

0572**Code : T-301**Register
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III Semester Diploma Examination, November 2011**E & C BOARD****ANALOG ELECTRONICS****Time : 3 Hours]****[Max. Marks : 100**

- Instructions :** (1) Section – I is compulsory.
(2) Answer any two full questions from the remaining Sections.

SECTION – I

1. (a) Fill in the blanks : 5
- (i) Percentage regulation of an local power supply is _____.
 - (ii) Positive feed back is _____.
 - (iii) _____ circuit is used to converting a sine wave to square wave.
 - (iv) The main use of emitter follower is _____ as ckt.
 - (v) A differentiator circuit is also a _____ circuit.
- (b) Write a note on over voltage protection circuit. 5

SECTION – II

2. (a) With a neat diagram explain the working of a Bridge Rectifier. 6
- (b) Describe the action of capacitor filter. 4
- (c) Explain how zener maintains constant voltage across the load. 5
3. (a) List the types of transistor biasing. State their advantages and disadvantages. 10
- (b) Write a note on operating point in transistor. 5
4. (a) Classify the amplifiers in terms of voltage gain and power gain. 5
- (b) With a neat diagram, explain the operation of C.E. Amplifier. What its advantages ? 10

EC-055

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SECTION - III

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|----|-----|--|----|
| 5. | (a) | Give the comparison of different types of power amplifiers. | 5 |
| | (b) | Explain the working of Class-B power amplifier with a neat diagram. | 7 |
| | (c) | Explain the need for using heat sink. | 3 |
| 6. | (a) | Write a note on thermal run away. | 5 |
| | (b) | Explain Damped and undamped oscillations. | 5 |
| | (c) | Explain how oscillations are produced in tank circuit. | 5 |
| 7. | (a) | With a neat diagram explain the operation of phase-shift oscillator. | 10 |
| | (b) | Explain the Barkhausen criteria in oscillator. | 5 |

SECTION - IV

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| 8. | (a) | What is a multivibrator? Explain the working of Mono-stable multivibrator. | 8 |
| | (b) | Explain the working of crystal oscillator with a neat diagram. | 7 |
| 9. | (a) | Define CMRR and explain its significance. | 2 |
| | (b) | What is active filter? What are its advantages? | 6 |
| | (c) | Explain with a neat diagram comparator circuit. | 7 |
| 10. | (a) | List the ideal OP-Amp characteristics. | 5 |
| | (b) | Explain how an OP-Amp is used to obtain Inverting and non-Inverting amplifier. | 10 |

SECTION - III

5. (a) Give the comparison of different types of power amplifiers.
 (b) Explain the working of Class-B power amplifier with a neat diagram.
 (c) Explain the need for using heat sink.
6. (a) Write a note on thermal run away.
 (b) Explain Damped and undamped oscillations.
 (c) Explain how oscillations are produced in tank circuit.
7. (a) With a neat diagram explain the operation of phase-shift oscillator.
 (b) Explain the Barkhausen criteria in oscillator.

SECTION - IV

8. (a) What is a multivibrator? Explain the working of Mono-stable multivibrator.
 (b) Explain the working of crystal oscillator with a neat diagram.
9. (a) Define CMRR and explain its significance.
 (b) What is active filter? What are its advantages?
 (c) Explain with a neat diagram comparator circuit.
10. (a) List the ideal OP-Amp characteristics.
 (b) Explain how an OP-Amp is used to obtain Inverting and non-Inverting amplifier.

0573

Code : T-302

Register
Number

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III Semester Diploma Examination, November 2011

E & C BOARD

DIGITAL ELECTRONICS - II

Time : 3 Hours]

[Max. Marks : 100

- Instructions : (1) Section - I is compulsory.
 (2) Answer any six full questions choosing any two full questions each from Section - II, III & IV.

