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ಕರ್ನಾಟಕ ಪ್ರೌಢ ಶಿಕ್ಷಣ ಪರೀಕ್ಷಾ ಮಂಡಳಿ, ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು – **560 003**

KARNATAKA SECONDARY EDUCATION EXAMINATION BOARD, MALLESWARAM, BANGALORE – 560 003

ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪರೀಕ್ಷೆ, ಮಾರ್ಚ್/ಏಪ್ರಿಲ್ — **2019**

S. S. L. C. EXAMINATION, MARCH/APRIL, 2019

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWERS

ದಿನಾಂಕ : 23. 03. 2019] ಸಂಕೇತ ಸಂಖ್ಯೆ : **73**

Date : 23. 03. 2019] **CODE NO. : 73**

ವಿಷಯ : ಎಲಿಮೆಂಟ್ಸ್ ಆಫ್ ಎಲೆಕ್ಟ್ರಾನಿಕ್ಸ್ ಇಂಜಿನಿಯರಿಂಗ್

Subject : ELEMENTS OF ELECTRONICS ENGINEERING

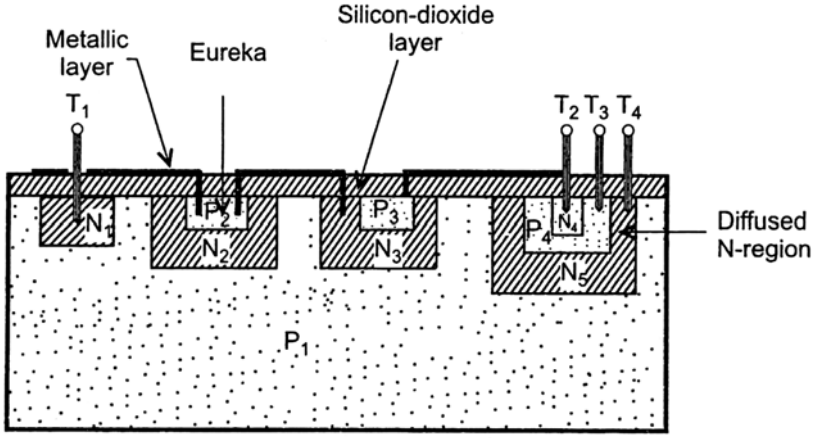
(ಶಾಲಾ ಅಭ್ಯರ್ಥಿ & ಪುನರಾವರ್ತಿತ ಶಾಲಾ ಅಭ್ಯರ್ಥಿ/ Regular Fresh & Regular Repeater)

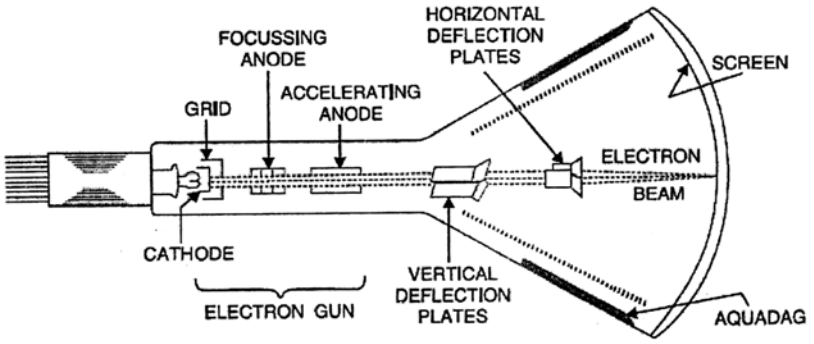
[ಗರಿಷ್ಠ ಅಂಕಗಳು : **90**

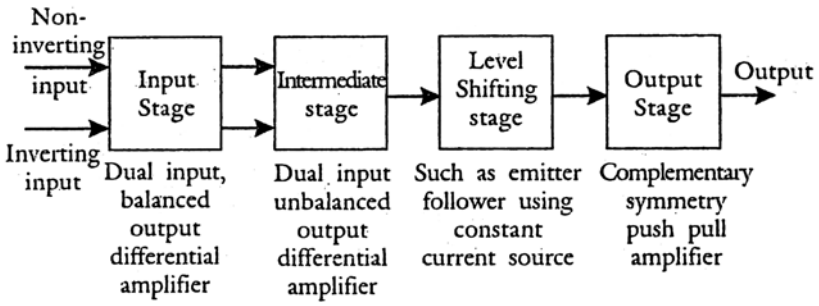
[Max. Marks : 90

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
1.		Fill in the blanks with the appropriate figure/word(s) by selecting from the choices given in the brackets : $10 \times 1 = 10$	
	i)	IC consumes ..... power. (a) more (b) less (c) none of these. *Ans.* (b) less	
	ii)	Normally ICs are made of ..... . (a) Aluminium (b) Copper (c) Silicon. *Ans.* (c) Silicon	

