	No.:		CE SILLERGIA	) P	(17U 0126
VI Semester B.Sc. Degree (CCSS - Supple./Improv.)  Examination, May 2017  CORE COURSE IN PHYSICS  6B14 PHY: Digital Electronics  (2009 - 2013 Admns.)					
Time :	3 Hours				Weightage: 30
		SECTIO	N – A		
Ansv	wer all questions. Eac	h bunch carries a	wt of 1.		
1. 1)	The decimal equivale a) 60	ent of octal 120 is b) 80	c) 100	d) 90	
2)	The hexa decimal eq	uivalent of decima b) CA	al 205 is c) CD	d) DE	
3)	The 2's complement a) 01100	of 10011 is b) 01101	c) 01011	d) 011	10
4)	The ASCII code for that a) 4A	ne character A is b) 41	c) 31	d) 30	~ 4
2. 1)	Adding 1010 with 111 a) 11001	1 gives b) 10011	c) 11101	d) 1000	01
2)	A + AB = A is called _ a) distributive	lawi	n Boolean algebra b) commutative	ı.	

3) For amplitude modulation, the frequency of carrier wave is

c) absorption

a) Greater than signal frequencyb) Less than signal frequencyc) Equal to the signal frequencyd) Half of the signal frequency

d) none of these

P.T.O.





- 4) An IF amplifier is a part of
  - a) Amplitude modulator
- b) Frequency modulator
- c) Super heterodyne circuit
- d) Pulse modulator

(Wt:1×2=2)

## SECTION-B

Answer any six. Each carries a wt of 1.

- 3. Convert decimal 1449 to hexadecimal.
- 4. Write down the BCD code for the following numbers.
  - a) 4080

- b) 921
- 5. Write the Boolean expression and truth table of a two input NOR gate.
- 6. Apply Demorgans principle to the equation A+B+C.
- 7. Add the numbers + 38 and 22 using 2's complement method.
- 8. Sketch the logic circuit for an EX-OR gate and give its truth table.
- 9. Draw the frequency spectrum of an amplitude modulated wave and explain.
- 10. What do you mean by demodulation?

 $(Wt : 1 \times 6 = 6)$ 

## SECTION - C

Answer any nine. Each carries a wt of 2.

- 11. What do you mean by the base of a number system ? Give the relationship between the base and positional weights of digits in numbers.
- 12. Perform the following arithmetic operation on signed binary numbers.
  - a) Add + 39 and 22
- b) Subtract 21 from + 39
- 13. What are the advantages of 2's complement scheme?
- 14. Distinguish between ASCII code and BCD code.
- 15. What do you mean by the parity of a binary code ? What is its importance ?



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- 16. Explain the De-Morgan's theorems.
- 17. Simplify the following Boolean equations.
  - a)  $(\overline{A}+B)(A+B)$

b) AB+BC+BC

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- 18. Draw a logic circuit for the expression Y = (AB + AB).C.
- 19. The truth table of a three variable logic circuit gives output 1 for the combinations 101, 110, 011, 111 and 0 for all other combinations. Draw a K-map and write a SOP form Boolean equation.
- 20. Write down the equation for an amplitude modulated wave and explain the terms.
- 21. Explain the concept of frequency modulation.
- 22. An audio signal of 1 KHz is used to modulate a carrier of 500 KHz. Determine the side band frequencies and band width. (Wt: 2×9=18)

## SECTION-D

Answer any one. Each carries a wt of 4.

- 23. With the help of suitable diagram, explain the operation of a full adder. Implement a four bit parallel adder using full adder.
- 24. With the help of a block diagram, explain the operation of a super heterodyne receiver. (Wt: 4×1=4)