SECTION - I

1. (a) Fill in the blanks : 5 × 1 = 5
 (i) If both mode control inputs [S_0, S_1] to 74194 IC are low, the unit is in _____ mode.
 (ii) Synchronous counter operate at _____ speed than Asynchronous counters.
 (iii) A $2K \times 4$ memory can store _____ no. of bits.
 (iv) The fastest ADC is _____.
 (v) _____ type of ROM can erase one byte at a time.
- (b) Using flip flops, explain Johnson counter. 5

SECTION - II

2. (a) Explain 4 bit bi-directional shift register using D-flip flops. 8
 (b) For a 3 bit shift Register, Compare SISO & PIPO regarding the 3
 (i) No. of clock pulses
 (ii) Speed of shifting data and
 (iii) Hardware requirement
 (c) How long will it take to shift a 8 bit number into a 8 bit shift register if clock frequency is 10 MHz? 4
3. (a) With truth table, timing diagram and using J-K flip flops, explain synchronous decade counter. 12
 (b) Why are Asynchronous counters operate at low speed? 3
4. (a) Give the pin details of IC 7490. 3
 (b) With truth table, timing diagram & using D-FFS, explain 4 bit Ring counter. 12

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SECTION- III

5. (a) A certain memory has a capacity of $4K \times 8$. Calculate 5
 (i) the no. of address lines
 (ii) data input lines
 (iii) data output lines and
 (iv) capacity of memory in bits & bytes
 (b) Explain the following with respect to memory : 10
 (i) Non-volatile
 (ii) Refresh
 (iii) Write operation of RAM
 (iv) Access time
 (v) Firmwave
6. (a) What EPROM shortcomings are overcome by EEROMS ? 3
 (b) Explain : 12
 (i) PROM (ii) EPROM
 (iii) EEPROM (iv) FLASH EEROM
7. (a) Explain the operation of R-2R Ladder type DAC with diagram. 8
 (b) List two disadvantages of weighted resistor DAC and one advantage of R-2R DAC. 3
 (c) Calculate the no. of comparators & resistors required for a 7 bit flash type converter. 4

SECTION - IV

8. (a) Explain successive ADC with diagram. 8
 (b) The voltage range of an A/D converter that uses 14 bit number is -6 to $+6$ V. Find : 7
 (i) the number of discrete levels.
 (ii) the no. of voltage increments to divide the total range.
 (iii) the resolution of ADC.
9. (a) Explain the following with respect to ADC : 6
 (i) Resolution
 (ii) Quantization error
 (iii) Conversion time
 (b) Give the circuit set for driving seven segment LED display using 7447 IC. 3
 (c) Explain the operation of LED and concept of 7-segment display. 6
10. (a) List two advantages and five disadvantages of LCD. 7
 (b) Implement PAL for the following Boolean equations : 8
 (i) $X = \overline{A}B\overline{C} + \overline{A}B\overline{C} + ABC$
 (ii) $Y = \overline{A} + BC$
 (iii) $Z = \overline{A} + \overline{B} + \overline{C}$

SECTION- III

5. (a) A certain memory has a capacity of $4K \times 8$. Calculate
 (i) the no. of address lines
 (ii) data input lines
 (iii) data output lines and
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 (b) Explain the following with respect to memory :
 (i) Non-volatile
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 (b) List two disadvantages of weighted resistor DAC and one advantage of R-2R DAC.
 (c) Calculate the no. of comparators & resistors required for a 7 bit flash type converter.
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 (b) Implement PAL for the following Boolean equations :
 (i) $X = \overline{A}BC + \overline{A}B\overline{C} + ABC$
 (ii) $Y = \overline{A} + BC$
 (iii) $Z = \overline{A} + \overline{B} + \overline{C}$

0574

Code : T-303/T-327

Register
Number

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III Semester Diploma Examination, November 2011

E & C BOARD

ANALOG COMMUNICATION

Time : 3 Hours]

[Max. Marks : 100

- Instructions : (1) Section - I is compulsory.
 (2) Answer any two full questions from each of the remaining Sections.

