PaperCode: 2001 **Paper Name:** 2001-B.E. (LATERAL ENTRY) (SET III)-GROUP A **Set Name:** Original

Q-1 Aditya-L1 is dedicated mission of ISRO to study ------.

A Moon
B Mars
C Jupiter
D Sun

Correct Answer : D

Q-2 The Indus water treaty which has recently been suspended was between India and ---------.

A China
B Pakistan
C Bangladesh
D Nepal

Correct Answer : B

Q-3 Cellular jail is located in --------.

A Goa
B Shaheed dweep
C Pune
D Sri Vijaya Puram

Correct Answer : D

Q-4 The ratio of Sun's distance from earth to the diameter of Sun is approximately ---------.

A 100
B 104
C 108
D 112

Correct Answer : C

Q-5 As per the latest data released by the IMF World Economic Outlook, position of India among World largest economies is expected to be at ---------- in May/June 2025.

A 4th
B 5th
C 6th
D 3rd

Correct Answer : A

Q-6 What is the missing number in sequence 4,8,14,22,32,--------?

A 42
B 44
C 46
D 48

Correct Answer : B

Q-7 Choose the correct passive form of the sentence given below:
Had the police arrested the burglar.

A Had the burglar been arrested by the police.
B Have the burglar been arrested by the police.
C The burglar has been arrested by the police.
D Had the burglar was arrested by the police.

Correct Answer : A

I can't find my _____ bag.

Q-8

A lose

B loosing

C lost

D left

Correct Answer : C

Q-9 Identify the word which is similar in the meaning to the phrase (in inverted commas) of the sentence:
When she heard the news, she was "like a dog with two tails".

A very greedy

B very enthusiastic

C very morose

D very happy

Correct Answer : D

Q-10 Let's wait until it _____ raining.

A stops

B stopped

C stopping

D stop

Correct Answer : A

Q-11 Which element has the largest atomic radius?

A Li

B Na

C F

D I

Correct Answer : D

Q-12 In the following reaction, what happens to Mn ? It undergoes

$$2KMnO_4 + 5H_2C_2O_4 + 3H_2SO_4 \longrightarrow 2MnSO_4 + 10CO_2 + 8H_2O + K_2SO_4$$

A reduction

B oxidation

C Loss of electron

D no change

Correct Answer : A

Q-13 The correct order of orbitals in which electrons are filled is?

A 3d, 4s, 4p, 4d

B 4s, 3d, 4p, 5s

C 5s, 4p, 3d, 4d

D 3d, 4p, 4s, 4d

Correct Answer : B

Q-14 Which of the following is incorrect about 's' orbitals?

A They are spherical in shape

B They are found in all principal energy levels

C They can only hold one electron

D None of these

Correct Answer : C

Q-15 Which pair of metals has the same electronic configuration

A Cr^{3+}, Fe^{3+}

B Mn^{2+}, Fe^{3+}

C V^{3+}, Cr^{3+}

D Mn^{2+}, Ni^{2+}

Correct Answer : B

Q-16 The hybridisation of S in SF_6 molecule is

A **sp^3d^2**
B dsp^3
C d^2sp^3
D sp^3

Correct Answer : A

Q-17 Among the following compounds which one is most ionic?

A BeS
B BCl_3
C **$MgCl_2$**
D Al_2O_3

Correct Answer : C

Q-18 Which element has the highest first ionization energy?

A O
B **N**
C C
D B

Correct Answer : B

Q-19 The chemical formula of ammonium phosphate is

A $(NH_4)PO_4$
B $(NH_4)_2PO_4$
C **$(NH_4)_3PO_4$**
D None of these

Correct Answer : C

Q-20 Arrange the following in increasing order of their bond order He_2, O_2 , N_2 and NO

A $He_2<O_2<N_2<NO$
B $He_2>O_2>N_2>NO$
C $He_2<N_2<NO<O_2$
D **$He_2<O_2<NO<N_2$**

Correct Answer : D

Q-21 Which of the following is scalar physical quantity?

A Velocity
B Acceleration
C **Speed**
D Momentum

Correct Answer : C

Q-22 Newton's first law of motion is also known as:

A **Law of inertia**
B Law of acceleration
C Law of action-reaction
D Law of gravitation

Correct Answer : A

Q-23 If m is mass of the displaced object, x is displacement and k is spring constant, then the restoring force (F) in SHM (Simple harmonic motion) is given by:

A F = kx
B **F = -kx**
C F = ma
D F = mv

Correct Answer : B

Q-24 The distance between two consecutive crests or troughs in a transverse wave is called

A Amplitude
B Frequency
C Time period
D **Wavelength**

Correct Answer : D

Q-25 The ability of material to return to its original state after deformation is called:

A Plasticity

B Elasticity

C Ductility

D Malleability

Correct Answer : B

Q-26 Bernoulli's principle is based on the conservation of...