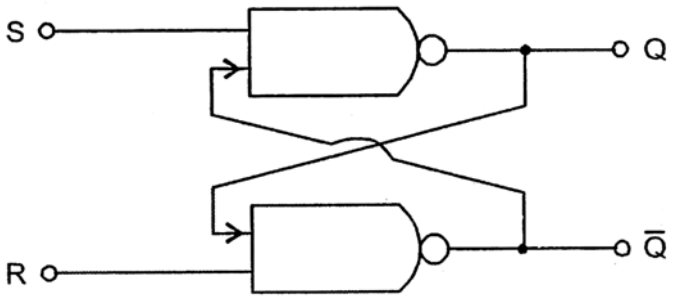
Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	iii)	ICs are generally in the form of ..... . (a) Flat pack (b) Triangle (c) Sphere. *Ans.* (a) Flat pack	
	iv)	IC 741 is an example of ..... . (a) MOSFET (b) Op-Amp (c) FET. *Ans.* (b) Op-Amp	
	v)	Op-Amp has ..... impedance. (a) low (b) medium (c) high. *Ans.* (c) high	
	vi)	Octal number system has ..... logic symbols. (a) 8 (b) 4 (c) 6. *Ans.* (a) 8	
	vii)	If the inputs of NAND gate IC are 1 & 1 then its output is ..... . (a) 1 (b) 0 (c) 2. *Ans.* (b) 0	
	viii)	Binary number 0111 represents ..... . (a) 9 (b) 8 (c) 7. *Ans.* (c) 7	
	ix)	..... is used to store binary word temporary. (a) Buffer register (b) SISO register (c) SIPO register. *Ans.* (a) Buffer register	
	x)	..... is used to count number of clock pulses arrived at its input. (a) Inverter (b) Counter (c) Converter. *Ans.* (b) Counter	

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
2.	a)	List any two active components. 2 *Ans.* i) Triode ii) SCR	2 × 1 = 2 (each 1)
	b)	Explain monolithic IC. 3 *Ans.* The most popular type of IC is monolithic IC. It consists of capacitor, resistor, diode and transistor. All these components are made on a fine wafer which is called wafer. This type of IC are used widely.	3
	c)	Draw a neat sketch to show the construction of monolithic IC. 5 *Ans.*  Sketch - 4 Parts - 1	5
3.	a)	Define the term SSI. 2 *Ans.* SSI — Small Scale Integration, it contains up to 12 gates / unit	2
	b)	Describe how registors are fabricated in IC. 3 *Ans.* For making resistor, nichrome or eureka is diffused in the wafer to form P_2 region. This P_2 region is made inside an already made N_2 region. Second terminal of the resistor is connected to another element.	3

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	c)	Draw a neat sketch of CRT. 5 *Ans.*  Sketch - 4 Parts - 1	5
4.	a)	List types of ICs based on manufacturing process. 2 *Ans.* i) Monolithic ii) Thin film iii) Thick film iv) Hybrid	2 × 1 = 2
	b)	Describe how hybrid ICs are differ from monolithic IC. 3 *Ans.* Hybrid IC is the combination of thick and thin film IC, it differs from monolithic IC because of size, *i.e.* hybrid ICs are of more weight also occupies more space.	3
	c)	Why ICs need less power to operate and more reliable than discrete components ? 5 *Ans.* IC works on less power because, thousands of components *Ex* : resistor, capacitor, diode etc. are fabricated in small area even single square inch of chip and using IC wiring becomes simple and solderless circuit, hence all these reasons IC works on less power.	5
5.	a)	What is meant by an Op-Amp ? 2 *Ans.* Op-Amp generally written as operational amplifier, it is a direct coupled high gain amplifier.	2

