

APTITUDE TEST FOR RECRUITMENT OF CURATOR 'B' ELECTRONICS

(SECTION B)

Name of the Candidate :

Form No :Signature.....

INSTRUCTIONS :

- (a) Place Tick Mark (✓) in the appropriate column for the most appropriate alternative corresponding to the RIGHT ANSWER on the ANSWER SHEET ONLY
 - (b) Each correct answer carries ONE mark
 - (c) There is no Negative Marking
 - (d) For changing your answer, place **X** on earlier answer and then provide correct answer
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Q.1 The direction of flow of current in a conductor is

- a) In the direction of flow of electrons
- b) Opposite to the direction of flow of electrons
- c) Sometimes in the direction of flow of electrons and sometimes opposite
- d) Not possible to determine from the direction of flow of electrons

Q.2 You have 4 resistors of 100Ω with 0.25 Watt rating. If you need to generate 100 mA current from a 10 Volts supply using these resistors without damaging them, the combination will be

- a) All resistors in series
- b) Series of each two keeping in parallel
- c) Parallel of each two keeping in parallel
- d) None of the above.

Q.3 The purpose of doping is to

- a) Make the charge carriers move faster
- b) Cause holes to flow
- c) Give a semiconductor material certain properties
- d) Protect devices form damage in case of transients

- Q.4 Which of the following will serve as a donor impurity in silicon?
- (a) Boron
 - (b) Indium
 - (c) Germanium
 - (d) Antimony
- Q.5 Of the following which material allows the lowest forward voltage drop in a diode?
- a) Selenium
 - b) Silicon
 - c) Copper
 - d) Germanium
- Q.6 If an SCR is connected in AC circuit and triggered at the beginning of each cycle
- a) It will behave as an attenuator
 - b) It will behave as a transducer
 - b) It will behave as an amplifier
 - d) It will behave as a rectifier
- Q.7 When a PN junction is reverse biased, the capacitance depends on all the following except
- a) The Frequency
 - b) Width of the depletion region
 - c) The cross sectional area of the junction
 - d) Type of the semiconductor material
- Q.8 If the reverse bias exceeds the avalanche voltage in a P-N junction
- a) The junction will be destroyed
 - b) The junction will insulate; no current will flow
 - c) The junction will conduct current
 - d) The capacitance will become extremely high
- Q.9 What is the relationship between current (I) and voltage (E) in a circuit consisting of a capacitor in series with a resistor?
- a) I and E are in phase across the capacitor
 - b) I leads E across the resistor
 - c) E leads I across the capacitor
 - d) I and E are in phase across the resistor

Q.10 A tunnel diode is

- a) High resistivity p-n junction diode
- b) A slow switching device
- c) An amplifying device
- d) A very heavily doped p-n junction diode

Q.11 An LED made using GaAs emits radiation in

- (a) Visible region
- (b) Ultraviolet region
- (c) Infrared region
- (d) Microwave frequency region

Q.12 If you increase the gain of an audio amplifier by 3dB, it will produce

- a) Twice louder sound
- b) Thrice louder sound
- c) Six times louder sound
- d) Same intensity of sound as before

Q.13 A Darlington pair is used for

- a) Low distortion
- b) High frequency range
- c) High power gain
- d) High current gain

Q.14 Sine wave output of a function generator is fed to both the horizontal (X) and vertical (Y) inputs of a CRO. What will be the pattern on the cathode ray screen?