A Mass

B Momentum

C Charge

D Energy

Correct Answer : D

Q-27 The majority charge carriers in p-type semiconductor are....

A Electrons

B Holes

C Protons

D Positrons

Correct Answer : B

Q-28 The process of adding impurities to a semiconductor is called

A Diffusion

B Ionization

C Doping

D Recombination

Correct Answer : C

Q-29 Which quantum number is used to find energy of electron in an energy level

A Principle quantum number (n)

B Azimuthal quantum number (l)

C Magnetic quantum number (m)

D Spin quantum number (s)

Correct Answer : A

Q-30 Which of the following is not emitted during a radioactive decay?

A Alpha particle

B Gamma rays

C Beta particle

D Neutron

Correct Answer : D

Q-31 How many different ways can a team of five people be formed from a total of ten people so that two specific people are included in each team ?

A 56

B 55

C 57

D 58

Correct Answer : A

Q-32 The principal solutions of the equation $\sin x = \frac{-1}{\sqrt{2}}$ are

A $\frac{3\pi}{4}, \frac{5\pi}{4}$

B $\frac{5\pi}{4}, \frac{7\pi}{4}$

C $\frac{3\pi}{2}, \frac{5\pi}{2}$

D $\frac{3\pi}{4}, \frac{7\pi}{4}$

Correct Answer : B

Q-33 Evaluate the integral $\int \log(x)\, dx$

A $\frac{1}{x} + C$

B $x(\log x - 1) + C$

C $\log x + 1 + C$

D $\log x + \frac{1}{x} + C$

Correct Answer : B

Q-34 The order and the degree of the differential equation $\frac{d^4y}{dx^4} - x^2\left(\frac{d^2y}{dx^2}\right)^{\frac{1}{2}} = 0$ are

A 2,4

B 4,1

C 4,2

D 2,2

Correct Answer : C

Q-35 The solution of the differential equation $\frac{dy}{dx} + \frac{y}{x} = x^2$ is

A $y = \frac{x^4}{2} + \frac{C}{x}$

B $y = \frac{x^2}{2} + C$

C $y = \frac{x^4}{4} + \frac{C}{x}$

D $y = \frac{x^3}{4} + \frac{C}{x}$

Correct Answer : D

Q-36 If the mean of certain set of data is 25 and variance is 16, then the coefficient of variance is

A 15

B 16

C 17

D 18

Correct Answer : B

Q-37 For the matrix $M = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$, find the value of a and b such that $M^2 + aM + bI = 0$.

A a=4,b=1

B a=1,b=4

C a=-4,b=1

D a=4,b=-4

Correct Answer : C

Q-38 If the matrix $\begin{bmatrix} 1+x & 3 & 0 \\ 1 & -1 & 2 \\ 2x & 1 & -5 \end{bmatrix}$ is singular, the value of x is

A 6/5

B 5/6

C (-5)/6

D (-6)/5

Correct Answer : D

Q-39 Find the equation of the line in cartesian form that passes through the point with position vector $2\hat{\imath} - \hat{\jmath} + 4\hat{k}$ and is in the direction $\hat{\imath} + 2\hat{\jmath} - \hat{k}$.

A $\frac{x-1}{2} = \frac{y-2}{-1} = \frac{z+1}{4}$

B $\frac{x-2}{1} = \frac{y+1}{2} = \frac{z-4}{-1}$

C $\frac{x-1}{1} = \frac{y+1}{2} = \frac{z-4}{-1}$

D $\frac{x-1}{1} = \frac{y-2}{2} = \frac{z+1}{1}$

Correct Answer : B

Q-40 If a line has direction ratios 2,-1,-2, determine its direction cosines

A $\frac{2}{9}, \frac{-1}{9}, \frac{-2}{9}$

B $\frac{-2}{9}, \frac{1}{9}, \frac{2}{9}$

C $\frac{2}{5}, \frac{-1}{5}, \frac{-2}{5}$

D $\frac{2}{3}, \frac{-1}{3}, \frac{-2}{3}$

Correct Answer : D

Q-41 Ideal current sources have

A zero internal resistance

B low value of voltage

C large value of current

D infinite internal resistance

Correct Answer : D

Q-42 If the voltage across a capacitor is constant, the current passing through it is

A 1

B 0

C -1

D ∞

Correct Answer : B

Q-43 In Norton's Theorem, Equivalent Circuit consists of

A Current Source and Resistance

B Voltage Source and Resistance

C Current Source and Voltage Source

D Resistance and Capacitance

Correct Answer : A

Q-44 Which of the following circuits exhibits power dissipation?

