CCE RR

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

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

ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪರೀಕ್ಷೆ, ಜೂನ್ — 2017

S. S. L. C. EXAMINATION, JUNE, 2017

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWERS

ವಿಷಯ : ಎಲಿಮೆಂಟ್ಸ್ ಆಫ್ ಎಲೆಕ್ಟ್ರಾನಿಕ್ಸ್ ಇಂಜಿನಿಯರಿಂಗ್

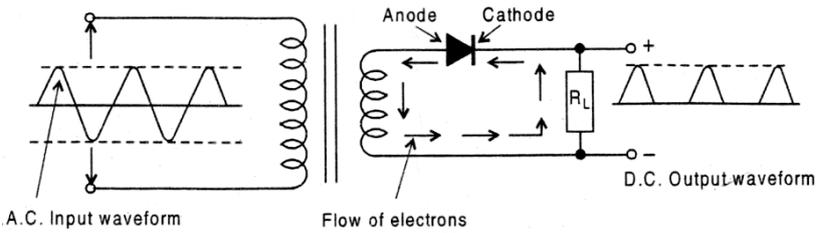## Subject : ELEMENTS OF ELECTRONICS ENGINEERING

(ಹೊಸ ಪಠ್ಯಕ್ರಮ / New Syllabus)

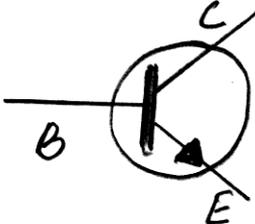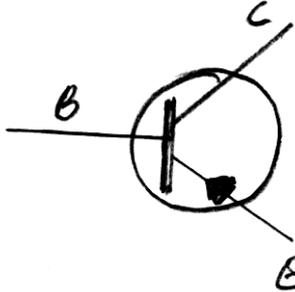(ಪುನರಾವರ್ತಿತ ಶಾಲಾ ಅಭ್ಯರ್ಥಿ/ Regular Repeater)

[ಗರಿಷ್ಠ ಅಂಕಗಳು : **90**

[Max. Marks : **90**

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
1.	i)	tungsten	
	ii)	*N*-type semiconductor	
	iii)	two *PN* junctions	
	iv)	less power	
	v)	more than 100 gates	
	vi)	zero	
	vii)	very simple	
	viii)	register	
	ix)	hexadecimal system	
	x)	counter	$10 \times 1 = 10$ (each 1)

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
2.	a)	Consequently pure germanium and pure silicon are almost insulator but either conductivity can be increased by adding impurities of other elements to them. Pure semiconductor is called intrinsic semi-conductor.	2
	b)	<u>Donor impurity</u> : An impurity which donates electrons to a semiconductor is called donor impurity. *Ex :* Pentavalent impurity like antimony or arsenic. <u>Acceptor impurity</u> : An impurity which creates holes to accept electrons from pure semiconductor atom is called acceptor impurity. *Ex :* Gallium, indium, bismuth etc.	2 + 2 = 4
	c)	i) *P*-type materials ii) *N*-type materials It is used in the manufacture of diodes, transistor and microprocessors.	2 + 2 = 4
3.	a)	The process of conversion of A.C. into D.C. is known as rectifier. Rectifier is required for the purpose of rectifications.	2
	b)	 **Half-wave rectifier** Sketch — 3 marks Parts — 1 mark	3 + 1

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	c)	Comparison between Half-wave & Full-wave rectifier :	

Half-wave rectifier	Full-wave rectifier
i) It has low efficiency	i) It has high efficiency
ii) Since the ripple frequency is 50 Hz	ii) Since the ripple frequency is 100 Hz
iii) Circuit assembly is easy	iii) Circuit assembly is comparatively tough
iv) It employs only one diode	iv) It employs two diodes
v) It is a cheap circuit	v) It is costly
vi) Size is large	vi) Size is small

$4 \times 1 = 4$
(each 1)

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
4.	a)	*N-P-N* symbol *P-N-P* symbol 	$1 + 1 = 2$ (each 1)
	b)	A semiconductor diode doped heavily to have a sharp break-down voltage is called Zener diode. It is always reverse biased. Applications : i) Voltage regulator ii) Voltage limiter iii) Fixed reference voltage for biasing & comparison purpose iv) As a standard voltage for calibration of voltmeter.	2 $2 \times 1 = 2$ (each 1)