SECTION - I

1. (a) Fill in the blanks : 5 × 1 = 5
 (i) Slotted line is used to measure _____.
 (ii) _____ antenna radiates uniform in all direction.
 (iii) The distance of line of sight is called _____.
 (iv) The pre-emphasis is achieved at the transmitter by _____.
 (v) The ability of the receiver to receive weak signal is called _____.
- (b) Define the following terms w.r.t. networks : 5
 (i) Active network
 (ii) Node
 (iii) Mesh
 (iv) Branch
 (v) Voltage source

SECTION - II

2. (a) State and prove 'Super-position Theorem applied to DC circuits. 7
 (b) State 'maximum power transfer' theorem. 2
 (c) Define 'series resonance' and obtain an expression for it. 6
3. (a) Define Q-factor and explain its - impact on response - curve. 5
 (b) Define 'Cut off frequency' for high pass filter & derive an expression for it. 7
 (c) Derive a relation between NEPER & Decibel. 3
4. (a) Mention and explain different types of equalizers. 8
 (b) List the types of Attenuators and explain each in brief. 7

SECTION - III

- 5. (a) Describe the electrical model of transmission line. 5
- (b) Define attenuation constant and derive an expression for it. 6
- (c) Define the following : 4
 - (i) Characteristics
 - (ii) Propagation constant

- 6. (a) Sketch and explain open-circuited line. 6
- (b) Derive the relation between reflection coefficient and SWR. 5
- (c) Describe the various types of losses in transmissions lines. 4

- 7. (a) Define the following terms w.r.t. antennas : 5
 - (i) Radiation pattern.
 - (ii) Radiation intensity.
 - (iii) Antenna resistance.
 - (iv) Directivity.
 - (v) Antenna Gain.
- (b) Describe the Dish-antenna. 5
- (c) Define antenna Array. Mention different types of array's. 5

SECTION - IV

- 8. (a) Explain the Inosphere of earth's atmosphere. 5
- (b) Explain space wave propagation. 5
- (c) Explain single-stub matching. 5

- 9. (a) What is VSB ? What are its advantages ? 4
- (b) Derive an expression for AM wave. 5
- (c) Explain the working of simple modulator circuit. 6

- 10. (a) Explain the operation of high level AM Transmitter with block diagram. 8
- (b) Explain the operation of linear AM diode detector. 5
- (c) List the advantages of ratio detector. 2

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SECTION - III

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SECTION - IV

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 (b) Explain space wave propagation.
 (c) Explain single-stub matching.
9. (a) What is VSB ? What are its advantages ?
 (b) Derive an expression for AM wave.
 (c) Explain the working of simple modulator circuit.
10. (a) Explain the operation of high level AM Transmitter with block diagram.
 (b) Explain the operation of linear AM diode detector.
 (c) List the advantages of ratio detector.

0572

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III Semester Diploma Examination, November 2011

E & C BOARD

ANALOG ELECTRONICS

Time : 3 Hours]

[Max. Marks : 100

- Instructions : (1) Section - I is compulsory.
 (2) Answer any two full questions from the remaining Sections.

SECTION - I

1. (a) Fill in the blanks : 5
 (i) Percentage regulation of an local power supply is _____.
 (ii) Positive feed back is _____.
 (iii) _____ circuit is used to converting a sine wave to square wave.
 (iv) The main use of emitter follower is _____ as ckt.
 (v) A differentiator circuit is also a _____ circuit.
 (b) Write a note on over voltage protection circuit. 5

SECTION - II

2. (a) With a neat diagram explain the working of a Bridge Rectifier. 6
 (b) Describe the action of capacitor filter. 4
 (c) Explain how zener maintains constant voltage across the load. 5
3. (a) List the types of transistor biasing. State their advantages and disadvantages. 10
 (b) Write a note on operating point in transistor. 5
4. (a) Classify the amplifiers in terms of voltage gain and power gain. 5
 (b) With a neat diagram, explain the operation of C.E. Amplifier. What its advantages ? 10

SECTION - III

5.
 - (a) Give the comparison of different types of power amplifiers.
 - (b) Explain the working of Class-B power amplifier with a neat diagram.
 - (c) Explain the need for using heat sink.
6.
 - (a) Write a note on thermal run away.
 - (b) Explain Damped and undamped oscillations.
 - (c) Explain how oscillations are produced in tank circuit.
7.
 - (a) With a neat diagram explain the operation of phase-shift oscillator.
 - (b) Explain the Barkhausen criteria in oscillator.