- a) A circle
- b) An ellipse
- c) A straight line with 45° slope
- d) Sinusoidal

Q.15 The gain of a transistor in a common-emitter circuit is 100 at a frequency of 1000 Hz. The gain is 70.7 at 335 kHz. The gain drops to 1 at 210 MHz. The alpha Cut off is

- a) 1 kHz
- b) 335 kHz
- c) 210 MHz
- d) None of the above

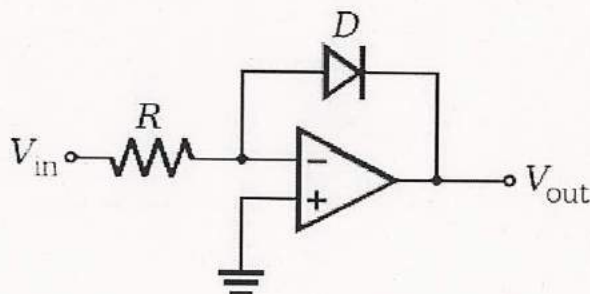
Q.16 A CE amplifier has $R_L = 10K$ ohms. Given $h_{ie} = 1 k$ ohm, $h_{fe} = 50$, $h_{re} = 0$, $1/h_{oe} = 140 K$ ohms ; the voltage gain A_v is

- a) -500
- b) -400
- b) -50
- d) -40

Q.17 Two stages of BJT amplifiers are cascaded by RC coupling. The voltage gain of the first stage is 10 and that of the second stage is 20. The overall gain of the coupled amplifier is

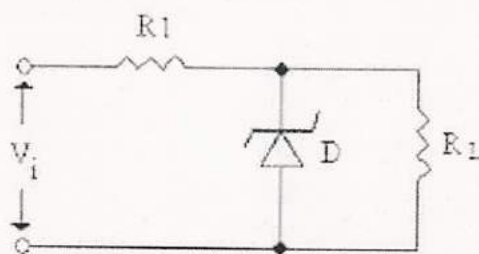
- a) 10×20 b) $10 + 20$ c) $(10 + 20)^2$ d) $(10 \times 20) / 2$

Q.18 The circuit given below uses an ideal operational amplifier. For small positive values of V_{in} , the circuit functions as a



- a) Half wave rectifier b) Differentiator
c) Logarithmic amplifier d) Exponential amplifier

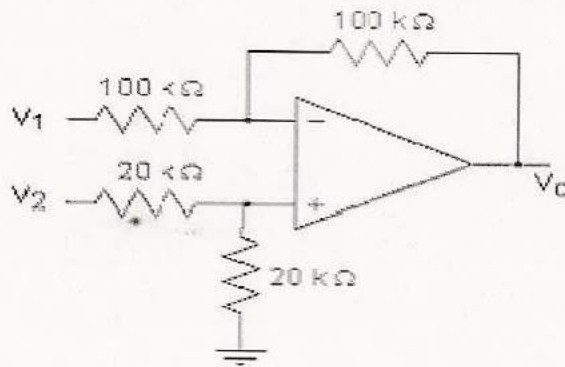
Q.19 In the circuit given below, what should be the minimum value of R_L so that the voltage across it does not fall below 6V



$V_i = 10$ Volt , $R_1 = 50$ ohm , Zener rating = 6 Volt, Knee current = 5 mA

- a) 1.2 K ohms b) 80 ohms
c) 50 ohms d) Zero ohm

Q.20 Determine the output voltage when $V_1 = -V_2 = 1\text{ V}$



- a) 0 V b) -2 V c) 1 V d) 2 V

Q.21 The control terminal (pin 5) of 555 timer IC is normally connected to ground through a capacitor ($\sim 0.01\mu\text{F}$). This is to

- a) Protect the IC from inadvertent application of high voltage
- b) Prevent false triggering by noise coupled onto the pin
- c) Convert the trigger input to sharp pulse by differentiation
- d) Suppress any negative triggering pulse

Q.22 Transformers used in SMPS are small in size because –

- a) They are operated at a higher frequency than the line frequency
- b) They are operated at a Lower frequency than line frequency
- c) They are operated in the same frequency of line frequency
- d) They have poor efficiency

Q.23 An IMPATT diode

- a) Makes a good audio oscillator
- b) Can be used for waveform analysis
- c) Is used as a microwave oscillator
- d) Allows for frequency adjustment of a VCO

