined.
- B. The magnetic field lines spread out and become weaker. ✓
- C. The MMF is not constant.
- D. The reluctance of the material increases.

Q82 Technical Abilities

In a 100% modulated AM signal with a carrier power of 100 W, what is the power in the lower sideband?

- A. 25 W ✓
- B. 15 W
- C. 50 W
- D. 150 W

Q83 Technical Abilities

Which of the following is a unary operator in C?

- A. +
- B. -- ✓
- C. %
- D. *

Q84 Technical Abilities

Which of the following factors is primarily used to determine the rating of a resistor?

- A. Power dissipation capacity ✓
- B. Temperature coefficient
- C. Colour code
- D. Material used for construction

Q85 Technical Abilities

Which of the following statements about oscillator circuits is FALSE?

- A. Multivibrators are used for generating non-sinusoidal waveforms.
- B. The frequency of an oscillator depends on the RC or LC network.
- C. A circuit that generates a non-sinusoidal wave without any input is called a linear oscillator. ✓
- D. A circuit that generates a sine wave without any input is called a linear oscillator.

Q86 Technical Abilities

What determines the length of the delay in an electrical delay line used in oscilloscopes?

- A. The propagation speed of the signal in the line ✓
- B. The resistance of the delay line
- C. The frequency of the input signal
- D. The speed of the electron beam

Q87 Technical Abilities

In a non-inverting op-amp, if the feedback resistance is 20 K Ω and resistance between input and inverting terminal is 4 K Ω , the value of voltage gain is _____.

- A. 5
- B. 1.2
- C. 6 ✓
- D. 0.2



Q88 Technical Abilities

A half-wave rectifier is designed using a transformer and a diode. The primary winding of the transformer, with N_1 turns, is connected to a $240 \sin(\omega t)$ V supply. The secondary winding has N_2 turns. What is the rectified DC output voltage (V_{dc}) if $N_1/N_2 = 1:1$?

A. 240π

B. 240

C. $240/\pi$ ✓D. $480/\pi$ **Q89 Technical Abilities**

The address range of the bit addressable memory area in the 8051 microcontroller is ____.

A. 00-FFh

B. 20-2Fh ✓

C. 20-7Fh

D. 00-7Fh

Q90 Technical Abilities

Capture range frequency of a PLL ____.

A. is inversely proportional to the value of capacitance

B. is inversely proportional to the square root value of capacitance ✓

C. does not depend on the value of capacitance

D. is directly proportional to the value of capacitance

Q91 Technical Abilities

Why is shielding used in oscilloscope probes?

A. To reduce external electromagnetic interference ✓

B. To increase the probe's sensitivity

C. To control the electron beam in the oscilloscope

D. To amplify weak signals

Q92 Technical Abilities

What is the output of the following code?

```
int i = 1;
while ( i <= 10 )
printf ( "%d\n", i );
```

A. 1 2 3 4 5 6 7 8 9 10

B. 0 1 2 3 4 5 6 7 8 9

C. Infinite loop ✓

D. 10 9 8 7 6 5 4 3 2 1

Q93 Technical Abilities

A half-wave rectifier is designed using a diode and a resistor. The diode will burn out if it remains ON for more than $10 \mu s$. What is the minimum input frequency required for safe operation?

A. 20 kHz

B. 50 kHz ✓

C. 100 kHz

D. 1 MHz

Q94 Technical Abilities

Which of the following statements is correct when comparing a bridge rectifier to a centre-tapped full-wave rectifier?

A. The transformer utilisation factor is the same for both circuits.

B. The transformer utilisation factor (TUF) is better for a bridge rectifier than for a centre-tapped rectifier. ✓

C. A bridge rectifier has double the peak inverse voltage (PIV) compared to a centre-tapped rectifier.

D. The PIV of both rectifiers is the same.

Q95 Technical Abilities

A practical silicon diode with a cut-in voltage of 0.7 V is connected as follows:

- P-terminal (anode) $\rightarrow$ Ground (0V)
- N-terminal (cathode) $\rightarrow$ +10V

Given that the current flowing through the diode is $1 \mu A$, what is the DC resistance in reverse biased diode?

A. $10 M\Omega$ ✓B. $9.30 M\Omega$ C. $-9.30 M\Omega$ D. $10.7 M\Omega$ **Q96 Technical Abilities**

Which of the following functions is used to find the length of a string in C?

A. length()

B. strlen()

C. strlen() ✓

D. sizeof()



Q97 Technical Abilities

In a multiple trace oscilloscope, the display of two signals is achieved by:

- A. using multiple phosphor screens
- B. using a single electron gun with alternating sweeps ✓
- C. using two electron guns
- D. using a digital display panel

Q98 Technical Abilities

There are _____ register banks in the 8051 microcontroller.

- A. two
- B. three
- C. six
- D. four ✓

Q99 Technical Abilities

For a bipolar junction transistor (BJT) working as an amplifier, which of the following options is INCORRECT?

- A. For the emitter junction of a PNP transistor, the P-terminal is connected to positive voltage, and the N-terminal is connected to negative voltage.
- B. For the collector junction of an NPN transistor, the P-terminal is connected to positive voltage, and the N-terminal is connected to negative voltage. ✓
- C. For the collector junction of a PNP transistor, the N-terminal is connected to positive voltage, and the P-terminal is connected to negative voltage.
- D. For the emitter junction of an NPN transistor, the P-terminal is connected to positive voltage, and the N-terminal is connected to negative voltage.

Q100 Technical Abilities

In the communication of the PPM method, the information is encoded in the:

- A. width of the pulse
- B. position of the pulse ✓
- C. amplitude of the pulse
- D. power of the pulse

Q101 Technical Abilities

In which topology does a failure in one node NOT affect the entire network?

- A. Ring topology
- B. Fully connected mesh topology
- C. Star topology ✓
- D. Bus topology

Q102 Technical Abilities

Which of the following is a characteristic of diamagnetic materials when placed in a magnetic field?

- A. They exhibit weak repulsion from the magnetic field and align in the opposite direction. ✓
- B. They are strongly magnetised in the same direction as the applied magnetic field.
- C. They exhibit a strong attraction to the magnetic field.
- D. They exhibit no effect in a magnetic field.

Q103 Technical Abilities

What is the region around a magnet where the magnetic force is experienced known as?

- A. Magnetic field ✓
- B. Magnetic flux
- C. Magnetic domain
- D. Magnetic pole

Q104 Technical Abilities

Which of the following is a characteristic of a primary cell?

- A. It is used in rechargeable applications.
- B. It has a longer shelf life compared to secondary cells.
- C. It can be recharged multiple times.
- D. Once discharged, it cannot be reused. ✓

Q105 Technical Abilities

The time delay in an oscilloscope can be measured by:

- A. measuring the amplitude of the signal
- B. counting the number of weak signals
- C. measuring the decibel of the signal
- D. measuring the time between two successive peaks of the signal ✓



Q106 Technical Abilities

In 8051 microcontroller, Special Function Registers can be addressed using addresses from _____.

- A. F0h - FFh
- B. 20h - 2Fh
- C. 00h - 7Fh
- D. 80h - FFh

**Q107 Technical Abilities**

What is a 'memory bank' in RAM organisation?

- A. An independent memory module that can be accessed concurrently
- B. A cache memory location
- C. A section of memory reserved for the operating system
- D. A group of memory cells arranged in a single row

**Q108 Technical Abilities**

In a magnetic circuit, if the reluctance of a path increases, which of the following occurs?