SECTION - IV

8.
 - (a) What is a multivibrator? Explain the working of Mono-stable multivibrator.
 - (b) Explain the working of crystal oscillator with a neat diagram.
9.
 - (a) Define CMRR and explain its significance.
 - (b) What is active filter? What are its advantages?
 - (c) Explain with a neat diagram comparator circuit.
10.
 - (a) List the ideal OP-Amp characteristics.
 - (b) Explain how an OP-Amp is used to obtain Inverting and non-Inverting amplifier.

SECTION - III

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 (b) Explain the working of crystal oscillator with a neat diagram.
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 (b) What is active filter? What are its advantages?
 (c) Explain with a neat diagram comparator circuit.
10. (a) List the ideal OP-Amp characteristics.
 (b) Explain how an OP-Amp is used to obtain Inverting and non-Inverting amplifier.

573

Code : T-302

Register
Number

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III Semester Diploma Examination, November 2011

E & C BOARD

DIGITAL ELECTRONICS - II

Time : 3 Hours]

[Max. Marks : 100

- 10 Instructions : (1) Section - I is compulsory.
 5 (2) Answer any six full questions choosing any two full questions each from Section - II, III & IV.

SECTION - I

- 8 (a) Fill in the blanks : 5 × 1 = 5
 7 (i) If both mode control inputs [S_0, S_1] to 74194 IC are low, the unit is in _____ mode.
 2 (ii) Synchronous counter operate at _____ speed than Asynchronous counters.
 6 (iii) A $2K \times 4$ memory can store _____ no. of bits.
 7 (iv) The fastest ADC is _____.
 5 (v) _____ type of ROM can erase one byte at a time.
- (b) Using flip flops, explain Johnson counter. 5

SECTION - II

- 2 (a) Explain 4 bit bi-directional shift register using D-flip flops. 8
 (b) For a 3 bit shift Register, Compare SISO & PIPO regarding the 3
 (i) No. of clock pulses
 (ii) Speed of shifting data and
 (iii) Hardware requirement
 (c) How long will it take to shift a 8 bit number into a 8 bit shift register if clock frequency is 10 MHz? 4
3. (a) With truth table, timing diagram and using J-K flip flops, explain synchronous decade counter. 12
 (b) Why are Asynchronous counters operate at low speed? 3
4. (a) Give the pin details of IC 7490. 3
 (b) With truth table, timing diagram & using D-FFS, explain 4 bit Ring counter. 12

EC-058

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SECTION- III

5. (a) A certain memory has a capacity of $4K \times 8$. Calculate
 (i) the no. of address lines
 (ii) data input lines
 (iii) data output lines and
 (iv) capacity of memory in bits & bytes
 (b) Explain the following with respect to memory :
 (i) Non-volatile
 (ii) Refresh
 (iii) Write operation of RAM
 (iv) Access time
 (v) Firmwave
6. (a) What EPROM shortcomings are overcome by EEROMS ?
 (b) Explain :
 (i) PROM (ii) EPROM
 (iii) EEPROM (iv) FLASH EEROM
7. (a) Explain the operation of R-2R Ladder type DAC with diagram.
 (b) List two disadvantages of weighted resistor DAC and one advantage of R-2R DAC.
 (c) Calculate the no. of comparators & resistors required for a 7 bit flash type converter.

