रेलवे भर्ती बोर्ड / RAILWAY RECRUITMENT BOARD

सी ई एन नं. - 03/2024 / CEN No. - 03/2024

Test Date	22/04/2025
Test Time	2:30 PM - 4:30 PM
Subject	RRB JE Stage 2 Electronics and Allied Engineering

*** Note**
Correct Answer will carry 1 mark per Question.
Incorrect Answer will carry 1/3 Negative mark per Question.

1. Options shown in green color with a tick icon are correct.
2. Chosen option on the right of the question indicates the option selected by the candidate.

Section : **General Abilities**

Q.1	**What is the primary function of a firewall tool in a computer network?**
Ans	✔ 1. To monitor and control incoming and outgoing network traffic
	✘ 2. To speed up internet connections
	✘ 3. To store data securely
	✘ 4. To detect and remove viruses

Q.2	**Which function key is used to move text or graphics in a document?**
Ans	✔ 1. F2
	✘ 2. F1
	✘ 3. F12
	✘ 4. F5

Q.3	**An alloy is considered a homogeneous mixture because:**
Ans	✘ 1. its components can be separated by filtration
	✘ 2. its components are chemically combined in fixed proportions
	✔ 3. it exhibits uniform composition throughout
	✘ 4. it contains two or more phases

Q.4	**What is the general orientation of the Himalayan ranges in the northwestern part of India?**
Ans	✘ 1. East-South
	✔ 2. Northwest to Southeast
	✘ 3. South-North
	✘ 4. Northeast to Southwest

Q.5	**A metal wire is stretched, but it does not break easily. This property is known as:**
Ans	✔ 1. ductility
	✘ 2. brittleness
	✘ 3. hardness
	✘ 4. malleability

Q.6	Which of the following is NOT a source of collection of municipal solid waste?
Ans	✗ 1. Waste from hospitals
	✗ 2. Waste from homes
	✓ 3. Radioactive waste
	✗ 4. Waste from schools

Q.7	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?
Ans	✓ 1. 16.67%
	✗ 2. 20%
	✗ 3. 25%
	✗ 4. 45%

Q.8	Who among the following Indian female cricketers won the Best International Cricketer Award (Women) at the BCCI Naman Awards 2025?
Ans	✗ 1. Jhulan Goswami
	✓ 2. Smriti Mandhana
	✗ 3. Mithali Raj
	✗ 4. Harmanpreet Kaur

Q.9	Which of the following MS Excel functions is used to convert a numeric value into a text with a specific format?
Ans	✗ 1. FORMAT()
	✓ 2. TEXT()
	✗ 3. NUMBERTOTEXT()
	✗ 4. VALUE()

Q.10	Which of the following elements has an atomic number of 8?
Ans	✗ 1. Hydrogen
	✗ 2. Nitrogen
	✗ 3. Carbon
	✓ 4. Oxygen

Q.11	The main reason for which we are dependent on air is our _____.
Ans	✗ 1. osmoregulation
	✓ 2. respiration
	✗ 3. digestion
	✗ 4. excretion

Q.12	Which operating system is known for its open-source nature and community-driven development for desktops and laptops?
Ans	✗ 1. macOS
	✗ 2. Windows
	✓ 3. Linux
	✗ 4. iOS

Q.13	For the protection and improvement of the environmental quality, the Environment Protection Act came into force in the year _____.
Ans	✔ 1. 1986
	✘ 2. 1984
	✘ 3. 1972
	✘ 4. 1992

Q.14	The power to issue an ordinance when Parliament is NOT in session is given to the President under which Article?
Ans	✔ 1. Article 123
	✘ 2. Article 72
	✘ 3. Article 356
	✘ 4. Article 110

Q.15	Who among the following developed the notation system for Hindustani classical music?
Ans	✘ 1. Ustad Bismillah Khan
	✔ 2. Pandit Vishnu Narayan Bhatkhande
	✘ 3. Pandit Ravi Shankar
	✘ 4. Ustad Amjad Ali Khan

Q.16	Which of the following bridges is constructed over the Brahmaputra River in India?
Ans	✔ 1. Dhola-Sadiya Bridge
	✘ 2. Howrah Bridge
	✘ 3. Pamban Bridge
	✘ 4. Mahatma Gandhi Setu

Q.17	Radiations that are emitted from nuclear wastes are known to cause _____ at a high rate.
Ans	✘ 1. diseases
	✘ 2. emotional defects
	✔ 3. mutations
	✘ 4. syndromes

Q.18	Who is known as the leader of the Green Revolution in India?
Ans	✘ 1. C Subramaniam
	✔ 2. Prof. MS Swaminathan
	✘ 3. Tribhuvandas Kishibhai Patel
	✘ 4. Dr. Rajendra Prasad

Q.19	Which of the following will increase the heat produced by a heating element?
Ans	✘ 1. Using a material with high conductivity
	✘ 2. Using a wire of lower resistance
	✘ 3. Decreasing the applied voltage
	✔ 4. Increasing the current flowing through the wire

Q.20	Which type of RAM is faster and DOES NOT require refreshing?
Ans	✔ 1. SRAM
	✘ 2. Flash Memory
	✘ 3. DRAM
	✘ 4. ROM

Q.21	What is the primary function of a computer firewall?
Ans	✗ 1. To speed up internet connectivity
	✓ 2. To prevent unauthorised access to a private network
	✗ 3. To detect and remove computer viruses
	✗ 4. To store user passwords securely

Q.22	Why do covalent compounds generally have low melting and boiling points?
Ans	✓ 1. They have weak intermolecular forces.
	✗ 2. They have a rigid lattice structure.
	✗ 3. They have strong electrostatic forces.
	✗ 4. They contain metallic bonds.