- A. The magnetomotive force (MMF) will increase.
- B. The magnetic flux will increase.
- C. The resistance to magnetic flux will decrease.
- D. The magnetic flux will decrease.

**Q109 Technical Abilities**

How does the SNMP Agent communicate with the SNMP Manager?

- A. By generating encrypted data streams
- B. By responding to GET and SET requests from the SNMP Manager
- C. By initiating a TCP connection
- D. By sending files via FTP

**Q110 Technical Abilities**

What is a primary application of VSB (Vestigial Sideband) modulation?

- A. Satellite communication
- B. Telephonic communication
- C. FM radio broadcasting
- D. Television signal transmission

**Q111 Technical Abilities**

Which of the following devices operates at the Data Link Layer of the OSI model?

- A. Modem
- B. Firewall
- C. Switch
- D. Router

**Q112 Technical Abilities**

Which SNMP component resides on the network device being monitored?

- A. Protocol Analyzer
- B. SNMP Manager
- C. MIB Server
- D. SNMP Agent

**Q113 Technical Abilities**

How many select lines are required for a 1-to-8 Demultiplexer?

- A. 2
- B. 1
- C. 3
- D. 4

**Q114 Technical Abilities**

What is the difference between edge-triggering and level-triggering?

- A. Edge-triggering responds to the transition of the clock, while level-triggering responds to the level of the clock.
- B. Edge-triggering requires more power than level-triggering.
- C. Edge-triggering responds to the level of the input, while level-triggering responds to the transition.
- D. Edge-triggering is faster than level-triggering.

**Q115 Technical Abilities**

What does the 'D' in DRAM stand for?

- A. Digital
- B. Dynamic
- C. Direct
- D. Data



Q116 Technical Abilities

The DMA sends DACK - acknowledgement signal to the peripheral when ____.

- A. lower address bus A0- A7 is available on the address bus
- B. entire address bus A0- A15 is available on the address bus
- C. higher address bus A8- A15 is available on the address bus
- D. MPU sends the HLDA signal ✓

Q117 Technical Abilities

_____ interrupt is a positive edge sensitive interrupt and can be triggered with a short pulse.

- A. RST 7.5 ✓
- B. RST 5.5
- C. RST 6.5
- D. RST 4.5

Q118 Technical Abilities

In an op-amp integrator circuit, the output voltage is proportional to the ____.

- A. integral of the input signal ✓
- B. derivative of the input signal
- C. cube of the input signal
- D. sum of the input signal

Q119 Technical Abilities

What does DSB-SC stand for in communication system engineering?

- A. Dual Sideband with Single Carrier
- B. Double Sideband Suppressed Carrier ✓
- C. Dependent Sideband Suppressed Carrier
- D. Double Sideband with Single Carrier

Q120 Technical Abilities

Which of the following statements about a bipolar junction transistor (BJT) is correct?

- A. Collector current is the sum of emitter current and base current.
- B. If β is the common emitter amplifier current gain, then $I_C = \beta I_E$.
- C. The current gain in common base amplifier is the ratio of collector current to base current.
- D. $I_E = [I_C/\beta] + \beta I_B$ ✓

Q121 Technical Abilities

Thermistors are favoured over other temperature transducers because they ____.

- A. are highly linear over a wide range
- B. have a fast response time and high sensitivity ✓
- C. have a wide temperature range
- D. are not affected by environmental conditions

Q122 Technical Abilities

Which of the following switching techniques breaks data into small packets that are transmitted independently over the network?

- A. Circuit Switching
- B. Message Switching
- C. Packet Switching ✓
- D. Token Switching

Q123 Technical Abilities

Which combination of symbols represents an XOR (Exclusive-OR) gate?

- A. An AND gate with an additional curved at the input end.
- B. An OR gate with an additional curve at the input end. ✓
- C. An OR gate with a bubble at the output.
- D. An AND gate with a bubble at the output

Q124 Technical Abilities

In which modulation technique is the carrier modulated using phase shifts of 0° , 90° , 180° , and 270° ?

- A. BPSK (Binary Phase Shift Keying)
- B. FSK (Frequency Shift Keying)
- C. QPSK (Quadrature Phase Shift Keying) ✓
- D. ASK (Amplitude Shift Keying)

Q125 Technical Abilities

Which of the following is NOT a commonly used pulse-shaping filter in communication systems?

- A. Gaussian filter
- B. High-pass filter ✓
- C. Raised cosine filter
- D. Sinc filter



Q126 Technical Abilities

Which of the following is the syntax of the conditional operator in C?

- A. condition1 && expression1 || expression2
- B. expression1 ? expression2 : expression3
- C. condition1 : expression1 ? expression2 ✓
- D. expression || expression1 && expression2

Q127 Technical Abilities

In an n-type semiconductor, which of the following is true regarding the majority charge carriers?

- A. The majority charge carriers are protons.
- B. The majority charge carriers are holes.
- C. The semiconductor contains an equal number of electrons and holes.
- D. The majority charge carriers are electrons. ✓

Q128 Technical Abilities

Analyse the given program for 8085 and answer the question that follows.

```
MVI B, 06h  
MVI A, F2H  
ADD B
```

What is the content of Accumulator Register after the execution of the given program?

- A. F0h
- B. 6Ah
- C. F8h ✓
- D. 6Bh

Q129 Technical Abilities

In an asynchronous counter, the clock input of each flip-flop except first flip-flop is connected to:

- A. a common reset line
- B. the same clock source
- C. a separate clock source
- D. the output of the previous flip-flop ✓

Q130 Technical Abilities

In an electrical circuit, there are two resistors ($R_1 = 5 \Omega$ and $R_2 = 10 \Omega$) connected in series with a 15 V battery. What is the voltage drop across R_2 , according to Kirchhoff's Voltage Law (KVL)?

- A. 15 V
- B. 10 V ✓
- C. 0 V
- D. 5 V

Q131 Technical Abilities

Which of the following materials is typically preferred for electrical conductors due to its high conductivity and resistance to corrosion?

- A. Steel
- B. Copper ✓
- C. Gold
- D. Manganin

Q132 Technical Abilities

In the 8085 microprocessor, when RD signal is low and IO/M signal is high, the instruction is in the _____ cycle of execution.

- A. I/O write
- B. memory read
- C. memory write
- D. I/O read ✓

Q133 Technical Abilities

What is the purpose of the sizeof operator in C?

- A. To allocate memory dynamically
- B. To allocate memory at compile time
- C. To determine the size of a data type or variable in bytes ✓
- D. To determine the size of a data type or variable in bits

Q134 Technical Abilities

In a priority encoder, what happens when two or more input lines are active at the same time?

- A. The encoder will output the binary code for the lowest priority active input.
- B. The encoder will output an error.
- C. The encoder will output the binary code for the highest priority active input. ✓
- D. The encoder will output the binary code for both the priority active inputs.



Q135 Technical Abilities

Which of the following statements about the AM detection using PLL circuit is/are correct?

S1: It has higher noise immunity than the conventional peak detector type AM detector.

S2: The PLL is locked to the carrier frequency of the AM signal.

A. Both S1 and S2



B. Only S2

C. Neither S1 nor S2

D. Only S1

Q136 Technical Abilities

Which of the following statements is INCORRECT for a common-emitter (CE) BJT amplifier?