SECTION - IV

8. (a) Explain successive ADC with diagram.
 (b) The voltage range of an A/D converter that uses 14 bit number is -6 to $+6$ V. Find :
 (i) the number of discrete levels.
 (ii) the no. of voltage increments to divide the total range.
 (iii) the resolution of ADC.
9. (a) Explain the following with respect to ADC :
 (i) Resolution
 (ii) Quantization error
 (iii) Conversion time
 (b) Give the circuit set for driving seven segment LED display using 7447 IC.
 (c) Explain the operation of LED and concept of 7-segment display.
10. (a) List two advantages and five disadvantages of LCD.
 (b) Implement PAL for the following Boolean equations :
 (i) $X = \overline{ABC} + \overline{ABC} + ABC$
 (ii) $Y = \overline{A} + BC$
 (iii) $Z = \overline{A} + \overline{B} + \overline{C}$

SECTION- III

5. (a) A certain memory has a capacity of $4K \times 8$. Calculate
 (i) the no. of address lines
 (ii) data input lines
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 (b) Explain the following with respect to memory :
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 (i) $X = \overline{A}BC + \overline{A}BC + ABC$
 (ii) $Y = \overline{A} + BC$
 (iii) $Z = \overline{A} + \overline{B} + \overline{C}$

574

Code : T-303/T-327

Register
Number

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III Semester Diploma Examination, November 2011

E & C BOARD

ANALOG COMMUNICATION

[Time : 3 Hours]

[Max. Marks : 100]

- Instructions : (1) Section - I is compulsory.
 (2) Answer any two full questions from each of the remaining Sections.

SECTION - I

- (a) Fill in the blanks : 5 × 1 = 5
 (i) Slotted line is used to measure _____.
 (ii) _____ antenna radiates uniform in all direction.
 (iii) The distance of line of sight is called _____.
 (iv) The pre-emphasis is achieved at the transmitter by _____.
 (v) The ability of the receiver to receive weak signal is called _____.
- (b) Define the following terms w.r.t. networks : 5
 (i) Active network
 (ii) Node
 (iii) Mesh
 (iv) Branch
 (v) Voltage source

SECTION - II

- (a) State and prove 'Super-position Theorem applied to DC circuits.' 7
 (b) State 'maximum power transfer' theorem. 2
 (c) Define 'series resonance' and obtain an expression for it. 6
- (a) Define Q- factor and explain its - impact on response - curve. 5
 (b) Define 'Cut off frequency' for high pass filter & derive an expression for it. 7
 (c) Derive a relation between NEPER & Decibel. 3
- (a) Mention and explain different types of equalizers. 8
 (b) List the types of Attenuators and explain each in brief. 7

EC-061

[Turn over

SECTION - III

5.
 - (a) Describe the electrical model of transmission line.
 - (b) Define attenuation constant and derive an expression for it.
 - (c) Define the following :
 - (i) Characteristics
 - (ii) Propagation constant

6.
 - (a) Sketch and explain open-circuited line.
 - (b) Derive the relation between reflection coefficient and SWR.
 - (c) Describe the various types of losses in transmissions lines.

7.
 - (a) Define the following terms w.r.t. antennas :
 - (i) Radiation pattern.
 - (ii) Radiation intensity.
 - (iii) Antenna resistance.
 - (iv) Directivity.
 - (v) Antenna Gain.
 - (b) Describe the Dish-antenna.
 - (c) Define antenna Array. Mention different types of array's.

SECTION - IV

8.
 - (a) Explain the Inosphere of earth's atmosphere.
 - (b) Explain space wave propagation.
 - (c) Explain single-stub matching.

9.
 - (a) What is VSB ? What are its advantages ?
 - (b) Derive an expression for AM wave.
 - (c) Explain the working of simple modulator circuit.

10.
 - (a) Explain the operation of high level AM Transmitter with block diagram.
 - (b) Explain the operation of linear AM diode detector.
 - (c) List the advantages of ratio detector.

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III Semester Diploma Examination, May 2011

ELECTRONICS & COMMUNICATION ENGG. BOARD

ANALOG ELECTRONICS

[Max. Marks : 100

Time : 3 Hours]

- Note : (1) Section - I is compulsory.
(2) Answer any two full questions from each of the remaining questions.

