Total No. of Printed Pages:02

SUBJECT CODE NO:- H-529
FACULTY OF SCIENCE AND TECHNOLOGY
T.E.(ECT/EC/E&C/IE)
Microprocessors And Microcontroller
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1. Q. No. 1 and Q.No.6 are compulsory.
2. Solve any two questions from remaining in each section.
3. Assume suitable additional data / memory locations if necessary.

Section A

Q.1   Solve any **Two** of the following.   10
1) Explain the interrupt structures in 8085 with SIM and RIM interrupt.

2) Explain the various types of instruction formats used in 8085. Give one example of each type.

3) Draw and explain pin diagram of 8085 with its important features.

4) Specify and explain the four control signals commonly used by 8085.

Q.2   a) Explain the different types of instruction set in 8085 with suitable example.   07

       b) Define op – code and operand. Specify the following instructions in 8085 with its addressing 08
          mode.
          i.   STA 2600H.   ii.   MVI A, 00H.
          iii.   SHLD Addr.   iv.   ANA, r.

Q.3   a) Draw the flow- chart and write ALP of 8085 to find the largest number from the series of   08
          number with its specific memory location.

       b) Write a routine to enable RST 5.5 and disable RST 6.5 and RST 7.5 interrupt.   07

Q.4   a) Draw and explain the timing diagram of MVI A, data.   08

       b) Explain the salient features of 8253 and 8259 in detail.   07

Q.5   a) With the help of neat diagram, explain interfacing of a seven segment display with 8085, and 08
          write a program to implement decimal counter.

       b) Write a program to generate a continuous square wave of 5 KHz using 8253. Assume clock   07
          freq. of 1 MHz

1

Section B

Q.6 Solve any **Two** of the following. 10
1) Describe the programming model and memory organization in 8051 μ controller.
2) Explain the comparison between microprocessor and micro controller example and outcomes.
3) Explain interrupt structure available in 8051 micro controller.
4) Discuss the criteria for selecting a microcontroller device.

Q.7 a) Describe the architecture of 8051 with block diagram. 08

b) Discuss and comment on the program and data memories of 8051 microcontroller. 07

Q.8 a) Explain the operation of mnemonics with comments on following instructions of 8051 microcontroller. 08
   i) MOV X, @ DPTR
   ii) MOV 36H, 23H.
   iii) ORL 34H, # 35H.
   iv) SUB B A, 56H.

b) Write ALP for 8051 to add two 8- bit numbers which are stored at internal RAM location 20H and 21H. Store the 16- bit result at 30H and 31H. 07

Q.9 a) Describe the different serial data transmission modes which are supported for 8051. 07

b) Explain different data transfer group which supports for 8051. 08

Q.10 a) Draw the interfacing of stepper motor with 8051 micro controller; write a program to rotate the stepper motor clockwise continuously by step angle 1.8°. 08

b) Draw the interfacing of DAC with 8051. Write the program to generate square wave with clock frequency of 50Hz and amplitude 10v. 07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-536
FACULTY OF SCIENCE AND TECHNOLOGY
T.E.(ECT/EC/E&C/IE)
Digital Communication
(REVISED)

[Time: Three Hours] [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1. Q.no.1 and Q.no.6 are compulsory.
2. Solve any two questions from remaining questions in both sections.

Section A

Q.1 Explain any two of following 10
1) Define PCM? What are the advantages and disadvantages of PCM.
2) State and prove various properties of probability.
3) Line the difference between discrete and continues random variables.
4) Discuss the Noise effect in Delta modulation.

Q.2 a) Give the comparison of different digital pulse modulation methods. 08

b) What is quantization error in PCM? Derive the expression of signal to quantization noise 07
ratio for linear quantization .

Q.3 a) State and prove the Baye's theorem used in probability calculations of binary symmetric 08
channel.

b) Suppose that 5 digits one transmitted over a noisy channel with per digit error probability 07
of 0.01 what is the probability that upto 2 digits will be in error Also calculate mean and
variance of error use binomial probability distribution .

Q.4 a) Explain in detail Ergodic random process in detail. 08

b) What is power spectral Density? Explain properties of power spectral density. 07

Q.5 Write short note on following 15
a) Adaptive delta modulation
b) Conditional probabilities
c) Probability density function (PDF)

1

Section – B

Q.6   Explain any two of following.   10
1) Describe the properties of line codes
2) Explain Advantages and disadvantages of MSK over QPSK.
3) Explain the necessity of spred spectrum modulation.
4) Explain ASK system in brief.

Q.7   a) What is matched filter? What are their properties?   08
       b) The bit sequence = 10110010 is transmitted using   07
           i)   Unipolar RZ
           ii)   Polar RZ
           iii)   AMI
           iv)   M-ary where M=4
                  Draw the resulting waveform

Q.8   a) Draw the block diagram of QPSK system and explain its working.   08

       b) Sketch the QPSK waveform and find the transmitted phase sequence for the input binary   07
          sequence b(k)= 1, -1, 1, -1, -1, -1, 1,1

Q.9   a) Explain the following performance parameter of DSSS system   07
           i)   Processing gain
           ii)   Probability of error
           iii)   Jamming margin

       b) Explain in detail slow and fast frequency hopping.   08

Q.10   a) Explain in detail performance of error for binary system.   08

       b) Explain Application of FHSS.   07

2

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-522
FACULTY OF SCIENCE AND TECHNOLOGY
T.E.(ECT/EC/E&C/IE)
Electromagnetic Engineering
(Revised)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1. Questions no.1 and 6 are compulsory.
2. Answer any two questions from Q.No.2 to Q.no.5 from section A.
3. Answer any two questions from Q. no.7 to Q.no.10 from section B
4. Numbers shown in right side indicates full marks.
5. Assume suitable data if necessary.

Section - A

Q.1   Answer the following questions in brief (any five)   10
   a) Consider ,$\bar{A} = 2a_x - 3a_y + 4a_z$ and $\bar{B} = -a_x + 2a_y + 3a_z$. Find cross product $\bar{B} \times \bar{A}$
   b) Convert point P (3, 2, 1) in equivalent cylindrical coordinate system.
   c) What is a Del operator?
   d) Define a mathematical expression of Gauss Law.
   e) Relate electric field and electric flux density?
   f) What are the boundary conditions for conductor – free space?
   g) Why can there be no field inside the perfect conductor?
   h) What is meant by loss tangent?

Q.2   a) Consider $A = -a_x - 4a_y - 3a_z$ and $B = 2a_x + 2a_y - 3a_z$ and point C(1,3,4). Find   07
        i) A.B   ii) $|A|$ iii) A+2B   and iv) Unit vector directed from C to A.

        b) I) If $A = a_x$ at $P(3, -4,5)$. Convert A in spherical component at P.   08
        ii) If $B = a_\theta$ at $Q(3, -4, 5)$. Convert B in Cartesian components at Q.

Q.3   a) Derive the expression for electric field intensity for infinity sheet of charge.   07

        b) Given the potential $V = 10(x^2 + xy)$ and point $P (2, -1, 3)$ on a conductor to free   08
        space boundary. Find $V, \bar{E}, \bar{D}$ at point P.

Q.4   a) In cylindrical co- ordinates, $J = 10xe^{-100r} a_\Phi \, A/m^2$. Find the current crossing the   07
        region $0.01 \leq r \leq 0.02$ and intersection of this region with Φ= constant plane.

        b) Explain energy and potential in a moving point charge in an electric field.   08

1

Q.5   a)   Four point charge each of $10\mu C$ are placed in free space at the points (1,0,0), (-1,0,0),   07
                  (0,1,0) and (0,-1,0) m respectively. Determine the force F on point charge of $30\mu C$
                  located at a point (0,0,1) m.

     b)   Find D (in Cartesian coordinates) at point P(6,8,-10) caused by point charge of 30mC at   04
                  the origin and uniform line $\rho 1 = 50\mu \ C/m$ on z-axis.

     c)   State and explain divergence theorem.   04

Section – B

Q.6   Answer the following questions in brief (any five)   10
         a)   State Biot- Savart law
         b)   What are boundary conditions for static magnetic field?
         c)   What is meant by Lassy dielectrics?
         d)   Write Maxwell's equation in integral form
         e)   What is a skin effect?
         f)   State Faraday's law.
         g)   What are the transmission line parameters?
         h)   State analogy between uniform plane wave parameters and transmission line parameters.

Q.7   a)   Given points A(1,2,4), B(-2,1,3) and C(3,1,-2) . Let a differential element with I=6A and   07
                  $|dl| = 10^{-4}m$ be located at A. The direction of dl is from A to B. find dH at C.

     b)   A current filament carrying 16 A in a_z directions lies along the entire Z axis. Find H in   08
                  Cartesian coordinate at i) $A(\sqrt{20}, 0, 4)$ ii) $B(2, -4, -4)$.

Q.8   a)   Discuss and proof the Poynting theorem and also mention its applications.   07

     b)   What is force and torque on closed circuit?   08

Q.9   a)   Explain the role of Smith chart in measurement of various parameters in transmission line. 07

     b)   A 30 m long transmission line with $Z_o = 5 \ \Omega$ operating at 2 MHz is terminated with a load 08
                  $Z_L = 60 + j40\Omega$. If the velocity of wave is $1.8 \times 10^8 m/s$ on the line. Find i) reflection
                  coefficient   ii)standing wave ratio and   iii) input impedance.

Q.10   a)   For the steady magnetic field , show that $\nabla \times H = J$ 07

     b)   Explain in brief about displacement current and displacement current density.   04

     c)   What are the different types of losses in transmission line?   04

Code No : H – 543 – 2018

FACULTY OF SCIENCE & TECHNOLOGY
T.E. (ECT/EC) Revised Examination
DECEMBER, 2018
Digital Signal Processing

Time: Three Hours

Max. Marks: 80

"Please check whether you have got the right the question paper"

N.B.
(i) Q.No. 1 and Q.No. 6 are compulsory.
(ii) From remaining questions, solve any two questions from each section.

Section A

Q.1 Attempt any five of the following (10)

1. What is DFT?

2. Find z transform of x(n)={ 1,3.4.5}

3. Define DSP?

4. What is aliasing?

5. Relation between Laplace and Z- transform

6. Explain any two limitations of DSP.

Q.2 a) Determine Z-transform of following signals. (8)

  1. $x(n)=\sin\omega_0 n$.   2. $x(n)= u(-n)$

b) Determine inverse Z- transform of X(z)= Z/ z-a. For ROC =mod Z>1. (7)

Q.3 a) State and explain properties of DFT. (7)

b) Find inverse DFT of X(k)= { 1,0,1,2}. (8)

Q.4 a) What is FFT ? Explain DIT FFT algorithm. (7)

  b) Determine DFT of X(n) = { 1,2,1,-1}. (8)

Q.5 Wrote short note on any three. (15)

a) Block diagram of DSP.

b) Properties of Z- transform.

c) Realization of FIR structure.

d) Relation between Z and Fourier transform.

PTO

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Section B

Q.6 Attempt any five of the following   (10)

1. What is IIR Filter?

2. What is rounding error?

3. What is Recursive system?

4. What are ideal filter requirements?

5. Properties of FIR Filter (any two)

6. What is condition for Linear Phase FIR Filter?

Q.7 a) Explain bilinear transformation method for IIR filter design.   (7)

b) Apply BLT to $H(s) = 2/(S^2+3S+2)$. With T =1 sec. Find H(Z).   (8)

Q.8 a) Explain FIR window filter design using Hamming window also draw magnitude and phase plot . (7)

b) Find corresponding H(Z) using impulse invariance method if $H(s)= 1 / (S+1) (S+2)$. (8)

Q.9 a) Explain product round off error.   (7)

b) Explain quantization effect for computing DFT.   (8)

Q.10 a) Explain FIR filter design using Kaiser window.   (8)

b) Describe architecture of any DSP processor.   (7)

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Code No: H – 550 – 2018

FACULTY OF SCIENCE & TECHNOLOGY
T.E. (ECT/EC/E&C/IE) (Rev.) (CBCGS) Examination
DECEMBER, 2018

Programming in Java
(Elective – I)

Time: Three Hours

Max. Marks: 80

"Please check whether you have got the right the question paper"

N.B.   (i)   Q.No. 1 and Q.No. 6 are compulsory,.

(ii)   Answer any Two questions remaining questions each Section A & B.

(iii)   Figures in right columns indicates full marks.

SECTION – A

Q.1   Answer the following in brief (Any Five) :   2x5=10

(a)   How object oriented programming is different from procedural concepts?

(b)   What is an object? How to allocate memory for objects?

(c)   What is the difference between >> and >>> operators?

(d)   "Java is called machine independent language". Justify the statement.

(e)   What are assertions?

(f)   What is the different between interface and an abstract class?

(g)   What is the difference between checked and unchecked exceptions?

(h)   What is exception propagation?

Q.2   (a)   Discuss various control structures available in Java.   07

(b)   How packages differ from interfaces? Explain it with suitable example.   08

Q.3   (a)   Write a program to perform the following functions using classes, objects, constructors and destructors wherever necessary.   07
     (i)   Read 4 subjects marks of 20 students.
     (ii)   Calculate the total and print the result on the screen.

(b)   Explain 5 keywords used in handling exception in Java.   08

Q.4   (a)   Explain hierarchy of Java exception classes with net diagram.   07

(b)   Explain about Java variables and arrays with suitable examples.   08

Q.5   Write short note on :   5x3=15

(a)   Byte code interpretation

(b)   Wrapper classes

(c)   Exception as objects.

P.T.O.

SECTION – B

Q.6   Answer the following in brief (Any Five) :   2x5=10

(a)   What is stream in Java?

(b)   What is meant by 'Object serialization'?

(c)   What is the importance of synchronisation in Java?

(d)   What are the advantages of multithreading?

(e)   State the programming code for stopping and blocking a Thread.

(f)   What are the advantages of event driven programming?

(g)   What is the role of layout manager in AWT?

(h)   What is event? What methods are available to handle events in Java?

Q.7   (a)   Explain the working of Java output stream and Inputstream with a neat diagram.   07

(b)   What is thread synchronization? Discuss with an example.   08

Q.8   (a)   Write a Java program to demonstrate a multithreading operation.   07

(b)   Explain about JFram and JList in context to GUI creation in Java.   08

Q.9   (a)   Explain about any two layout managers with example programs.   07

(b)   Explain the Java File Inputstream using a programming example.   08

Q.10   Write short notes on :   5x3=15

(a)   Object Deserialization

(b)   Thread Life Cycle

(c)   Applet Life Cycle.

Code No: H – 551 – 2018

FACULTY OF SCIENCE & TECHNOLOGY
T.E. (ECT/EC/E&C/IE) (Rev.) (CBCGS) Examination
DECEMBER, 2018
Information Theory & Coding
(Elective – I)

Time: Three Hours

Max. Marks: 80

"Please check whether you have got the right the question paper"

N.B.
(i) Q.No. 1 and Q.No. 6 are compulsory,.
(ii) Answer any Two questions remaining questions each Section A & B.
(iii) Assume suitable data, if necessary.

SECTION – A

Q.1 Answer the following in brief. (Any Five)   2x5=10
(a) State two properties of mutual information and give example.
(b) What is the capacity of binary symmetric channel?
(c) What is meant by 'Optimal linear codes'?
(d) Define : Hamming weight and distance.
(e) Give code word structure of linear block code.
(f) The binary linear code (000, 101, 011, 110) is cyclic. Justify.
(g) State any one disadvantages of cyclic code.
(h) State properties of a cyclic code.

Q.2 (a) Prove that the entropy for a discrete source is a maximum when the output symbols are equally probable.   07

(b) The (6,3) linear block code, has the following generator matrix.   08

$$G = \begin{bmatrix} g_1 \\ g_2 \\ g_3 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

Find all code vectors.

Q.3 (a) Explain the importance of Hamming Codes and how these can be used for error detection and correction.   07

(b) Consider a (15,11) cyclic codes with the generator polynomial $G(D) = 1 + D + D^4$. Draw encode circuit. Also, explain the encoding procedure with message 1000101011.   08

Q.4 (a) For the given generator polynomial $g(x) = 1 + x + x^3$ 07
 (i) Find the non-symmetric code word for message sequence 1011.
 (ii) Draw cyclic encoder.

(b) State and explain source coding theorem.   08

Q.5 Write short notes on :   5x3=15
(a) Shannon's Limit
(b) Matrix description of linear block code.
(c) Burst error correction.

P.T.O.

Code No: H – 551 – 2018

-2-

SECTION – B

Q.6   Answer the following in brief (Any Five) :   2x5=10
    (a)   Define – t-error connecting BCH Code.
    (b)   Let α be the primitive element of $GF(2^4)$ such that $1+\alpha+\alpha^4 = 0$. Determine minimum polynomials of α and α^3.
    (c)   What is meant by 'Block length' and 'minimum distance' in BCH code?
    (d)   What are the advantages of viterbi decoding?
    (e)   What are the methods for decoding of convolution codes?
    (f)   What are the properties of convolution codes?
    (g)   What are the different audio perceptual coding?
    (h)   What is the need of adaptive Huffman coding?

Q.7   (a)   Explain the steps for generating polynomials in BCH code with suitable example.   07
    (b)   Explain about Tree codes and trellis codes in brief.   08

Q.8   (a)   Explain the following terms in context with convolution codes.   07
        (i)   Distance bound
        (ii)   Performance bound.
    (b)   Explain the psychoacoustic model with neat diagram.   08

Q.9   (a)   Explain LZW algorithm.   07
    (b)   Explain properties of RS codes with examples.   08

Q.10   Write short notes on :   5x3=15
    (a)   Nested codes
    (b)   Turbo coding / decoding
    (c)   Channel Vocoder.

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Code No: H – 552 – 2018

FACULTY OF SCIENCE & TECHNOLOGY
T.E. (ECT/EC/E&C/IE) (Rev.) (CBC&S) Examination DECEMBER, 2018

Computer Architecture & Operating System
(Elective – I)

Time: Three Hours

Max. Marks: 80

"Please check whether you have got the right the question paper"

N.B.
(i) Q.No. 1 and Q.No. 6 are compulsory,.
(ii) Answer any Two questions remaining questions each Section A & B.

SECTION – A

Q.1 Answer the following in brief (Any Five) :   2x5=10
- (a) List the constraints of conventional computer systems.
- (b) State advantages of pipelining processing.
- (c) State applications of parallel processing.
- (d) What is meant by "Speculative loading"?
- (e) What is out-of-order execution?
- (f) What are the loop unrolling techniques?
- (g) What are the features of Pentium processor?
- (h) What are basic architectural differences between single core and dual core processor?