A Pure Inductive Circuit
B Pure Capacitive Circuit
C Pure Resistive Circuit
D None of the above

Correct Answer : C

Q-45 What happens to the inductive reactance when the frequency of the AC supply is increased?

A Increases
B Decreases
C Remains the same
D Decreases inversely

Correct Answer : A

Q-46 For the same active power, the current is more in circuit

A With lower power factor
B With higher power factor
C With unity power factor
D None of these

Correct Answer : A

Q-47 Which condition is most likely to produce Magnetic field?

A Moving Electric Charge
B Stationary Electric Charge
C No Electric Charge
D Copper wire

Correct Answer : A

Q-48 Which of the following current is carried in Field winding ?

A both exciting current and load current
B load current only
C exciting current only
D none of these

Correct Answer : C

Q-49 The primary and secondary of a transformer are _____ connected.

A electrically
B magnetically
C magnetically, and electrically
D None of these

Correct Answer : B

Q-50 Which of the following loss majorly varies with the load

A hysteresis loss
B eddy current loss
C copper loss
D core loss

Correct Answer : C

Q-51 Which of the following instruments indicate the instantaneous value of the quantity being measured?

A Absolute instruments
B Indicating instruments
C Recording instruments
D Integrating instruments

Correct Answer : B

Q-52 A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly

A Deflecting
B Controlling
C Damping
D Reflecting

Correct Answer : C

Q-53 A moving-coil permanent-magnet instrument can be used as _____ by using a low resistance shunt.

A ballistic galvanometer
B flux-meter
C voltmeter
D ammeter

Correct Answer : D

Q-54 A potentiometer may be used for

A measurement of resistance
B measurement of current
C calibration of ammeter
D All of these

Correct Answer : D

Q-55 For measuring a very high resistance we should use

A Kelvin's double bridge
B Wheatstone bridge
C Meggar
D None of the above

Correct Answer : C

Q-56 In an Anderson bridge, the unknown inductance is measured in terms of

A known inductance and resistance
B known capacitance and resistance
C known resistance
D known inductance

Correct Answer : B

Q-57 Which of the following is a type of pressure sensor?

A Ultrasonic sensor
B Thermocouple
C Strain gauge
D Photoelectric sensor

Correct Answer : C

Q-58 Which of the following is an example of a piezoelectric sensor?

A Thermocouple
B Strain gauge
C Accelerometer
D Photodetector

Correct Answer : C

Q-59 A good control system has all the following features except

A good stability
B slow response
C good accuracy
D sufficient power handling capacity

Correct Answer : B

Q-60 ---------- is a part of the human temperature control system.

A Digestive system
B Perspiration system
C Ear
D Leg movement

Correct Answer : B

Q-61 To obtain electron as majority charge carrier in a semiconductor the impurity mixed is

A Monovalent

B Trivalent

C Pentavalent

D None of these

Correct Answer : C

Q-62 The energy gap is maximum in

A Conductors

B Semiconductors

C Insulators

D Superconductor

Correct Answer : C

Q-63 A silicon sample is uniformly doped with donor type impurities with a concentration of $10^{16}/cm^3$. The electron and hole mobilities in the sample are 1200 $cm^2/V-s$ and 400 $cm^2/V-s$ respectively. Assume complete ionization of impurities. The charge of an electron is 1.6×10^{-19} C. The resistivity of the sample (in Ω-cm) is .....

A 0.52

B 0.47

C 0.89

D 0.67

Correct Answer : A

Q-64 A MOSFET in saturation has a drain current of 1 mA for V_{DS} = 0.5V. If the channel length modulation coefficient is 0.05 V^{-1}, the output resistance (in KΩ) of the MOSFET is.....