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	c)	Gallium arsenide or gallium phosphide Germanium or silicon *PN* junction. Applications : i) It is used as a light indicator in electronic equipment for visual display purpose ii) Decoration lighting purpose.	2 + 2 = 4
5.	a)	IC packages : i) Hermatic (metal or ceramic) ii) Non-hermatic (plastic)	2 × 1 = 2 (each 1)
	b)	i) Small size ii) Light weight iii) Low electric power consumption iv) High reliability v) Working capacity at higher temperature	4 × 1 = 4 (each 1)
	c)	Construction of monolithic I.C. (a) Construction (b) Circuit of I.C. Sketch — 3 marks Parts — 1 mark	3 + 1
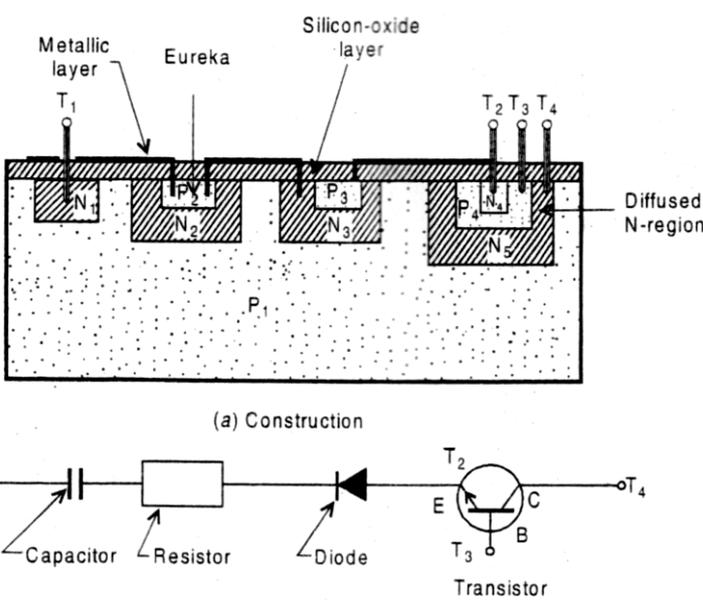
Qn. Nos.	Sub. Qn.No.	Value Points	Marks
6.	a)	Octal system is a base 8 system in which 8 basic symbols 0, 1, 2, 3, 4, 5, 6, 7 are used. This system was used in early computers and now it has been replaced by hexadecimal system.	2
	b)	Decimal to octal number : 8 | 37 8 | 4 – 5 0 – 4 $\therefore 37_{10} = 45_8$ Octal to decimal number : 73_8 $73_{(8)} = 3 \times 8^0 + 7 \times 8^1$ $= 3 + 56$ $= 59_{10}$	2 2
	c)	Symbol of OR gate : Truth table : <table><tr><td colspan="2">Input</td><td>Output</td></tr><tr><td>A</td><td>B</td><td>Y</td></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></table>	2 + 2 = 4
7.	a)	A flip-flop is a bistable multivibrator which has two table states *i.e.* O/P is either low or high. These are two states called Reset and Set respectively.	2

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	b)	Flip-flops are used for : i) building blocks of resistor ii) memories iii) counters iv) control logic etc.	4 × 1 = 4 (each 1)
	c)	<u>Register</u> : It is a logic block which is used for storage and transfer of binary information in a digital system. Storing of a binary bit is done with the help of flip-flops. <u>Shift register</u> : The shift operation of a register permits the movement of data stored at a particular bit location to some other bit location within the same register or into some other register on the occurrence of clock pulse.	2 + 2 = 4
8.	a)	A microprocessor is an IC chip which can act as CPU of a digital computer. It consists of a number of LSI and VLSI devices such as Intel 8085 which contains 40 connecting pins.	2
	b)	i) SSI : It contains up to 12 logic gates / unit ii) MSI : It contains more than 12 but less than 100 logic gates iii) VLSI : It contains more than 400 and up to several thousand iv) ULSI : It contains more than 10 lac logic gates.	4 × 1 = 4 (each 1)
	c)	Important features of Intel 8085 : i) It can accept 8 bits data simultaneously ii) It uses about 6200 N channel iii) It requires single power supply of +5 volts. It has on-chip clock oscillator and control signals iv) Its maximum clock frequency is 5 MHz v) It can be used to assemble a microcomputer with supporting chips 8155 and 8355.	4 × 1 = 4 (each 1)

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
9.	a)	A high gain I.C. based direct coupled amplifier is known as operation amplifier. The amplifier is capable to amplify A.C. and D.C. both types of input signals.	2
	b)	Op-Amps available in the market : MA 741, LM 381, CA 3002	$2 \times 1 = 2$ (each 1)
	c)	i) <u>Oscilloscope</u> : The instrument made for viewing the amplitude variations on a time base scale of an electrical wave is called an oscilloscope. ii) <u>Amplifier</u> : A circuit capable of increasing the amplitude or power of input signal is called amplifier. Amplifiers are used in radio, TV, audio etc. iii) <u>Digital I.C.</u> : An I.C. whose output is not proportional to its input is known as a digital I.C. It is used to perform various functions in calculators and computers. Digital I.C.s may be classified as follows : SSI, MSI, LSI, VLSI.	$2 \times 3 = 6$ (each 3)