Q.2 (a) State and explain principles of scalable performance.   07

     (b) What are the design aspects of arithmetic and instruction pipelining?   08

Q.3 (a) Explain job sequencing and collision in detail.   07

     (b) Present the case study of Intel Itanium Processor   08

Q.4 (a) Write short note on – EPIC architecture.   07

     (b) Distinguish between Instruction level and Thread level parallelism with examples.   08

Q.5 (a) What are the future trends in the computer architecture / processing? Explain .   07

     (b) Write short note on – Register Stack engine.   08

P.T.O.

Code No: H – 552 – 2018
-2-

SECTION – B

Q.6   Answer the following in brief (Any Five) :   2x5=10
    (a)   Explain the need of operating system.
    (b)   What is meant by buffering? State the typical example.
    (c)   What are the functions of inker and loader in OS?
    (d)   What are the scheduling criteria?
    (e)   What is mutual exclusion?
    (f)   What are the types of threads?
    (g)   What is swapping in context to memory?
    (h)   Differentiate between segmentation and paging.

Q.7   (a)   What are the different operating systems? Explain the structure of   07
        any one OS with block diagram.

    (b)   Draw a process state transition diagram using five states and explain   08
        the interpretation of each transition.

Q.8   (a)   Explain a typical critican section problem and its solution.   07

    (b)   Explain the segmentation concept with the help of architecture and   08
        example.

Q.9   (a)   What are the page replacement algorithms? Explain any one with an   07
        example.

    (b)   Explain the function of assembler, compiler, Inker and Loader in   08
        context to operating system.

Q.10   (a)   Write a short note on – Semaphore implementation.   07

    (b)   Explain the components of an operating system with a neat diagram.   08

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-170
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
Digital Logic Design
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
i.   Question No.1 from section A and Question No.6 from section B are compulsory.
ii. From the remaining, solve two questions.
iii. Figures to the right indicate full marks.

Section A

Q.1   Solve any five questions of the following: 10
a) What is wired AND logic?
b) Define data selector. What are uses of it?
c) What is propagation delay time? How it is measured?
d) Enlist the characteristics of digital ICs.
e) What are MOS families?
f) Convert 0101 into gray code.
g) What is tristate logic?
h) Compare SOP and POS form.

Q.2   a) Design a full adder using logic gates.   07
b) Explain Transistor Transistor Logic (TTL).   08

Q.3   a) Reduce the following expression using k-map and implement using NAND gates.   07
$$F(A, B, C, D) = \Sigma m(1,4,5,6,9,12,13,14) + d(8,10,11)$$
b) Simplify the logic function using the Quine McCluskey minimization technique.   08
$$f(a, b, c, d) = \Sigma(0,5,8,9,10,11,14,15)$$

Q.4   a) Realize the function given using 16:1 multiplexer.   08
$$Y = \Sigma m(0,3,6,8,11,12,14)$$
b) Explain Arithmetic Logic Unit IC 74181.   07

Q.5   Write short notes on (any three)   15
i.   BiCMOS
ii. IC 7483
iii. ECL (Emitter Coupled Logic)
iv. Parity generator & checker
v.   Binary to gray code convertor

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Section B

Q.6   Solve any five questions of the following: 10
- a) Explain role of clear and preset terminal of flip flop.
- b) State applications of flip flop.
- c) Explain how to overcome race-around condition in JK flip flop.
- d) What is ripple counter?
- e) Explain flash memory.
- f) What is VHDL?
- g) What is entity?
- h) Define state diagram.

Q.7
- a) Draw and explain Master-Slave JK flip flop.   07
- b) Design mod-6 counter using IC7490.   08

Q.8
- a) Perform following flip flop conversions: 08
  - i.   JK to SR
  - ii.   D to T
- b) Explain operation of left shift register.   07

Q.9
- a) Explain Moore and Mealy machines.   07
- b) Briefly explain three basic modeling styles provided by VHDL?   08

Q.10   Write short notes on (any three)   15
- i.   IC7495
- ii.   Ring Counter
- iii.   State reduction and state assignment
- iv.   SRAM & DRAM
- v.   Asynchronous and synchronous counter

2

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-396
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (ECT/E&C/IE)
Analog Communication Engineering
(REVISED)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B
1. Question no.1 & question no.6 are compulsory
2. Attempt any two questions from remaining in each section.
3. Figure to right indicate full marks.
4. Assume suitable data if necessary.

Section A

Q.1   Solve any five.   10
   a) Draw AM waveform for modulation index 0,0.5 and 1
   b) What is fly – wheel effect?
   c) Draw the waveform of PAM, PWM & PPM.
   d) Explain multiplexing in communication
   e) Define modulation index of AM, FM and PM.
   f) How VSB signal used in TV broad casting?
   g) Explain in short about DSB-SC signal.

Q.2   a) Explain Armstrong method of FM generation with example.   08

        b) Compare AM, FM and PM.   07

Q.3   a) Draw and explain balanced modulator in detail.   08

        b) What is the ISB signal? How to generate ISB signal?   07

Q.4   a) The antenna current of AM transmitter modulated to a depth of 40% by an audio sine wave   08
           is 12A. It increases to 13A because of simultaneous modulation by another sine wave.
           Calculate modulation index due to second sine wave.

        b) Draw & explain block diagram of communication system.   07

Q.5   Write short note (any three)   15
   a) Third method of SSB generation
   b) TDM & FDM Technique
   c) Necessity of modulation
   d) Simplex and duplex system
   e) Block diagram of super heterodyne AM receiver & its application

1

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Section B

Q.6   Solve any five   10
    a) What is meant by intermediate frequency? Give its typical value for AM & FM.
    b) Define sensitivity and selectivity.
    c) Define noise figure and Noise temperature.
    d) What is maximum usable frequency?
    e) What is the function of mixer in receiver?
    f) Explain concept of Beamwidth.
    g) What is the function of amplitude limiter in FM receiver?

Q.7   a) Explain RF amplifier of radio receiver with neat circuit diagram.   08

      b) What is mean by noise? What are their types? Explain in detail.   07

Q.8   a) Compare ground wave, sky wave and space wave propagation.   08

      b) Draw and explain Dipole antenna and yaggi udda antenna.   07

Q.9   a) In a broadcast super heterodyne radio receiver having no RF amplifier, the loaded Q of the 08
      antenna coupling circuit is 100. If the intermediate frequency is 455KHz, calculate
        1) The image frequency and its rejection ratio at 1000KHz
        2) The image frequency and its rejection ratio at 24mHz.

      b) Draw the circuit diagram of delayed AGC and explain the function with appropriate wave 07
      forms.

Q.10   Write short note on (any three)   15
    a) Envelop detector
    b) Phase discriminator
    c) Noise calculations
    d) Ionosphere
    e) TRF Receiver
    f) Pre-emphasis and De- emphasis N/W

Total No. of Printed Pages:2

SUBJECT CODE NO: H-408
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (ECT/E&C)
Microwave & Radar Engg.
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1) <u>Q.1 and Q.6 are compulsory</u>.
2) Solve <u>any two</u> from <u>Q.2 to Q.5.</u>
3) Solve <u>any two</u> from <u>Q.7 to Q.10</u>.
4) Assume suitable data of necessary.

Section A

Q.1   Write short note on <u>any two</u>   10

1) PIN Diode
2) Types of microwave tees.
3) Parametric amplifier.
4) S – Parameters.

Q.2   a) Discuss high frequency limitations on conventional vacuum tubes.   07

b) A TWT having beam voltage of 3.2Kv and beam current of 28MA. The characteristic   08
impedance is 7.2 Ω and the circuit length is 45. If the frequency of operation is 10GHz
then calculate,
i)   Gain parameter
ii)   Output power gain in dB
iii)   All propagation constants.

Q.3   a) Explain the construction and working of TWTA using helix type slow wave structures.   07

b) Explain the working of directional coupler with its coupling factor and directivity of a   08
directional coupler.

Q.4   a) Explain the working of magic tee with scattering matrix.   07

b) Explain the importance and properties of scattering matrix in MW network.   08

1

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Q.5   a)   Explain EMI and EMC in detail.   07

            b)   Explain   08
                i)   Effect of microwave on human body
                ii)   Applications of microwaves

Section B

Q.6   Write short notes on <u>any two</u>   10

                i)   Low angle tracking
                ii)   Duplexer
                iii)   Staggered Frequencies
                iv)   Radar Frequencies.

Q.7   a)   Derive the simple form of radar range equations with factors governing them.   08

            b)   Explain and draw the basic block diagram of radar system with its application.   07

Q.8   a)   Explain radar range determination and range ambiguities.   07

            b)   Draw and explain diagram of MTI radar. Why DLC are used in such radars.   08

Q.9   a)   Explain the working of monopulse tracking Radar.   07

            b)   Explain different types of system losses in radar and radar displays.   08

Q.10   a)   Explain the working of coherent AMTI Radar with the help of block diag.   07

            b)   Explain the functions of Pulsed Doppler Radar with schematic block diagram.   08

2

Total No. of Printed Pages:2

SUBJECT CODE NO: H-409
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC)
Robotics
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B
1) Assume suitable data if necessary.
2) <u>Q. No. 1 & Q. No.6 are compulsory</u>. & then solve <u>any two</u> questions <u>from each section A & section B.</u>

Section A

Q.1   Answer the following questions.   10

        a) What are matrix operations?
        b) What are vector operations?
        c) What is dynamic constraints?
        d) Give four typical applications of robotic arm.
        e) Define robotic arm.

Q.2   a) Explain the classification of robotic arm.   08

        b) Give specification of robotic arm with typical values.   07

Q.3   a) Explain different components of robotic arm.   08

        b) Explain Newton's & ruler's equations.   07

Q.4   a) Explain D- H matrix in detail.   08

        b) Consider a vector $\overline{v} = 2i + 3j + 4k$ give its homogeneous representation with   07
$s = -10, 2, 1, \& 0.$

Q.5   a) A frame has been moved nine unit along the X axis & five units along the Z axis of the   08
ref. frame. Find the new location of the frame F:

$$F = \begin{bmatrix} .527 & -.574 & .628 & 4 \\ .369 & .819 & .439 & 2 \\ -.766 & 0 & .643 & 7 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

        b) If $\overline{x} = i + j + 2k$ & $\overline{y} = 3i + 4j + 5k$ find $\overline{x}.\overline{y}$ & $\overline{x} \times \overline{y}$ in homogenous coordinate   07
system.

1

Section B

Q.6 Answer the following questions. 10

    a) What is machine vision system?
    b) What are basic control actions?
    c) What are external sensors?
    d) Give classification of actuator?
    e) What are different end effecters?

Q.7 a) Explain object recognition system in robotics. 08

    b) Give need & applications of machine vision system. 07

Q.8 a) Explain fuzzy controller in robotics. 08

    b) Explain Jacobean in terms of D –H matrix. 07

Q.9 a) Explain magnetic grippers in detail. 08

    b) Explain any one dc motor as an actuator, in detail. 07

Q.10 a) Explain laser range finder system in robotics. 08

    b) Explain camera as a sensor. 07

Total No. of Printed Pages:2

[Time: Three Hours]   **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B
1) Q.No.1 from Section A& Q.No.6 from Section B is compulsory.
2) From remaining questions in Section A& B student are supposed to solve any two questions from each section.
3) Assume suitable data wherever necessary.
4) Draw neat sketches wherever necessary.

Section A

Q.1	Write a short note on(Any Two)	10
	a) Management accounting & corporate governance.	
	b) Life cycle management.	
	c) Sales order management.	
Q.2	a) Explain the procurement of consumable material.	07
	b) What are valuated & non-valuated receipts?	08
Q.3	a) Explain standard report in service.	07
	b) Explain drafting of material requisition planning.	08
Q.4	a) Explain system wide concept.	07
	b) Explain procurement of stock material.	08
Q.5	a) Explain the importance of batch record.	07
	b) Explain how you can link a document to a vendor master record?	08

Section B

Q.6	Write a short note on(Any Two)	10
	a) Basics of price determination.	
	b) Explore source determination with quota.	
	c) Extracting purchase information.	
Q.7	a) Define function authorization for buyers & explain it in detail.	07
	b) What is invoicing plan?	08
Q.8	a) How to post invoice? Explain procedure.	07
	b) How to create invoice entry by applying taxes, cash discount & foreign currency.	08

1

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| Q.9 | a) | How to create purchase order with reference of source determination. | 07 |
| | b) | Explain how to enter the invoice without reference to purchase order. | 08 |

| Q.10 | a) | What are the steps involved in consignment cycle. | 07 |
| | b) | What is the difference between stock transfer between two plants belonging to same company code & those belonging to different company code? | 08 |

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-458
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (ECT/E&C)
Elective-I: Artificial Neural Network & Fuzzy Logic
(REVISED)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B   i.   Q.No.1 from section A and Q.No.6 from section B are compulsory.
            ii.   Attempt any two questions from the remaining questions in each section
            iii.   Figure to the right indicate full marks.
            iv.   Assume suitable data wherever necessary and mention it clearly.

Section A

Q.1   Solve any two   10
        a) Define Euclidean distance.
        b) What is a recurrent neural network?
        c) What are the three basic element of a neuronal model?

Q.2   a) Draw and explain the architectural graph of a Hopfield network consisting of N=4 neurons. 08
        b) Explain the energy analysis of discrete Hopfield network.   07

Q.3   a) Explain in detail supervised learning .How it is different from unsurprised learning?   07
        b) What is meant by epoch in training process?   08

Q.4   a) Explain in details Hopfield net.   07
        b) Give suggestions to improve and modify back propagation network.   08

Q.5   Discuss the operation of single neuron system. A neuron j receives inputs from four other neurons   15
        whose activity levels are 12, -20, 4 and -2. The respective synaptic weights of the neuron j are 0.7,
        0.2, -1.0 and -0.9. Calculate the output of neuron for the following two situations.
                a) The neuron is linear.
                b) The neuron is represented by a McCulloch – Pitts model. Assume that the bias applied
                   to the neuron is zero.

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Section B

Q.6   solve any two:-   10

      a) State operations and properties of fuzzy sets.
      b) List properties of crisp relation.
      c) What is meant by crossover point in fuzzy set?

Q.7   Using your own intuition ,develop fuzzy membership functions on the real line for the fuzzy   15
number "approximately 2 AND approximately 8" ,using the following functions shapes:
      a) Symmetric triangles.
      b) Trapezoidal.
      c) Gaussian functions.

Q.8   a) Write a short note on fuzzy ordering.   08
      b) Differentiate between center of sums and weighted average method.   07

Q.9   a) Explain multi attribute decision making in detail.   07
      b) Give details on membership value assignments using inductive reasoning.   08

Q.10   Design and develop a pressure process control by Fuzzy logic control model. Formulate necessary   15
membership functions and required fuzzy rules for the application.

2

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-459
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (ECT/E&C)
Elective-I: Wireless Mobile Communication
(REVISED)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B
    i.   Q.No.1 from section A and Q.No.6 from section B are compulsory.
    ii.   Attempt any two questions from the remaining questions in each section.
    iii.   Assume suitable data wherever necessary.

Section A

Q.1	a) Compare TDMA, FDMA and CDMA.	05
	b) What is handoff? Explain its advantages.	05
Q.2	a) What is line of sight? Explain the concept of frequency reuse.	07
	b) Explain UMTS in detail.	08
Q.3	a) Explain ISDN services.	07
	b) Explain DECT in detail.	08
Q.4	a) Compare 2G, 3G and 4G.	07
	b) Explain necessity of wireless networks. Also explain wireless data services.	08
Q.5	Write short note (any three)	15

    a) SDMA.
    b) Bluetooth.
    c) Roaming.
    d) DTH.

Section B

Q.6	a) Explain PRMA in detail.	05
	b) Compare Symbian and iOS.	05
Q.7	a) Explain GSM architecture in detail.	08
	b) Explain Zigbee in detail.	07
Q.8	a) Explain WLAN IEEE 802.11 architecture.	08
	b) What is role of portal? Explain architecture showing DSS and BSS.	07

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Q.9   a) Explain wireless protocols and standards for IEEE.   08
            b) Explain IEEE 802.15.4 in detail.   07

Q. 10   Write short note (any three)   15

            a) Handover in GSM.
            b) GSM vs CDMA.
            c) Mobile IP.
            d) WAP.

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-461
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC)
Elective-I: Advanced Power Electronics
(REVISED)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B   i) Q.1 & Q.6 are compulsory.
                 ii) Solve any two questions from Q.2, Q.3, Q.4, & Q.5 in section 'A'.
                 iii) Solve any two questions from Q.7, Q.8, Q.9, & Q.10 in section 'B'.
                 iv) Figures to the right indicate full marks.

Section A

Q.1   Attempt any two: 10

      a) Performance parameters of Inverters.
      b) Explain load resonating converters?
      c) Explain step down 'E' chopper
      d) Source filters design.

Q.2   a) Draw & explain DC-DC converter with isolation.   08
      b) Distinguish between 120& 180 mode Inverter.   07

Q.3   a) Draw & explain parallel resonant converters in detail.   08
      b) Derive an expression for current ripple in the o/p of chopper.   07
      Draw & explain chopper.

Q.4   a) Derive for separately excited DC motor.   08
      b) Draw & explain resonant DC-Link converters.   07

Q.5   a) The fully-bridge series resonant Inverter has $L = 40\mu n, C = 6.8\mu F$ & $R = 3\Omega$.The frequency 08
      of o/p voltage is 6KHz& dc i/p is 200V, SCR turn-off time is $15\mu s$.Calculate:
      i)   Circuit turn-off time
      ii)   Maximum possible o/p frequency
      iii)   Capacitor
      iv)   rms load current
      v)   o/p power
      vi)   Average & rms SCR currents.
      b) Draw & explain step-down type 'C' chopper.   07

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Section B

Q.6 Attempt any two: 10
  a) Dual feeders
  b) Power quality & Power Conditioner.
  c) Static frequency changer.
  d) PM brushless DC motor.

Q.7 a) Explain Radio frequency interference & their Transient suppression in detail.   08
  b) Draw & explain steady state analysis of $3 - \emptyset$ converter DC motor drive. 07

Q.8 a) Explain Induction motor performance characteristics.   08
  b) Explain in detail power factor correctors.   07

Q.9 a) Explain vector control schemes in detail.   08
  b) Explain sensor less control techniques in detail.   07

Q.10 a) Explain control modelling of 3-phase converter in detail.   08
  b) Explain D.C. drive selection criteria along with advantages, disadvantages & applications. 07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-460
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC/ECT/E&C)
Elective-I: Biomedical Electronics
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
    i.   Question 1 and 6 are compulsory.
    ii.   Solve any two questions from each section.

Section A

Q.1   Solve any two:-   10

    a) Explain the factors that influence the design and application of a medical instrument.
    b) What are bio potential electrodes? Distinguish between metallic microelectrode and nonmetallic microelectrode.
    c) Describe the recording setup used in EMG.