SECTION - I

1. (a) Fill in the blanks : 5
- (i) The PIV of centre-tapped F.W.R. is _____.
 - (ii) For Harmonic generation _____ amplifier is used.
 - (iii) Pulse-width of IC 555 monostable Multivibrator is _____.
 - (iv) _____ circuit is used for converting sine wave to square wave.
 - (v) A integrator is also a _____ circuit.
- (b) Explain the working of Series-Voltage Regulator. 5

SECTION - II

2. (a) With a neat diagram, explain the working of Bridge Rectifier. 8
- (b) Explain the adjustable voltage regulator using LM 317. 7
3. (a) Describe the block diagram of SMPS. 5
- (b) List the merits and demerits of UPS. 5
- (c) Define the terms voltage and line and load regulator. 5
4. (a) Explain the self-bias circuit to set the operating point. 10
- (b) Compare voltage amplifier with power amplifier. 5

[Turn over

EC-055

SECTION - III

5. (a) Explain the working class B power-amplifier cut with a neat diagram.
 (b) Explain the need of Heat-Sink to power amplifier.
6. (a) Explain the operation common Emitter Amplifier with a neat diagram.
 (b) Explain the working of combination biased diode clipper.
7. (a) Explain the block diagram of LM 741 Op-Amp.
 (b) Define the following w.r.t. Op-amplifier.
 (i) Slew rate
 (ii) CMRR
 (iii) Voltage gain

SECTION - IV

8. (a) Explain the virtual ground concept in Op-Amplifier.
 (b) List the ideal characteristics of Op-Amp.
 (c) List the advantages of active filters.
9. (a) Explain how a astable multivibrator can be constructed using Op-Amp.
 (b) Explain inverting amplifier with a neat diagram.
 (c) Explain the differentiator circuit using Op-Amp.
10. (a) Explain the working of Wein-bridge oscillator using Op-Amp.
 (b) List the classification of oscillator.
 (c) Describe the block diagram of frequency multiplexer using PLL.

SECTION - III

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9. (a) Explain how a astable multivibrator can be constructed using Op-Amp.
 (b) Explain inverting amplifier with a neat diagram.
 (c) Explain the differentiator circuit using Op-Amp.
10. (a) Explain the working of Wein-bridge oscillator using Op-Amp.
 (b) List the classification of oscillator.
 (c) Describe the block diagram of frequency multiplexer using PLL.

Register
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III Semester Diploma Examination, May 2011

ELECTRONICS & COMMUNICATION ENGG. BOARD

DIGITAL ELECTRONICS - II

Time : 3 Hours]

[Max. Marks : 100

Note : (1) Section - I is compulsory.

(2) Answer six full questions choosing any two full questions from each Sections - II, III & IV.

SECTION - I

1. (a) Fill in the blanks with appropriate word / words : 5
 (i) Natural count of 4 bit counter is _____.
 (ii) Bidirectional counter is _____ counter.
 (iii) The output of a Johnson counter are always _____ waves.
 (iv) A ring counter resembles _____.
 (v) Easing EPROM can be done by using _____ light.
 (b) Brief different kinds of classification of counters. 5

SECTION - II

2. (a) Explain the working of four bit ripple binary counter with logic diagram, truth table. 10
 (b) List merits and demerits of asynchronous counter. 5
3. (a) Explain the working of two bit synchronous counter with logic diagram truth table and timing diagram. 8
 (b) Draw the logical diagram of four bit serial in serial out shift register. 4
 (c) List three application of shift register. 3

4. (a) With logic diagram. Brief serial in shift right and shift left of serial data using IC T4/94. 10
(b) Draw the pinout diagram for IC 74/90. 5

SECTION - III

5. (a) Explain construction and working of DRAM and List its merits and demerits. 10
(b) List the merits, demerits and application of SRAM. 5
6. (a) Briefly explain non volatile random access memory. 10
(b) Brief flash memory. 5
7. (a) Explain binary weighted resistor DAC with circuit diagram. 10
(b) List the features and pin out diagram of IC 1408. 5