A 30

B 40

C 50

D 20

Correct Answer : D

Q-65 A band limited signal is sampled at the Nyquist rate. The signal can be recovered by passing the samples through

A an RC filter

B an envelope detector

C an ideal low-pass filter with appropriate bandwidth

D a PLL

Correct Answer : C

Q-66 For JFET and MOSFET, which of the following statement is correct:

A MOSFET is a voltage -controlled capacitor

B BJT is faster than FET

C Leakage currents are zero in FET

D MOSFET is slower than JFET

Correct Answer : A

Q-67 Which one of the following expressions does NOT represent exclusive NOR of x and y?

A xy +x'y'

B x⊕y'

C x'⊕y

D x'⊕y'

Correct Answer : D

Q-68 The simplified SOP (Sum of Product) form of Boolean expression (P + Q' + R'). (P + Q' + R). (P + Q + R') is

A (P.Q + R')

B (P + Q'. R')

C (P'. Q + R)

D (P.Q + R)

Correct Answer : B

Q-69 What is the minimum number of gates required to implement the Boolean function (AB+C) if we have to use only 2-input NOR gates?

A 2
B 3
C 4
D 5

Correct Answer : B

Q-70 A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?

A AND or OR gates
B XOR or XNOR gates
C NOR or NAND gates
D AND or NOR gates

Correct Answer : C

Q-71 How is a J-K flip-flop made to toggle?

A J = 0, K = 0
B J = 1, K = 0
C J = 0, K = 1
D J = 1, K = 1

Correct Answer : D

Q-72 The maximum power efficiency of an AM modulator is

A 25%
B 33.3%
C 50%
D 22.5%

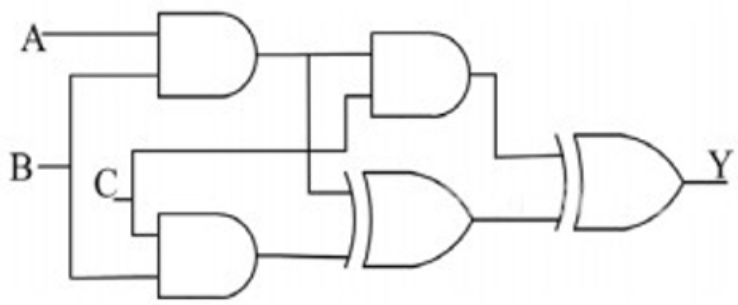
Correct Answer : B

Q-73 A 0 to 6 counter consist of 3 flip-flops and a combination circuit of 2 input gate(s). The combination circuit consists of

A one AND gate
B one OR gate
C one AND gate & one OR gate
D two AND gate

Correct Answer : D

Q-74 The output of the combinational circuit given below is



A A+B+C
B B(C+A)
C C(A+B)
D A(B+C)

Correct Answer : B

Q-75 Shifting a register content to the left by one bit is equivalent to

A Division by 2
B Addition by 2
C Multiplication by 2
D More than one of the above

Correct Answer : C

Q-76 The minimum number of flip-flops required to construct a counter to count upto 200 (decimal) is -

A 5

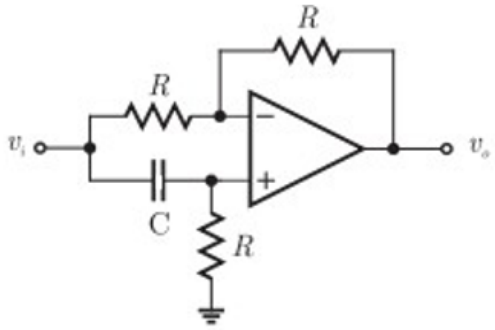
B 9

C 10

D 8

Correct Answer : D

Q-77 The circuit shown in the figure behaves as



A an all-pass filter

B a band-pass filter

C a high-pass filter

D a low-pass filter

Correct Answer : A

Q-78 Consider binary data transmission at a rate of 56 kbps using baseband binary pulse amplitude modulation (PAM) that is designed to have a raised-cosine spectrum. The transmission bandwidth (in kHz) required for a roll-off factor of 0.25 is -------

A 70

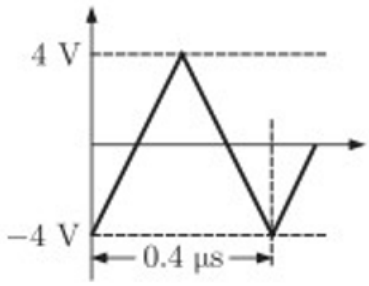
B 35

C 40

D 60

Correct Answer : B

Q-79 The output of an op-amp whose input is a 2.5 MHz square wave is shown in Fig. The slew rate of the op-amp is



A 0.8 V/μs

B 8.0 V/μs

C 20.0 V/μs

D 40.0 V/μs

Correct Answer : D

Q-80 A Hilbert transformer is a

A Non-linear system

B Non casual system

C Time - varying system

D Low-pass system

Correct Answer : B

Q-81 Which of the following operations is commutative but not associative?