A. The input characteristics are drawn between input current (I_B) and input voltage (V_{BE}) at constant V_{CE} .

B. It has the moderate input impedance and moderate output impedance.

C. The output characteristics are drawn between output current (I_C) and output voltage (V_{CE}) at constant input current.

D. The CE amplifier cannot be used as a small signal amplifier.

**Q137 Technical Abilities**

In a 3-to-8 decoder, how many outputs are active for any given input?

A. 2

B. 1



C. 8

D. 3

Q138 Technical Abilities

In the internal circuit diagram of an IC 741 Op-amp, the second stage is also known as _____.

A. output stage

B. input stage

C. level shifting stage

D. intermediate stage

**Q139 Technical Abilities**

Which of the following instruments typically has the highest resolution?

A. Oscilloscope

B. Digital thermometer

C. Digital multimeter



D. Analog voltmeter

Q140 Technical Abilities

In PLL as frequency synthesizer, if the crystal oscillator having frequency 500 MHz is passed through divide by 2 network, then the input frequency to PLL is _____ MHz.

A. 1500

B. 250



C. 1000

D. 0.004

Q141 Technical Abilities

Which of the following components is required to detect (demodulate) Pulse Position Modulation (PPM)?

a) Pulse Generator

b) RS Flip-Flop

c) PWM Demodulator

A. All a, b, and c



B. Only a

C. Only a and b

D. Only c

Q142 Technical Abilities

Which of the following characteristics is associated with a distance relay used for fault protection?

A. It operates based on the voltage at the fault location.

B. It operates based on the current only.

C. It operates based on the impedance between the relay and the fault.



D. It is used only for short-circuit protection.



Q143 Technical Abilities

Which of the following statements about rectifiers is INCORRECT?

- A. The transformer utilization factor (TUF) is equal for both the bridge and center-tapped rectifier. ✓
- B. The transformer utilization factor (TUF) is better for a bridge rectifier compared to a center-tapped rectifier.
- C. Each half of the secondary winding of a center-tapped transformer is utilised for only half the time.
- D. The transformer utilization factor (TUF) is higher for a full-wave rectifier compared to a half-wave rectifier.

Q144 Technical Abilities

In a Nickel-Iron cell, which of the following best describes the working principle during the discharging process?

- A. Nickel at the positive electrode is reduced to metallic nickel, and iron hydroxide at the negative electrode is oxidised.
- B. Nickel hydroxide at the positive electrode is reduced to metallic nickel, and iron is oxidised at the negative electrode.
- C. Iron at the negative electrode is reduced to metallic iron, and nickel hydroxide at the positive electrode is oxidised.
- D. Iron at the negative electrode is oxidised to iron oxide, and nickel at the positive electrode is reduced to nickel hydroxide. ✓

Q145 Technical Abilities

Which of the following is a major application of carbon in electrical engineering?

- A. Semiconductor components in circuits
- B. Insulating material for high-voltage cables
- C. Conducting wires for power transmission
- D. Electrical contacts and brushes in motors ✓

Q149 Technical Abilities

A Colpitts oscillator is designed as a radio frequency oscillator. Which of the following statements is INCORRECT?

- A. It operates on the principle of parallel resonance.
- B. In a Colpitts oscillator, two capacitors and an inductor form the feedback network.
- C. An LC network is used in the design of Colpitts oscillators.

- D. The frequency of oscillation is $\omega = \frac{1}{\sqrt{L \left(\frac{C_1 + C_2}{C_1 C_2} \right)}}$ ✓

Q146 Technical Abilities

Dielectric strength is an important property of insulating materials. Which of the following best describes the dielectric strength of a material?

- A. The electrical conductivity of a material under stress
- B. The amount of heat a material can tolerate before melting
- C. The maximum voltage a dielectric material can withstand without breaking down ✓
- D. The resistance of a material to thermal expansion

Q147 Technical Abilities

Which of the following statements about FM detection using PLL circuit are correct?

S1: At the error amplifier output, we get demodulated FM output.
S2: FM signal is applied to the input of the PLL.

- A. Both S1 and S2 ✓
- B. Neither S1 nor S2
- C. Only S1
- D. Only S2

Q148 Technical Abilities

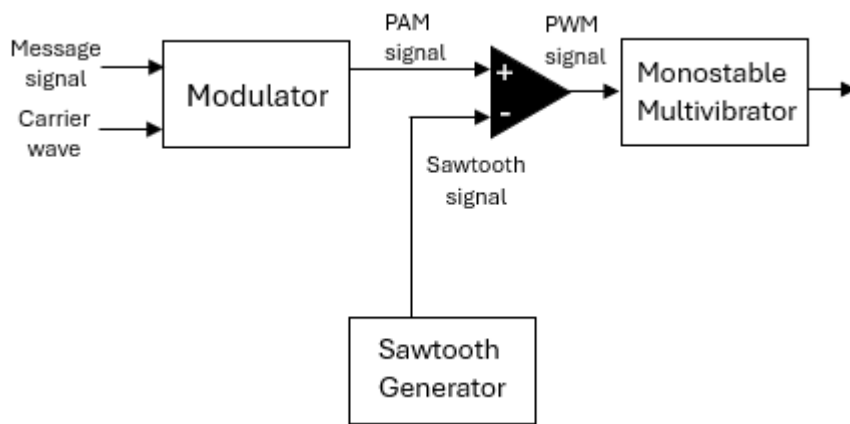
What is the limitation of the conditional operator (?:) in C?

- A. It cannot be nested.
- B. It can only be used with integer values.
- C. It allows only one statement after ? and :. ✓
- D. It cannot be used inside a loop.



Q150 Technical Abilities

The following block diagram represents which type of signal generation in communication?



A. PPM



B. PAM

C. PWM

D. PCM



General Abilities

50 Questions • Answer Key

Q1 General Abilities

The Montreal Protocol came into force in the year _____.

A. 1989



B. 1992

C. 1990

D. 1986

Q2 General Abilities

Which of the following best describes a heterogeneous mixture?

A. It has a uniform composition.

B. The components cannot be separated.

C. The composition varies throughout the mixture.



D. It contains only one phase.

Q3 General Abilities

The speed of a wave is given by which of the following formulas?

A. Speed = Frequency × Wavelength



B. Speed = Time × Frequency

C. Speed = Frequency × Amplitude

D. Speed = Amplitude × Wavelength

Q4 General Abilities

The loss of forests, which is remarkably seen in the tropical areas of India, is around _____.

A. 30%

B. 40%



C. 20%

D. 10%

Q5 General Abilities

Who among the following won the gold medal in the women's high jump event at the National Games in February 2025?

A. Abhinaya Shetty

B. Swapna Barman

C. Pooja Singh



D. Vithya Ramraj

Q6 General Abilities

A student calculates the formula unit mass of calcium fluoride (CaF_2). If the atomic masses of Ca and F are 40 u and 19 u, respectively, what is the correct formula unit mass?

A. 97 u

B. 78 u



C. 59 u

D. 100 u

Q7 General Abilities

As per Article 78, it is the duty of the Prime Minister to communicate all decisions of the Council of Ministers to whom?

A. President



B. Chief Justice of India

C. Vice President

D. Speaker of Lok Sabha

Q8 General Abilities

What is the typical range of a Local Area Network (LAN)?