Q.23	A concave lens has a focal length of −2 cm. What is its power?
Ans	✗ 1. −0.5 D
	✗ 2. 25 D
	✓ 3. −50 D
	✗ 4. 0.5 D

Q.24	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?
Ans	✓ 1. Carl Zeiss AG
	✗ 2. Leica
	✗ 3. Jenoptik
	✗ 4. Schneider Kreuznach

Q.25	The people of _____ were famously involved in execution of the Chipko movement.
Ans	✗ 1. Assam
	✓ 2. Garhwal Himalayas
	✗ 3. Gujarat
	✗ 4. Delhi

Q.26	What does LAN stand for?
Ans	✓ 1. Local Area Network
	✗ 2. Linked Access Network
	✗ 3. Limited Access Node
	✗ 4. Large Area Network

Q.27	Which formula should be entered in cell C2 to multiply the values of cells A2 and B2 in Excel?
Ans	✗ 1. =A2-B2
	✓ 2. =A2*B2
	✗ 3. =A2+B2
	✗ 4. =MULTIPLY(A2,B2)

Q.28	Due to global warming, the temperature of the earth has increased by _____
Ans	✓ 1. 0.6°C
	✗ 2. 0.7°C
	✗ 3. 0.8°C
	✗ 4. 0.5°C

Q.29	Which of the following correctly differentiates mixtures and compounds?

Feature	Mixture	Compound
A) Separation	Can be separated by physical methods	Requires chemical me
B) Composition	Fixed ratio	Variable ratio
C) Properties	Always the same as constituents	Different from consti
D) Formation	By chemical reaction	By simple mixing

Ans	✗ 1. Option B (Composition) is correct
	✗ 2. Option D (Formation) is correct
	✗ 3. Option C (Properties) is correct
	✓ 4. Option A (Separation) is correct

Q.30	Who among the following established the Bengal Chemical Swadeshi Stores?
Ans	✓ 1. Acharya PC Ray
	✗ 2. BG Tilak
	✗ 3. Dadabhai Naoroji
	✗ 4. Surendranath Banerjee

Q.31	What happens to the pH of pure water when a few drops of lemon juice are added?
Ans	✗ 1. The pH becomes neutral
	✗ 2. The pH remains the same
	✗ 3. The pH increases
	✓ 4. The pH decreases

Q.32	Where can one find the option to change a PowerPoint template?
Ans	✗ 1. Home → Layout
	✗ 2. Insert → Themes
	✗ 3. View → Slide Master
	✓ 4. Design → Themes

Q.33	Which of the following was NOT an artisan guild during the Mauryan period?
Ans	✗ 1. Carpenters
	✓ 2. Astrologers
	✗ 3. Bankers and Merchants
	✗ 4. Potters

Q.34	Who among the following referred to the Directive Principles as the 'life-giving provisions' of the Constitution of India?
Ans	✗ 1. Ivor Jennings
	✗ 2. BR Ambedkar
	✓ 3. LM Singhvi
	✗ 4. HM Seervai

Q.35	The kinetic energy of an object is derived using which of the following equations of motion?
Ans	✗ 1. $v = u + at$
	✓ 2. $v^2 - u^2 = 2as$
	✗ 3. $a = (v - u) / t$
	✗ 4. $s = ut + ½ at^2$

Q.36	The President has the power to dissolve which house of Parliament?
Ans	✗ 1. Legislative Assembly
	✗ 2. Both Rajya Sabha and Lok Sabha
	✗ 3. Rajya Sabha only
	✓ 4. Lok Sabha only

Q.37	The wavelength of ultraviolet radiations which is most powerful and causes damage to the DNA is _____.
Ans	✓ 1. UV-B
	✗ 2. UV-D
	✗ 3. UV-A
	✗ 4. UV-C

Q.38	Electricity production is categorised under which of the following economic sectors?
Ans	✗ 1. Quaternary sector
	✗ 2. Tertiary sector
	✓ 3. Secondary sector
	✗ 4. Primary sector

Q.39	In an aquatic ecosystem, the phenomenon of biomagnification can best be studied in the case of _____.
Ans	✗ 1. chlorine
	✓ 2. DDT
	✗ 3. organochlorine
	✗ 4. phosphates

Q.40	A ball of mass 50 grams is moving with a velocity of 15 m/s. What is its kinetic energy?
Ans	✗ 1. 7.500 J
	✗ 2. 3.750 J
	✓ 3. 5.625 J
	✗ 4. 1.875 J

Q.41	Which country proposed the idea of holding a United Nations conference on human interactions with the environment in 1968?
Ans	✗ 1. France
	✗ 2. United States
	✓ 3. Sweden
	✗ 4. Canada

Q.42	What happens when you click on the 'Forward' button in an email?
Ans	✓ 1. The original message is copied into a new email draft.
	✗ 2. The email is automatically sent to all contacts.
	✗ 3. A blank email opens.
	✗ 4. The email is permanently deleted.

