Seat
No.

T.E. (Electronics and Telecommunication)

(Part-III) (Semester - VI) (Revised) Examination, November- 2019

VLSI DESIGN

Sub. Code : 66917

Day and Date : Thursday, 14- 11 - 2019

Time : 10.00 a.m. to 1.00 p.m.

Total Marks : 100

Instructions :
1) All main question are compulsory.
2) Figures to the right indicate full marks
3) Assume suitable data if necessary.
4) Draw diagrams and Truth Tables Wherever necessary.

Q1) Attempt any three of the following.　　　　　　　　　　　[3×6=18]

　　a) Describe different levels of abstraction in VHDL

　　b) Write VHDL code for 4:1 multiplexer using any concurrent statement.

　　c) Write the meaning of 'Identifiers' used in VHDL. With suitable examples
　　　write the various rules to look at before choosing any identifier.

　　d) Write entity diagram, truth table and VHDL code for JK flipflop

　　e) Explain guarded block with appropriate example.

Q2) Attempt any two of the following:　　　　　　　　　　[2×8=16]

　　a) Draw and explain VLSI Design Flow.

　　b) What is meant by 'package' in VHDL? With the help of proper syntax
　　　briefly write about package body and package declaration.

　　c) Write a VHDL code for N-bit parity generator using "generic" statement.
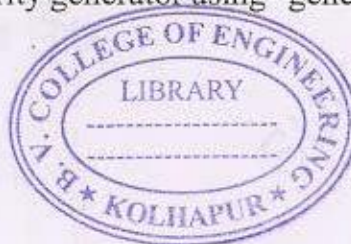
P.T.O.

Q3) Answer any two of the following: [2×8=16]
- a) Design a Mealy FSM to detect 1001 overlapping sequence. Write a VHDL code for the same.
- b) Write a VHDL code for 4-bit counter with
  - i) Process sensitivity list
  - ii) Without process sensitivity list
- c) Explain attributes in VHDL with example for each.

Q4) Attempt any three of the following: [3×6=18]
- a) Briefly explain about Assignment and control statements in Verilog with examples.
- b) Write entity diagram, truth table and Verilog code for 4:1 Mux.
- c) Draw physical structure of MOS Transistor (MOSFET). Explain the V-I characteristics of the same.
- d) Write a Verilog code for 4 bit counter. Also provide Reset input for the counter.
- e) Write schematic and layout/stick diagram for 2 input NOR gate.

Q5) Answer any two of the following. [2×8=16]
- a) Derive the expression for Threshold voltage of MOSFET under static conditions.
- b) Draw and explain input-output block for Xilinx make 9500 series CPLD.
- c) Draw and explain the basic block diagram of Spartan3E family FPGA.

Q6) Attempt any two of the following: [2×8=16]
- a) Explain the following methodologies for testing combinational circuits. Take an example for each.
  - i) Stuck -at-Fault models
  - ii) Path sensitization
- b) Briefly write about Built-In-Self-Test used for testing digital ICs. with a neat diagram explain of 4-bit BILBO Register.
- c) Write a VHDL/ Verilog code to model 8:3 priority encoder circuit where the priority order of input is 0,4,3,2,6,5,1 and 7, with 0 being the highest priority.

● ● ●

Seat No.	

T.E. (Electronics and Telecommunication) (Part - III) (Revised) (Semester - VI) Examination, November - 2019
OPTICAL COMMUNICATION AND NETWORK
Sub. Code : 66919

Day and Date : Tuesday, 19 - 11 - 2019
Time : 10.00 a.m. to 1.00 p.m.

Total Marks : 100

Instructions :
1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

Q1) Attempt any two of the following: [16]

   a) Explain in detail generation of optical networks?

   b) Explain with necessary diagrams the different types of optical fiber structures?

   c) Explain waveguide dispersion & bending loss in the optical fibers?