Q.24 If a Sine wave is passed through a Schmitt Trigger circuit it will produce

- a) Square wave
- b) Triangular Wave
- c) Saw-Tooth Wave
- d) Noise

Q.25 One of the differences between Solar cell and LDR is

- a) Solar cell needs external power supply to be operated but LDR needs not
- b) Solar cell has more resistance and LDR has less
- c) LDR needs external power supply to be operated but solar cell needs not
- d) They are not operated in the same bandwidth of light

Q.26 In a 2 input exclusive OR gate the output is High, if both the inputs are

- a) Same
- b) Inverted
- c) Different
- d) Indeterminate

Q.27 A T-flip-flop function is obtained from a JK flip-flop, if the flip-flop belongs to a TTL family, the connections needed at the input must be

- a) $J=K=1$
- b) $J=K=0$
- c) $J=1$ AND $K=0$
- d) $J=0$ and $K=1$

Q.28 Microcontrollers are different from microprocessors because

- a) They have inbuilt cache memory
- b) They have peripherals attached on the same package
- c) They have less operating voltage
- d) They have inbuilt power supply

Q.29 The frequency of an AC wave form is 1.5 KHz. The periodic time is

- a) $1.5 \mu\text{s}$
- b) 66 mS
- c) $666 \mu\text{s}$
- d) 1.5 mS

Q.30 An assembler is utilized for

- a) Translating a set of instructions to a processor usable pattern of bits.
- b) Translating high level language to instruction sets.
- c) Translating a high level language to processor usable pattern of bits.
- d) None of the above

Q.31 This program code of microcontroller 8051 will be executed continuously:

```
STAT:MOV A, #01H  
JNZ STAT
```

- a) True
- b) False
- c) Invalid Program Code
- d) Can't Determine

Q.32 What does the following instruction of controller 8051 do?

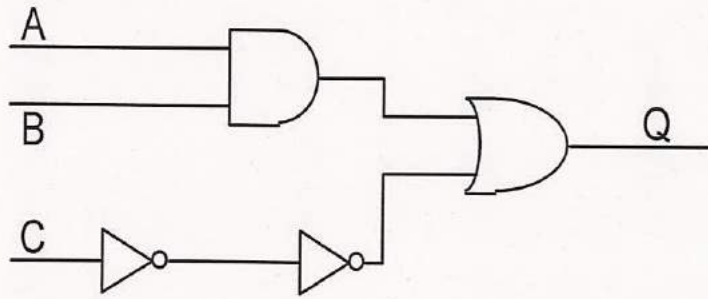
```
MOV A, @ R1
```

- a) Copy R1 to the accumulator
- b) Copy the accumulator to R1
- c) Copy the contents of memory whose address is in R1 to the accumulator
- d) Copy the accumulator to the contents of memory whose address is in R1

Q.33 For a 4-bit DAC, the least significant bit (LSB) is _____

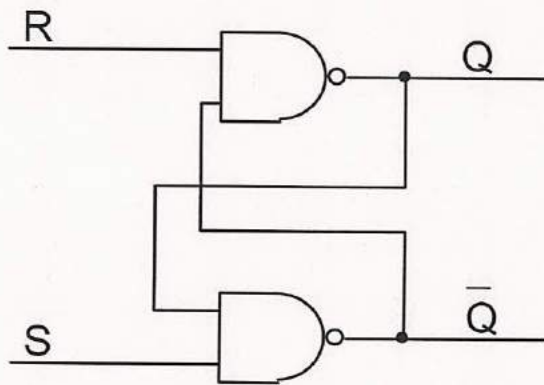
- a) 6.25% of full scale
- b) 0.625% of full scale
- c) 12% of full scale
- d) 1.2% of full scale

Q.34 The Boolean expansion that represents the combination below is



- a) $Q = A \cdot B + C$ b) $Q = A + C + B$
 c) $Q = A + B \cdot \bar{C}$ d) $Q = A \cdot B + \bar{C}$