Q.43	In which of the following events did Deepthi Jeevanji set a world record at the 2024 World Para Athletics Championships?
Ans	✗ 1. 600 metres T20
	✓ 2. 400 metres T20
	✗ 3. 200 metres T20
	✗ 4. 100 metres T20

Q.44	Which of the following is NOT toxic to non-target organisms in the soil?
Ans	✗ 1. Herbicides
	✗ 2. Pesticides
	✓ 3. Organic fertilisers
	✗ 4. Fungicides

Q.45	In January 2025, India launched the NVS-02 satellite to strengthen which of the following navigation systems?
Ans	✓ 1. Navigation with Indian Constellation (NavIC)
	✗ 2. Global Positioning System (GPS)
	✗ 3. Global Navigation Satellite System (GLONASS)
	✗ 4. Galileo

Q.46	A car moving at a constant speed of 123 km/hr along a straight road is an example of _____.
Ans	✗ 1. non-uniform motion
	✓ 2. uniform motion
	✗ 3. rotational motion
	✗ 4. random motion

Q.47	Which of the following options is NOT a greenhouse gas?
Ans	✗ 1. Methane
	✗ 2. Carbon dioxide
	✓ 3. Carbon tetrachloride
	✗ 4. Nitrous oxide

Q.48	The atomic mass of sulphur is 32 u, and sulphur exists as S_8 molecules. What is the molecular mass of sulphur?
Ans	✗ 1. 64 u
	✗ 2. 128 u
	✓ 3. 256 u
	✗ 4. 32 u

Q.49	A sound wave with a low frequency will have _____.
Ans	✗ 1. a high pitch
	✓ 2. a low pitch
	✗ 3. a low amplitude
	✗ 4. a short wavelength

Q.50	An object is placed 15 cm in front of a convex lens of focal length 25 cm. The image distance will be _____.
Ans	✓ 1. −37.5 cm
	✗ 2. −10.0 cm
	✗ 3. 17.5 cm
	✗ 4. −9.37 cm

Section : **Technical Abilities**

Q.1	In the 8085 microprocessor, when RD signal is low and IO/M signal is high, the instruction is in the _____ cycle of execution.
Ans	✗ 1. I/O write
	✗ 2. memory write
	✓ 3. I/O read
	✗ 4. memory read

Q.2	In the communication of the PPM method, the information is encoded in the:
Ans	✓ 1. position of the pulse
	✗ 2. power of the pulse
	✗ 3. amplitude of the pulse
	✗ 4. width of the pulse

Q.3	Which of the following switching techniques breaks data into small packets that are transmitted independently over the network?
Ans	✗ 1. Circuit Switching
	✗ 2. Message Switching
	✗ 3. Token Switching
	✓ 4. Packet Switching

Q.4	For a bipolar junction transistor (BJT) working as an amplifier, which of the following options is INCORRECT?
Ans	✗ 1. 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.
	✓ 2. 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.
	✗ 3. 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.
	✗ 4. 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.

Q.5	In a non-inverting op-amp, if the feedback resistance is 20 KΩ and resistance between input and inverting terminal is 4 KΩ, the value of voltage gain is _____.
Ans	✗ 1. 0.2
	✗ 2. 1.2
	✗ 3. 5
	✓ 4. 6

Q.6	Which of the following describes the effect of hardening in conducting materials such as copper and aluminium?
Ans	✗ 1. It increases ductility and reduces resistance.
	✓ 2. It reduces electrical conductivity and increases brittleness.
	✗ 3. It has no effect on the material's electrical properties.
	✗ 4. It increases hardness and tensile strength, but reduces ductility.

Q.7	In 8051 microcontroller, Special Function Registers can be addressed using addresses from _____.
Ans	✗ 1. 00h - 7Fh
	✓ 2. 80h - FFh
	✗ 3. F0h - FFh
	✗ 4. 20h - 2Fh

Q.8	The roll-off factor (β:beta) in raised cosine filter represents the ratio of:
Ans	✗ 1. excess power of system to the minimum Nyquist bandwidth
	✗ 2. additional bandwidth to total system bandwidth
	✗ 3. total available bandwidth to the Nyquist bandwidth
	✓ 4. excess bandwidth to the Nyquist bandwidth

Q.9	The IC 723 is primarily used as a _____.
Ans	✗ 1. clamper
	✗ 2. clipper
	✗ 3. rectifier
	✓ 4. voltage regulator

Q.10	In Frequency Shift Keying (FSK) modulation, the carrier frequency is switched between two frequencies based on _____.
Ans	✗ 1. amplitude variation
	✓ 2. whether a binary 1 or 0 is sent
	✗ 3. phase variation
	✗ 4. frequency variation

Q.11	What is the hexadecimal equivalent of the binary number 110101?
Ans	✗ 1. 2B
	✗ 2. 38
	✗ 3. 6A
	✓ 4. 35

Q.12	What is the limitation of the conditional operator (? :) in C?
Ans	✗ 1. It cannot be nested.
	✗ 2. It can only be used with integer values.
	✓ 3. It allows only one statement after ? and :.
	✗ 4. It cannot be used inside a loop.