Q.2   a) Explain with a diagram medical preamplifier and explain its action.   08
        b) Draw the electrical equivalent circuit of microelectrode and explain its electrical nature.   07

Q.3   a) Give the origin of brain waves and describe the 10-20 electrode system used in EEG.   08
        b) Explain with diagram the salient features of phonocardiography (PCG).   07

Q.4   a) How the blood pressure is measured by ultrasonic method.   08
        b) What is electromagnetic blood flow meter & define the principle based on it?   07

Q.5   Write short notes on the following   15

    a) NMR.
    b) Arrhythmia monitor.
    c) Ultrasonic imaging.

Section B

Q.6   Solve any two:-   10

    a) Explain the origin of different heart sounds.
    b) Explain working of X – ray machine with detailed functional block.
    c) Explain ventilator principle.

Q.7   a) Define cardiac output. Give the reason for decrease of cardiac output.   08
        b) What is phonocardiography? Give its important application.   07

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Q.8   a) Discuss in details the radiation therapy techniques.   08
            b) Explain with suitable diagram the diagnostic X-ray machine. What are the applications of 07
               X-ray examination?

Q.9   a) Define & explain systole & diastole.   08
            b) State and explain plethysomography principle.   07

Q. 10   Write short notes on the following   15

            a) Detectors for beta radiation:
            b) Gas flow counter.
            c) Liquid scintillation counter.

Examination NOV/DEC 2018

H-420

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-420
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (EC/ECT/IEC/E&C)
Digital Signal Processing
(OLD)

[Time: Three Hours]   **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B
   i   Q. No. 1 & Q. No. 6 are compulsory from each section A and B respectively.
   ii Solve any two questions from Q. No. 2 to Q. No. 5
  iii Solve any two questions from Q. No. 7 to Q. No. 10
  iv Figure to the right indicate full marks
   v Assume suitable data if necessary

Section A

Q.1   Attempt any two of the following   10

      a) Describe the relation between Fourier Transform and Z- transform
      b) Differentiate between circular convolution & linear convolution
      c) Describe application and limitation of DSP
      d) Explain decimation in time (DIT) algorithm

Q.2   a) The impulse response of a linear time invariant system is   07

$$h(n) = \{1,2,1,-1\}$$
$$\uparrow$$

Determine the response of the system to the input signal
$$x(n) = \{1,2,3,1\}$$
$$\uparrow$$

    b) Determine the convolution of the sequences   08
      X(n)=1 for 0≤ n≤ 4
      =0 elsewhere

      h(n)={1,1,1,1,1}

Q.3   a) State and explain properties of Z-transform   07
    b) Determine the Z-transform of the following   08

      i) $x(n) = \propto^n u(n)$
      ii) $x(n) = -\propto^n u(-n-1)$

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Q.4   a) Obtain DFT of the following sequences   08

            i) $x(n) = \{1,0,-1,2\}$ ii) $x(n) = \{0,1,2,3\}$

        b) State and explain properties of DFT   07

Q.5   a) Explain DIF FFT algorithm   07

        b) Perform the circular convolution of the following two sequences   08

$$x_1(n) = \{2,1,2,1\}$$
$$x_2(n) = \{1,2,3,4\}$$

Section B

Q.6   Attempt <u>any two</u> of the following   10

        a) Compare FIR with IIR
        b) Bilinear transformation method
        c) Parameters of Butterworth filters
        d) Ideal filter requirement

Q.7   a) Convert the analog filter into digital filter whose system function is   08
$H(S) = \dfrac{s+0.2}{(S+0.2)^2+9}$ $T_s = 1sec$ Using impulse invariant.

        b) Explain frequency sampling method for design of FIR filter   07

Q.8   a) Design a low pass FIR filter with 11 coefficients for the following specification   07

            Pass band frequency edge=0.25KH$_z$

            Sampling frequency = 1KH$_z$

            Use rectangular window

        b) Explain Fourier series method to design of FIR filter   08

Q.9   a) Explain quantization error in computation of DFT   08

        b) Explain the product round off error   07

Q.10   a)   Design a single-pole low pass digital filter with a 3-dB bandwidth of 0.2π, using bilinear   08
transformation applied to the analog filter $H(S) = \frac{\Omega C}{S + \Omega C}$ where ΩC is 3-dB bandwidth of
the analog filter

      b)   Explain Gibb's phenomenon   07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-339
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC/ECT/E&C)
Embedded Systems
(REVISED)

[Time: Three Hours] **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B
1) Question no.1 & Question no.6 are compulsory.
2) Attempt any two questions from remaining questions from each section.
3) Figures to right indicate the maximum marks.
4) Assume suitable data, if necessary.

Section A

Q.1 Solve any two questions from following. 10
    a) List and explain application of embedded system in various areas.
    b) Explain Bus architecture of ARM processor.
    c) Explain Watchdog timer in ARM7.

Q.2 a) Discuss common design metrics in embedded system. 08
    b) Explain with neat diagram SPI protocol. 07

Q.3 a) Explain LOAD-STORE instruction. 07
    b) Explain THUMB instruction in ARM7 with example. 08

Q.4 a) Describe format of CPSR in ARM7. 07
    b) Compare RISC/CISC processor. 08

Q.5 Write short notes on (Any 3) 15
    a) On chip Timers in ARM7.
    b) CAN protocol.
    c) Interrupts in ARM7 w.r.t. LPC2148.
    d) ARM Processor modes and states.

Section B

Q.6 Answer any two from following. 10
    a) Explain in detail features of μc/os-II.
    b) Differentiate between non-preemptive and preemptive multitasking.
    c) Discuss RTOS kernel architecture.

1

Q.7   a) With neat diagram explain touch screen interfacing with ARM7.   08

       b) Write a C program to blink the 8 LED's with a small delay and LED's connected to PORT 0   07
         pins.

Q.8   a) Explain use of message queue, mailboxes and pipes.   08

       b) Explain in detail need of interfacing and interfacing techniques.   07

Q.9   a) Explain porting in RTOS.   07

       b) Explain ARM based smart card.   08

Q.10   Write short notes on(Any Three)   15
         a) Memory management in RTOS.
         b) Graphical LCD interfacing.
         c) Task scheduler and task states.
         d) Semaphore related functions under μc/os-II

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-395
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
Communication Engineering
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1. Question no.1 question no.6 are compulsory
2. Solve any two from remaining question from each section.
3. Figure to right indicate full marks.

Section A

Q.1   Solve any five questions.   10
   a) Define V.S.B system
   b) State formula for modulation index of AM and FM.
   c) Define flywheel effect in modulation
   d) Define fidelity and selectivity of a radio receiver.
   e) Define phase modulation
   f) Define noise and state the types.
   g) What are the advantages of SSB over DSBFC.

Q.2   a) Derive and explain the power relations of AM wave.   08
        b) Explain ISB system with block diagram.   07

Q.3   a) Give comparison of AM, FM & PM.   08
        b) Explain the indirect method of FM generation with neat block diagram. 07

Q.4   a) Explain RF amplifier of AM receiver with neat block diagram.   08
        b) Explain image frequency and its rejection. How to avoid image frequency in AM receiver. 07

Q.5   Write short note (any three)   15
   a) Tracking
   b) AGC
   c) Balanced modulator
   d) TRF receiver
   e) DSBSC signal

1

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Section B

Q.6	Solve any five questions.	10
	a) Define delta modulation	
	b) What is the function of microphone?	
	c) Define FDM and TDM.	
	d) State the sampling Theorem	
	e) State the types of FM demodulator.	
	f) What are different types of loudspeaker?	
	g) Define pulse modulation give its types.	

Q.7	a) Draw and explain the block diagram of FM receiver.	08
	b) Explain the working of Balanced slope detector with circuit diagram.	07

Q.8	a) Draw & explain block diagram of PCM.	08
	b) Give the comparison of PAM, PWM,& PPM.	07

Q.9	a) Explain carbon type microphone with their advantages, disadvantages & application.	08
	b) Explain optical recording & reproduction.	07

Q.10	Write short note (any three)	15
	a) Amplitude limiter	
	b) Principle of T.V signal generation	
	c) Horn type loudspeaker	
	d) Quantization	
	e) PA system	

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-385
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (EC/ECT/IEC/E&C)
Analog Integrated Circuit & Applications
(OLD)

[Time: Three Hours]   [Max .Marks: 80]

Please check whether you have got the right question paper.

N.B
i) Q. No 1 & Q. No 6 are compulsory.
ii) Solve any two questions from Q.2 to Q.5
iii) Solve any two questions from Q.7 to Q.10
iv) Assume suitable data if necessary.

Section A

Q.1   Attempt any two   10
1. Explain block diagram of op-amp.
2. Describe low voltage ac voltmeter.
3. Explain zero crossing detector.
4. Discuss square wave generator.

Q.2   a) Derive expression for output of summing and difference amplifier using op-amp.   08

        b) Explain working of triangular wave generator with circuit diagram and waveforms.   07

Q.3   a) Explain operation of op-amp as an integrator   07

        b) Draw and explain block diagram of IC 8038   08

Q.4   a) Explain monostable multivibrator using IC 555   07

        b) Discuss comparator using op amp and its characteristics.   08

Q.5   a) Discuss ideal and practical op-amp   07

        b) Explain Inverting and non-inverting amplifier.   08

Section B

Q.6   Attempt any two.   10
1) Explain first order switched capacitor filter
2) Describe major building blocks of PLL.
3) Explain Linear voltage regulator using op-amp.
4) Discuss Bi-quad filter

1

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Q.7	a)	What Tow –Thomas filter? Explain in detail	07
	b)	Design Wien bridge oscillator with $F_0 = 1KHZ$. Use op amp I(74)	08
Q.8	a)	Draw and explain operation of PLL as FSK modulator	07
	b)	Explain how PLL is used for Frequency translator.	08
Q.9	a)	Explain working of stepdown switching regulator using IC 78540 device	08
	b)	Explain adjustable regulator using IC LM317	07
Q.10	a)	Compare active network and passive network design.	07
	b)	What is switching regulator? List four major components of switching regulator. State advantages of it.	08

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-462
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC)
Elective-I: Consumer Electronics
(REVISED)

[Time: Three Hours]   **[Max. Marks: 80]**

Please check whether you have got the right question paper.
N.B   i) Q. No 1 and Q. No 6 are compulsory.
              ii) Solve any two questions from section A and section B from remaining.

Section A

Q.1	a)	Enlist the advantages of LASER printer.	05
	b)	Compare 3G and 4G Technology.	05
Q.2	a)	Explain Dolby digital system .	07
	b)	Explain structure of Blue Ray disc.	08
Q.3	a)	Enlist the feature of I – phone	07
	b)	Explain working principle of microwave oven	08
Q.4	a)	Explain Block diagram of microwave oven.	07
	b)	Explain PA system and its Applications.	08
Q.5	a)	Write note on Plasma TV	08
	b)	Advantages of LED lamps and its importance.	07

Section B

Q.6	a)	Explain working principle of CFL.	05
	b)	Write Notes on DVD.	05
Q.7	a)	Explain Biosensor for Biometric Attendance system.	07
	b)	What do you mean by Home Automation Systems?	08

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Q.8	a)	Explain How scanner is working?	08
	b)	Explain Advantages & disadvantages of Inkjet printer.	07
Q.9	a)	Explain the advantages of solar lamp.	08
	b)	Explain Different controls used in water purifier.	07
Q.10	a)	Explain RF interference & immunity.	07
	b)	Explain product safety issues.	08

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-431
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (ECT/E&C/IE)
Data Structure and Linux
(REVISED)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.
N.B   i) Q. No.01 and Q. No.6 are compulsory.
            ii) Attempt any two questions from Q.2 to Q.5 and From Q.7 to Q.10 of each section.
            iii) Figure to the right indicates full marks.

Section A

Q.1   Attempt any Five of the following   10

        (a) What is pointer? Give an example.
        (b) Differentiate between array and linked list
        (c) How binary tree is represented using array?
        (d) Give applications of stack.
        (e) Which C functions are used for dynamic memory allocation?
        (f) Define data structures. Give example of any two linear data structures.
        (g) What is graph? Give an application.
        (h) Evaluate following postfix expression using stack,
                2   3   *   5   +

Q.2   (a) What is necessity of an ADT? Explain Functions necessary to create ADT for Natural   08
            Number
        (b) What is array? What are limitations of array? Explain different types of array with example. 07

Q.3   (a) Write C program for stack using array. Give its drawbacks.   08
        (b) How to create binary search tree from following list of elements?   07
            40,30, 50, 60, 80, 10, 35

Q.4   (a) Explain how to add following polynomials,   08
            $A(X) = 3 X^{14} + 2X^8 + 1$
            $B(X) = 8X^{14} + 3X^{10} + 10X^6$
        (b) What is recursion? Write C program to illustrate concept of recursive function.   07

Q.5   (a) Write algorithms to perform following operations on linear linked list. Give one example of   08
            each
            (i) Inserting a node into front of the list and end of the list.
            (ii) Deleting a node from the list

        (b) Explain different graph representation techniques.   07

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Section B

Q.6   Attempt any five of following   10

(a) With an example, explain yum command in Linux.
(b) Enlist File types in Linux
(c) What are the types of sorting available in C?
(d) Why the shell is called as command interpreter?
(e) What is the essential condition for binary search to be performed?
(f) Enlist run levels in Linux.
(g) With an example, explain nice command in Linux.
(h) Describe use of mkdir and rmdir commands.

Q.7   (a) Compare different types of sorting techniques.   08
       (b) What is OS? Explain GUI and CLI interfaces of OS.   07

Q.8   (a) Differentiate between Linux and windows operating system.   08
       (b) Explain different file handling commands in Linux with suitable examples   07

Q.9   (a) Differentiate between gedit and vim text editors in Linux.   08
       (b) How to write and execute C program in Linux?   07

Q.10   (a) With example and options explain *l*s command in Linux   08
       (b) With example, describe algorithm for merge sort.   07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-430
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
Data Structure
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B   i) Que. No.1 & Q.No.6 are compulsory.
              ii) Attempt any two questions from Q.2 to Q.5 and any two questions from
              Q.7 & Q.10

Section A

Q.1   Answer any five   10

        (i)   Explain array of structure?
        (ii)   Write postfix form of the expression a*-b+c?
        (iii)   Define circular linked list.
        (iv)   What is pointer?
        (v)   Explain stack with example
        (vi)   How to search element from linked list?
        (vii)   What is singly linked list?
        (viii)   What is storage classes

Q.2   (a) Explain ADT with example.   08
        (b) Explain application of linked list.   07

Q.3   (a) Evaluate the postfix expression 6 2/3 -4 2*+   08
        (b) Compare different linked list.   07

Q.4   (a) Explain non primitive data structure.   08
        (b) What is queue explain with example   07

Q.5   Write short notes on (any three)   15
        1) Linked list
        2) Priority Queue
        3) Doubly linked lists
        4) Pointer

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Section B

Q.6   Answer any five   10

      (i)   Explain strongly connected graph with example?
      (ii)   What is Forest?
      (iii)   What is binary search?
      (iv)   What is tree explain with example?
      (v)   What is shortest path?
      (vi)   What is selection sort?
      (vii) Explain level of Node.
      (viii) Explain sorting

Q.7   (a) Explain minimum cost spanning tree   08
       (b) Explain binary search tree.   07

Q.8   (a) Explain bubble sort with example   07
       (b) Explain graph traversal   08

Q.9   (a) Explain radix sort with example   07
       (b) Explain graph with an example   08

Q.10   Write short notes on (any three)   15
      (a) B+ trees
      (b) heap sort
      (c) Application of tree
      (d) BFS

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-171
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
Digital Logic Design
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
i) Question No.1 from Section A & Question No.6 from Section B are compulsory.
ii) From the remaining, solve any two question from each section.
iii) Figure to the right indicates full marks.

Section A

Q.1   Solve any five questions of the following.   10
   a) Differentiate between TTL and CMOS.
   b) Classify logic families
   c) Convert the Given expression into standard SOP Form.
      $Y = AB + A\bar{C}$
   d) Convert given binary number into Gray number
      $(101101)_B \rightarrow (\quad)_G$
   e) Draw 4:1 mux using gates
   f) Define encoder & decoder
   g) What are the application of Demultiplexer
   h) Write IC number of
      1. Parallel adder
      2. ALV
      3. Priority Encoder (Decimal to BCD)
      4. 1:8 Demux

Q.2   (a) Explain in detail characteristics of digital IC   08
       (b) Explain Tristate TTL inverter in detail   07

Q.3   (a) Reduce the following expression using Quine Mccluskey method.   08
       $F(ABCD) = \Sigma m(0,2,4,6,8,9,12,15)$
       (b) Minimize the following expression using K map   07
       $F(ABCD) = TTM(4,5,6,7).d(1,2,3,8,11,14)$

Q.4   (a) Design BCD to seven segment decoder   08
       (b) Explain parallel adder in detail.   07

Q.5   Write Short Note on any three   15
       (a) Tristate buffer
       (b) Full Substractor
       (c) demultiplexer

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(d) Comparator

(e) BiCMOS

Section B

Q.6   Solve any five of the following   10

        a) Draw 1 bit latch

        b) Application of Flip-Flop

        c) Enlist types of Shift Register

        d) Draw Moore Machine Model

        e) Compare between SRAM & DRAM

        f) How to expand memory using word size

        g) Write syntax of Entity for VHDL

        h) Def^n concurrent & sequential Statement.

Q.7   (a) What is race around condition?   08

          How it can be overcome using JK f/f

      (b) Design asynchronous up down 4 bit counter.   07

Q.8   (a) Design sequential CKT using T f/f for the state diagram shown below   08
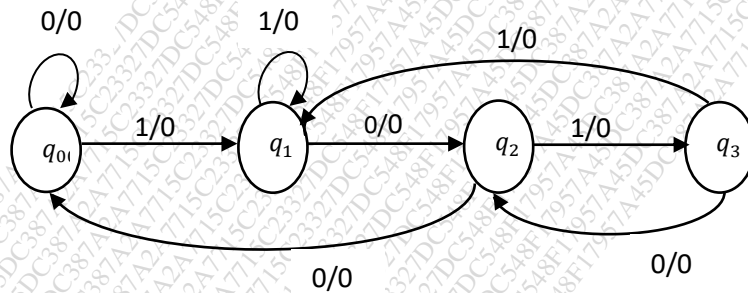
      (b) Explain in detail classification of Memory   07

Q.9   (a) Explain in detail modeling styles of VHDL   08

      (b) Write VHDL code for half adder   07

Q.10   Write short note on any three   15

        a) Excitation table of Flip – Flop

        b) Universal shift register

        c) State table

        d) Flash Memory

        e) Library & Packages in VHDL

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-496
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (ECT/E&C)
Antenna Theory & Wave Propagation [Elective-II]
(REVISED)

[Time: Three Hours]   **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B   1) Q.No.1 & Q.No.6 are compulsory.
             2) Solve any two questions from remaining questions in each section.
             3) Assume suitable data wherever necessary.