Q2) Attempt any two of the following: [16]

   a) Explain Mechanical properties of fiber & find the expression for failure probability?

   b) Explain LED structures in detail?

   c) What is signal distortion? What are the conditions to achieve distortionless system?

Q3) Attempt any three: [18]

   a) Scattering losses in optical fiber.

   b) Optical laws & definition.

   c) Semiconductor injection laser.

   d) Light source linearity.
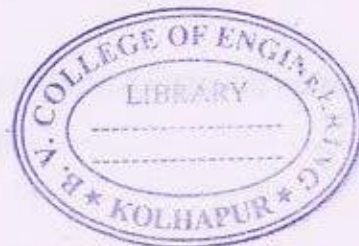
Q4) Attempt any two of following. [16]

    a)   Explain in detail performances of different network topologies and their power budget?

    b)   Compare various Photo Detectors?

    c)   Explain in detail transmission formats and speeds in SONET?

Q5) Attempt any two of the following. [16]

    a)   Draw and explain internal structure of in GaAs avalanche photodiode?

    b)   Draw Digital Optical Receiver and explain performance parameters?

    c)   Explain in detail WDM+EDFA performance?

Q6) Write a note on any three of following. [18]

    a)   Optical CDMA.

    b)   Ultrahigh capacity optical networks.

    c)   Bragg grating.

    d)   PIN photodiode.

Seat No.

T.E. (Electronics & Telecommunication Engineering) (Semester - VI) (Revised) Examination, November - 2019
MICROPROCESSOR & MICROCONTROLLER
Sub. Code : 66918

Day and Date : Friday, 15 - 11 - 2019   Total Marks : 100
Time : 10.00 a.m. to 1.00 p.m.

Instructions :   1)   All questions are compulsory.
                 2)   Figures to the right indicate full marks.
                 3)   Assume suitable data if necessary.

Q1) Attempt any two of the following: **[2×8=16]**

   a)   Draw and explain Flag register in 8085 and also explain various addressing modes in 8085 with two example each.

   b)   Draw and Explain Machine Cycle diagram of Instruction **IN 40H**.

   c)   Draw and explain Interrupt structure in 8085 also explain different software interrupts in 8085.

Q2) Attempt any two of the following: **[2×8=16]**

   a)   Draw and explain BSR Mode of 8255 and write a program to generates square wave on PC0 and PC1 which are In-Phase to each other.

   b)   Interface 8K×8 ROM to 8085 using 8K×4 ROM chip with starting address 0000H.

   c)   Interface four seven segments LED display to 8085 using 8255 and write a program to display "BEST" on it.

Q3) Attempt any two of the following: **[2×9=18]**

   a)   Draw and explain RAM and ROM memory organization in 8051 and explain use of $\overline{PSEN}$.

   b)   Draw and Explain PSW of 8051 and also explain with instruction how to access external RAM memory.

   c)   Explain alternate functions of PORT 3 and also explain various rotate instructions of 8051.

P.T.O.

Q4) Attempt any two of the following: [2×8=16]

a) Draw and explain the format of SCON register in detail. Also write a program to transmit **"SHIVAJI UNIVERSITY"** serially with baud rate 9600H (SMOD = 0 and Crystal frequency = 12 MHz).

b) Draw and explain interrupts structure in 8051. What is the default priority of interrupts? Mention the vector addresses of each interrupt.

c) Draw and explain block diagram of mode 3 of timer 0 in 8051. Also draw the format of TCON SFR.

Q5) Attempt any two of the following: [2×9=18]

a) Interface LCD to 8051. Also write assembly language program to display continuous counting of numbers from 0 to 9.

b) Draw and explain interfacing of 8k × 8 RAM to 8051 using memory chips of 4k × 8 capacity. Also mention the starting and end address of each memory chip.

c) Interface ADC 0808 to 8051. Also write detail algorithm to covert analog voltage connected to channel 3 of ADC.