Q.35 In Fig below, if $R=0$ and $S=1$, the outputs Q and \bar{Q} are



- a) 1, 0 b) 0, 1 c) Indeterminate d) 1, 1

Q.36 The value of the decimal number 23 in binary form is

- a) 10110
 b) 11011
 c) 10111
 d) 11100

Q.37 Binary number 0.101011 when converted into decimal is

- a) 671875 b) 0.671875 c) 6.71875 d) 0.0671875

- Q.38 Hexadecimal number 3C when converted into decimal is
 a) 60 b) 6 c) 600 d) 58
- Q.39 The largest possible decimal number that can be represented by six binary digits (bits) is
 a) 256 b) 128 c) 64 d) 63
- Q.40 32 bit computer word consists of
 a) 8 bytes b) 4 bits c) 4 bytes d) 8 bits
- Q.41 Baud rate is measured in
 a) bits per second b) bytes per second
 c) nibble per second d) None of the above
- Q.42 If a microcomputer has 64K memory, the hexadecimal notation for the first and last memory locations are
 a) 0000, FFFF b) 0000, 0FFF
 c) 0000, 1FFF d) 0000, 7FFF
- Q.43 IC 2732 is a 4096 x 8 EPROM. How many address lines does it have?
 a) 12 b) 11 c) 13 d) 14
- Q.44 The frequency of an AC waveform is 1.5 KHz. The periodic time is
 a) 1.5 μ S b) 66 mS c) 666 μ S d) 1.5 mS
- Q.45 If a full-wave bridge rectifier circuit is used with a transformer having secondary voltage as 50 V rms. The PIV across the diodes will be
 a) 50 V b) 70 V c) 100 V d) 140 V
- Q.46 A Microcomputer has memory location from 0000 to 3FFF each storing 1 byte. The number of bytes that can be stored in the memory are
 a) 8,192 b) 8,000 c) 16,383 d) 16,384
- Q.47 In a microprocessor, the address of the instruction that is to be executed is stored in
 a) Accumulator b) Program Counter
 c) Register d) Stack

Q.48 In microprocessor 8085, the instruction used to load the HL register with the bytes at memory locations 2000h & 2001h is

- a) LHLD 2001h
- b) LHLD 2000h
- c) PCHL
- d) XTHL

Q.49 Which one of the following statements describes the operation of multiplexer?

- a) A logic circuit used to generate codes output
- b) A logic circuit used to generate F's complement
- c) A logic circuit that accepts two or more inputs and allows one of them at a time to get through the output
- d) A logic circuit that transmits one input to several output lines

Q.50 What is the octal equivalent of decimal 0.3125?

- a) 0.42
- b) 0.3125
- c) 0.24
- d) 0.12

Q.51 An image uses 512X512 picture elements. Each of the picture element can take any of the 8 distinguishable intensity levels. The maximum entropy in the above image will be

- a) 2097152 bits
- b) 786432 bits
- c) 648 bits
- d) 144 bits

Q.52 The binary sum of 111010_2 and 11011_2 is

- a) 1010101_2
- b) 1010111_2
- c) 1011111_2
- d) 1111111_2

Q.53 The sum S of A and B in a Half Adder can be implemented by using K NAND gates. The value of K is

- a) 3
- b) 4
- c) 5
- d) 2

Q.54 The Gray code for decimal number 2 is

- a) 0010
- b) 0011
- c) 1000
- d) 0101

Q.55 In a ripple counter using edge triggered J-K flip-flop, the pulse input is applied to

- a) Clock input of all flip-flops
- b) Clock input of one flip-flop
- c) J and K input of one flip-flop
- d) J and K input of all flip-flops

Q.56 In 8086 microprocessor the following has the highest priority among all type of interrupts

- a) NMI
- b) DIV 0
- c) TYPE 255
- d) OVER FLOW

Q.57 In 8086 microprocessor one of the following statements is not true.