Section A

Q.1	Write a short note on(Any Two)	10
	a) Friis transmission equation.	
	b) Infinitesimal dipole.	
	c) Cassergain antennas.	

Q.2   Describe the following characteristics of an antenna radiation.   15
             a) Directivity.
             b) Gain.
             c) Effective aperture.
             d) Efficiency.
             e) Polarization.

Q.3   a) Define antenna. Explain the detailed classification of antenna.   07
       b) Explain the radiation from circular & rectangular appertures.   08

Q.4   a) Write a short note on small circular loop.   07
       b) Explain the Linear elements near conductor.   08

Q.5   a) State and explain the importance of Huygens principle for radiation.   07
       b) What is horn antenna? Explain the radiation from pyramidal horn.   08

1

Section B

Q.6 Write a short note on (Any Two) 10
        a) Broadcast antennas.
        b) Rectangular Patch antenna.
        c) Duct Propagation.

Q.7 a) Explain Yagi and Log periodic antenna. 07
     b) State and explain the necessity & working of antenna arrays. 08

Q.8 a) Explain the various feeding methods of microstrip antenna. 07
     b) What is a process of design of circular & triangular patch antennas? 08

Q.9 a) Describe the calculation of field strength at a distance for ground waves. 07
     b) Explain reflection from ground for vertically & horizontally polarised waves. 08

Q.10 a) Explain the structure of ionosphere with neat diagram. 07
      b) For a sky wave propagation. Explain the mechanism of refraction & refractive index. 08

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-105
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (EC/ECT/IEC/E&C)
Power Electronics
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
        i) Q.No.1 & Q.No.6 are compulsory.
        ii) Solve any two questions from the remaining questions in both sections.

Section A

Q.1 Solve <u>any two</u>.   10
    a) Principle of ON-OFF control in AC voltage controller.
    b) Power factor improvement techniques.
    c) Reverse recovery characteristics of power diode.
    d) Compare IGBT with SCR.

Q.2 a) With the help of circuit diagram and waveforms explain working of RC triggering methods 08
       of SCR.
    b) Discuss V-I characteristics of UJT by drawing its equivalent circuit diagram.   07

Q.3 a) Explain operating principle of a dual converter in detail. What is the necessity of   07
       circulating current reactor in it.
    b) A single phase dual converter operated from 230V, 50Hz supply and the load resistance is 08
       20Ω, the circulating inductance is Lc=25mH, delay angles are $\alpha_1 = 60^o$ and $\alpha_2 = 120^o$,
       calculate peak circulating current and peak current of converter 1.

Q.4 a) An AC voltage controller has a resistive load R=10Ω and RMS input voltage is Vs=230V, 08
       50Hz. The SCRS are switched on for n=25 cycles and off for m=75 cycles. Determine.
       a) RMS output voltage
       b) Input power factor
       c) Average and RMS current ratings of SCR
    b) Discuss the working of single-phase cycloconverter with applications.   07

Q.5 a) Explain effect of source inductance on 1-ϕ full converter.   07
    b) What is the function of GTO? Also explain the static V-I characteristics of GTO.   08

1

Section B

Q.6   Solve any two.   10
    a) Explain various applications of induction heating.
    b) Write short note on flasher circuit.
    c) Write a short note on time delay circuit.
    d) Write a short note on step-down chopper.

Q.7   a) A DC Chopper (step down) has a resistive load R=10Ω and i/p voltage Vs=200V when   08
       the chopper remains on. Its voltage drop is 2V. the chopper frequency is 1KHz. If the duty
       cycle is 50%. Determine.
       a) Average O/P voltage
       b) RMS O/P voltage
       c) Chopper efficiency
       d) Effective i/p resistance of chopper

    b) Explain the basic principle of step-up chopper. Obtain the expression for O/P voltage.   07

Q.8   a) Describe a voltage commutated chopper with relevant current and voltage waveforms. As   08
       a function of time.
    b) Discuss in brief the operation of improved series inverter. Draw the voltage and current   07
       waveforms.

Q.9   a) Find out the o/p frequency and attenuation factor of series inverter circuit having following   08
       particulars.
       L=10mH, C=0.14μF, R_L=0.4kΩ t_{off}=0.2msec.
    b) Explain the working of power ckt for 180° mode 3-ϕ bridge inverter. Draw the relevant   07
       voltage and current waveforms.

Q.10   a) What are the methods for voltage control of inverter? Explain sine pulse modulation   08
       voltage control technique.
    b) With neat circuit diagram. Explain the operation of four-quadrant chopper.   07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-135
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
High Speed Analog Devices
(REVISED)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.

N.B
1. Q.no.1 and 6 are compulsory.
2. Solve any two questions from remaining from section A and B.

Section A

Q.1   Solve any five   10
1) Enlist features of AD847.
2) What do you mean by PSRR?
3) State the working principle of PLL.
4) Define Bandwidth and frequency response.
5) Draw pin diagram of IC 565.
6) Enlist Application of AD8073.

Q.2   a) Explain difference Amplifier.   07
        b) Explain Schmitt trigger and state its advantages & Application.   08

Q.3   a) Explain features of current F/B amplifier.   08
        b) Explain current feedback model.   07

Q.4   a) Explain working principle of PLL.   08
        b) Explain frequency synthesizer.   07

Q.5   a) Write case study of AD847.   07
        b) Compare between AD8001 and AD8002.   08

Section – B

Q.6   Solve any five   10
1) What do you mean by HEMT?
2) Enlist Application of HEMT.
3) Define sampling Rate.
4) Define Resolution.
5) Explain Advantages of Heterojunction BJT.
6) Explain principle of operation of HEMT.

Q.7	a)	Explain high Electron Mobility transistors.	07
	b)	Write notes on cable drivers and receivers.	08
Q.8	a)	Explain differential line driver.	07
	b)	Explain power Amplifier.	08
Q.9	a)	Explain ADC Application in Ultrasound.	07
	b)	Explain the different types of High speed ADC.	08
Q.10	A)	Explain successive Approximation ADC.	07
	B)	Explain High speed clamping Amplifier.	08

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-361
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
Network Analysis
[OLD]

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B   (i) Question No.1 from section A and Question no.6 from Section B are Compulsory.
            (ii) From the remaining, solve any two questions from each Section.
            (iii) Figures to the right indicate full Marks.

Section A

Q.1   Solve any five.   10

a) State star to delta transformation with its important equations.
b) State significant principle of duality
c) Distinguish between voltage and current source
d) A network is shown in fig, draw the directed graph.
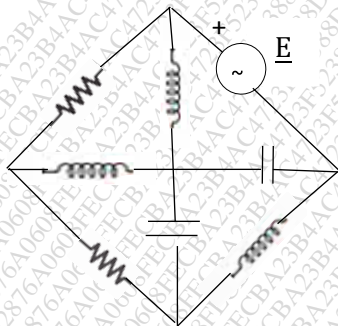
e) Define four terminal equalizers
f) Define any two types of network
g) Define Norton's theorem

Q.2   a) State and explain superposition theorem with proof   08
          b) Determine the current through branch AB of the given network shown in fig, by using   07
             Nodal analysis.

1

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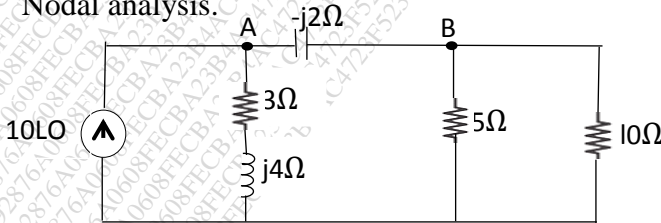
Q.3   a) Define the following terms with suitable example   07
              i.   Tie-set and cut set matrix
              ii.   Oriented graph
              iii.   Incidence matrix
              iv.   Graph of network
          b) For the given graph, write the incidence matrix, reduce incidence matrix, cut set matrix   08
              and number of maximum possible tress.
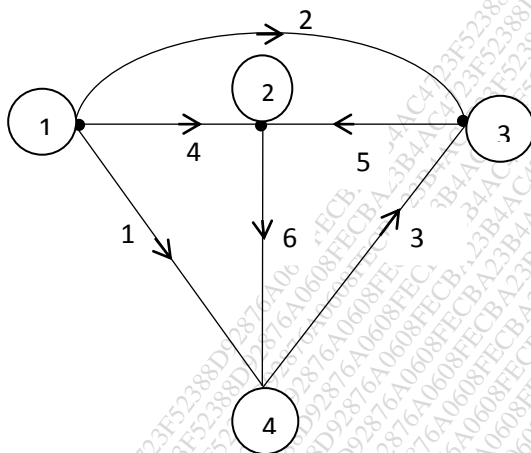
Q.4   a) Define duals and duality. Draw dual network of the given network.   08
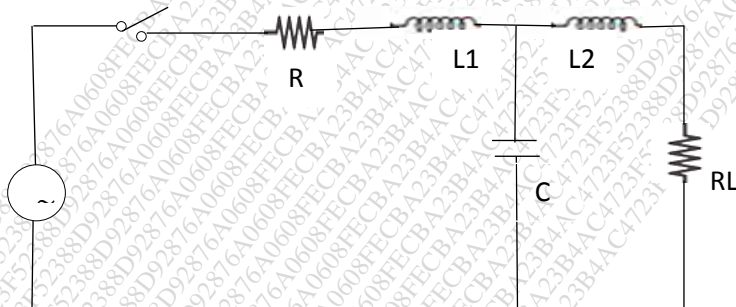
          b) What is mesh or loop analysis? Explain with suitable example.   07

Q.5   Write a short note on   15

              i.   Network topology
              ii.   State and prove Millman's theorem
              iii.   Decibel and Neper

## Section – B

Q.6   Solve any five   10

         a) State four important characteristics of resonant circuit.
         b) Explain briefly ABCD parameters
         c) Why Y parameters are called short circuit admittance parameter
         d) Write a note on initial conditions in basic circuit element.
         e) State Laplace transform of delayed standard time function
         f) Write the Laplace transform of unit step and unit impulse signal
         g) What are the different parameters of two port network?

Q.7   a) Define resonance. Derive the expression for resonant frequency of the series RLC circuit.   08
         b) Derive the relation between duality factor (Qr) and detuning factor (δ) of RLC series   07
            circuit.

Q.8   a) Establish relationship between Z and Y parameters   08
         b) Find the Z parameters of the network shown   07
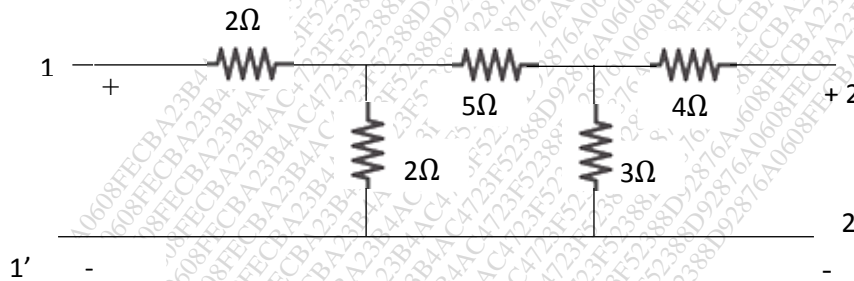
Q.9   a) Define LT of function f (t). Derive the LT of the standard time functions.   08
         b) What is antiresonance? Derive and expression for antiresonant frequency and also prove   07
            that:
$$Xc = X_1(1 + 1/Q_0^2)$$

Q.10   Write a short note on   15
         i.   Comparison of series and parallel resonance
         ii.   Bandwidth and selectivity
         iii.   Interconnection of two port network

Total No. of Printed Pages:4

SUBJECT CODE NO:- H-362
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (ECT/E&C/IE)
Network Analysis
[REV]

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.

N.B
1. Q.1 and Q.6 are compulsory.
2. Solve any two from Q.2 , Q.3 , Q.4 and Q.5
3. Solve any two from Q.7, Q.8, Q.9 and Q.10
4. Figures to the right indicate full marks.
5. Assume suitable data if necessary

Section A

Q.1   Solve any five   10
a) Give the classification of sources
b) Convert the given source into equivalent voltage source of the following network.
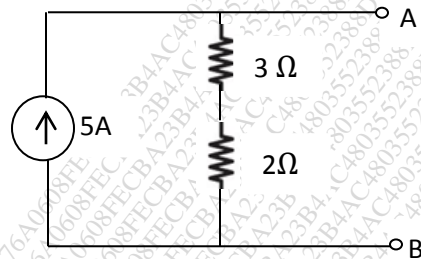
c) What are the properties of the incidence matrix?
d) Which law is used to solve the circuit by nodal analysis?
e) Define Kirchhoff's voltage law
f) What is meant by resonance?
g) Define quality factor.

Q.2   a) Find I1 & I2 of the network shown by mesh analysis.   08
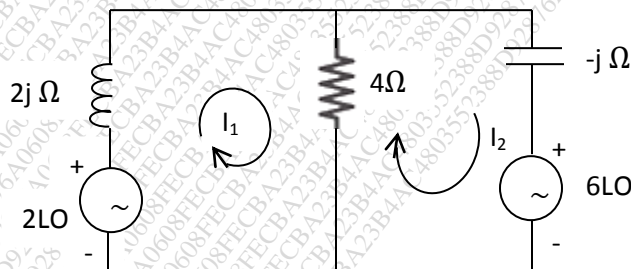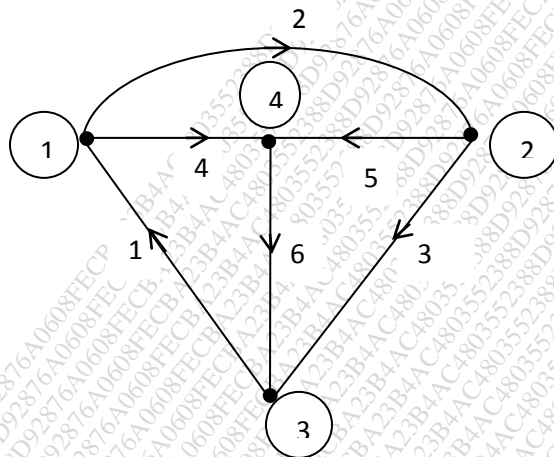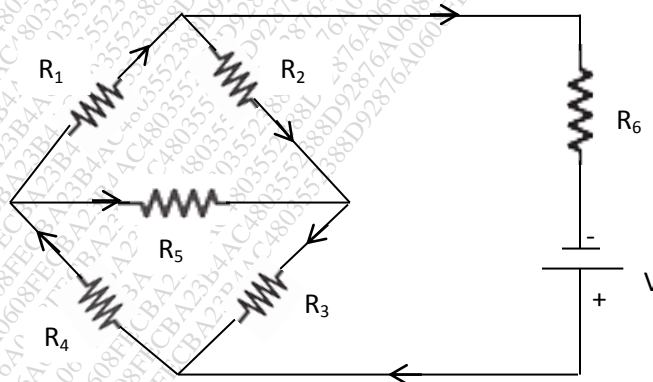
b) For the network write the node voltage equation and find the current in each branch   07
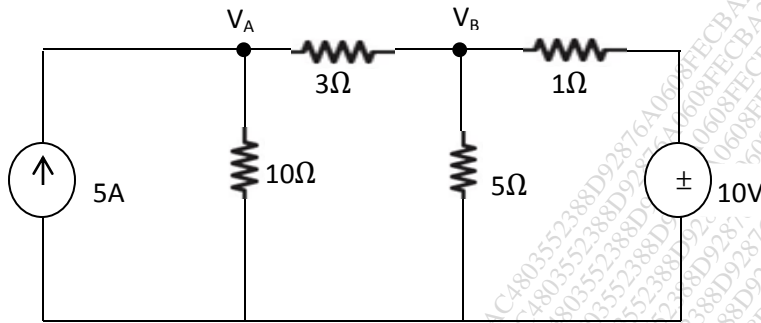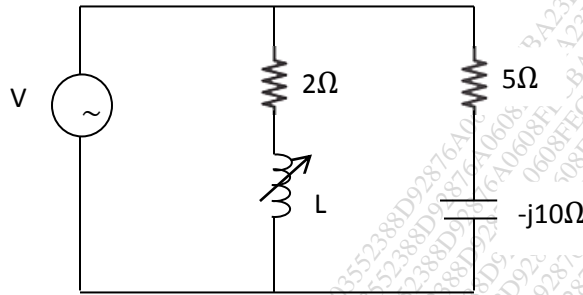

Q.3   a) Find the number of possible trees of the graph shown in following fig.   07

b) A network shown in following fig, draw the oriented graph and hence obtain the incidence 08 matrix.

Q.4   a) Find value of L for which in fig. is resonant at frequency of $\omega=500$rad/s.   07

b) A parallel circuit has a fixed capacitor and variable inductor Q of inductor is 4 and is   08
constant. Find the value of L and C for the circuit impedance of $(100 + j_o)$ at $f =$
2.4 Mhz. What is B.W at matched condition.

Q.5   Write a short note on   15
a) Bandwidth and Selectivity
b) Derivation of delta to star conversion
c) Mesh analysis
d) Series resonance

Section – B

Q.6   Solve any five   10
a) State Superposition theorem
b) On the basis of frequency parameters classify the filters
c) List the different types of transmission line.
d) State reciprocity theorem
e) Why ABCD parameters are called transmission parameters?
f) State the limitations of superposition theorem.
g) Write short circuit admittance parameter.

Q.7   a) Determine the voltage across $(2 + j5)\Omega$ impedance by using superposition theorem.   08
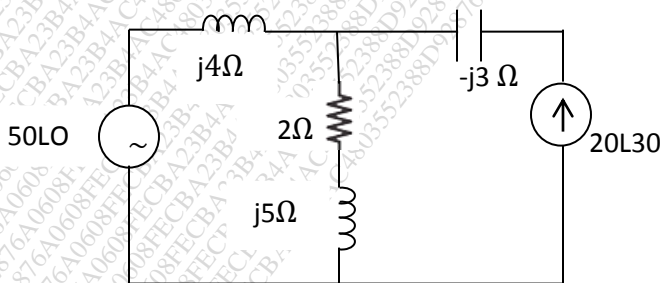
b) State and prove Millman's theorem.   07

Q.8   a) Find the Z- parameter of the network shown in figure   08
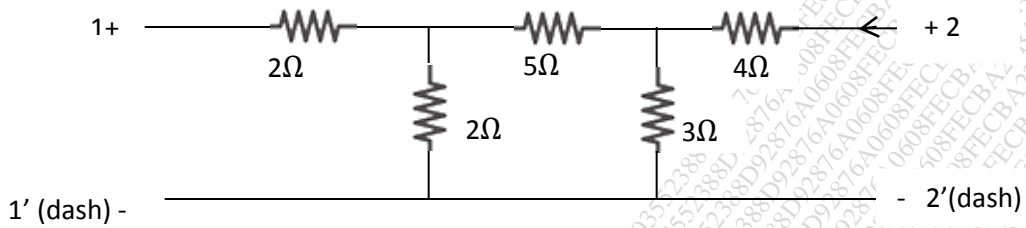
b) Obtain H- parameter in terms of Z –parameter   07

Q.9   a) Explain Decibel and Neper. State the relation between them.   07

      b) Design constant K- low pass filter (π and $T - section$) having cut of frequency of 4 KHz 08
and nominal characteristic impedance of 500Ω.

