AQ – 2789

First Semester M. E. (Digital Electronics) (CGS) Examination

MODERN ELECTRONIC DESIGN TECHNIQUES

Paper – 1 UMEF 3

P. Pages : 3

Time : Three Hours] [Max. Marks : 80

Note : (1) Separate answer book must be used for each section in the subject Geology, Engineering material of civil branch and Separate answer-book must be used for Section A and B in Pharmacy and Cosmetic Tech.
(2) Answer **Three** questions from Section A and **Three** questions from Section B.
(3) Assume suitable data wherever necessary.
(4) Illustrate your answer wherever necessary with the help of neat sketches.
(5) Use pen of Blue/Black ink/refill only for writing the answer book.

SECTION A

1. (a) Explain working of PGA AD526. Hence design PGA with gain of 1, 2, 4, 8 and 16. 7

(b) Explain high speed logic isolators, with the working specifications, hence explain practical application of digital isolation in data acquisition systems. 6

OR

2. (a) Explain digital isolation techniques, henceAD 260/AD 261 High speed logic isolators. 6

(b) What is i-coupler technology ? Hence explain with specifications the construction of ADuM1100 single channel digital isolator. 7

3. (a) Explain construction of modern Schotty diodes with specifications used in switched mode supplies. 7

(b) Explain construction and selection of Bipolar transistor, Also passivation on Bipolar transistor. 7

OR

4. (a) What is switch mode power converters ? Explain working of buck regulator with waveforms and its design concepts. 8

(b) Design Boost regulator for V_{dc} = 20 V and V_o = 80 V with R_L = 500 Ω and peak to peak ripple voltage = 12 mV, and switching frequency of 12 KHz. 6

5. (a) Explain the working with block diagram of simple coherent pulsed radar. 6

(b) What is phase lock loop? Explain with block diagram the working of PLL. 7

OR

6. (a) Draw and explain the block diagram of moving target detector system. 6

(b) Explain working of radar with basic radar range equations. 7

SECTION B

7. (a) Draw and explain electrical starting system of turbine engine starter circuit of aircraft. 6

(b) Explain engine speed tachometer system and engine temperature monitor system for aircraft. 7

OR

8. (a) Explain various basic flight instruments. 6

(b) Draw and explain digital engine control system for automobile. 7

9. (a) Explain with block diagram the function of Glucose meter. 7

(b) Draw and explain a block diagram of non -invasive device for measuring the oxygen content in the blood. 6

OR

10. (a) Explain with block diagram the working of barcode scanner. 7

(b) Explain with applications the working of ultrasound meters. 6

11. (a) What is thermal management? Draw and explain electrical analog model for heat transfer from component to ambient. Also explain some practices that will improve thermal performance. 8

(b) Explain rules for design of enclosure for electronic product for EMC, hence explain shilding efficiency. 8

OR

12. (a) What is reliability ? Explain the following design aspect for reliability. MTBF, failure rate, availability, the cost of reliability, simplicity and redundancy. 8

(b) Explain testability techniques, hence explain In-circuit testing, functional testing by ATE and boundry scan JTAG. 8