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	b)	Explain Inventing amplifier. 3 *Ans.* Inverting amplifier inverts the phase of the applied signal, in which input V_{in} is applied to the inverting terminal and non-inverting terminal is grounded, so it is called inverting amplifier *i.e.* $V_0 = -A\ V_{in}$	3
	c)	Draw the block diagram of an Op-Amp and explain input stage. 5 *Ans.* Block diagram of an Op-Amp :  Input stage is having dual inputs, but balanced output differential amplifier, it provides voltage gain of the amplifier. Diagram - 2 Notes - 3	5
6.	a)	Name the IC which inverts input data. 2 *Ans.* 'NOT' gate IC always inverts input signal *i.e.* if the input is '1' then its output is '0'.	2
	b)	Describe about universal logic gates. 3 *Ans.* 'NAND' gate & 'NOR' gate are known as universal building blocks or universal gates. This is because using only 'NAND' gates or 'NOR' gates, we can produce many logic functions.	3

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	c)	Determine the values of i) 6 – 4 by using binary subtraction method ii) 24 + 8 by using binary addition method. 5 *Ans.* i) Determination of 6 – 4 Decimal subtraction: 6 − 4 = 2 Binary subtraction: 0110 − 0100 = 0010 ii) Determination of 24 + 8 Decimal addition: 24 + 8 = 32 Binary addition: 1 ← carry; 11000 + 1000 = 100000	$2\frac{1}{2} + 2\frac{1}{2} = 5$
7.	a)	How many digits are used in octal number system ? 2 *Ans.* The octal number system has a base of 8 *i.e.* it uses 8 digits, normally these are 0, 1, 2, 3, 4, 5, 6 and 7.	2
	b)	Why binary number system is most popular ? 3 *Ans.* The early computers employed decimal system but now-a-days new system called binary system. The main reason of utility is based on the fact that an electrical circuit has only two states off & on or 0 & 1. In this way this system is more popular.	3
	c)	Convert octal numbers $(512)_8$ and $(1035)_8$ into decimal numbers. 5 *Ans.* i) $(1035)_8$ to decimal number $(1035)_8 = 5\times8^0 + 3\times8^1 + 0\times8^2 + 1\times8^3$ $= 5 + 24 + 0 + 512$ $= (541)_{10}$ ii) $(512)_8$ into decimal number $(512)_8 = (2\times8^0) + (1\times8^1) + (1\times8^2)$ $= 2 + 8 + 320$ $= (330)_{10}$	$2\frac{1}{2} + 2\frac{1}{2} = 5$

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
8.	a)	Define the term flip-flop. 2 *Ans.* Flip-flop is a basic memory element. It has two stable states *i.e.* its output is either 0 or 1.	2
	b)	Explain JK flip-flop. 3 *Ans.* JK flip-flop is a modified form of RS flip-flop, it removes the forbidden condition (R = 1 & S = 1) of RS flip-flop. In a *RS* flip-flop, the state with R = 1 & S = 1 is invalid, whereas in JK flip-flop the O/P Q and $\overline{Q}$ is available. These are used in counter.	3
	c)	Draw a neat diagram of RS flip-flop using NAND gates and explain. 5 *Ans.* RS flip-flop  *RS* flip-flop is a Set-Reset flip-flop with which we can store a desired specific state. It has two inputs R & S and two outputs Q & $\overline{Q}$, the input S is called sit and R is referred as reset or clear input. Diagram - 3 Explain - 2	5
9.	a)	What do you mean by microprocessor ? 2 *Ans.* A microprocessor is an IC chip which can act as central processing unit of a digital computer, it contains 40 pins.	2
	b)	Explain 8085 microprocessor. 3 *Ans.* Intel 8085 microprocessor is a semiconductor device consisting of electronic logic circuits manufactured by using either a LSI or VLSI technique. It has various sections such as, Interrupt control, Serial I/O control etc. These are used in computers, instrumentation field etc.	3

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	c)	Explain Up and Down counter. 5 *Ans.* Counter is a special type of register, designed to count the number of clock pulses arriving at its input. Up counter counts upwards *i.e.* from 0000 to 1111 is called an up counter such as a ripple counter. Down counter counts downwards *i.e.* from 1111 to 0000 is called down counter. In this counter a preset signal is amplified to all the flip-flops for setting them at 1111.	5