Q.10   Write short note on   15
1) H- parameter
2) Explain the term primary constant and secondary constant of transmission line
3) Condition of symmetry for Y- Parameter
4) Compensation theorem

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-506
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (ECT)
Elective-I: Internet of Things Embedded System
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B   i) Q.No.1 from section A and Q. No.6 from section B are compulsory.
          ii) Solve any two questions from Q. No.2.3.4, 5 and solve any two questions from
          Q.no7,8,9,10.

Section A

Q.1   Write short note on (any two):   10
          A) Arduino Wi-Fi shield
          B) Features of Arduino and NodeMCu
          C) Models of Raspberry Pi

Q.2   A) Explain function declaration and function calling in c language.   07
          B) Explain how to read and write files inside python using syntax.   08

Q.3   A) Write a program to interfacing of DC motor to Arduino.   07
          B) Explain Arduino UNO pin configuration in detail.   08

Q.4   A) Write a program to interface digital sensor to Raspberrry Pi3.   07
          B) Write difference between Raspberry Pi and NodeMCU.   08

Q.5   A) Draw interfacing diagram and write program to automatic street light control using LDR and 07
          Arduino UNO.
          B) Explain interface of Node MCU to Arduino IDE.   08

Section B

Q.6   Write short note on (any two):   10
          A) Bluetooth Low Energy
          B) Smart Wearable
          C) Industrial internet.

Q.7   A) Explain element and architecture of AMQP.   08
          B) Explain MQTT protocol message format.   07

Q.8   A) Explain example of publishing and subscribing data from web services using Raspberry 08
          Pi3.
          B) Write a program to interface NodeMCU to web services.   07

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Q.9   A) Explain cloud data logging system.   08
       B) Explain concept of home Automation using IoT.   07

Q.10   A) Explain UART for raspberry Pi3.   08
       B) How to configure NodeMCU to connect the serve.   07

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-206
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
Electronics Devices & Circuits - II
[OLD]

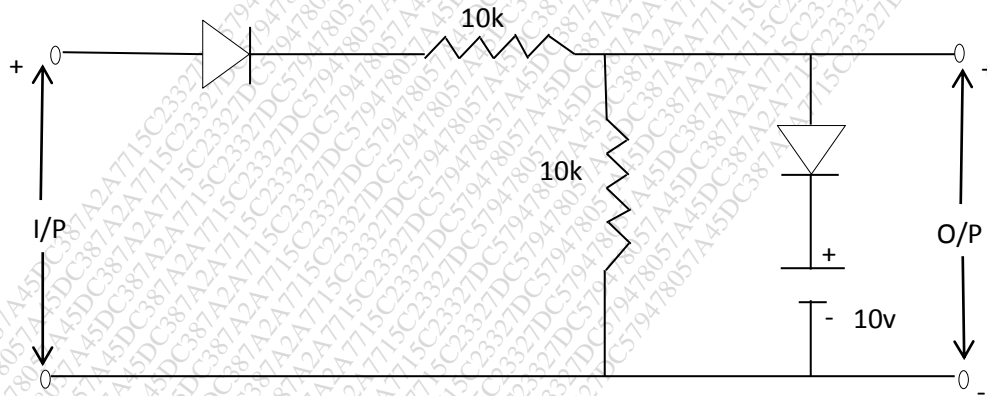[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.

N.B
1) Q. 01 from Section A and Q.06 from Section B are compulsory.
2) Solve any two questions from remaining questions from each section and
3) Assume suitable data wherever necessary.

Section A

Q.1   Solve any five questions:-   10

    a) List the applications of BARITT diode.
    b) Draw the construction of IMPATT diode.
    c) Explain working of LASER diode in brief.
    d) What are ideal characteristics of op-amp?
    e) Draw I/P, O/P wave forms for class AB amp.
    f) What is meant by push pull amplifier?
    g) Draw time domain response of pulse amplifier.
    h) Draw block diagram of operational amplifier.

Q.2   a) Draw and explain V-I characteristics of Tunnel diode.   08
      b) List the types of special purpose diodes and their applications.   07

Q.3   a) Draw and explain RC coupled amplifier.   07
      b) Class-A output stage has an efficiency of 60% if the maximum collector dissipation of   08
        each transistor is 0.5w, calculate the d.c input power and the a.c output power.

Q.4   a) Derive dual input dual output AC analysis of operational Amplifier.   08
      b) Explain why pulse amplifier is needed draw its freq. domain response.   07

Q.5   Write short note on (any three)   15

    a) PIN diode
    b) Heat sink design
    c) Class-B amplifier
    d) Harmonic distortion in power amplifier.

1

Section B

Q.6   Solve any five questions.   10

   a) Draw the response of differentiator for square wave input.
   b) What is clamper? Draw input and output waveform for positive clamper.
   c) Explain in brief the role of commutating capacitor in self-biased binary.
   d) Differentiate between symmetric and asymmetric triggering.
   e) What is RC control blocking oscillator?
   f) What are basic types of sweep generators?
   g) Derive an equation for integrator.
   h) What is the effect of positive clipper circuit?

Q.7   a) What is the effect of negative biasing in negative clamper circuit?   08
       b) Draw the frequency response of integrator for sine wave input.   07

Q.8   a) Draw & Explain Mono Stable multivibrator.   07
       b) For the circuit shown below the input is 50 sin wt. draw the transfer characteristics and 08
           input output wave forms assuming ideal diodes.

Q.9   a) What are different methods for controlling pulse duration in blocking oscillator?   08
       b) Draw and explain Miller's time base generator.   07

Q.10   Write short note on (any three)   15

   a) Schmitt Trigger
   b) Boot strap sweep generator
   c) Current time base generator
   d) Differentiator

2

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-529
FACULTY OF SCIENCE AND TECHNOLOGY
T.E.(ECT/EC/E&C/IE)
Microprocessors And Microcontroller
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1. Q. No. 1 and Q.No.6 are compulsory.
2. Solve any two questions from remaining in each section.
3. Assume suitable additional data / memory locations if necessary.

Section A

Q.1   Solve any **Two** of the following.   10
1) Explain the interrupt structures in 8085 with SIM and RIM interrupt.

2) Explain the various types of instruction formats used in 8085. Give one example of each type.

3) Draw and explain pin diagram of 8085 with its important features.

4) Specify and explain the four control signals commonly used by 8085.

Q.2   a) Explain the different types of instruction set in 8085 with suitable example.   07

b) Define op – code and operand. Specify the following instructions in 8085 with its addressing 08
mode.
   i.   STA 2600H.   ii.   MVI A, 00H.
   iii.   SHLD Addr.   iv.   ANA, r.

Q.3   a) Draw the flow- chart and write ALP of 8085 to find the largest number from the series of 08
number with its specific memory location.

b) Write a routine to enable RST 5.5 and disable RST 6.5 and RST 7.5 interrupt.   07

Q.4   a) Draw and explain the timing diagram of MVI A, data.   08

b) Explain the salient features of 8253 and 8259 in detail.   07

Q.5   a) With the help of neat diagram, explain interfacing of a seven segment display with 8085, and 08
write a program to implement decimal counter.

b) Write a program to generate a continuous square wave of 5 KHz using 8253. Assume clock 07
freq. of 1 MHz

1

Section B

Q.6 Solve any **Two** of the following.   10
1) Describe the programming model and memory organization in 8051 μ controller.
2) Explain the comparison between microprocessor and micro controller example and outcomes.
3) Explain interrupt structure available in 8051 micro controller.
4) Discuss the criteria for selecting a microcontroller device.

Q.7 a) Describe the architecture of 8051 with block diagram.   08

     b) Discuss and comment on the program and data memories of 8051 microcontroller.   07

Q.8 a) Explain the operation of mnemonics with comments on following instructions of 8051 microcontroller.   08
       i)   MOV X, @ DPTR
       ii)   MOV 36H, 23H.
       iii)   ORL 34H, # 35H.
       iv)   SUB B A, 56H.

     b) Write ALP for 8051 to add two 8- bit numbers which are stored at internal RAM location 20H and 21H. Store the 16- bit result at 30H and 31H.   07

Q.9 a) Describe the different serial data transmission modes which are supported for 8051.   07

     b) Explain different data transfer group which supports for 8051.   08

Q.10 a) Draw the interfacing of stepper motor with 8051 micro controller; write a program to rotate the stepper motor clockwise continuously by step angle 1.8°.   08

     b) Draw the interfacing of DAC with 8051. Write the program to generate square wave with clock frequency of 50Hz and amplitude 10v.   07

2

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-463
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC/ECT/E&C)
Elective-I: Android Technology
(REVISED)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.
N.B   i) Question No.1 and 6 are compulsory.
               ii) Solve any two question from Q. No.2 to 5 and Q. No.7 to 10
               iii) Assume suitable data if required.

Section A

Q.1   Solve any two from the following   10
        a) Differentiate between private and protected class members in oop.
        b) Define Inheritance. Explain multi-level inheritance. with programing example.
        c) Importance of Destructor.
        d) Differentiate between static and dynamic binding.

Q.2   a) Write a program which explains the concept of single level inheritance.   07

        b) Explain all types of constructor with programming example.   08

Q.3   a) List out the advantages and applications of object oriented programming.   07

        b) Define Identifier . what are the rules to be followed for Identifier?   08

Q.4   a) Discuss the Exception Handling in Java. Along with it advantages and limitations. 07

        b) Explain the term packages in Java? List out the advantages of using packages in Java. 08

Q.5   a) Explain in detail about Android development tools   07

        b) Explain how to create , save and retrieve shared preferences in android application. 08

1

Section B

Q.6   Solve any two from the following   10
   a) Explain telephony in Android OS.
   b) Enlist methods used in controlling audio and video.
   c) Explain how to manage Device discoverability.
   d) What do you mean by Alert dialogs? Explain.

Q.7   a) What do you mean by Android Layouts? Explain linear , Relative and Table Layouts.   07

   b) How to create menus in Android . Explain with example.   08

Q.8   a) Write short note on use of location based services in Android application.   07

   b) How to send SMS and MMS from Android application? Explain in detail.   08

Q.9   a) How to manage local Bluetooth Device adapter? Explain in detail.   07

   b) What is SQLite database? How to provide database connection using SQLite database?   08

Q.10 a) Explain how to share database among two different applications using content provider.   07

   b) Explain and list out the limitations while designing a widget.   08

Total No. of Printed Pages:2

SUBJECT CODE NO: H-493
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC/ECT/E&C)
Elective-I: Advanced Industrial Automation
(REVISED)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.
N.B   i) Q.No.1 and 6 are compulsory.
             ii) Solve any Two questions from section 'A' and solve any Two questions from section
             'B' from remaining.

Section A

Q.1   Write a short note on following any two.   10
       a) Differential pressure transmitter
       b) Reed switch
       c) Plant Automation

Q.2   a) What is need of Transmitter? Explain Smart Transmitter.   08
       b) Draw & Explain a standard symbol set for process loop components.   07

Q.3   a) Why positioner is essential in Automation? How it effects the performance of control   08
          valve?
       b) What do you mean by process control? Why it is necessary?   07

Q.4   a) What is significance of the current to pneumatic converter? Explain it in detail.   08
       b) Explain the concept of volume booster & pressure booster. Explain with the help of   07
          suitable example.

Q.5   a) How drives are beneficiary to industry application? Explain DC Drive.   08
       b) What are the advantages of SMART transmitter over conventional transmitter?   07

Section B

Q.6   Write a short note on following (any two)   10
       a) Interfacing PLC with pneumatic system
       b) DeviceNet
       c) SCADA

Q.7   a) Draw the pneumatic control circuit for P^+Q^+ P^-Q^- sequence.   08
       b) Draw & Explain architecture of DCS in detail.   07

Q.8   a) Develop a LAD logic for following. When switch is turned ON.   08
          i)   A light & fan are turned ON. When switch is turned OFF.
          ii)   The light goes OFF immediately but fan remains ON for another 15 sec & then goes
                OFF.

1

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b) Describe the HART protocol. Explain about frame structure & programming system.   07

Q.9   a) Explain the different transmission modes of Modbus.   08
       b) Explain the DCS function   07
          i)   Alarm management
          ii)   Third party interface

Q.10   a) Explain different types of timer used in PLC LAD programming.   08
       b) Explain the structure of foundation field bus state advantages of foundation bus.   07

2

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-160
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (EC/ECT/IEC/E&C)
Microcontroller & Advanced Processors
(OLD)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.

N.B
      i) Q.No.1 & 6 are compulsory
      ii) Answer any two questions from the remaining questions of each section
      iii) Assume suitable data whenever necessary

SECTION A

Q.1   Answer any two   10
      a) Explain maximum mode configuration
      b) Explain memory segmentation in 8086
      c) Explain the following
             1. DUP
             2. DB
             3. SEGMENT

Q.2   a) Explain an Addressing mode of 8086   08
     b) WAP using 8086 to add two 16-bits numbers stored in Num 1 & Num 2. Store the result in 07
        Num 3.

Q.3   a) Explain interrupt in 8086   08
     b) Interface the steeper motor with 8086.WAP to rotate steeper motor in clockwise direction 07

Q.4   a) Explain instruction format of 8086   08
     b) Draw and explain 8086 Architecture   07

Q.5   Write short Note (any three)   15
      a) Conditional Jump Instructions
      b) D/A interfacing with 8086
      c) Stack of 8086
      d) Flag register of 8086

SECTION B

Q.6   Solve any two   10
        a) Enlist features of Pentium Processor
        b) Give difference between microprocessor & microcontroller
        c) WAP to generate delay of 2ms with crystal of 12MH$_Z$ using timer in 8051

Q.7   a) Explain the Architecture of 80386   08
        b) Explain the block diagram of 8051   07

Q.8   a) Explain following instruction of 8051   08
            1. MUL A,B
            2. INCA
            3. RLA
            4. XRL direct, A

        b) Explain serial communication in 8051   07

Q.9   Design an 8051 based microcontroller system with following specification   15
            1. 12MH$_Z$ frequency & Power on Reset
            2. 16 KB EPROM
            3. 8KB ROM
            4. One 8255

Q.10   Write short note (any three)   15
            1. Psw of 8051
            2. Steeper motor interfacing with 8051
            3. Timer in 8051
            4. PVAm

2

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-148
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC/ECT/E&C)
Optical Fiber Communication
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B   i) Q. No5 from section A & Q. No 10 from section B are compulsory.
             ii) Attempt any two questions from remaining questions of each section.

Section A

Q.1   (a) Explain modulation techniques in official fibre communication system.   08
       (b) Explain advantages of optical fibre communication system in detail   07

Q.2   (a) Explain photo detector parameters in detail?   07
       (b) Explain optoisolators in detail   08

Q.3   (a) Explain scattering and dispersion in detail related to ofc system.   07
       (b) Explain attenuation and absorption in detail related to ofc system.   08

Q.4   (a) Explain various losses in optical fibre communication system.   08
       (b) Explain photodiode and photo transistor of ofc system in detail.   07

Q.5   Write short note (any two)   10
       (a) Splices and Connectors
       (b) optoisolators
       (c) LED and Laser
       (d) Types of optical fiber.

Section B

Attempt any three
Q.6   (a) Explain noise penalties in detail?   08
       (b) Explain WDM in detail?   07

Q.7   (a) Explain link power Budget and Rise time budget related to foc system in detail.   07
       (b) Explain network topologies in detail.   08

Q.8   (a) Describe Eye design test in detail.   07
       (b) Explain OTDR measurement in detail.   08

Q.9   (a) Explain measurement standards of foc in details.   08
       (b) Explain optical time domain reflectometer in detail   07

1

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Q.10   Write Short note on : (any two)   10

1. Optical Ethernet
2. SONET
3. Optical fiber characteristics.
4. SDH Tracking

2

Total No. of Printed Pages:03

SUBJECT CODE NO:- H-136
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
Signals & Systems
(OLD)

[Time: Three Hours]   **[Max.Marks:80]**

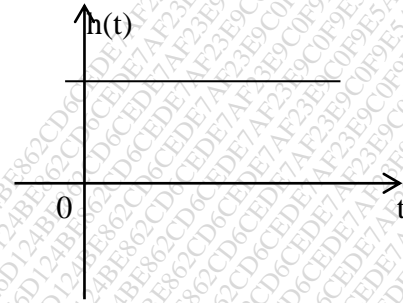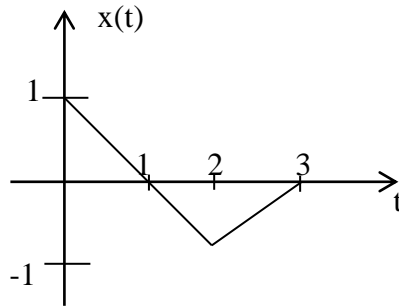Please check whether you have got the right question paper.
N.B
1) Q.No.1 and Q.No.6 are compulsory.
2) Attempt any two questions from Q. No. 2 to Q. No. 5 and Q. No. 7 to Q. No. 10.
3) Assume suitable data if necessary.

Section A

Q.1   Attempt any five.   10

a) What is fundamental time period of $cos\ (0.01\pi n)$
b) Give examples of continuous time & Discrete time signal.
c) Define with example stable and unstable system.
d) Enlist types of signals & systems.
e) What is mean by signals? Represent it in terms of variables.
f) State the properties of convolution integral.