- a) Coprocessor is interfaced in MAX mode
- b) Coprocessor is interfaced in MIN mode
- c) I/O can be interfaced in MAX / MIN mode
- d) Supports pipelining

Q.58 For a microprocessor system using IO mapped IO the following statement is NOT TRUE

- a) memory space available is smaller
- b) not all data transfer instructions are available
- c) IO and Memory address space are distinct
- d) IO address space is greater

Q.59 Start and stop bits do not contain any 'information' but are used in serial communication for

- a) error detection
- b) error correction
- c) synchronization
- d) baud rate reduction

Q.60 In a 4 bit counter, the outputs of 3 JK Flip-flops from MSB downward are connected to the NAND gate whose output is connected to CLR

- a) It is a MOD -14 counter
- b) It is a MOD -16 counter
- c) It is a MOD -13 counter
- d) It is a MOD -12 counter

Q.61 The initial state of a MOD-16 down counter is 0110. What state will it be in after 37 clock pulses?

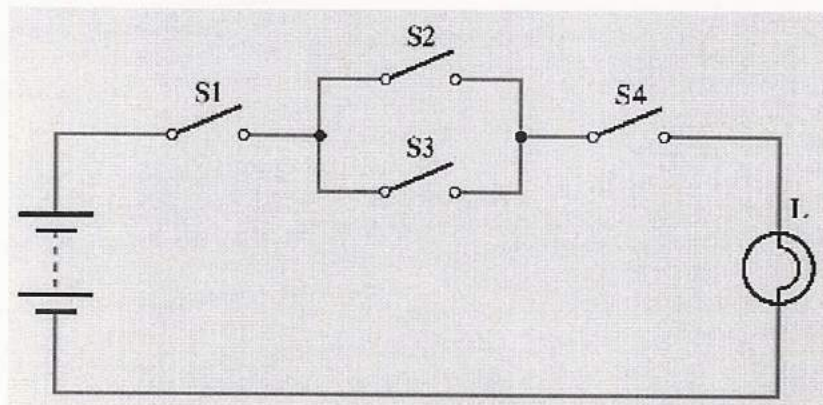
- a) 0100
- b) 1010
- c) 0101
- d) 0001

Q.62 If register B contains 28H and accumulator 97H, what will be content of register C after the following programme has been executed?

```
MOV A,B
MOV C,A
MOV B,C
MOV C,B
```

- a) 28H
- b) AAH
- c) 97 H
- d) 00H

Q.63 What logic function corresponds to the following arrangement?



- a) $L = S1 \text{ OR } (S2 \text{ AND } S3) \text{ OR } S4$
- b) $L = (S1 \text{ AND } S2) \text{ OR } (S3 \text{ AND } S4)$
- c) $L = S1 \text{ AND } (S2 \text{ OR } S3) \text{ AND } S4$
- d) $L = (S1 \text{ OR } S2) \text{ AND } (S3 \text{ OR } S4)$

Q.64 Which one of the following transducers is the most suitable for the measurement of linear displacement?

- a) Strain gauge
- b) LVDT
- c) Piezoelectric crystal
- d) Microphone

Q.65 On a computer hard drive, the circular tracks are broken into arcs called:

- a) Clusters
- b) Bytes
- c) Sectors
- d) Divisions

Q.66 In 8051 microcontroller, the execution time of a single cycle instruction for a 16 MHz crystal is

- a) 0.75 micro seconds
- b) 7.5 micro seconds
- c) 1 micro second
- d) 2 micro seconds

Q.67 PIC family of microcontrollers is based on

- a) Neumann's architecture
- b) Von architecture
- c) Harvard architecture
- d) None of the above

Q.68 VHF range lies between

- a) 3MHz to 300 MHz
- b) 30 MHz to 300 MHz
- c) 3 MHz to 30 MHz
- d) 30 GHz to 300 GHz

Q.69 Bluetooth is an example of

- a) Wireless Metropolitan Area Network.
- b) Wireless Wide Area Network.
- c) Wireless Local Area Network
- d) Wireless Personal Area Network

Q.70 In quantum computer, qubits represent

- a) 0,0
 - b) 1,1
 - c) 1,0 & both, 1 and 0 simultaneously
 - d) None of the above
-