A. More than 50 km

B. Up to 5 km

C. Up to 1 km



D. Up to 10 km

Q9 General Abilities

The greenhouse gas that is known to contribute the least amount to global warming is _____.

A. carbon dioxide

B. CFCs

C. methane

D. nitrous oxide



Q10 General Abilities

Which of the following is NOT a file management task?

A. Deleting files

B. Browsing the internet



C. Renaming files

D. Creating files



Q11 General Abilities

An object is placed 25 cm in front of a convex lens with a focal length of 15 cm. What is the magnification produced by the lens?

A. $M = -1.5$ ✓

B. $M = 2.5$

C. $M = 1.5$

D. $M = -2.5$

Q12 General Abilities

Which mouse pointer appears when adjusting column width / cell width in a table?

A. ↔ (Horizontal double-headed arrow) ✓

B. Hand cursor

C. I-beam (Text cursor)

D. ↑ (Vertical double-headed arrow)

Q13 General Abilities

Two objects of masses 80 kg and 250 kg are placed 200 m apart. What is the gravitational force between them? ($G = 6.7 \times 10^{-11} \text{ N}\cdot\text{m}^2/\text{kg}^2$)

A. $5.75 \times 10^{-11} \text{ N}$

B. $6.35 \times 10^{-11} \text{ N}$

C. $3.35 \times 10^{-11} \text{ N}$ ✓

D. $4.50 \times 10^{-11} \text{ N}$

Q14 General Abilities

The method of storage of nuclear wastes is to be done in _____.

A. shielded containers ✓

B. bottles

C. dustbins

D. open containers

Q15 General Abilities

Where is the magnetic field strength maximum around a magnet?

A. At the poles of the magnet ✓

B. At the centre of the magnet

C. Equidistant from the poles

D. At infinity

Q16 General Abilities

The Railways Employment of Members of the Armed Forces Act was passed in which of the following years?

A. 1951

B. 1965 ✓

C. 1957

D. 1962

Q17 General Abilities

Which of the following is an example of a WAN?

A. A Bluetooth connection between a phone and a laptop

B. A university campus network

C. A home Wi-Fi network

D. The internet ✓

Q18 General Abilities

In an experiment, 25 g of reactant A reacts with 35 g of reactant B to form 50 g of product C and some amount of product D. What is the mass of product D?

A. 10 g ✓

B. 25 g

C. 35 g

D. 60 g

Q19 General Abilities

What is the primary goal of application security?

A. To enhance the graphical user interface of applications

B. To increase the execution speed of applications

C. To reduce the size of application files

D. To protect applications from security threats by identifying and fixing vulnerabilities ✓

Q20 General Abilities

The Punjab Plain is formed by which river system?

A. Ganga and its tributaries

B. Brahmaputra and its tributaries

C. Indus and its tributaries ✓

D. Narmada and its tributaries



Q21 General Abilities

Which of the following is a string instrument?

- A. Flute
- B. Sitar
- C. Shehnai
- D. Tabla

Q22 General Abilities

Which statement correctly explains why liquids can flow?

- A. Liquids do not have kinetic energy.
- B. Liquids have no intermolecular forces.
- C. Liquid molecules move randomly without any restriction.
- D. Liquids have loosely packed molecules that slide past each other.

Q23 General Abilities

In September 2024, which of the following Indian institutions was designated as the Thematic Hub for Quantum Computing under the National Quantum Mission?

- A. Indian Institute of Technology Gandhinagar
- B. Indian Institute of Technology Madras
- C. Indian Institute of Science Bengaluru
- D. Indian Institute of Technology Kanpur

Q24 General Abilities

If the mass of an object is 74.5 kg, what is its approximate weight on Earth? (Take $g = 9.8 \text{ m/s}^2$)

- A. 74.5 N
- B. 447 N
- C. 7.6 N
- D. 730 N

Q25 General Abilities

What is the purpose of the 'BCC' field in an email?

- A. It allows recipients to see each others' addresses.
- B. It marks an email as urgent.
- C. It deletes an email after it is read.
- D. It hides recipients from each other.

Q26 General Abilities

According to the Tendulkar methodology, what was the estimated national poverty line for rural areas in 2011-12?

- A. ₹816 per month
- B. ₹512 per month
- C. ₹1,200 per month
- D. ₹1,000 per month

Q27 General Abilities

The melting of snow and ice caps from the polar regions is responsible for _____.

- A. condensation
- B. the decline in sea levels
- C. rainfall
- D. the rise in sea levels

Q28 General Abilities

Which property of solids allows them to be compressed the least compared to liquids and gases?

- A. High intermolecular spaces
- B. The ability to diffuse into other solids
- C. High kinetic energy of particles
- D. Strong intermolecular forces and close packing of particles

Q29 General Abilities

When were the 38th National Games held in Uttarakhand?

- A. January 15 - 30, 2025
- B. February 1 - 20, 2025
- C. January 28 - February 14, 2025
- D. February 10 - 25, 2025

Q30 General Abilities

Under the Delhi Sultanate what was the name of the state laws that grew under the monarchy, even if they violated the Shari'at?

- A. Iqta
- B. Zawabit
- C. Fatwas
- D. Farman



Q31 General Abilities

If three resistors of $15\ \Omega$, $35\ \Omega$ and $50\ \Omega$ are connected in series to a 25-V battery, what is the current flowing in the circuit?

A. 0.25 A



B. 4 A

C. 2.88 A

D. 1.5 A

Q32 General Abilities

Which of the following economic estimators provided estimates of India's national and per capita income during the colonial period?

A. Adam Smith

B. John Maynard Keynes

C. Karl Marx

D. VKRV Rao

**Q33 General Abilities**

Which of the following is an example of a chemical change?

A. Freezing of water

B. Tearing of paper

C. Curdling of milk



D. Dissolution of sugar in water

Q34 General Abilities

What is the function of the Linux Shell?

A. To directly manage hardware resources

B. To store user data

C. To create and delete partitions

D. To execute user commands and act as an interface between the user and the kernel

**Q35 General Abilities**

If the area of contact increases while keeping the thrust constant, the pressure will _____.

A. first increase, then decrease

B. decrease



C. increase

D. remain the same

Q36 General Abilities

The Indian Desert lies towards the western margins of which mountain range?

A. Satpura Hills

B. Vindhya Hills

C. Aravali Hills



D. Western Ghats

Q37 General Abilities

Which of the following is NOT an example of system software?

A. macOS

B. Microsoft Word



C. Windows 10

D. Linux

Q38 General Abilities

Which of the following is NOT an example of an agrochemical?

A. Pesticides

B. Fungicides

C. Biogas



D. Herbicides

Q39 General Abilities

In December 2024, Jasprit Bumrah became the fastest Indian bowler to reach 200 Test wickets during which of the following series/tournament?

A. India vs New Zealand Test Series

B. Border-Gavaskar Trophy



C. Asia Cup

D. India vs England Test Series

Q40 General Abilities

The effect of particulate matter which is a common air pollutant is maximally seen on the _____.

A. intestines

B. kidneys

C. liver

D. lungs



Q41 General Abilities

The area termed as the ozone hole is known to mainly develop over _____.

- A. America
- B. India
- C. Antartica
- D. Africa

Q42 General Abilities

Which of the following is an effective way to prevent rancidity in packaged food?