SECTION - IV

8. (a) Explain dual slope ADC with logic diagram and wave form. 10
(b) Brief successive approximation ADC with block diagram. 5
9. (a) What is active display and passive display? 3
(b) Explain LED driver using IC 7447 Decoder. 7
(c) List five difference between LED and LCD. 5
10. (a) With a diagram explain Dot-Matrix display. 5
(b) Explain the operation of LED and Concept of seven segment display. 7
(c) Draw an example of a PAL. 3
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T-302

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4. (a) With logic diagram. Brief serial in shift right and shift left of serial data using IC T4/94. 10
(b) Draw the pinout diagram for IC 74/90. 5

SECTION - III

5. (a) Explain construction and working of DRAM and List its merits and demerits. 10
(b) List the merits, demerits and application of SRAM. 5
6. (a) Briefly explain non volatile random access memory. 10
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Code : T-303/327

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III Semester Diploma Examination, May 2011

ELECTRONICS & COMMUNICATION ENGG. BOARD

ANALOG COMMUNICATION

Time : 3 Hours]

[Max. Marks : 100

Note : (1) Section - I is compulsory.

(2) Answer any other six full questions choosing any two questions from each Sections - II, III & IV.

SECTION - I

1. (a) Fill in the blanks : 5
(i) The current during parallel resonance is _____.
(ii) If modulation index is greater than 100 then it is called _____ modulation.
(iii) Reflection is absent under _____ condition.
(iv) In a filter $R_0 =$ _____.
(v) SWR in terms of K = _____.
(b) Explain variation diode method of generating FM. 5

SECTION - II

2. (a) State and explain superposition theorem with circuits. 5
(b) A resistor of $R = 10\Omega$, $L = 30\text{ mH}$ is connected in series and this combination is connected in parallel with a capacitor of 30 micro farad. Find resonating frequency, current and dynamic impedance. 5
(c) Explain Q factor and Band width of a resonant circuit. 5
3. (a) Write the attenuation v/s frequency characteristics graph of the following filter. 4
(i) LPF
(ii) HPF
(iii) BPF
(iv) BSF

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[Turn over

- (b) Design a LPF, pie type for a cut off frequency of 10 kHz. with characteristic impedance of 1 k Ω .
- (c) Design a 'T' Type attenuator having attenuation of 40 db and characteristic impedance of 300 Ω .

4. (a) Discuss the need for AGC.
 (b) Describe essential elements of communication system.
 (c) Define modulation index. Show with wave forms the effect on modulation for different values of m.

SECTION - III

5. (a) Explain power relationship in AM wave. 5
 (b) Explain benefits of SSB over DSB. 5
 (c) Explain the frequency response of pre-emphasis and de-emphasis circuits. 5
6. (a) Write the block diagram of high level and low level modulation transmitter. 5
 (b) With neat curve explain selectivity. 5
 (c) Define Image frequency. Explain why LOF is made greater than incoming signal frequency to obtain derived incoming frequency. 5
7. (a) Explain the working of AM Linear diode detector circuit. 5
 (b) Explain working of FM receiver with block diagram. 5
 (c) Explain the electrical characteristics of Transmission lines. 5

SECTION - IV

8. (a) Draw & explain the electrical model of a transmission line. 5
 (b) Calculate the characteristic impedance and attenuation constant of a transmission line. Given $R = 50 \Omega$, $L = 0.6 \text{ mH}$, $C = 0.04 \mu\text{F}$, $G = 1 \mu\text{S}$, $f = 1000 \text{ Hz}$. 5
 (c) Define reflection co-efficient and SWR. 5
9. (a) With neat diagram explain single stub matching used in Transmission lines. 5
 (b) Explain vertical, horizontal and elliptical polarization. 5
 (c) Write short note on Ionospheric propagation. 5
10. (a) Define antenna array mention the types of array and their application. 6
 (b) Explain space wave propagation. 5
 (c) Write a note on isotropic radiator. 4