Q.2   a) Sketch $y(t) = 2u(t) - 2u(t-4) - 2u(t-6) + 2u(t-2)$.   07

b) Check whether the system is Causal / Non-Causal for following-   08
i) $y(t) = x(t).\cos wt$
ii) $T[x(n)] = ax(n) + b$
iii) $y(t) = x(t^2)$
iv) $y(n) = \sum_{k=0}^{2} x(n-k)$

Q.3   a) Find output of LTI system to unit step Input Signal having impulse response is   07
$h(t) = \frac{R}{L} . e^{-t \frac{R}{L}} . u(t)$ for all 't'

b) Obtain convolution sum.   08
i) $x(n) = \{1,1,0,1,1\}$ & $h(n) = \{1,-2,-3,4\}$
ii) $x(n) = \{1,2,1,2\}$ & $h(n) = u(n)$

Q.4   a) Determine whether the following signals are periodic/ Non-periodic.   08

i) $\sin 3n$
ii) $cos\left(\frac{2\pi n}{5}\right) + \cos\left(\frac{2\pi n}{7}\right)$
iii) $\cos 3\pi n$
iv) $\cos(n/8).\cos\left(\frac{n\pi}{8}\right)$

1

H-136

b) Obtain convolution of   07

Q.5   a) What is system? Classify & explain it in details.   07

b) Sketch following signals for   08
$x(t) = 2 \qquad -2 \leq t \leq 2$
$\quad\quad = 0 \qquad otherwise$
   i) $x(-2-t)$
   ii)   Odd part
   iii) $2x(t) + \delta(t)$
   iv) $2x(1-t)$

Section B

Q.6   Attempt any five:-   10

a) What is correlation? Define correlogram.
b) Explain the value of auto correlation function for energy signal at origin.
c) Give explanation for ESD of energy signal is even/symmetric.
d) Give formula to identify ESD.
e) Define Fourier series. Explain its types.
f) Explain the effect of under sampling.

Q.7   a) Obtain Exponential Fourier series of following signal.   07

2
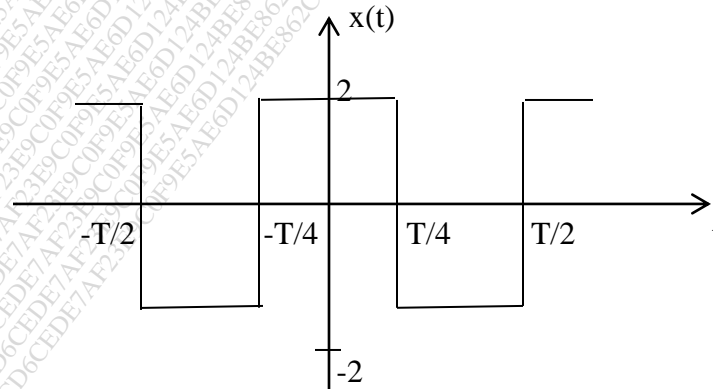
b) State & explain following properties of Fourier transform 08

   i) Time scaling

   ii) Time Differentiation

   iii)   Complex conjugate

   iv)   Convolution.

Q.8   a) Draw Correlogram of 07
$x(t) = A \sin(2 \pi f t)$

b) Show that, the cross correlation of two energy signal corresponding to multiplication of 08
Fourier transform of one signal by complex conjugate of Fourier transform of other
signal.

Q.9   a) Explain the properties of ESD. 07

b) For decaying exponential signal given below, Find percentage of total energy obtained 08
inside the frequency band
$-w \le f \le w$ where $w = a/2\pi$

Q.10   a) Write a short note on Reconstruction of continuous time signal. 05

b) Using properties of autocorrelation, find power of $x(t) = \cos Wot$ 10

Total No. of Printed Pages:3

SUBJECT CODE NO: H-125
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (EC/ECT/E&C)
Signal Coding & Estimation Theory
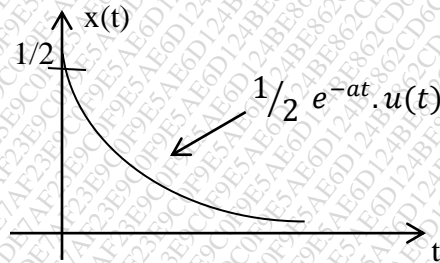**(OLD)**

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B   i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
             ii) Attempt any two questions from the remaining questions in each section

Section A

Q.1   Write short notes on : (any 2)   10
      a) Lossless channel
      b) Run length coding
      c) Prefix codes

Q.2   a) Prove that mutual information of a channel is related to Joint entropy of the channel by   07
         relation.
         $I(x, y) = H(x) + H(y) - H(x, y)$

      b) A source consist of 4 letters A, B, C and D, for transmission each letter is coded into a   08
         sequence of two binary pulses. A is represented by 00, B by 01, C by 10 and D by 11. The
         probability of occurrence of each letter is $P(A) = \frac{1}{5}, P(B) = \frac{1}{4}, P(C) = \frac{1}{4}$ and $P(D) = \frac{3}{10}$.
         Determine the entropy of the source and average rate of transmission of information.

Q.3   a) Explain Huffman coding algorithm with me example.   07

      b) Apply the Shannon-fano coding procedure for following message ensemble and determine   08
         the average length and efficiency of the coded system.
         $[M] = [m_0, m_1, m_2, m_3, m_4, m_5, m_6, m_7]$

         $[P] = \left[\frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{16}, \frac{1}{16}, \frac{1}{4}, \frac{1}{16}, \frac{1}{8} \right]$

1

Q.4 a) Two binary symmetrical channels are connected in cascade as shown in figure. Find the 08
channel matrix of resultant channel. Also find $P(z_1)$ and $P(z_2)$ if $P(x_1) = 0.6$ and
$P(x_2) = 0.4$
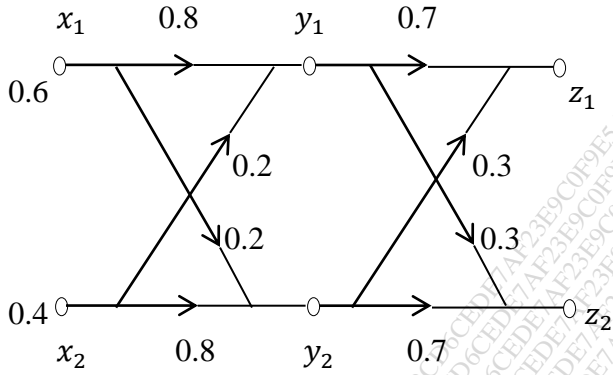
  b) Compare between Binary Symmetric channel and Binary Erasure Channel. 07

Q.5 a) Prove that entropy of a information sources is maximum when messages are equally likely. 07
  b) State and prove channel coding theorem. 08

Section B

Q.6 Answer <u>any two</u>. 10
  a) Hamming weight & Hamming distance
  b) Trellas coded modulation
  c) Golay codes & fire codes

Q.7 a) For a systematic linear block code, the three parity check digits C_4, C_5, C_6 are given by , 10
$C_4 = d_1 \oplus d_2 \oplus d_3$
$C_5 = d_1 \oplus d_2$
$C_6 = d_1 \oplus d_3$

   i) Construct generator matrix
   ii) Construct code generated
   iii) Determine error correcting capabilities.
   iv) Decode the receive words
     101100 and 000110

  b) Explain syndrome decoding of (n, k) block codes. 05

2

Q.8   a) The generator polynomial of a (7,4) cyclic code is $g(x) = 1 + x + x^3$. Find the 16   08
       codewords of this code.

       b) Explain BCH codes.   07

Q.9   What is estimation theory? Explain maximum likely hood estimation and least square estimation   15
methods.

Q.10   a) Explain time domain approach of convolutional codes.   08
       b) Explain Viterbi decoding algorithm with one example.   07

3

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-115
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC/ECT/E&C)
Computer Communication Network
(REVISED)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.

N.B
1. Q.1 & Q.6 are compulsory
2. Solve any two from Q.2, Q.3, Q.4 & Q.5 of sections A & from Q.7, Q.8, Q.9, Q.10 of section B
3. Figure to the right indicate full marks

Section A

Q.1
a) With the help of suitable diagram explain TCP/IP reference model.   05
b) Define & explain topologies of network.   05

Q.2
a) Explain different computer network with suitable diagram.   08
b) What are different design issues of network?   07

Q.3
a) Explain in detail distance vector routing algorithm.   08
b) Explain sliding window protocol in detail   07

Q.4
a) With the help of suitable diagram explain TCP connection establishment.   08
b) Explain E- mail with its basic function   07

Q.5   Write a short note on (any three)   15
   a) WWW
   b) UDP
   c) Framing
   d) A simplex stop & wait protocol

Sections B

Q.6
a) Describe Basic ISDN interface.   05
b) Discuss in brief user network interface configuration   05

Q.7
a) Explain B- ISDN protocol architecture   07
b) What are different services provided by N-ISDN & B-ISDN   08

1

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Q.8   a) Explain frame relay congestion control algorithms   08
        b) Explain ATM adaptation layer in detail   07

Q.9   a) Discuss in brief traditional cryptography techniques.   07
        b) What do you mean by cryptography? Explain public key algorithm RSA   08

Q.10   Write a short note on (any three)   15
        a) DLCI
        b) ATM cell format
        c) Steganography
        d) Secrete key algorithm

Total No. of Printed Pages:2

SUBJECT CODE NO: H-231
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (ECT/E&C)
Elective-II: Robotics
(REVISED)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B
- i)   Assume suitable data if necessary.
- ii) Q. No. 1 & Q. No.6 are compulsory then solve any two questions from each Section A and B

Section A

Q.1 Answer the following questions.   10
- a) What are different joints?
- b) What are components of robot system?
- c) What is dynamic constraints?
- d) What are matrix operations?
- e) What is kinematics of robotic arm?

Q.2   a) Explain the term automation & robotics   08
      b) Explain basic structure of robotic arm.   07

Q.3   a) What is a present & future trend in robotics?   08
      b) Explain Newton's & Euler's equation.   07

Q.4   a) What is D-H. Matrix? Explain in detail.   08
      b) Consider a vector $\overline{V} = 3i + 4j + 5k$ give its homogeneous representation with   07
          $S = 0,1,2, \& -10$.

Q.5   a) A frame F has moved nine units along X axis & five units along Z axis of the ref. frame. Find   08
          the new location of the frame F:
$$F = \begin{bmatrix} .527 & -.574 & .628 & 5 \\ .369 & .819 & .439 & 3 \\ -.766 & 0 & .643 & 8 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

      b) If $\overline{x} = 1 + 2j + 3k$ & $j = 4i + 5j + 6k$ find $\overline{x}.\overline{y}$ & $\overline{x} \times \overline{y}$ in homogeneous coordinate system 07

Section B

Q.6 Answer the following questions   10
- a) What is object recognition?
- b) What are different electrical actuators?
- c) What is image processing?
- d) State different proximity sensors?
- e) What are different grippers?

1

H-231

| Q.7 | a) | What are different applications of machine vision system? | 08 |
| | b) | What is image description, sensing & digitization? | 07 |

| Q.8 | a) | Explain obstacle avoidance system | 08 |
| | b) | Explain Jacobian in terms of D-H matrix. | 07 |

| Q.9 | a) | What are different force sensors? Explain any one. | 08 |
| | b) | What are different touch & slip sensors? Explain functions of touch & slip sensors | 07 |

| Q.10 | a) | Explain adhesive gripper in detail. | 08 |
| | b) | Explain magnetic end effecter in detail | 07 |

Total No. of Printed Pages:2

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SUBJECT CODE NO: H-235
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC/ECT/E&C)
Elective-II: Advanced Industrial Automation - II
(REVISED)

</div>

[Time: Three Hours]　　　　　　　　　　　　　　　　　　　　　　　　　　　　**[Max.Marks:80]**

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Please check whether you have got the right question paper.

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N.B　　　　　　　　i) Q.No.1 and 6 are compulsory.
　　　　　　　　　　ii) Solve any two questions from remaining from each section.

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Section A

</div>

Q.1　Write a short note on <u>any two</u> of following.　　　　　　　　　　　　　　　　10
　　　　a) Pneumatic direction control valve
　　　　b) P-I diagram
　　　　c) Recipe management

Q.2　a) Develop an Electro-pneumatic control circuit to execute motor forward – Reverse Logic.　08
　　　b) Explain Mounting & Installation guideline of control panel design.　　　　　　07

Q.3　a) Develop $A^+ B^- B^+ A^-$ pneumatic control circuit using cascade method.　　　08
　　　b) Explain any typical P-I Diagram with appropriate diagram.　　　　　　　　07

Q.4　a) Explain SCADA system configuration with neat diagram.　　　　　　　　　08
　　　b) Explain Electro pneumatic system in detail.　　　　　　　　　　　　　07

Q.5　a) Explain significance of pneumatic time delay valve with suitable example.　　08
　　　b) What are different SCADA protocols? Explain in detail.　　　　　　　　　07

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Section B

</div>

Q.6　Write a short note on <u>any two</u> of following.　　　　　　　　　　　　　　10
　　　　a) Pressure relief valve
　　　　b) Kick of meeting
　　　　c) Kiln Automation

Q.7　a) Develop hydraulic control circuit to generate the sequence of $A^+ B^+ B^- A^-$ by using PRV.　08
　　　b) Explain in detail Man-Machine interface of Thermal power plant DCS.　　07

<div align="center">

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Q.8   a) Develop carton sorting with suitable operational diagram & explain it in detail.   08
       b) What is pascal law? Explain hydrostatic & hydraudynamic in detail.   07

Q.9   a) Explain irrigation canal automation strategy with its block diagram.   08
       b) Give difference between hydraulics & pneumatics.   07

Q.10   a) Design Dough maker with operation diagram, logic diagram and control panel diagram.   10
       b) Explain hydraulic system with its block schematic.   05

Total No. of Printed Pages:3

SUBJECT CODE NO: H-195
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (EC/ECT/IEC/E&C)
Electronics System Design
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B   i) Q.No.1 and Q.No.6 are compulsory.
             ii) Solve any two questions from remaining questions of each section A & B.
             iii) Assume suitable components and data wherever necessary.
             iv) Figures to the right indicate full marks.
             v) Required data sheet is provided.

Section A

Q.1   Solve any two.   10
       a) Explain the types and selection criteria in design for resistors.
       b) Explain the importance of fuse and filter capacitor in DC power supply.
       c) Explain the measurement setup of temperature by thermistor.
       d) Explain the role of transformer in regulated power supply.

Q.2   a) Explain over current & over voltage protection circuits.   07
       b) Design a regulated power supply using LM317 with given specification V_O = 3V to 20V,   08
          load current = 0.5 A.

Q.3   a) Derive an o/p equation of op-amp based integrator.   07
       b) Design an instrumentation amp[r] (using three opamps) with the following specifications. Gain   08
          can be varied over the range $1V/V \leq A \leq 10^3 \, V/V$ by means of $100k\Omega$ pot.

Q.4   a) Explain measurement of strain and working principle of strain gauge.   07
       b) Design monostable multivibrator using IC 741 opamp for pulse duration of 100 msec with   08
          reference voltage of 5V use $V_{cc} = \pm15V$

Q.5   a) Discuss Auto zero phase, signal integrate phase and de-integrate phase which is used in IC   07
          7106 / 7107. Also draw the typical integrator amplifier output waveform (at INT pin)
       b) Design AM detector with following specifications   08
          $R_i = 8k\Omega$, $f_m = 7KH_z$, $f_c = 450KH_z$ and modulation index of 0.7

Section B

Q.6   Solve any two.   10
       i)   Define the terms MTTR, MTBF & MTTF.
       ii)   Explain noise due to ground and supply line.
       iii)   Explain PCB design rules for analog circuits.
       iv)   Explain features of IC 555.

1

Q.7	a)	Design PLL using IC 565 for VCO o/p frequency of 3KHz. Also calculate the lock range, capture range, use $\pm V_{cc} = 10V$.	08
	b)	Explain interfacing of relay to digital circuits by drawing a neat circuit diagram.	07
Q.8	a)	Design mod-6 counter using 7490.	07
	b)	Explain working of function generator using ICL 8038.	08
Q.9	a)	Describe various design considerations to ensure reliability of an electronic product.	07
	b)	Explain electronics system design consideration and selection of material for enclosure.	08
Q.10	a)	Discuss the various types of signal grounds.	07
	b)	Explain in detail guarding.	08

Data Sheet

		Device	Type	Icmax	VcEo	Vcbo	Ptmax	Life min	f_r
1.		General Purpose Transistors:							
	1)	2N 2996	NPN	100 mA	18 V	18 V	200 MW	200	200 MHz
	2)	BFY 51	NPN	1 Amp	30 V	60 V	800 MW		50 MHz
	3)	2N 3702	PNP	200 mA	25 V	40 V	300 MW		100 MHz
	4)	BCY 70	PNP	20 mA	40 V	50 V	300 MW		200 MHz
2.		Small Signal Transistors:							
	1)	BC 107	NPN	100 mA	45 V	50 V	300 MW	110	
	2)	BC 157	PNP	100 mA	45 V	50 V	300 MW	470	
3.		Switching transistors:							
	1)	2N 2219 A	NPN	800 mA	40 V	75 V	800 MW	75	200 MHz
	2)	2N 2905	PNP	600 mA	40 V	60 V	600 MW	150	
4.		RF Transistors:							
	1)	2N 2969 A	NPN	200 mA	15 V	40 V	360 MW	40	500 MHz
	2)	BFY 90	NPN	50 mA	15 V		200 MW		14 GHz
	3)	BC 177	PNP	100 mA	45 V	50 V	300 MW	75	130 MHz
	4)	BC 178	PNP	100 mA	25 V	30 V	300 MW	75	130 MHz
5.		Driver Transistors:							
	1)	2N 3053	NPN	700 mA	40 V	60 V	800 MW	125	100 MHz
	2)	2N 2905	PNP	1 A	40 V		600 MW	100	

6.   Power Transistor:

1)	2N 3055	NPN	15 A	60 V	100 V	115 W	20	1 MHz
2)	BD 131	NPN	3 A	45 V	70 V	15 W	20	60 MHz
3)	BD 132	PNP	3 A	45 V	45 V	15 W	20	60 MHz
4)	TIP 31 A	NPN	3 A	60 V	60 V	40 W	10	8 MHz
5)	TIP 32 A	PNP	3 A	60 V		40 W		8 MHz
6)	SL 100	NPN	0.5 A	50 V		4 W	40	
7)	SK 100	PNP	0.5 A	50 V		4 W	40	

7.   Darlington Transistors:

1)	TIP 132	NPN	8 A	100 V	100 V	70 W	1000	1 MHz
2)	TIP 137	PNP	8 A	100 V	100 V	70 W	1000	1 MHz

1. Resistor Std. Values ($\Omega, k\Omega, M\Omega$, with fixed values) :
1.0, 1.1, 1.2, 1.3, 1.5, 1.6, 1.6, 2.0, 2.2, 2.4, 2.7, 3.0, 3.3, 3.6, 3.9, 4.3, 4.7, 5.1, 5.6, 6.2, 6.8, 7.5, 8.2, 9.1.