- A. Adding antioxidants
- B. Storing in a warm place
- C. Increasing moisture content
- D. Keeping it in direct sunlight

Q43 General Abilities

Which of the following metals is placed between aluminium and zinc in the reactivity series?

- A. Carbon
- B. Magnesium
- C. Iron
- D. Copper

Q44 General Abilities

What are the sand dunes commonly found in the Indian Desert called?

- A. Moraines
- B. Loess
- C. Barchans
- D. Cirques

Q45 General Abilities

What happens when you use the 'Sort A to Z' option on a column containing text?

- A. The text is sorted from Z to A.
- B. The text is converted into numbers.
- C. The text remains unchanged.
- D. The text is sorted alphabetically from A to Z.

Q46 General Abilities

_____ is the most efficient method used for the disposal of hospital-generated waste.

- A. Furnace
- B. Sanitary landfills
- C. Incinerator
- D. Open dumps

Q47 General Abilities

Which of the following is an example of database management software?

- A. Notepad
- B. PowerPoint
- C. Microsoft Access
- D. MS Paint

Q48 General Abilities

Who among the following is NOT appointed by the President of India?

- A. Vice President
- B. Governors of States
- C. Chief Election Commissioner
- D. Comptroller and Auditor General

Q49 General Abilities

Which of the following is a zero waste procedure?

- A. Integrated organic farming
- B. Inorganic farming
- C. Pest management
- D. Organic farming

Q50 General Abilities

Which dynasty was overthrown by Chandragupta Maurya to establish the Mauryan Empire?

- A. Shunga Dynasty
- B. Gupta Dynasty
- C. Kushan Dynasty
- D. Nanda Dynasty



Q51 Technical Abilities

A common emitter amplifier with a gain of 10 is used to design an oscillator. What should be the gain and phase shift of the feedback network for sustained oscillation?

- A. 10, 180°
- B. 1, 360°
- C. 0.1, 180°
- D. 0.1, 360°

**Q52 Technical Abilities**

What is the typical maximum frequency deviation for Wide Band FM (WBFM) used in FM broadcasting?

- A. 105 kHz
- B. 5 kHz
- C. 75 kHz
- D. 25 kHz

**Q53 Technical Abilities**

Which type of AM signal is generated using only balanced modulator and/or ring modulator without using any additional processing?

- A. Double Sideband Suppressed Carrier (DSB-SC)
- B. Wideband FM Signal
- C. Single Sideband Suppressed Carrier (SSB-SC)
- D. Vestigial Sideband Modulation (VSB)

**Q54 Technical Abilities**

Which type of load cell is best suited for measuring dynamic forces?

- A. Pneumatic load cell
- B. Piezoelectric load cell
- C. Strain gauge load cell
- D. Hydraulic load cell

**Q55 Technical Abilities**

The 8051 Microcontroller is packaged in a ____ pin DIP.

- A. 40
- B. 35
- C. 42
- D. 45

**Q56 Technical Abilities**

What type of voltage is applied to the horizontal deflection plates in an oscilloscope?

- A. Sinusoidal voltage
- B. Constant DC voltage
- C. Sawtooth waveform
- D. Triangular waveform

**Q57 Technical Abilities**

Which of the following is the correct syntax of an if statement in C?

- A. `if (condition) { statement; }`
- B. `if condition { statement; }`
- C. `if condition then { statement; }`
- D. `if { condition } ( statement ) ;`

**Q58 Technical Abilities**

Determine the DC current gain of a common collector (CC) amplifier given:

Emitter current (I_E) = 3.02 mA

Collector current (I_C) = 3 mA.

- A. 0.99
- B. 99
- C. 150
- D. 151

**Q59 Technical Abilities**

Which input function is considered unsafe due to buffer overflow risks?

- A. `gets()`
- B. `fgets()`
- C. `getchar()`
- D. `scanf()`

**Q60 Technical Abilities**

In 8085 MPU to operate a system at 3 MHz, the crystal connected to pins X1 and X2 should have a frequency of ____.

- A. 4 MHz
- B. 3 MHz
- C. 1.5 MHz
- D. 6 MHz



Q61 Technical Abilities

Bipolar RAM primarily utilises which type of transistor?

- A. Field-effect transistors
- B. MOSFETs
- C. BJTs
- D. CMOS transistors

Q62 Technical Abilities

Which of the following CANNOT be done to minimise the ripple factor in a rectifier?

- A. Decreasing the capacitance of the capacitive filter
- B. Increasing the inductance of the inductive filter
- C. Using a capacitor in parallel with the load resistor
- D. Using an inductor in series with the load resistor

Q63 Technical Abilities

What is the primary operating principle of a thermal relay in an electrical protection system?

- A. It measures the impedance in the circuit and trips when it exceeds a certain limit.
- B. It operates based on the difference in voltage across the protected equipment.
- C. It measures the amount of heat generated due to the current flow and operates when a preset temperature is reached.
- D. It operates based on the phase angle difference between the currents.

Q64 Technical Abilities

In the Constant Voltage Charging Method, which of the following is most likely to occur if the charging voltage is set too high?

- A. Increased battery capacity
- B. Reduced charging efficiency
- C. Overcharging of the battery leading to increased temperature
- D. Improved charge retention

Q65 Technical Abilities

Select the correct statement(s) regarding a voltage controlled oscillator (VCO) in a phase lock loop.

S1: The control-voltage is applied at the input of a VCO.
S2: Phase detector compared the VCO frequency with the input frequency.

- A. Neither S1 nor S2
- B. Only S1
- C. Only S2
- D. Both S1 and S2

Q66 Technical Abilities

Which of the following terms refers to the process by which a battery or cell loses its ability to hold charge over time?

- A. Charge efficiency
- B. Internal resistance
- C. Capacity
- D. Battery aging

Q67 Technical Abilities

What happens to the output of a JK Flip-Flop when $J = 1$, $K = 1$, and clock is active?

- A. It resets.
- B. It sets.
- C. It remains unchanged.
- D. It toggles.

Q68 Technical Abilities

Which of the following options for the output characteristics of a common-base (CB) configuration of BJT is INCORRECT?

- A. The output characteristics are plotted between the output current (I_C) and output voltage (V_{CB}).
- B. The output characteristics show that I_C increases significantly with an increase in V_{CB} due to the Early effect.
- C. When the input current is zero, a non-zero output current exists due to minority carriers.
- D. In a CB configuration, the current gain is slightly greater than one.



Q69 Technical Abilities

Which of the following terms describes a material that becomes magnetised in the presence of an external magnetic field and loses its magnetism once the field is removed?

- A. Hard magnetic material
- B. Permanent magnet
- C. Soft magnetic material ✓
- D. Ferromagnetic material

Q70 Technical Abilities

For a 2-to-1 Multiplexer with inputs $I_0 = 0$, $I_1 = 1$, and select line $S = 1$, what is the value of the output Y ?

- A. 0
- B. 0.5
- C. 1 ✓
- D. Undefined

Q71 Technical Abilities

What is the primary advantage of full-duplex communication over half-duplex communication?

- A. It uses less bandwidth.
- B. It allows simultaneous data flow in both directions. ✓
- C. It is easier to implement.
- D. It is less expensive to set up.

Q72 Technical Abilities

What is the correct specific gravity reading for an electrolyte in a fully charged lead-acid cell?

- A. 1.000
- B. 1.270 ✓
- C. 1.150
- D. 1.400

Q73 Technical Abilities

A 4-bit parallel adder uses four full adders. What is the maximum number of bits in the sum output, including the carry-out bit?

