



M 8174

Reg. No. :

Name :

VI Semester B.Sc. Degree (CCSS – Reg./Supple./Improv.)
Examination, May 2015
CORE COURSE IN PHYSICS
6B14 PHY : Digital Electronics

Time : 3 Hours

Max. Weightage : 30

Instructions : Answer **all** questions from Section A, **each** bunch carries a weightage 1, **any six** questions from Section B, **each** question carries a weightage 1, **any nine** questions from Section C, **each** question carries a weightage 2 and **any one** question from Section D, **each** carries a weightage 4.

SECTION – A

Choose the correct answer. Answer **all** questions. **Each** bunch carries a weightage of **one**.

1. i) The number system which uses alphabets as well as numerals is
 - a) Binary
 - b) Octal
 - c) Decimal
 - d) Hexadecimal
- ii) A string of 8 bits is known as a
 - a) Quad
 - b) Octet
 - c) Nibble
 - d) Byte
- iii) If each successive code differs from its preceding code by a single bit only, then this code is called
 - a) BCD code
 - b) Gray code
 - c) Weighted code
 - d) Binary code
- iv) An exclusive NOR gate is logically equal to
 - a) Inverter followed by XOR gate
 - b) NOT gate followed by XOR gate
 - c) Exclusive OR gate followed by inverter
 - d) Complement of NOR gate

P.T.O.



2. i) The gate ideally suited for bit comparison is
- a) Two input exclusive NOR gate
 - b) Two input exclusive OR gate
 - c) Two input NAND gate
 - d) Two input NOR gate
- ii) A digital word has even parity
- a) If it has even number of 1's
 - b) If it has even number of 0's
 - c) If the decimal value of the digital word is even
 - d) None of these
- iii) How many inputs and outputs does a full adder have ?
- a) two inputs, two outputs
 - b) two inputs, one output
 - c) three inputs, two outputs
 - d) two inputs, three outputs
- iv) Which of the following is known as half adder ?
- a) XOR gate
 - b) XNOR gate
 - c) NAND gate
 - d) NOR gate
- (2×1=2)

SECTION – B

Answer **any six** questions. **Each** question carries a weightage of **one**.

3. What do you mean by 'signed magnitude' form of representation ?
4. What are the characteristics of 2's complement method ?
5. Explain odd and even parity systems.
6. Name the universal gates. Why are they called so ?
7. How will you obtain the dual of a Boolean function ?
8. How will you convert a SOP form of Boolean expression into POS form ?
9. Explain the frequency spectrum of amplitude modulated wave.
10. Explain the working of a diode detector for AM signals. (6×1=6)



SECTION – C

Answer **any nine** questions. **Each** question carries a weightage of **two**.

11. How will you convert a hexadecimal number to octal and vice versa ?
12. What are the advantages and disadvantages of BCD code ?
13. Explain the construction and use of a XOR gate.
14. How will you get a Boolean expression from a truth table ? Explain with an example.
15. What is a K-map ? How is it used to simplify Boolean expressions ?
16. What is a half adder ? Write its truth table and develop its logic circuit.
17. Explain how parallel binary adders can be used for addition of signed binary numbers.
18. What are the advantages of frequency modulation over amplitude modulation ?
19. Explain pulse amplitude modulation.
20. The carrier power transmitted from an AM transmitter is 75 kW. If the percentage of modulation is 40, calculate the total power.
21. Explain how a FM wave is demodulated.
22. A 500 W, 100 kHz carrier is modulated to a depth of 60% by modulating signal of frequency 1 kHz. Calculate the power transmitted. What are the side band components of the wave ? (9×2=18)

SECTION – D

Answer **any one** question. **Each** question carries a weightage of **four**.

23. a) What is a full adder ? Explain with a logic diagram the working of a full adder.
b) Write a note on parallel n-bit binary adder.
24. Explain the principle of amplitude modulation. Obtain expressions for the instantaneous voltage and total power of an amplitude modulated wave. (1×4=4)