2. Capacitance Values ($\mu F, nF, pF$):
0.1, 0.15, 0.22, 0.33, 0.47, 0.60 and multiplies of 10.

3. Inductance Values ($H, mH, \mu H$):
1.0, 1.1, 1.2, 1.3, 1.5, 1.6, 1.8, 2.0, 2.2, 2.4, 2.7, 3.0, 3.3, 3.6, 3.9,3.9, 4.7, 5.1, 5.6, 6.2, 6.8, 7.5, 3.2, 9.1

4.   Diodes:

Normal:	Device	PIV	I_f
	EC 103	100 V	3 Amp
	EC 403	400 V	3 Amp
Rectifier :	IN 4001	50 V	1 Amp
	IN 4007	1000 V	1 Amp

5. Zener Diodes:

Types No:	V_s	$I_n(mA)$	$Z_n(\Omega)$	$I_m(mA)$
1N 4370	2.4 V	20	30	150
1N 4371	2.7 V	20	30	135
1N 4372	3.0 V	20	29	120
1N 746	3.3 V	20	20	110
1N 747	3.6 V	20	24	100
1N 748	3.9 V	20	23	95
1N 749	4.3 V	20	22	85
1N 750	4.7 V	20	19	75

3

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-205
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
Signals and Systems
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
    i.   Q.No.1 and Q.No.6 are compulsory.
    ii.   Attempt any two from Q2 to Q5 and Q7 to Q10
    iii.   Assume suitable data if required

Section A

Q.1   Attempt <u>any five</u> questions   10
       a) Define Gaussian function
       b) Determine the power and rms value of the signal $x(t) = 7\cos\left(20t + \frac{\pi}{2}\right)$
       c) Write properties of continuous time Fourier series.
       d) State conditions to verify even/odd signals.
       e) Analogy between CTFS and DTFS.
       f) Describe static and dynamic system.
       g) Compare deterministic & nondeterministic

Q.2   a) Sketch the following signal given as   08
       $x(t) = r(t + 1) - r(t) + r(t - 2)$
       $x(t) = u(t + 1) - 2u(t)$

       b) What is mean by linear & nonlinear system? Determine the following system is linear or not. 07
          If not give suitable condition for linearity. $y(t) = \frac{1}{12}x(t) - \frac{5}{6}$

Q.3   a) Compute convolution integral of $x_1(t) = u(t)$ and $x_2(t) = u(t - 2)$ 08

       b) What is LTI system and its impulse response? And also discuss the importance of impulse 07
          response of LTI system in system analysis.

Q.4   a) Find trigonometric Fourier series of the wave shown in fig.   08

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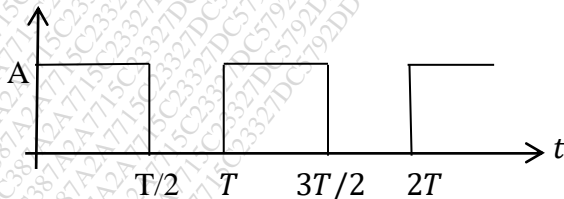
b) Obtain the Fourier transform of the delta function shown in fig.   07

$$x(t) = \delta(t)$$
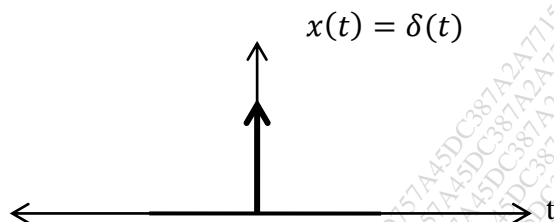
Q.5   Write short notes on (any three)   15
       a) Energy signal & power signal
       b) Properties of convolution sum
       c) Explain system interconnection
       d) Explain merits and limitations of Fourier transform

Section B

Q.6   Attempt any five questions   10
       a) Explain the significance region of convergence for Laplace transform
       b) Find Laplace transform of $x(t) = (t-3)^2$
       c) What is instantaneous & average normalized power?
       d) State any two properties of ESD
       e) Explain effect of under sampling
       f) Define correlation & correlogram
       g) Calculate the total energy for the signal $x(t) = A sinc(2wt)$

Q.7   a) State and Prove any four properties of Laplace Transform   08
       b) Find Laplace transform of signals and Draw ROC.   07
$$x(t) = \cos\left(3t + \frac{\pi}{4}\right)u(t)$$

Q.8   a) Draw the correlogram of the signals $x(t)$ and $y(t)$ if $x(t) = A\sin(2\pi ft)$ and   08
         $y(t) = A\cos(2\pi ft)$
       b) Define and state properties of cross correlation find ACF of DT signal $x_n = \{1,2,3,0,-1\}$ 07

Q.9   a) State and explain the properties of PSD in detail   07
       b) Find ESD and total energy of the given signal   08
         $x(t) = A\sin C(2wt)$

Q.10   Write short notes on(any three)   15
       a) Pole zero concept in LT
       b) Interrelation between correlation and spectral density
       c) Sampling of band pass signals
       d) Inversion using duality

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-326
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
Electronics Devices & Circuits-I
(OLD)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.
N.B   1) Q.No. 1 and Q. No. 6 are compulsory.
                       2) Solve three questions from each Section.
Section A

Q.1   Answer the following questions (Any five)   10

           a) What is Avalanche breakdown?
           b) Draw the construction of point contact diode.
           c) What is stability factor?
           d) What is thermal runaway in transistors?
           e) What is pinch off voltage?
           f) Draw MOSFET as an Amplifier.
           g) What is MOSFET capacitance?

Q.2   a) Explain the Qualitative theory of PN Junction diode. Draw its volt-ampere   08
              characteristics.

           b) Draw and explain the operation of half wave rectifier using capacitor filter. Draw input   07
              and output waveforms.

Q.3   a) Explain the voltage divider biasing method for transistor. State its advantages.   08

           b) What is CMOS Inverter? Explain.   07

Q.4   a) What is Power MOSFET? Explain. State its applications.   08

           b) Compare FET with MOSFET and BJT.   07

Q.5   Write notes on:-   15

           a) Solar cells
           b) Darlington Amplifier
           c) Handling precautions of CMOS Devices.

1

H-326

Section B

Q.6		Answer the following questions: (Any five)	10

        a) Draw the high frequency equivalent circuit of BJT.
        b) What is Video Amplifier?
        c) What is voltage series and voltage shunt feedback?
        d) Draw Wien Bridge Oscillator.
        e) What is the principle of positive feedback?
        f) What is Emitter follower?
        g) State the advantages of RC phase shift oscillator.

Q.7   a) What is Hetrojunction Bipolar transistor? Explain.   08

          b) Draw and explain high frequency equivalent circuit for FET amplifier.   07

Q.8   a) Explain the effect of Negative feedback on Input and output impedance, voltage and   08
           current gain, Bandwidth, Noise and distortion of amplifier. [In brief].

          b) Draw and explain the operation of Hartley oscillator. State its advantages.   07

Q.9   a) Define:- i) F_α 08
                ii) F_β
                iii) F_T
                iv) G,B,W.

          b) Draw and explain UJT relaxation oscillator.   07

Q.10   Write notes on:-   15

        a) BJT modeling
        b) Concept of stability in electronics circuits.
        c) Emitter follower at high frequency.

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-327
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (ECT/E&C/IE)
Electronics Devices & Circuits
(REVISED)

[Time: Three Hours]   [Max. Marks:80]

Please check whether you have got the right question paper.

N.B   i)Q. No. 1 and Q. No. 6 are compulsory
                             ii) Solve three questions from each section.

Section [A]

Q.1   Answer the following questions(any five)   10
       a) Comment on frequency response of RC coupled amplifier.
       b) Draw the JFET characteristics.
       c) What is the difference between Voltage and Power amplifier?
       d) A transistor has a typical value of $\beta = 100$, if collector current is $40mAmp$. What is the
          value of emitter current?
       e) What is stability factor?
       f) With mathematical equation. Describe Diode current equation.
       g) Draw CMOS Inventor.
       h) What is emitter follower?

Q.2   A) Draw and explain the operation of Bridge rectifier using capacitor filter. Draw the input and   07
          output waveforms.
       B) Explain i. Volt ampere characteristics of z diode.   08
                  ii. Zener and Avalanche break down.

Q.3   A) A collector to base bias circuit is shown in fig (a)   07

Fig(a)

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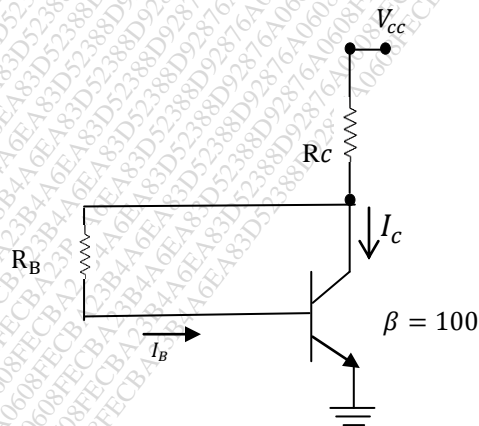
In above circuits $R_B = 270 \ k\Omega, \quad R_C = 2.2k\Omega, \ V_{cc} = 18V$ and z transistor with $\beta = 100$. Analyse the circuit to determine $I_B, I_C, \ and \ V_{CE}$.

B) Show that, the efficiency of class B power amplifier is 78.5%. 08

Q.4 A) Explain the construction and working of $E - MOSFET$ in detail. 07
 B) Explain FET as V.V.R. 08

Q.5 Write notes on(Any three) 15
 A) Clippers
 B) Transistor as an amplifier
 C) Handling precautions of CMOS devices.
 D) Transformer coupled class-A amplifier

Section [B]

Q.6 Answer the following(Any five) 10
 a) What is voltage shunt and current shunt feedback?
 b) What are Barkhausen criteria for oscillation?
 c) State the two conditions to achieve good differentiation at output of a Differentiator.
 d) State the advantages of Negative feedback.
 e) If square wave signal is applied as an input to the Integrator circuit, what will be the output of Integrator? Draw waveforms.
 f) State the limitations of voltage multiplier circuit.
 g) Draw clapp oscillator. State applications of this circuit.
 h) In a R_c phase shift oscillator if $R_1 = R_2 = R_3 = 200k\Omega$,and if $C_1 = C_2 = C_3 = 100pf$. Find the frequency of oscillations.

Q.7 A) Draw and explain the operation of Bistable multi vibrator. State the applications. 07
 B) Determine the value of capacitors to be used in an astable multi vibrator to provide a train of 08
 pulse $2\mu s$ wide at a repetition rate of $100kHz$, if $R_1 = R_2 = 20k\Omega$.

Q.8 A) Explain the wein Bridge oscillator circuit in detail. 07
 B) In the Hartley oscillator, $L_2 = 0.4mH$ and $c = 0.004\mu F$. If the frequency of the oscillator is 08
 120 kHz. Find the value of L_1.Neglate the mutual inductance.

Q.9 A) Explain the working of voltage Tripler and Quadruple circuit in detail. 07
 B) Explain the operation of shunt voltage regulator. 08

Q.10 Write notes on, (Any three) 15
 a) Voltage series feedback amplifier
 b) UJT Relaxation oscillator
 c) Integrator.
 d) Three terminal voltage regulators.

2

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-316
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (EC/ECT/IEC/E&C)
Microprocessors & Peripheral
(OLD)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B   1.   Q.No.1 & Q.No.6 are compulsory.
          2.   Solve any two from Q.No.2, Q.No.3, Q.No.4 & Q.No.5.
          3.   Solve any two from Q.No.7, Q.No.8, Q.No.9 & Q.No.10.
          4.   Assume suitable additional data if necessary.

Section A

Q.1   Attempt <u>any two</u> of the following.
      i)   Write the classification of computers.   05
      ii)   Explain the different software development tools need to be by the programmer.   05
      iii)   What are the needs of demultiplexing in 8085 microprocessor.   05
      iv)   Explain the concept of stack.   05

Q.2   a) Draw the timing diagram of MOV A, B.   07
      b) Write a 8085 program to substract two 16 bit numbers.   08

Q.3   a) Draw & explain pin diagram of 8085.   07
      b) Write a program to transfer block of data from one memory location to another.   08

Q.4   a) Draw & explain interrupt structure.   07

      b) Design a fully decoding memory system that provides 4KB of EPROM immediately followed   08
          by 4KB of RAM. The EPROM starts at address 0000H.

Q.5   a) Write a program to generate a time delay of 100 μsec. Assume system clock of 3MHz.   07
      b) Write the classification of memory & explain it.   08

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Section B

Q.6 Attempt <u>any two</u> of the following.
     i)   Write the features of 8255.   05
     ii)   Compare 8155 & 8355.   05
     iii)   Enlist silent features of 8259.   05
     iv)   Explain control words of 8255.   05

Q.7   a) Explain interfacing of 7-segment display with 8255? Write a program to display decimal   07
               counter.

      b) With the help of diagram explain 0809 interfacing with 8085.   08

Q.8   a) Draw and explain the block diagram of 8253.   07
      b) With the help of block diagram explain the features of 8251 (USART)   08

Q.9   a) With the help of neat diagram explain digital IC-Tester.   07
      b) Explain the application of current measurement.   08

Q.10   a) With the help of neat diagram explain interfacing of stepper motor with 8255 & write a program 07
               to rotate a motor in clockwise by 180^0.

      b) Explain the I/O operating modes of 8155.   08

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-305
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC/ECT/E&C)
Digital Image Processing
(REVISED)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B
    i.   Q.5 and Q.10 are compulsory.
    ii.   Solve any two from Q.1, Q.2, Q.3, and Q.4.
    iii.   Solve any two from Q.6, Q.7, Q.8, and Q.9.
    iv.   Figures to the right indicate full marks.
    v.   Assume suitable data, if necessary.

Section A

Q.1   a) What is digital image? List and explain its types in detail.   08
        b) Explain different fundamental steps in digital image processing.   07

Q.2   a) Explain elements of visual perception in detail.   08
        b) Explain sampling and quantization of image in detail.   07

Q.3   a) If all pixels in an image are shuffled, will there be any change in the histogram? Justify your   07
            answer:

1	2	4	8		9	7	3	5
3	5	7	9		3	5	7	9
4	2	4	6		1	2	4	8
9	7	3	5		4	2	4	6

               Image 1   Image 2

        b) What is enhancement? Explain enhancement using arithmetic and logical operation?   08

Q.4   a) What is median filter and compute the median value of marked pixel shown in using a 3×3 08
            mask.

$$\begin{vmatrix} 1 & 2 & 7 \\ 2 & 4 & 6 \\ 3 & 2 & 1 \end{vmatrix}$$

        b) Explain smoothing and sharpening in spatial domain filters in detail?   07

Q.5   Write note on(Any Two)   10
        a) Gray level transformation.
        b) Camera model and calibration.
        c) Haar function.

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Section B

Q.6 a) Explain various operators used in image segmentations. 08
1) Roberts.
2) Prewitt.
3) Sobel.
4) Canny.

b) Explain chain code representation with its drawback. 07

Q.7 a) Calculate efficiency of Huffman code for following symbol whose probability of occurrence is 08
given by below.

Symbol	Probability
a1	0.9
a2	0.06
a3	0.02
a4	0.02

b) Define redundancy? List its types and explain any one in detail. 07

Q.8 a) Write a program for Morphological operations on Gray scale images. 08
b) Explain morphological algorithm thinning and thickening in detail. 07

Q.9 a) What is compression? Explain its need with basic block diagram of compression. 07
b) Explain the different types of region descriptor required in image descriptive step. 08

Q.10 Write note on (Any Two). 10
a) Compression standards.
b) Use of watershed.
c) Dilation and erosion.

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-288
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC/ECT/E&C)
Elective-II: Satellite Communication
(REVISED)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
i) Q1 & Q6 are compulsory.
ii) Solve any two question from Q.No.2,3,4 & 5. Solve any two questions from Q.No. 7,8,9 & Q.10.

Section A

Q.1   Attempt any two from the following.   10
(a) What is free space loss?
(b) What is satellite? Explain its application.
(c) Explain solar eclipse & sun transit outage effects on satellite performance.

Q.2   (a) The apogee & perigee of an elliptical satellite orbit are 300 km & 200 km, determine   08
eccentricity, semimajor axis & semiminor axis.
(b) What is Inospheric scintillation?   07

Q.3   (a) In Satellite Communication link the uplink carrier to noise is 20 dB whereas the downlink   07
carrier to noise is 25 dB. Find the link C/W Ratio.
(b) What is SPADE system? Explain SPADE frequency plan.   08

Q.4   (a) What is single & multiple access? Explain PAMA in detail.   08
(b) Explain link power Budget in detail.   07

Q.5   Write note on   15
(a) Noise figure
(b) SDMA
(c) Sun synchronous orbit

Section B

Q.6   Attempt Any two from the following   10
(a) Explain three axis stabilization
(b) What is DTH? Explain
(c) Explain Noise Temperature

Q.7   (a) Explain types of earth station in detail   08
(b) Explain VSAT in detail.   07

1

Q.8   (a) Explain GSM & GPS in detail   08
                (b) Explain LEO & MEO in detail   07

Q.9   (a) Explain thermal control subsystem   08
                (b) Explain TT&C in detail.   07

Q.10   Write Note on   15

            (a) Types of earth station antenna
            (b) DBS Television
            (c) INTELSAT series.