- A. Three
- B. Five ✓
- C. Eight
- D. Four

Q74 Technical Abilities

Which of the following materials is/are commonly used to make the wires in thermocouples?

- A. Lead and zinc
- B. Copper and nickel ✓
- C. Silver and aluminium
- D. Gold

Q75 Technical Abilities

An NPN transistor is configured to amplify an audio signal. Which of the following statements is correct?

- A. The depletion regions of the collector junction and emitter junction are almost equal.
- B. The emitter junction is reverse biased, and the collector junction is forward biased.
- C. Very few charge carriers from the emitter recombine in the base region. ✓
- D. Only a small number of electrons from the emitter cross the collector junction because it is reverse biased.

Q76 Technical Abilities

What is the typical bandwidth of a twisted pair cable used in Ethernet networks?

- A. 1 mbps
- B. 1 kbps
- C. 100 gbps
- D. 10 mbps to 1 gbps ✓

Q77 Technical Abilities

Which of the following statements is FALSE for a feedback amplifier?

- A. Negative feedback can reduce the effect of temperature on the output.
- B. Positive feedback increases both gain and bandwidth. ✓
- C. Emitter resistance in a bipolar transistor helps stabilise the amplifier's gain.
- D. Negative feedback reduces gain but improves amplifier linearity.



Q78 Technical Abilities

Which of the following statements is correct for a bridge rectifier?

- A. The transformer utilization factor (TUF) is the same for both bridge and center-tapped rectifiers.
- B. A bridge rectifier has twice the PIV of a center-tapped rectifier.
- C. A bridge rectifier has a lower ripple factor than a center-tapped rectifier.
- D. The transformer utilization factor (TUF) of a bridge rectifier is higher than that of a center-tapped rectifier. ✓

Q79 Technical Abilities

Which ports are mainly utilised for address and data lines when interfacing external RAM with the 8051 microcontroller?

- A. Port 1 and Port 3
- B. Port 0 and Port 3
- C. Port 2 and Port 3
- D. Port 0 and Port 2 ✓

Q80 Technical Abilities

Which of the following is a commonly used thermosetting resin in electrical applications due to its excellent electrical insulating properties and resistance to high temperatures?

- A. Polystyrene
- B. Epoxy resin ✓
- C. Polyvinyl chloride
- D. Polyethylene

Q81 Technical Abilities

How is data typically erased from an EPROM?

- A. By removing the power supply
- B. By applying a high voltage electrical signal
- C. By exposure to ultraviolet (UV) light ✓
- D. By using a magnetic field

Q82 Technical Abilities

In Vestigial Sideband (VSB) demodulation, which of the following is used to recover the original modulating signal?

- A. Frequency discriminator followed by a band-pass filter
- B. Phase detector followed by a notch filter
- C. Product modulator followed by a low-pass filter ✓
- D. Signal detector followed by a high-pass filter

Q83 Technical Abilities

Which of the following scenarios best demonstrate the use of a repeater?

- A. Boosting the signal strength of an Ethernet cable over long distances ✓
- B. Filtering unwanted traffic in a network segment
- C. Interconnecting two separate LANs using different protocols
- D. Extending the range of a Wi-Fi network in a large building

Q84 Technical Abilities

What is the primary role of a modulator in a communication system?

- A. To filter out noise from the received signal
- B. To amplify the transmitted signal
- C. To extract the message signal from the carrier wave
- D. To superimpose the message signal onto the carrier wave ✓

Q85 Technical Abilities

A signal has a maximum frequency of 3 kHz. What is the minimum sampling rate required to satisfy the Nyquist criterion?

- A. 3 kHz
- B. 16 kHz
- C. 6 kHz ✓
- D. 9 kHz

Q86 Technical Abilities

Hydrogen is used as an insulating gas in electrical equipment. What is the main reason for its use in such applications?

- A. It has a high molecular density.
- B. It is stable at high temperatures.
- C. It has a high dielectric strength and low molecular weight. ✓
- D. It is a good conductor of electricity.



Q87 Technical Abilities

Which of the following options is INCORRECT for a voltage-shunt feedback amplifier?

- A. A collector-base bias circuit is an example of a voltage-shunt feedback amplifier.
- B. A non-inverting op-amp is an example of a voltage-shunt feedback amplifier. ✓
- C. An inverting operational amplifier uses a voltage-shunt feedback mechanism.
- D. It is also known as a transresistance amplifier.

Q88 Technical Abilities

Which of the following is true about the behaviour of a D Flip-Flop when the clock input is NOT transitioning?

- A. The output is undefined.
- B. The output remains at the last value. ✓
- C. The output follows the input.
- D. The output will always be zero.

Q89 Technical Abilities

A superheterodyne receiver consists of blocks in sequence as given in the options. Which of them gives the correct order?

- A. Antenna → RF stage → Mixer (other input from local oscillator) → IF Amplifier → Detector → Audio Amplifier ✓
- B. Antenna → IF Amplifier → Mixer → Detector → Audio Amplifier → Local Oscillator
- C. Antenna → Audio Amplifier → IF Amplifier → Mixer → Local Oscillator → Detector
- D. Antenna → IF Amplifier → Local Oscillator → Mixer → Detector → RF stage → Audio Amplifier

Q90 Technical Abilities

How does the 8051 microcontroller access external memory?

- A. By using register addressing
- B. By using immediate addressing
- C. By using indirect addressing through DPTR ✓
- D. By using direct addressing

Q91 Technical Abilities

The Address of the Accumulator register in the 8051 Microcontroller is ____.

- A. 0E0h ✓
- B. 92h
- C. 0B0h
- D. 82h

Q92 Technical Abilities

Which of the following is a valid relational operator in C?

- A. ===
- B. <>
- C. &=
- D. != ✓

Q93 Technical Abilities

What effect does a higher modulation index have on the amplitude of the modulated waveform?

- A. It only affects the frequency of the modulated signal.
- B. It does not affect the amplitude.
- C. It increases the peak-to-peak amplitude of the modulated signal. ✓
- D. It does not affect any signal.

Q94 Technical Abilities

Which of the following terms defines the time taken by a protective relay to operate and initiate a trip after detecting a fault?

- A. Pick-up time
- B. Reset time
- C. Tripping time
- D. Operating time ✓

Q95 Technical Abilities

Which of the following is the primary function of a crystal oscillator in frequency synthesizer?

- A. To increase the input frequency
- B. To remove the noise from the signal
- C. To decrease the input frequency
- D. To generate a stable output frequency ✓



Q96 Technical Abilities

In a Nickel-Iron battery, what occurs at the positive electrode during the discharge process?

- A. Nickel oxide is reduced to nickel metal.
- B. Iron is oxidised to iron(III) hydroxide.
- C. Nickel oxide reacts with water to form nickel hydroxide. ✓
- D. Nickel hydroxide is reduced to nickel metal.

Q97 Technical Abilities

Associativity of the Logical AND operator _____.

- A. depends on the compiler
- B. is right to left
- C. depends on the application
- D. is left to right ✓

Q98 Technical Abilities

Which of the following is a direct application of Kirchhoff's Current Law (KCL) in an electrical circuit?

- A. The total voltage across a series circuit is equal to the sum of individual voltages.
- B. The sum of voltages across all parallel components is constant.
- C. The sum of all currents entering a junction equals the sum of all currents leaving the junction. ✓
- D. The total power delivered to a circuit equals the sum of power losses in each component.