Q.13	Why does magnetic fringing occur at the ends of a magnetic circuit?
Ans	✗ 1. The magnetic poles are not well-defined.
	✗ 2. The reluctance of the material increases.
	✗ 3. The MMF is not constant.
	✓ 4. The magnetic field lines spread out and become weaker.

Q.14	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 µs. What is the minimum input frequency required for safe operation?
Ans	✗ 1. 1 MHz
	✗ 2. 20 kHz
	✗ 3. 100 kHz
	✓ 4. 50 kHz

Q.15	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?
Ans	✗ 1. 14 A
	✓ 2. 10 AT
	✗ 3. 12 A
	✗ 4. 1 A

Q.16	Which of the following devices operates at the Data Link Layer of the OSI model?
Ans	✓ 1. Switch
	✗ 2. Modem
	✗ 3. Firewall
	✗ 4. Router

Q.17	The ternary operator can be used as a replacement for which loop/statement?
Ans	✓ 1. If-else statement
	✗ 2. For loop
	✗ 3. While loop
	✗ 4. Switch-case statement

Q.18	In an electrical circuit, there are two resistors (R_1 = 5 Ω and R_2 = 10 Ω) connected in series with a 15 V battery. What is the voltage drop across R_2, according to Kirchhoff's Voltage Law (KVL)?
Ans	✗ 1. 5 V
	✗ 2. 15 V
	✗ 3. 0 V
	✓ 4. 10 V

Q.19	A BJT is configured as a common-base amplifier; which of the following statements is INCORRECT?
Ans	✗ 1. It is suitable for high-frequency applications.
	✗ 2. The voltage gain in a CB configuration is very high.
	✓ 3. The CB configuration operates as an amplifier when the transistor is in the saturation region.
	✗ 4. It works as an off switch if both junctions are reverse biased.

Q.20	Which of the following is a characteristic of diamagnetic materials when placed in a magnetic field?
Ans	✗ 1. They are strongly magnetised in the same direction as the applied magnetic field.
	✗ 2. They exhibit no effect in a magnetic field.
	✓ 3. They exhibit weak repulsion from the magnetic field and align in the opposite direction.
	✗ 4. They exhibit a strong attraction to the magnetic field.

Q.21	Which of the following is a major application of carbon in electrical engineering?
Ans	✗ 1. Semiconductor components in circuits
	✓ 2. Electrical contacts and brushes in motors
	✗ 3. Conducting wires for power transmission
	✗ 4. Insulating material for high-voltage cables

Q.22	The address range of the bit addressable memory area in the 8051 microcontroller is _____.
Ans	✗ 1. 00-FFh
	✗ 2. 00-7Fh
	✓ 3. 20-2Fh
	✗ 4. 20-7Fh

Q.23	Which SNMP component resides on the network device being monitored?
Ans	✗ 1. Protocol Analyzer
	✓ 2. SNMP Agent
	✗ 3. MIB Server
	✗ 4. SNMP Manager

Q.24	Capture range frequency of a PLL _____.
Ans	✓ 1. is inversely proportional to the square root value of capacitance
	✗ 2. is directly proportional to the value of capacitance
	✗ 3. is inversely proportional to the value of capacitance
	✗ 4. does not depend on the value of capacitance

Q.25	What does DSB-SC stand for in communication system engineering?
Ans	✗ 1. Double Sideband with Single Carrier
	✓ 2. Double Sideband Suppressed Carrier
	✗ 3. Dual Sideband with Single Carrier
	✗ 4. Dependent Sideband Suppressed Carrier

Q.26	The Port _____ in the 8051 microcontroller has no dual functions.
Ans	✓ 1. 1
	✗ 2. 2
	✗ 3. 3
	✗ 4. 0

Q.27	Which of the following functions is used to find the length of a string in C?
Ans	✗ 1. sizeof()
	✓ 2. strlen()
	✗ 3. length()
	✗ 4. strlength()

Q.28	Why is a delay line used in an oscilloscope?
Ans	✗ 1. To reduce noise in the signal
	✗ 2. To enhance signal resolution
	✗ 3. To increase signal amplitude
	✓ 4. To synchronise the input signal with the electron beam

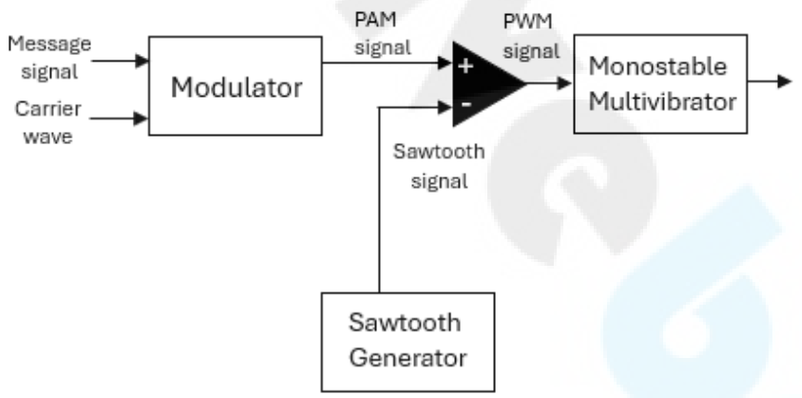
Q.29	What does the 'D' in DRAM stand for?
Ans	✓ 1. Dynamic
	✗ 2. Direct
	✗ 3. Data
	✗ 4. Digital

Q.30	**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?**
Ans	✗ 1. In a PNP transistor, current mainly flows due to electrons in the N-type base.
	✗ 2. The depletion width of the N-type base is smaller than that of the P-type collector.
	✓ 3. The collector current is the sum of the majority and minority currents.
	✗ 4. The depletion region of the emitter junction increases as the applied voltage increases.

