

[3762]-133

S.E. (Electrical) (I Sem.) EXAMINATION, 2010

ANALOG AND DIGITAL ELECTRONICS

(2008 COURSE)

Time : Three Hours

Maximum Marks : 100

N.B. :— (i) Answers to the two Sections should be written in separate answer books.

(ii) Neat diagrams must be drawn wherever necessary.

(iii) Your answers will be valued as a whole.

(iv) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.

(v) Assume suitable data, if necessary.

SECTION I

1. (A) Draw and explain RC coupled BJT amplifier. [8]

(B) Draw and explain CE configuration of BJT amplifier with input and output characteristic. [8]

Or

2. (A) Draw and explain construction of FET with its characteristics. [8]

(B) Explain push-pull amplifier with neat circuit diagram. [8]

P.T.O.

3. (A) With the help of neat circuit diagram explain application of op-amp as :

(i) Schmitt Trigger

(ii) Precision rectifier. [12]

(B) Explain application of op-amp as differentiator. [6]

Or

4. (A) Compare open-loop and closed-loop configuration of op-amp on the basis of gain, input impedance, output impedance, bandwidth. [8]

(B) What is instrumentation amplifier ? Draw its circuit using op-amp and explain it. Also give its applications. [10]

5. (A) Draw the construction diagram of IC 555 and explain the function of each pin. [8]

(B) Explain LM317 IC as adjustable voltage regulator. [8]

Or

6. (A) What are different configuration of active filters ? Draw the frequency response of each configuration. [8]

(B) Explain generation of sine wave using op-amp with related circuit diagram. [8]

SECTION II

7. (a) Convert the following numbers :

(i) 96.25 decimal to binary.

(ii) 754.51 octal to decimal.

(iii) 111101100 binary to octal.

(iv) 7BC.A3 hexadecimal to octal.

(v) 23.67 octal to binary.

[10]

(b) Using Boolean Algebra show that :

(i) $\bar{x}y\bar{z} + \bar{x}yz + xy\bar{z} + xyz = y$

[2]

(ii) $D(\bar{A} + B) + \bar{B}(C + AD) = D + \bar{B}C$

[3]

(iii) $(A + B)(A + C) = A + BC$

[3]

Or

8. (a) Draw the logic symbol and construct the truth table for each of the following gates and write the output equation :

(i) Two input NAND gate

(ii) Three input OR gate

(iii) Two input EXOR gate

(iv) Three input AND gate

(v) Single input NOT gate.

[10]

(b) Explain SOP and POS form of K-map for three variables. [8]

9. (a) Explain the master-slave JK flip-flop in detail with input-output waveforms. [8]

(b) Explain the following shift registers :

(i) Serial in serial out shift register.

(ii) Parallel in parallel out shift register. [8]

Or

10. (a) Explain the twisted ring counter in detail with truth table and timing sequence. [8]

(b) Design and explain the operation of MOD-7 asynchronous counter with related timing diagram. [8]

11. (a) Write short notes on :

(i) PROM .

(ii) EEPROM. [8]

(b) Explain binary weighted DAC in detail. [8]

Or

12. (a) Design 1 : 8 demultiplexer using two 1 : 4 demultiplexers. [8]

(b) Explain Dual slope SAR in detail. [8]