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**Question Paper Code : P 1263**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Fourth Semester

Electronics and Instrumentation Engineering

EC 1312 — DIGITAL LOGIC CIRCUITS

(Common to Instrumentation and Control Engineering)

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Show that  $A(A+B) = A$ .
2. Convert the binary [10101101]<sub>2</sub> into its Gray code.
3. Give an application each for a multiplexer and a demultiplexer.
4. Give an application for XOR function.
5. State the problem normally encountered in SR flip flop.
6. How many flip-flops are needed to realise a mod-16 counter?
7. What is an asynchronous sequential circuit?
8. What is a PLA?
9. Define fan-out.
10. Define noise-margin.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw and explain the principle and operation of TWT amplifiers. (8)  
(ii) Explain the characteristics and propagation of space waves. (8)

Or

- (b) (i) Discuss the principle of operation of Magnetron with a suitable diagram. (8)  
(ii) Explain the operation of pulsed radar with a neat diagram. (8)
12. (a) (i) Draw and explain the different types of satellite transponders. (8)  
(ii) Discuss the attitude control of satellites. (8)

Or

- (b) Draw the general block diagram of an earth station and briefly explain the different subsystems. (16)
13. (a) (i) Discuss the principle of different sources and detectors used in optical communication systems. (6)  
(ii) Explain the operation of optical transmitters and receivers with neat circuit diagrams. (10)

Or

- (b) (i) Write a brief note on fiber optic data communication systems. (8)  
(ii) Discuss the different types of losses present in an optical fiber system. (4)  
(iii) Give a brief note on optical connectors. (4)
14. (a) (i) Discuss the BORSCHT functions in telephony with a diagram. (8)  
(ii) Explain about the telephone hierarchy. (8)

Or

- (b) (i) Draw and explain the operation of a paging system. (8)  
(ii) Give a brief account of ISDN interfaces. (4)  
(iii) Briefly outline the applications of data compression in facsimile. (4)

15. (a) (i) Give a brief note on AMPS. (8)  
(ii) Why power control and security are regarded as major issues in mobile telephony and discuss how they can be optimized? (8)

Or

- (b) (i) Enumerate the salient features of IS-95 system. (10)  
(ii) Give a brief note on RF channels, time slots and modulation techniques of GSM (6)

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