Q.31	**What is a primary application of VSB (Vestigial Sideband) modulation?**
Ans	✗ 1. Telephonic communication
	✓ 2. Television signal transmission
	✗ 3. FM radio broadcasting
	✗ 4. Satellite communication

Q.32	**How many select lines are required for a 1-to-8 Demultiplexer?**
Ans	✗ 1. 4
	✗ 2. 1
	✗ 3. 2
	✓ 4. 3

Q.33	**The following block diagram represents which type of signal generation in communication?**



Ans	✗ 1. PWM
	✗ 2. PAM
	✗ 3. PCM
	✓ 4. PPM

Q.34	**In a multiple trace oscilloscope, the display of two signals is achieved by:**
Ans	✗ 1. using multiple phosphor screens
	✗ 2. using a digital display panel
	✗ 3. using two electron guns
	✓ 4. using a single electron gun with alternating sweeps

Q.35	**Which of the following statements is FALSE for a negative feedback amplifier?**
Ans	✗ 1. It reduces nonlinear distortion in the output of the circuit.
	✗ 2. It reduces the effect of temperature on the output.
	✗ 3. It reduces unwanted electrical signals at the output generated in the circuit.
	✓ 4. It reduces the bandwidth of the amplifier.

Q.36	**Which of the following is a characteristic of a primary cell?**
Ans	✔ 1. Once discharged, it cannot be reused.
	✘ 2. It can be recharged multiple times.
	✘ 3. It is used in rechargeable applications.
	✘ 4. It has a longer shelf life compared to secondary cells.

Q.37	**What is the primary function of a voltage differential relay in an electrical protection system?**
Ans	✘ 1. It detects phase angle differences between the currents and trips the system if the angle exceeds a set limit.
	✘ 2. It measures the impedance across the circuit and operates when a fault is detected.
	✘ 3. It compares the current entering and leaving the protected zone to detect faults.
	✔ 4. It detects the difference in voltage between two or more points and trips the system if the voltage difference exceeds a set threshold.

Q.38	**How many clock pulses are required to load n bits into an n-bit SIPO shift register?**
Ans	✘ 1. n^2
	✘ 2. 2n
	✔ 3. n
	✘ 4. 2^n

Q.39	**Which of the following statements is INCORRECT for a common-emitter (CE) BJT amplifier?**
Ans	✔ 1. The CE amplifier cannot be used as a small signal amplifier.
	✘ 2. The input characteristics are drawn between input current (I_B) and input voltage (V_{BE}) at constant V_{CE}.
	✘ 3. It has the moderate input impedance and moderate output impedance.
	✘ 4. The output characteristics are drawn between output current (I_C) and output voltage (V_{CE}) at constant input current.

Q.40	**Thermistors are favoured over other temperature transducers because they _____.**
Ans	✔ 1. have a fast response time and high sensitivity
	✘ 2. are highly linear over a wide range
	✘ 3. have a wide temperature range
	✘ 4. are not affected by environmental conditions

Q.41	**What is the difference between edge-triggering and level-triggering?**
Ans	✔ 1. Edge-triggering responds to the transition of the clock, while level-triggering responds to the level of the clock.
	✘ 2. Edge-triggering requires more power than level-triggering.
	✘ 3. Edge-triggering is faster than level-triggering.
	✘ 4. Edge-triggering responds to the level of the input, while level-triggering responds to the transition.

Q.42	**What is a 'memory bank' in RAM organisation?**
Ans	✘ 1. A cache memory location
	✘ 2. A group of memory cells arranged in a single row
	✘ 3. A section of memory reserved for the operating system
	✔ 4. An independent memory module that can be accessed concurrently

Q.43	**Which topology is most suitable for small networks or temporary setups?**
Ans	✘ 1. Star topology
	✘ 2. Ring topology
	✘ 3. Mesh topology
	✔ 4. Bus topology

Q.44	**A practical silicon diode with a cut-in voltage of 0.7 V is connected as follows:** **P-terminal (anode) → Ground (0V)** **N-terminal (cathode) → +10V** **Given that the current flowing through the diode is 1 μA, what is the DC resistance in reverse biased diode?**
Ans	✗ 1. 10.7 MΩ
	✗ 2. −9.30 MΩ
	✗ 3. 9.30 MΩ
	✓ 4. 10 MΩ

Q.45	**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.**
Ans	✗ 1. 1000
	✓ 2. 250
	✗ 3. 1500
	✗ 4. 0.004

Q.46	**Which of the following is true about microwaves in unguided media?**
Ans	✗ 1. They are slower than radio waves.
	✓ 2. They require line-of-sight transmission.
	✗ 3. They are not affected by obstacles like buildings or hills.
	✗ 4. They use fiber optics for data transmission.