A AND
B OR
C NAND
D XOR

Correct Answer : C

Q-82 The minterm expansion of $f(P,Q,R) = PQ + Q\bar{R} + P\bar{R}$ is

A $m_2+m_4+m_6+m_7$
B $m_0+m_1+m_3+m_5$
C $m_0+m_1+m_6+m_1$
D $m_2+m_3+m_4+m_5$

Correct Answer : A

Q-83 Which of the following page replacement algorithms suffers from Belady's anomaly?

A FIFO
B Optimal Page
C LRU
D MRU

Correct Answer : A

Q-84 The most suitable process scheduling policy for a time-shared operating system among these policies is

A Shortest Job First (SJF)
B Round Robin (RR)
C First Come First Served (FCFS)
D Longest Job First (LJF)

Correct Answer : B

Q-85 Which of the following requires device drivers?

A Register
B Cache
C Main Memory
D Disk

Correct Answer : D

Q-86 What would be the output of the following C Code?

```
#include <stdio.h>
#define mul(x) x*x
int main() {
    int a=10;
    printf ("%d", mul(10+1));
    return 0;
}
```

A 121
B 111
C 21
D 132

Correct Answer : C

Q-87 In a circular linked list organisation, insertion of a record involves modification of

A Two pointers
B One pointer
C Three pointers
D No Pointer

Correct Answer : A

Q-88 The following postfix expression with two digit operands is evaluated using a stack:
10 05 + 60 06 / * 08 –
The output will be (Assuming usual precedence and associativity of the operators in the postfix expression)

A 132
B 142
C 152
D 0

Correct Answer : B

Q-89 The transport layer protocols used for real time multimedia, file transfer, DNS and email, respectively are

A TCP, UDP, UDP and TCP
B UDP, TCP, TCP and UDP
C UDP, TCP, UDP and TCP
D TCP, UDP, TCP and UDP

Correct Answer : C

Q-90 The most suitable addressing mode to implement pointers is

A Implied
B Immediate
C Indirect
D Indexed

Correct Answer : C

Q-91 A CPU has 24 bit instructions. A program starts at address 300 (in decimal). Which one of the following is a legal location counter (all values in decimal)?

A 200
B 500
C 700
D 600

Correct Answer : D

Q-92 Which one of the following is used to represent the supporting many-one relationships of a weak entity set in an Entity-Relationship (ER) diagram?

A Diamonds with double/bold border
B Rectangles with double/bold border
C Ovals with double/bold border
D Ovals that contain underlined identifiers

Correct Answer : A

Q-93 Zero has two representations in

A 1’s Complement
B 2’s Complement
C Both A and B
D Neither A nor B

Correct Answer : A

Q-94 In a compiler the module that checks every character of the source program text and generates tokens/lexeme is called

A The code generator
B The code optimiser
C The lexical analyser
D The syntax analyser

Correct Answer : C

Q-95 Alpha testing is done at

A Developer’s end
B User’s end

C Either User's end or Developer's end

D None of the above

Correct Answer : A

Q-96 Software Requirements Specification (SRS) is an output of _____ stage of Software Development Life Cycle (SDLC)

A Project Planning

B Design

C Testing

D Gathering Requirements & Analysis

Correct Answer : D

Q-97 Which of these is not an example of e-marketplace?

A YouTube

B Amazon

C Myntra

D Ebay

Correct Answer : A

Q-98 UPI is developed by the National Payments Corporation of India (NPCI). UPI stands for

A United Payments Interface

B Union Payments Interface

C Unified Payments Interface

D Unified Payments of India

Correct Answer : C

Q-99 In a two-pass assembler each entry of the Table of Incomplete Instructions (TII) is in the form

A <instruction address>,<symbol>

B <symbol>,<instruction address>

C <label><symbol>,<instruction address>

D <symbol>,<value>

Correct Answer : A

Q-100 What would be the output of the following C program

```
#include <stdio.h>
int main()
{
   char s1[7] = "1234", *p;
   p = s1 + 2;
   *p = '0';
   printf("%s", s1);
}
```

A 1204

B 124

C 1240

D 1224

Correct Answer : A