Reg. No. :

Code No.: 6524 Sub. Code: ZPHM13

M. Sc (CBCS) DEGREE EXAMINATION, NOVEMBER 2021

First Semester

Physics -Core

INTEGRATED ELECTRONICS

(For those who joined in July 2021 onwards)

Time: Three hours

Maximum: 75 marks

PART A — $(10 \times 1 = 10 \text{ marks})$

Answer ALL questions.

Choose the correct answer :

- 1. In a FET, there are _____ pn junctions at the sides.
 - (a) Three (b) four
 - (c) five (d) two

2.	Which of the followin in an IC?	ng is most difficult to fabricate	
	(a) Diode	(b) capacitor	
	(c) Transistor	(d) FET	
3.	The full form of SR is	3	
	(a) System rated	(b) set reset	
	(c) Set ready	(d) set rated	
4.	How many method available?	ls of shitting of data are	
	(a) 2	(b) 3	
	(c) 4	(d) 5	
5.	The common- mode gain is		
	(a) Very high	(b) very low	
	(c) Always unity	(d) unpredictable	
6.	The expression for th is	e differentiator time constant	
	(a) CR	(b) 1/CR	
	(c) R/C	(d) C/R	
7.	Determine the time multivibrator	period of a monostable 555	
	(a) T=0.33RC	(b) T=1.1RC	
	(c) 3RC	(d) T=RC	
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2.

- 8. Over modulation results in _____
 - (a) Weakening of the signal
 - (b) Excessive carrier power
 - (c) Distortion
 - (d) None of the above
- 9. Which of the following is correct for tactile sensors?
 - (a) Touch sensitive
 - (b) Pressure sensitive
 - (c) Input voltage sensitive
 - (d) Humidity sensitive
- 10. Smallest change which a sensor can detect is
 - (a) Resolution (b) Accuracy
 - (c) Precision (d) Scale

PART B — $(5 \times 5 = 25 \text{ marks})$

Answer ALL questions, choosing either (a) or (b). Each answer should not exceed 250 words.

11. (a) Explain the applications of FET.

Or

(b) Explain how resistor can be constructed in a monolithic integrated circuit.

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12. (a) Draw the circuit of an RTL gate and explain its operation for positive logic.

Or

- (b) Describe in detail the working of RS flip flop.
- 13. (a) Explain Op-Amp as a integrator with neat circuit diagram.

Or

- (b) Describe the working of an instrumentation amplifier.
- 14. (a) With a neat circuit diagram explain the working of monostable Multivibrator using 555 Timer.

Or

- (b) Give the block diagram of IC 565 VCO and explain its operation.
- 15. (a) Explain the measurement and control in transducers.

Or

(b) Briefly explain filtering and reduction.

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PART C — $(5 \times 8 = 40 \text{ marks})$

Answer ALL questions, choosing either (a) or (b) Each answer should not exceed 600 words.

16. (a) Explain the construction working and characteristic of TRIAC.

Or

- (b) (i) The data sheet for an E- MOSFET gives I_D (ON) = 500 ma at V_{GS} =10 V and $V_{GS(th)}$ = 1 V .Determine the drain current for V_{GS} = 5V.
 - (ii) Distinguish between MOSFET and JFET.
- 17. (a) Explain with a neat circuit diagram function, truth table and waveform of a JK flip flop.

Or

- (b) Describe the operation of CMOS NAND and NOR gates.
- 18. (a) Describe the procedure for solving a second order differential equation. How are the initial conditions set up?

 \mathbf{Or}

- (b) With a neat circuit diagram explain the second order low- pass filter.
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19. (a) Explain the function of FSK modulation and demodulation.

\mathbf{Or}

- (b) With a neat circuit diagram explain the function of voltage controlled oscillator.
- 20. (a) Explain the noise and noise sources.

\mathbf{Or}

(b) Discuss in detail shielding and grounding.

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