Q.47	**What is the purpose of the sizeof operator in C?**
Ans	✗ 1. To allocate memory at compile time
	✗ 2. To allocate memory dynamically
	✓ 3. To determine the size of a data type or variable in bytes
	✗ 4. To determine the size of a data type or variable in bits

Q.48	**In a CRT oscilloscope, the horizontal deflection plates are used to:**
Ans	✗ 1. focus the beam on the phosphor screen
	✓ 2. create a sweeping movement of the beam from left to right
	✗ 3. control the electron gun
	✗ 4. display the vertical signal

Q.49	**Which of the following instruments typically has the highest resolution?**
Ans	✓ 1. Digital multimeter
	✗ 2. Oscilloscope
	✗ 3. Digital thermometer
	✗ 4. Analog voltmeter

Q.50	**The time delay in an oscilloscope can be measured by:**
Ans	✓ 1. measuring the time between two successive peaks of the signal
	✗ 2. measuring the amplitude of the signal
	✗ 3. counting the number of weak signals
	✗ 4. measuring the decibel of the signal

Q.51	**Why is shielding used in oscilloscope probes?**
Ans	✗ 1. To control the electron beam in the oscilloscope
	✓ 2. To reduce external electromagnetic interference
	✗ 3. To increase the probe's sensitivity
	✗ 4. To amplify weak signals

Q.52	**Selectivity in a protection relay system refers to:**
Ans	✗ 1. the ability of the relay to operate only for specific fault types
	✗ 2. the ability of the relay to discriminate between fault and normal conditions
	✓ 3. the ability of the relay to clear faults without affecting the rest of the system
	✗ 4. the ability of the relay to operate with a minimal time delay for all fault conditions

Q.53	**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.**
Ans	✗ 1. Only S1
	✗ 2. Neither S1 nor S2
	✗ 3. Only S2
	✓ 4. Both S1 and S2

Q.54	**What is a key difference between a modem and a network interface card (NIC)?**
Ans	✓ 1. A modem provides internet access, while a NIC manages local area network (LAN) traffic.
	✗ 2. A NIC connects to wireless networks, while a modem only supports wired connections.
	✗ 3. A NIC is used to modulate signals, while a modem is used to demodulate signals.
	✗ 4. A modem connects to the network, while a NIC connects individual devices.

Q.55	**What is another name for PWM in communication engineering?**
Ans	✗ 1. Pulse Amplitude Modulation (PAM)
	✗ 2. Pulse Code Modulation (PCM)
	✓ 3. Pulse Duration Modulation (PDM)
	✗ 4. Pulse Position Modulation (PPM)

Q.56	**In a priority encoder, what happens when two or more input lines are active at the same time?**
Ans	✗ 1. The encoder will output the binary code for the lowest priority active input.
	✗ 2. The encoder will output an error.
	✓ 3. The encoder will output the binary code for the highest priority active input.
	✗ 4. The encoder will output the binary code for both the priority active inputs.

Q.57	**Dielectric strength is an important property of insulating materials. Which of the following best describes the dielectric strength of a material?**
Ans	✗ 1. The electrical conductivity of a material under stress
	✓ 2. The maximum voltage a dielectric material can withstand without breaking down
	✗ 3. The amount of heat a material can tolerate before melting
	✗ 4. The resistance of a material to thermal expansion

Q.58	Which operator is used for bitwise OR in C?
Ans	✗ 1. ~
	✗ 2. &&
	✓ 3. |
	✗ 4. ||

Q.59	Which combination of symbols represents an XOR (Exclusive-OR) gate?
Ans	✗ 1. An OR gate with a bubble at the output.
	✗ 2. An AND gate with an additional curved at the input end.
	✗ 3. An AND gate with a bubble at the output
	✓ 4. An OR gate with an additional curve at the input end.

Q.60	Which of the following materials is typically preferred for electrical conductors due to its high conductivity and resistance to corrosion?
Ans	✗ 1. Manganin
	✗ 2. Gold
	✗ 3. Steel
	✓ 4. Copper

Q.61	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?
Ans	✓ 1. F8h
	✗ 2. 6Bh
	✗ 3. 6Ah
	✗ 4. F0h

Q.62	There are _____ register banks in the 8051 microcontroller.
Ans	✗ 1. three
	✓ 2. four
	✗ 3. six
	✗ 4. two

Q.63	In the internal circuit diagram of an IC 741 Op-amp, the second stage is also known as _____.
Ans	✓ 1. intermediate stage
	✗ 2. input stage
	✗ 3. level shifting stage
	✗ 4. output stage

Q.64	Which application commonly uses mineral insulating materials due to their mechanical strength and electrical insulating properties?
Ans	✗ 1. Batteries and electrodes
	✓ 2. Electrical insulators for high-voltage transmission lines
	✗ 3. Electrical wires for household use
	✗ 4. Low-voltage electronic devices

Q.65	**What determines the length of the delay in an electrical delay line used in oscilloscopes?**
Ans	✔ 1. The propagation speed of the signal in the line
	✘ 2. The resistance of the delay line
	✘ 3. The frequency of the input signal
	✘ 4. The speed of the electron beam

Q.66	**Which of the following statements about rectifiers is INCORRECT?**
Ans	✔ 1. The transformer utilization factor (TUF) is equal for both the bridge and center-tapped rectifier.
	✘ 2. Each half of the secondary winding of a center-tapped transformer is utilised for only half the time.
	✘ 3. The transformer utilization factor (TUF) is higher for a full-wave rectifier compared to a half-wave rectifier.
	✘ 4. The transformer utilization factor (TUF) is better for a bridge rectifier compared to a center-tapped rectifier.