2

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-295
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (EC/ECT/IEC/E&C)
Electromagnetic Engineering
(OLD)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.
N.B   i) Q.No.1 and Q.No.6 are compulsory.
             ii) Solve any two questions from Q.2, Q.3, Q.4 and Q.5 in section A
             iii) Solve any two questions from Q.7, Q.8, Q.9 and Q.10 in section B
             iv) Figures to the right indicate full marks
             v)Assume suitable data wherever necessary and mention it clearly

Section A

Q.1   Solve any two   10
          a.   Discuss electric field intensity due to an electric dipole
          b.   Derive point form of current continuity equation
          c.   Explain energy density in an electrostatic field

Q.2   a.   Give the points A(x=3, y=3, z=-2) and B ($r = 8, \theta = 25^0, \phi = 140^0$ find   07
          i.   The spherical coordinates of A;
          ii.   The Cartesian coordinates of B;
          iii.   The distance from A to B
       b.   Given points $E(2,5,1)$ $F(-1,4,-2)$ and $G(3,-2,4)$ find scalar projection of R_{EF} on R_{EG}.   08

Q.3   a.   Uniform line charges of 140 nC/m lie along the entire extent of the three coordinates axes.   07
          Assuming free space conditions find E at $p(-3, 2, -1)$
       b.   A charge of $-0.6\mu C$ is located at $A(15, -30,25)$ and a second charge of $0.7\mu C$ is at $B(-12,$ 08
          $9 , 14)$. Find E at origin

Q.4   a.   Two point charges $1nC$ at $(0,0,0.1)$ and $-1\ nC$ at $(0,0,-0.1)$ are in free space   07
          i.   Calculate V at P $(0.3, 0, 0.4)$
          ii.   Calculate $|E|$ at P
       b.   Calculate the work done in moving a 3 C charge from $B(1, 3, 5$) to $A(4,6,9)$ in the electric   08
          field $15x^2 a_x + 15\ y\ a_y$ V/m

Q.5   a.   Let the region $z < 0$ be composed of a uniform dielectric material for which $\varepsilon_{R1} = 3$ while   07
          the region $z > 0$ is characterized by $\varepsilon_{R2} = 2$.
          Let $D_1 = 250a_x + 200a_y - 50a_z$ nC/m^2
          Find D_{N1}, D_{T1}, D_{N2} and D_{T2}
       b.   A point charge Q $= 120nC\ is\ at$ the origin in free space. Find electric flux density at   08
          $P(1,0,1)$

1

Section B

Q.6   Solve any two   10
- a. Discuss Lorentz force equation
- b. Write the expression of curl of $\bar{H}$ in Cartesian, cylindrical and spherical coordinate system
- c. Explain magnetic flux and magnetic flux density

Q.7
- a. A current filament carrying 25 A in the a_z direction lies along the entire z axis   07
  Find H in rectangular coordinates at $P_A(\sqrt{30},0,5)$
- b. Region 1 is a semi-infinite space in which $2x - 5y > 0$ while region 2 is defined by   08
  $2x - 5y < 0$
  Let $\mu_{R1} = 2, \mu_{R2} = 6, \ H_1 = 20 \ a_z \ A/m$
  Find: a) $|B_1|$
           b) $|B_{N1}|$
           c) H_{t1}
           d) $|H_2|$

Q.8
- a. In a material for which $\sigma = 5S/m, \ \varepsilon_r = 1$, the electric field intensity is   07
  $$E = 250^* \sin(10^{10}t) \, V/m$$
  Find the conduction current density and displacement current density for the given field
- b. Using Amperes circuital Law find $\bar{H}$ due to infinitely long straight conductor along the z axis   08

Q.9
- a. A lossy dielectric is characterized by $\varepsilon_r = 2.5 , \mu_r = 4 \ and \ \sigma = 10^{-3} \ S/m$ 07
  At a frequency $20MHz$
  Find: a) attenuation constant b)Intrinsic impedance
- b. Derive the equation of total power in a uniform plane wave by poynting theorem   08

Q.10
- a. Write short note on stokes theorem   07
- b. Derive the equation of standing wave when a uniform plane wave is incident at a perfect   08
  dielectric and perfect conductor interface

2

Total No. of Printed Pages:03

SUBJECT CODE NO:- H-267
FACULTY OF SCIENCE AND TECHNOLOGY
**T.E. (EC/ECT/IEC/E&C)**
Feedback Control System
(OLD)

[Time: Three Hours]   **[Max. Marks: 80]**

Please check whether you have got the right question paper.
N.B   i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
             ii) Attempt any two questions from the remaining questions in each section A & B
             iii) Assume suitable data whenever necessary.
             iv) No. indicate in right side indicate full marks.

Section A

Q.1   Solve any five questions from following.   10

        a) What is meant by MIMO control system.
        b) What is feed forward control system.
        c) What are the properties of Transfer function.
        d) Explain any two block diagram reduction rule.
        e) Explain transient and steady state response.
        f) Explain the closed loop system.

Q.2   a) Explain mason's gain formula   07

         b) Obtain Transfer function of given figure.   08
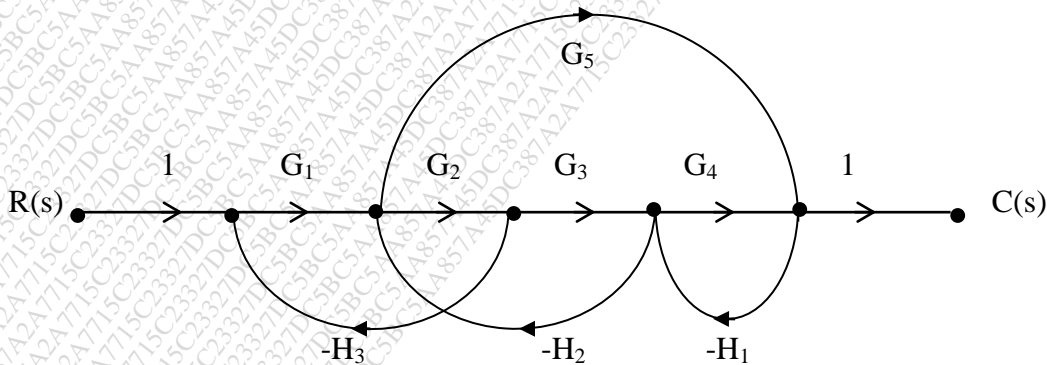
Q.3   a) For the mechanical system shown in figure.   08
                           i)   Draw the mechanical network .
                           ii)   Write the differential equation of performance.
                           iii)   Draw the force-voltage analogous.
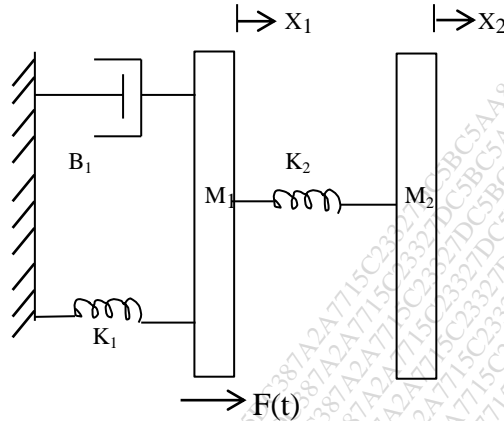
           b) Explain Block diagram reduction rules.   07

Q.4   a) Explain Time Domain specifications.   07

           b) The control system having unity feedback has $G(s) = \dfrac{20}{s(1+4s)(1+s)}$. Determine   08
                  i.   Static error coe.
                  ii. $r(t) = 2 + 4t + t^2/2$. find steady state error.

Q.5   Write short note on (any three)   15
           1) Signal flow graph.
           2) DC servomotor
           3) Potentiometer as error detector
           4) Force- voltage analogy.

Section B

Q.6   Solve any five.   10
           1) What is the effect of adding poles in root locus.
           2) What are the disadvantages of Hurwitz stability criteria.
           3) How stability is defined based on information of gain and phase margin.
           4) What is meant by controllability.
           5) Write the co-relation between time domain and frequency domain specifications.
           6) What do you mean by Neural network.

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Q.7   a) Determine the stability of
$$s^6 + 2s^5 + 3s^4 + 12s^3 + 20s^2 + 16s + 16 \text{ using R-H criterion.}$$ 07

b) For the unity feedback system with $G(s) = \frac{K}{(s+3)(s+5)}$. Find the range of K for stability.   08

Q.8   Draw the Bode plot for following and determine Gain and phase margin   15
$$G(s).H(s) = \frac{10}{s(0.1s+1)}$$

Q.9   a) Sketch the root locus diagram for a system having   08
$$G(s).H(s) = \frac{K}{s(s+1)(s+10)}$$

b) Evaluate controllability and observability of the system represented in state space model with   07

$$A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{bmatrix} \ and \ B = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix} \ \& \ c = \begin{bmatrix} 3 & 4 & 1 \end{bmatrix}$$

Q.10   Write short notes on.   15

1) Neural based control system
2) Nyquist stability criterion
3) Relays.

3

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-277
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
Electrical Machines & Instrumentation
(REVISED)

[Time: Three Hours]   [Max. Marks: 80]

Please check whether you have got the right question paper.
N.B   i) Q.No.1 and Q. No 6 are compulsory.
             ii) Solve any two questions from reaming.
             iii)Figure to right indicates full marks.

Section A

Q.1   Attempt any Five   10
        a) What are constrains for PM stepper motor
        b) Compose squirrel cage & phase wound rotor
        c) What is hunting in synchronous motor.
        d) What is significance of back EMF.
        e) Losses occur in D.C motors.
        f) What is armature section?
        g) Draw three characteristics for DC series generator.
        h) Application of 3-$\emptyset$ IM.

Q.2   a) Explain different methods of speed control for DC shunt motor.   07

        b) Derive EMF equation of DC generator.   08

Q.3   a) Explain various speed control methods of 3$\emptyset$ induction motor.   07

        b) Explain construction of synchronous motor with neat sketch.   08

Q.4   a) Explain construction and working of stepper motor.   07

        b) Explain hysteresis motor in detail.   08

Q.5   a) Explain 3 point starter with neat sketch.   07

        b) Explain effect of excitation on armature current and power factor.   08

1

Section B

Q.6	Attempt any Five	10

    a) What is RTC.
    b) List property of ESD.
    c) Draw neat circuit of LVDT.
    d) What is optical oscillograph
    e) Give classification of displays.
    f) Application of power spectral density.
    g) Give classification of recorder.
    h) What is seeback effect?

Q.7	a)	Explain LVDT with suitable diagram .List it's applications.	08
	b)	Explain signal conditioning with neat diagram.	07
Q.8	a)	Explain cold cathode display in detail	07
	b)	Explain working of object counters.	08
Q.9	a)	With neat sketch explain strip chart recorder.	08
	b)	With neat block diagram explain sound level meter.	07
Q.10	a)	Describe structure and working of LCD	07
	b)	Explain interfacing techniques of transducer with microprocessor	08

2

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-278
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C)
Electrical Machines & Instrumentation
(OLD)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B
i. Q.No.1 from section A and Q.No.6 from section B are compulsory.
ii. Attempt any two questions from the remaining questions in each section.

Section A

Q.1   Solve any five from following: 10

i)   List down the application of hysteresis motor.
ii)   Draw the slip-torque characteristics of induction motor.
iii)   Why the rotor copper bars are not parallel to the rotor shaft.
iv)   Write the application of induction motor.
v)   What are the different losses in DC generators?
vi)   What is synchronous condenser?
vii)   List down the application of stepper motor.
viii) Give the functions of yoke and pole shoes in DC generator.

Q.2   a) Explain the working principle & construction of synchronous motor.   08
        b) Explain the different electrical banking for series DC motor.   07

Q.3   a) Explain the principles, construction and working of electrical generator.   08
        b) Explain in details the construction, working and advantages of stepper motor.   07

Q.4   a) Explain power stages, losses and efficiency of induction motor.   08
        b) Explain the construction of three phase induction motor.   07

Q.5   a) Explain in detail variable reluctance motor with application.   08
        b) Explain the different method of speed control for DC shunt motor.   07

1

Section B

Q.6   Solve any five from following: 10

         a) Pressure measurement.
         b) What are different sensors for water level measurement?
         c) Difference between LED and LCD display.
         d) How smoke detector works.
         e) Give classification of transducer.
         f) Application of thermocouple
         g) Signal conditioning circuit. For measurement.
         h) How microphone works.

Q.7   a) What are the different photosensitive devices, explain in brief?   08
             b) What are different types of digital transducer, explain with example?   07

Q.8   a) Explain the classification of the transducer in details.   08
             b) Explain the working of piezoelectric transducers with application   07

Q.9   a) Explain the displacement measurement by LVDT in details.   08
             b) How temperature sensor LM35 –is interfacing with the microcontroller.   07

Q.10   Attempt any three.   15

         a) Alpha numerical display.
         b) Hall Effect transducer.
         c) Proximity sensors.
         d) VAW meter.

Total No. of Printed Pages:1

SUBJECT CODE NO:- H-183
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (ECT/E&C)
Consumer Electronics
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.
N.B   1) Q.No.1 and Q.No.6 are compulsory.
         2) Solve any two from remaining from each section.
         3) Figures to right indicate full marks.

Section A

Q.1	(a) Explain EPABX system with Neat Block diagram	05
	(b) Explain PA system with applications.	05
Q.2	(a) Draw Block diagram of colour TV.	08
	(b) Explain Role of antenna and its parts in TV Transmission.	07
Q.3	(a) Enlist the features of 3G Technology.	07
	(b) Give comparison between 2G & 3G Technology.	08
Q.4	(a) Explain the working principle of microwave oven	08
	(b) Enlist Types and applications of microwave oven.	07
Q.5	(a) Explain the working of washing machine.	08
	(b) Explain Air Conditioner with neat Block diagram.	07

Section B

Q.6	(a) Explain the different type of printers.	05
	(b) What do you mean by Biometric Sensors.	05
Q.7	(a) Explain the working principle of LASER printer.	07
	(b) Explain the working of photocopier.	08
Q.8	(a) Explain Bio-metric attendance monitoring system. Enlist its advantages.	08
	(b) What do you mean by home automation system? Why it is required.	07
Q.9	(a) Explain the working of Electronics Voting Machine.	08
	(b) Write Notes on CFL lamps.	07
Q.10	(a) Compare between LED and CFL lamps	08
	(b) Write Notes on ATM	07

1

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-184
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC)
Applied Digital Signal Processing
(REVISED)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B   1.   <u>Q.5 and Q.10 are compulsory.</u>
         2.   Answer three questions from each section.
         3.   Assume suitable data, if necessary.
         4.   Draw neat labeled diagram wherever required.

<u>Section A</u>

Q.1   a)   Explain decimation by factor D and its effect on spectra of signals.   07

       b)   Describe the process of multistage interpolation and multistage decimation.   08

Q.2   a)   Discuss in detail LMS adaptive algorithm.   08

       b)   Explain in detail adaptive equalization.   07

Q.3   a)   Explain the significance of backward linear prediction.   07

       b)   Define AR, MA, ARMA model. State relationship of an AR process to linear prediction. 08

Q.4   a)   With suitable diagram, explain AR lattice structure and ARMA Lattice structure.   08

       b)   Describe system identification in adaptive environment.   07

Q.5   Write short notes: (on any two)   10
       i)   Polyphase filter structures
       ii)   Autocorrelation method for LPC
       iii)   RLS algorithm

1

Section B

Q.6   a)   Explain Welch method for power spectrum estimation.   08

     b)   Give the estimate of autocorrelation function and power density of random signal.   07

Q.7   a)   Explain in brief on- chip peripherals of TMS 320 C 54XX processors.   08

     b)   Write an algorithm for implementing FIR filter on DSP processor.   07

Q.8   a)   Describe with suitable example applications of DSP in
        i.   Image processing   08
       ii.   Communication   07

Q.9   a)   Discuss in detail non-parametric methods for power spectrum estimation.   10

     b)   Enlist the characteristics of SHARC processor.   05

Q.10   Write short notes (on any two)   10

     1) Selection criterion for DSP processor
     2) Removal of artifacts in ECG signals
     3) Equalization of digital audio signals in audio processing.

Total No. of Printed Pages:2

SUBJECT CODE NO: H-374
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EC/ECT/E&C)
VLSI Design
(REVISED)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
    i.   Question No. 1 & Question No.6 are compulsory.
    ii.   Solve any two questions from Q. No. 2 to Q. No. 5.
    iii. Solve any two questions from Q. No. 7 to Q. No. 10.
    iv. Figure to the right indicate full marks.
    v.   Assume suitable data if necessary.

Section A

Q.1   Attempt any two from the following.   10

    a) Write in brief about EDA tools.
    b) Explain the entity and architecture in VHDL with one example.
    c) Explain block statement with example.
    d) Explain in brief full and partial scan.

Q.2   a) Explain any three concurrent statements in VHDL with one example.   07

    b) Write VHDL code for 4:1 multiplexer using selected concurrent signal assignment statement.   08

Q.3   a) What is the use of configuration? Explain with example.   07

    b) What is state diagram? Explain finite state machine with its block diagram.   08

Q.4   a) What is test bench? Write a test bench to verify the design of NAND gate.   07

    b) Describe fault model in detail with suitable example.   08

Q.5   Write short notes on any three   15

    i)   VLSI design flow
    ii)   Architecture of XC4000 FPGA family.
    iii) Package & library.
    iv) Boundary scan testing.

1

Section B

Q.6   Attempt <u>any two</u> from the following.   10

        a) Explain self – aligned process in CMOS.
        b) Explain skewed gates in static CMOS logic family.
        c) Static & dynamic power dissipation in CMOS.
        d) Layout design rule for CMOS technology.

Q.7   a) With the help of equations describe the behavior of NMOS in Cut – off, linear & saturation   07
          region.

      b) Explain CMOS inverter with voltage transfer characteristics in detail.   08

Q.8   a) Explain n – well process for CMOS fabrication.   07

      b) Sketch schematic for the following equation using CMOS.   08
        i) $Y = \overline{A + B(C + D)}$
        ii) $Y = \overline{AB + C\,(D + E)}$

Q.9   a) Explain twin – tub process for CMOS fabrication.   07

      b) Explain pass transistor logic with suitable example.   08

Q.10   Write short notes on <u>any three</u>   15

        i)   Stick diagram
        ii)   Noise margin and delay calculation
        iii)   Body effect
        iv)   CLM

Total No. of Printed Pages:02

SUBJECT CODE NO: H-351
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (ECT/E&C)
Digital Communication
(OLD)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
    1) Q. No. 1st and Q. No. 6 are compulsory.
    2) Solve any two Questions from the remaining Questions in both sections.

SECTION - A

Q.1   Attempt any two   10

    1. Compare pulse modulation technique such as PAM, PPM, PWM.
    2. Differentiate analog and digital communication system.
    3. Draw and explain digital communication system block diagram in brief.

Q.2   a) What is interpolation? Explain with mathematical analysis and waveforms.   08

    b) What is practical sampling? Which problems are occurred for ideal sampling? How it can be 07 overcome by using practical sampling.

Q.3   a) Draw and explain block diagram of PCM in detail.   08

    b) Define Companding. Give the compressor characteristic along with different types.   07

Q.4   a) Find Nyquist rate and Nyquist interval for the following signal.   08
    i) $X(t) = 3\cos(200\pi t) + 5\sin(6000\pi t) + 10\cos(12000\pi t)$
    ii) $X(t) = 12\cos(150\pi t) + 20\sin(300\pi t) + 10\cos(100\pi t)$

    b) What is Non – Uniform quantization? Explain in detail.   07

Q.5   Write Short Note on   15

    1. A – law and μ – law companding process
    2. Advantages and disadvantages of PCM
    3. Aliasing effect

1

H-351

SECTION – B

Q.6   Solve <u>any Two</u>   10

1. What is ideal solution to overcome the problem of Intersymbol interference?
2. Explain Notion of spread spectrum.
3. What is BPSK? Explain in detail.

Q.7   a) Identify the system to overcome the problem of slope overload distortion & granular noise.   08
       Explain in detail with its block diagram.

       b) What is white Gaussian Noise? Explain its mathematical expression and effect.   07

Q.8   a) What is DPSK? Explain in brief.   07

       b) Explain frequency shift keying with the help of block diagram and waveforms   08

Q.9   a) What is QPSK? Explain in detail with its Constellation diagram.   08

       b) Explain DSSS technique in detail.   07

Q.10   Write short note on: 15

1) Integrate and Dump filter
2) Slow frequency hopping technique
3) Noise in digital communication