Q99 Technical Abilities

If all the resistances of an inverting op-amp adder are equal, then the output voltage is _____.

- A. sum of input voltages
- B. zero as all the resistances are equal
- C. negative sum of the input voltages ✓
- D. difference of input voltages

Q100 Technical Abilities

The pulse width of the output of a monostable multivibrator using IC 555 if the external components are $R = 1000\text{ K}\Omega$ and $C = 10\text{ }\mu\text{F}$ is _____.

- A. 11 ms
- B. 22 s
- C. 11 s ✓
- D. 2.2 ms

Q101 Technical Abilities

DMA asserts _____ signal to 'low' at the end of data transfer to inform the peripheral that the data transfer is complete.

- A. EOP ✓
- B. DRQ
- C. HLDA
- D. HRQ

Q102 Technical Abilities

In which situation would a bridge be more effective than a switch?

- A. When connecting devices at the physical layer
- B. When filtering traffic based on IP addresses
- C. When requiring VLAN functionality
- D. When segmenting a large network to reduce collisions ✓

Q103 Technical Abilities

Which of the following is true about the Half Subtractor circuit?

- A. It subtracts two binary digits and generates a sum and carry-out.
- B. It is used for binary addition.
- C. It subtracts two binary digits and generates a difference and borrow-out. ✓
- D. It can handle borrow input from previous stages.

Q104 Technical Abilities

What is the main purpose of a Virtual Private Network (VPN)?

- A. To secure communication over a public network ✓
- B. To establish a local network connection
- C. To connect home devices wirelessly
- D. To extend a LAN within a building

Q105 Technical Abilities

Which of the following best describes a semiconductor material?

- A. A material that only conducts electricity at high temperatures.
- B. A material that allows electric current to pass freely in both directions.
- C. A material that can conduct electricity under certain conditions but not others. ✓
- D. A material that behaves as a conductor at low temperatures and as an insulator at high temperatures.



Q106 Technical Abilities

The raised cosine filter is commonly used in communication systems to reduce:

- A. channel complexity
- B. transmission power
- C. Intersymbol Interference (ISI) ✓
- D. channel length

Q107 Technical Abilities

What does the Plug Setting Multiplier (PSM) represent in the operation of a protective relay?

- A. It is the ratio of the actual fault current to the plug setting, which determines the relay's response time. ✓
- B. It is a constant factor that is independent of the fault current and only adjusts the relay's settings.
- C. It is a factor that determines the maximum fault current that can be handled by the relay.
- D. It is used to adjust the time delay of the relay based on fault severity.

Q108 Technical Abilities

Which of the following statements is/are correct regarding Frequency Modulation (FM) and Amplitude Modulation (AM)?

- a) FM provides better noise immunity.
- b) AM requires lower bandwidth than FM.
- c) FM utilises transmitted power more efficiently.

- A. Only b
- B. Only a
- C. Only a and c
- D. a, b and c ✓

Q109 Technical Abilities

Which of the following is the requirement of a good instrumentation amplifier?

- A. High power consumption
- B. Low slew rate
- C. Low CMRR
- D. Finite gain ✓

Q110 Technical Abilities

At what point does the slave flip-flop in a positive edge triggered JK Master-Slave configuration update its output?

- A. While the clock is low
- B. On the positive edge of the clock
- C. On the negative edge of the clock ✓
- D. While the clock is high

Q111 Technical Abilities

Which of the following is/are true about demodulation?

- a) It is performed at the transmitting end.
- b) It is performed at the receiving end.
- c) It recovers the original information signal from the modulated carrier wave.

- A. Only b and c ✓
- B. Only a and c
- C. Only b
- D. Only a

Q112 Technical Abilities

Which of the following options is INCORRECT for a feedback amplifier?

- A. The gain-bandwidth product remains constant for a negative feedback amplifier.
- B. In a feedback topology, sampling the output voltage reduces the output impedance.
- C. In a feedback topology, sampling the output current reduces the output impedance. ✓
- D. Negative feedback minimises nonlinear distortion in the amplifier's output.

Q113 Technical Abilities

The Stack Pointer SP is set to ____ when the 8051 microcontroller is reset.

- A. 07h ✓
- B. 00h
- C. 06h
- D. 08h



Q114 Technical Abilities

Which device connects multiple networks and determines the best path for data to travel?

- A. Switch
- B. Hub
- C. Bridge
- D. Router

**Q115 Technical Abilities**

Select the correct statement(s) regarding the ideal op-amp differentiator circuit.

S1: The output voltage is zero for a constant input voltage.
S2: The output voltage is the sum of the input signal.

- A. Neither S1 nor S2
- B. Only S1
- C. Both S1 and S2
- D. Only S2

**Q116 Technical Abilities**

Which type of error primarily affects the accuracy of an instrument?

- A. Systematic error
- B. Instrumental drift
- C. Gross error
- D. Random error

**Q117 Technical Abilities**

In phase locked loop, the primary role of the voltage controlled oscillator is _____.

- A. to synchronise the phase of the output signal
- B. to generate a frequency which is proportional to the dc input voltage
- C. to control the amplitude of output signal
- D. to amplify the input signal

**Q118 Technical Abilities**

What is the correct function to write a character to a file?

- A. putc()
- B. write()
- C. fputc()
- D. fwrite()

**Q119 Technical Abilities**

In a composite magnetic circuit with two magnetic materials having different permeabilities μ_1 and μ_2 , the total reluctance of the circuit is:

- A. the reciprocal of the sum of the reciprocals of each reluctance
- B. the product of reluctances of each material
- C. the sum of reluctances of each material
- D. the average reluctance of both materials

**Q120 Technical Abilities**

If the length of the magnetic path is increased while keeping the cross-sectional area and the magnetomotive force (MMF) constant, which of the following will occur?

- A. The flux will decrease.
- B. The flux will increase.
- C. The flux will remain constant.
- D. The reluctance will decrease.

**Q121 Technical Abilities**

Which of the following HTTP response codes indicates that the requested resource was not found?

- A. 200
- B. 500
- C. 404
- D. 403

**Q122 Technical Abilities**

Which format specifier is used to print a signed long?

- A. %l
- B. %lf
- C. %sl
- D. %ld

**Q123 Technical Abilities**

The 8085 microprocessor is a ____ pin IC.

- A. 40
- B. 20
- C. 30
- D. 45



Q124 Technical Abilities

Which of the following network types is ideal for connecting branches of a company located in different cities?

A. WAN



B. LAN

C. PAN

D. MAN

Q125 Technical Abilities

The two inputs to a phase detector in PLL are _____.

A. amplifier output and feedback voltage from a voltage controlled oscillator

B. low pass filter output and feedback voltage from a voltage controlled oscillator

C. input voltage and amplifier output

D. input voltage and feedback voltage from a voltage controlled oscillator

**Q126 Technical Abilities**

Which of the following artificial magnets is best suited for use in electrical motors and transformers due to its high efficiency and stable magnetic field?

A. Iron magnet

B. Ceramic magnet



C. Steel magnet

D. Alnico magnet

Q127 Technical Abilities

Which of the following statements is FALSE for a common-collector (CC) amplifier using a BJT?