Q.67	**What is the Boolean expression for the Carry-out (C) output of a Half Adder?**
Ans	✘ 1. C = A ⊕ B
	✘ 2. C = A OR B
	✘ 3. C = A AND B ⊕ Cin
	✔ 4. C = A AND B

Q.68	**Which of the following statements about a bipolar junction transistor (BJT) is correct?**
Ans	✔ 1. $I_E = [I_C/\beta] + \beta I_B$
	✘ 2. Collector current is the sum of emitter current and base current.
	✘ 3. If β is the common emitter amplifier current gain, then $I_C = \beta I_E$.
	✘ 4. The current gain in common base amplifier is the ratio of collector current to base current.

Q.69	**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(ωt) 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?**
Ans	✘ 1. 240π
	✔ 2. 240/π
	✘ 3. 240
	✘ 4. 480/π

Q.70	**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?**
Ans	✘ 1. 0
	✘ 2. Unchanged
	✔ 3. 1
	✘ 4. Toggles

Q.71	**In which modulation technique is the carrier modulated using phase shifts of 0°, 90°, 180°, and 270°?**
Ans	✔ 1. QPSK (Quadrature Phase Shift Keying)
	✘ 2. ASK (Amplitude Shift Keying)
	✘ 3. BPSK (Binary Phase Shift Keying)
	✘ 4. FSK (Frequency Shift Keying)

Q.72	What is the 2's complement of the binary number 101110?
Ans	✗ 1. 010011
	✓ 2. 010010
	✗ 3. 110001
	✗ 4. 010001

Q.73	Which of the following is NOT true about Unshielded Twisted Pair (UTP) cables?
Ans	✓ 1. They have a higher resistance to EMI than STP cables.
	✗ 2. They are commonly used in local area networks (LANs).
	✗ 3. They are lighter and more flexible than STP cables.
	✗ 4. They are cost-effective for short-distance communication.

Q.74	What is the output of a EX-OR gate when both inputs are '1'?
Ans	✗ 1. Undefined
	✗ 2. Z
	✗ 3. 1
	✓ 4. 0

Q.75	What is the region around a magnet where the magnetic force is experienced known as?
Ans	✓ 1. Magnetic field
	✗ 2. Magnetic flux
	✗ 3. Magnetic domain
	✗ 4. Magnetic pole

Q.76	In which topology does a failure in one node NOT affect the entire network?
Ans	✗ 1. Ring topology
	✗ 2. Fully connected mesh topology
	✓ 3. Star topology
	✗ 4. Bus topology

Q.77	_____ interrupt is a positive edge sensitive interrupt and can be triggered with a short pulse.
Ans	✗ 1. RST 6.5
	✓ 2. RST 7.5
	✗ 3. RST 5.5
	✗ 4. RST 4.5

Q.78	Which of the following statements is correct when comparing a bridge rectifier to a centre-tapped full-wave rectifier?
Ans	✗ 1. The PIV of both rectifiers is the same.
	✗ 2. The transformer utilisation factor is the same for both circuits.
	✗ 3. A bridge rectifier has double the peak inverse voltage (PIV) compared to a centre-tapped rectifier.
	✓ 4. The transformer utilisation factor (TUF) is better for a bridge rectifier than for a centre-tapped rectifier.

Q.79	**In an asynchronous counter, the clock input of each flip-flop except first flip-flop is connected to:**
Ans	✗ 1. the same clock source
	✓ 2. the output of the previous flip-flop
	✗ 3. a separate clock source
	✗ 4. a common reset line

Q.80	**If a C program contains only one function, it must be _____.**
Ans	✗ 1. primary()
	✗ 2. void()
	✗ 3. major()
	✓ 4. main( )

Q.81	**In a 3-to-8 decoder, how many outputs are active for any given input?**
Ans	✗ 1. 2
	✗ 2. 8
	✗ 3. 3
	✓ 4. 1

Q.82	**Which of the following is NOT a commonly used pulse-shaping filter in communication systems?**
Ans	✗ 1. Raised cosine filter
	✗ 2. Sinc filter
	✗ 3. Gaussian filter
	✓ 4. High-pass filter

Q.83	**In a 100% modulated AM signal with a carrier power of 100 W, what is the power in the lower sideband?**
Ans	✗ 1. 50 W
	✓ 2. 25 W
	✗ 3. 15 W
	✗ 4. 150 W

Q.84	**A Colpitts oscillator is designed as a radio frequency oscillator. Which of the following statements is INCORRECT?**
Ans	✗ 1. It operates on the principle of parallel resonance.
	✗ 2. In a Colpitts oscillator, two capacitors and an inductor form the feedback network.
	✓ 3. The frequency of oscillation is $\omega = \frac{1}{\sqrt{L\left(\frac{C_1+C_2}{C_1C_2}\right)}}$
	✗ 4. An LC network is used in the design of Colpitts oscillators.

Q.85	**The Fourier Transform of an real and even function results in:**
Ans	✗ 1. a purely real and odd function
	✗ 2. a purely imaginary and even function
	✗ 3. an imaginary and odd function
	✓ 4. a purely real and even function

Q.86	In an n-type semiconductor, which of the following is true regarding the majority charge carriers?
Ans	✔ 1. The majority charge carriers are electrons.
	✘ 2. The semiconductor contains an equal number of electrons and holes.
	✘ 3. The majority charge carriers are holes.
	✘ 4. The majority charge carriers are protons.

Q.87	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.
Ans	✘ 1. Only S1
	✘ 2. Only S2
	✘ 3. Neither S1 nor S2
	✔ 4. Both S1 and S2

Q.88	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?
Ans	✘ 1. Average voltage cannot be determined
	✘ 2. +1/2 V
	✘ 3. 0 V
	✔ 4. +1 V

Q.89	Which of the following is a unary operator in C?
Ans	✔ 1. --
	✘ 2. +
	✘ 3. *
	✘ 4. %

Q.90	Which of the following statements about oscillator circuits is FALSE?
Ans	✘ 1. A circuit that generates a sine wave without any input is called a linear oscillator.
	✔ 2. A circuit that generates a non-sinusoidal wave without any input is called a linear oscillator.
	✘ 3. The frequency of an oscillator depends on the RC or LC network.
	✘ 4. Multivibrators are used for generating non-sinusoidal waveforms.

Q.91	How does the SNMP Agent communicate with the SNMP Manager?
Ans	✘ 1. By generating encrypted data streams
	✔ 2. By responding to GET and SET requests from the SNMP Manager
	✘ 3. By initiating a TCP connection
	✘ 4. By sending files via FTP

Q.92	Which of the following is the syntax of the conditional operator in C?
Ans	✘ 1. expression1 ? expression2 : expression3
	✘ 2. expression || expression1 && expression2
	✔ 3. condition1 : expression1 ? expression2
	✘ 4. condition1 && expression1 || expression2

Q.93	**Which of the following components is required to detect (demodulate) Pulse Position Modulation (PPM)?** **a) Pulse Generator** **b) RS Flip-Flop** **c) PWM Demodulator**
Ans	✗ 1. Only a
	✓ 2. All a, b, and c
	✗ 3. Only c
	✗ 4. Only a and b

Q.94	**In a magnetic circuit, if the reluctance of a path increases, which of the following occurs?**
Ans	✗ 1. The magnetomotive force (MMF) will increase.
	✗ 2. The magnetic flux will increase.
	✓ 3. The magnetic flux will decrease.
	✗ 4. The resistance to magnetic flux will decrease.

Q.95	**Which of the following characteristics is associated with a distance relay used for fault protection?**
Ans	✓ 1. It operates based on the impedance between the relay and the fault.
	✗ 2. It is used only for short-circuit protection.
	✗ 3. It operates based on the current only.
	✗ 4. It operates based on the voltage at the fault location.

Q.96	**In a Nickel-Iron cell, which of the following best describes the working principle during the discharging process?**
Ans	✗ 1. Nickel at the positive electrode is reduced to metallic nickel, and iron hydroxide at the negative electrode is oxidised.
	✓ 2. Iron at the negative electrode is oxidised to iron oxide, and nickel at the positive electrode is reduced to nickel hydroxide.
	✗ 3. Nickel hydroxide at the positive electrode is reduced to metallic nickel, and iron is oxidised at the negative electrode.
	✗ 4. Iron at the negative electrode is reduced to metallic iron, and nickel hydroxide at the positive electrode is oxidised.

Q.97	**In an op-amp integrator circuit, the output voltage is proportional to the _____.**
Ans	✗ 1. cube of the input signal
	✗ 2. sum of the input signal
	✓ 3. integral of the input signal
	✗ 4. derivative of the input signal

Q.98	**The DMA sends DACK - acknowledgement signal to the peripheral when _____.**
Ans	✗ 1. higher address bus A8- A15 is available on the address bus
	✓ 2. MPU sends the HLDA signal
	✗ 3. entire address bus A0- A15 is available on the address bus
	✗ 4. lower address bus A0- A7 is available on the address bus

Q.99	**Which of the following factors is primarily used to determine the rating of a resistor?**
Ans	✗ 1. Material used for construction
	✓ 2. Power dissipation capacity
	✗ 3. Temperature coefficient
	✗ 4. Colour code

Q.100	**What is the output of the following code?** **int i = 1 ;** **while (i <= 10)** **printf ("%d\n", i);**
Ans	✗ 1. 10 9 8 7 6 5 4 3 2 1
	✗ 2. 1 2 3 4 5 6 7 8 9 10
	✗ 3. 0 1 2 3 4 5 6 7 8 9
	✓ 4. Infinite loop