A. It is commonly used for impedance matching and not for voltage gain.

B. It has very high input impedance and low output impedance.

C. It has the lowest output impedance, the highest current gain and the lowest voltage gain.

D. It is a current-controlled current source.

**Q128 Technical Abilities**

If a magnetic material has high permeability, which of the following effects is most likely to occur in a magnetic circuit?

A. Increased magnetomotive force

B. Decreased flux

C. Decreased reluctance



D. Increased reluctance

Q129 Technical Abilities

What is the correct way to read a string using scanf() in C?

A. `scanf("&s", str);`

B. `scanf("%s", str);`



C. `scanf("%c", str);`

D. `scanf("%d", str);`

Q130 Technical Abilities

Which of the following statements about the energy band structure of P-type and N-type semiconductors is true?

A. For a P-type semiconductor, the valence band energy is higher than the conduction band energy.

B. For Si, the energy gap between the conduction band and the valence band is larger than that of Ge.



C. For a semiconductor, the energy gap between the conduction band and the valence band is larger than that of an insulator.

D. For a N-type semiconductor, the valence band energy is higher than the conduction band energy.

Q131 Technical Abilities

Which of the following statements about extrinsic semiconductors is correct regarding the effect of temperature on their conductivity?

A. In p-type semiconductors, increasing the temperature leads to an increase in the number of holes as more electrons get excited to the conduction band.



B. Temperature has no significant effect on the conductivity of extrinsic semiconductors once they are doped.

C. The conductivity of n-type semiconductors increases with a decrease in temperature due to fewer free electrons.

D. In both n-type and p-type semiconductors, conductivity decreases sharply with an increasing temperature.



Q132 Technical Abilities

Which of the following options is correct for an open-loop configuration of an op-amp?

- A. It has zero output voltage.
- B. It has a very high open-loop voltage gain. ✓
- C. The output voltage is linearly proportional to the input voltage.
- D. It has a feedback connection between output and input.

Q133 Technical Abilities

What is the binary result of the following subtraction?

1101 – 0110

- A. 1001
- B. 1010
- C. 0101
- D. 0111 ✓

Q134 Technical Abilities

A DSB-SC signal is being detected synchronously. The phase error in the locally generated carrier will _____.

- A. have no effect on the demodulated signal
- B. increase the amplitude of the demodulated signal
- C. cause phase distortion and reduce the output also ✓
- D. completely block the demodulated signal always

Q135 Technical Abilities

Which of the following statements is INCORRECT regarding the input impedance and bandwidth of a feedback amplifier?

- A. If the feedback signal is returned to the input in series opposition with the applied signal, the input impedance increases.
- B. Positive feedback increases gain, but bandwidth remains almost unchanged. ✓
- C. If the feedback signal is subtracted from the applied signal, the amplifier's bandwidth increases.
- D. If the feedback signal is returned to the input in shunt with the applied signal, the input impedance decreases.

Q136 Technical Abilities

What does Td represent in phase angle measurement using an oscilloscope?

- A. Total time period of the waveform
- B. Frequency of the waveform
- C. Voltage difference between signals
- D. Time difference between corresponding points of two signals ✓

Q137 Technical Abilities

What is the correct syntax to declare a one-dimensional array 'students' of size 20 in C?

- A. array students[20];
- B. int students;
- C. students[20] int;
- D. int students[20]; ✓

Q138 Technical Abilities

Which ADC type is known for its high speed but relatively lower resolution?

- A. Sigma-Delta ADC
- B. Flash ADC ✓
- C. Dual-Slope ADC
- D. Successive Approximation ADC

Q139 Technical Abilities

Which technique is commonly used in a multiple trace oscilloscope to display two signals simultaneously?

- A. Voltage division
- B. Signal amplification
- C. Time multiplexing ✓
- D. Beam splitting

Q140 Technical Abilities

Which of the following best describes impulse noise?

- A. Continuous low-frequency noise
- B. Noise caused by temperature fluctuations
- C. Short bursts of high-amplitude interference ✓
- D. Gradual signal degradation over time



Q141 Technical Abilities

In the context of MUX applications, what does a MUX allow in terms of control?

- A. It allows control of multiple inputs to a single output based on select lines. ✓
- B. It amplifies the signal before sending it to the output.
- C. It generates clock pulses for digital circuits.
- D. It performs arithmetic operations on multiple data inputs.

Q142 Technical Abilities

What is the key difference between the working of while and do-while loops in C?

- A. A while loop executes at least once, whereas a do-while loop may not execute at all.
- B. A while loop evaluates the condition before executing the loop body, whereas a do-while loop evaluates the condition after executing the loop body. ✓
- C. A do-while loop is faster than a while loop.
- D. A while loop cannot contain a break statement, but a do-while loop can.

Q143 Technical Abilities

Strain gauges typically work by detecting a change in the _____.

- A. capacitance
- B. inductance
- C. resistance ✓
- D. voltage

Q144 Technical Abilities

A PN junction is formed using P-type and N-type semiconductors with doping concentrations:

$$N_A = 10^{12}/\text{cm}^3, N_D = 10^{10}/\text{cm}^3$$

Given:

Thermal voltage: $V_T = 25 \text{ mV}$

Intrinsic carrier concentration: $n_i = 10^6 / \text{cm}^3$

What is the built-in voltage V_0 across the PN junction?

- A. $500 \ln(100) \text{ V}$
- B. $250 \ln(10) \text{ mV}$ ✓
- C. $250 \ln(100) \text{ V}$
- D. $125 \ln(10) \text{ mV}$

Q145 Technical Abilities

Tungsten, due to its high melting point and excellent electrical conductivity, is widely used in high-temperature applications. Which of the following properties of tungsten makes it particularly suitable for use in electrical components like filaments and electrodes in high-temperature environments?

- A. High electrical conductivity and low resistivity
- B. Low melting point and excellent oxidation resistance
- C. High melting point and low coefficient of expansion ✓
- D. High melting point and resistance to thermal shock

Q146 Technical Abilities

Which of the following is an example of a digital modulation technique?

- A. Double side band Amplitude Modulation
- B. Phase Shift Keying (PSK) ✓
- C. Single Sideband Modulation (SSB)
- D. Narrow Band FM

Q147 Technical Abilities

What is the significance of 'resolution' in a DAC?

- A. It determines the maximum speed of the DAC.
- B. It sets the power consumption of the DAC.
- C. It limits the maximum input voltage of the DAC.
- D. It defines the smallest change in analogue output that can be produced. ✓

Q148 Technical Abilities

How many clock pulses are required for a 4-bit PIPO shift register to output the stored data?

- A. 0 ✓
- B. 2
- C. 4
- D. 1



Q149 Technical Abilities

A full-wave rectifier is designed using a center-tapped transformer and two diodes. The primary winding of the transformer, with N_1 turns, is connected to a 240V (RMS) AC supply, and the secondary winding has N_2 turns. What is the approximate rectified DC output voltage (V) if $N_1/N_2 = 15 : 1$?

A. $\frac{8\sqrt{2}}{\pi}$

B. $8/\pi$

C. $\frac{16\sqrt{2}}{\pi}$



D. $16/\pi$

Q150 Technical Abilities

How would you implement the Boolean expression $A + \bar{B}$ using basic logic gates?

A. An AND gate with input A and the output of a NOT gate with input B.

B. An AND gate with inputs A and B'.

C. An OR gate with input A and the output of a NOT gate with input B.



D. An OR gate with inputs A and B.