Q6) Attempt any two of the following: [2×8=16]

a) Write an embedded C program for 8051 to get the status of bit P1.0 and send it to P2.7 continuously.

b) Write an embedded C program for 8051 to convert packed BCD 0×29 to ASCII and display the bytes on P1(Higher byte) and P2 (Lower byte).

c) Explain various logical operations that can be performed using embedded C statements, also give the example of each.

♦ ♦ ♦

T.E. (Electronic & Telecommunication) (Semester - VI) (Revised) Examination, November - 2019
DIGITAL SIGNAL PROCESSING
Sub. Code : 66916

Day and Date :Wednesday, 13-11-2019   Total Marks :100
Time : 10.00 a.m. to 1.00 p.m.

Instructions :   1)   All questions are compulsory
                     2)   Figure to right indicates full marks.
                     3)   Assume suitable data if required.

Q1) Attempt any Two: **[18]**

    a)   Explain in detail any five properties of DTFT.

    b)   Define DFT and IDFT. Compute the DFT of given 4-point sequence, $X(n)=[0,1,2,3)$

    c)   Find circular convolution for $h(n) = \{1,1,2,1\}$ and $x(n) = \{1,2,3,4\}$ and Explain any three properties of DFT.

Q2) Attempt any Two: **[16]**

    a)   Find corresponding $X(K)$ using DIT FFT for $x(n) = \{1,2,2,1\}$

    b)   Explain DIF FFT algorithm.

    c)   Find response of FIR filter for $h(n)= \{3,2\}$ and
         $x(n)= \{1,2,-1,3,2,-3,-2,-1\}$ using overlap add method.

Q3) Attempt any Two: **[16]**

    a)   Design LPF that approximates $Hd[f]=1$ for $0 \le f \le 1000Hz$ Eleswhere 0 Impulse Response sequence duration limited to 2.5 m.Sec. Fs=8000sps

    b)   Design linear phase FIR filter using Hamming window for the following desired frequency response: $H_d(\omega)= e^{-j3\omega} \; \pi/4 \le /\omega/ \le \pi$

                                        $= 0$ otherwise for filter length7.

    c)   Explain windowing technique for FIR Filter design. State all window functions.

P.T.O.

.Q4) Attempt any Two: [18]

   a) Design Butterworth low pass filter for specifications

      Passband $-1 \leq H(\Omega)$ db $\leq_0$ for $0 \leq \Omega \leq 1404\pi$ rad/s

      Stopband $H(\Omega)$ db $\leq$ -60   for $\Omega \geq 8286\pi$ rad/s

   b) Explain Billnear transformation method of IIR filter design.

   c) Apply BLT method to transfer function H(s) = 1/(s+1) (s+2) with T=1sec.and find H(z).

Q5) Attempt any Two: [16]

   a) Explain the concept of direct form realization of FIR filter.
   b) State realizations of IIR filter. Explain any one in detail.
   c) A filter is described by

      Y[n] -3/4 y[n-1] +1/8y[n-2] = x[n]+½x[n-1] Draw Direct form I & II

Q6) Attempt any Two: [16]

   a) Draw and Explain architecture of DSP processor.

   b) Compare general purpose and DSP processors.

   c) Explain specifications of any DSP processor.

Seat
No.

T.E. (Electronics & Telecommunication) (Part - III)
(Semester - V) Examination, November - 2019
CONTROL SYSTEMS
Sub. Code : 66315

Day and Date : Monday, 25 - 11 - 2019   **Total Marks : 100**
Time : 2.30 p.m. to 5.30 p.m.

Instructions :   1)   All questions are compulsory.
                 2)   Assume suitable data wherever necessary.

SECTION - I

Q1) Solve any two: **[2×9=18]**

a)   List Block diagram reduction rules.

b)   Write note on steps for solving signal flow graph using Mason's gain
     formula.

c)   Draw the corresponding signal flow graph and evaluate transfer function
     of the complete system using Mason's gain formula.
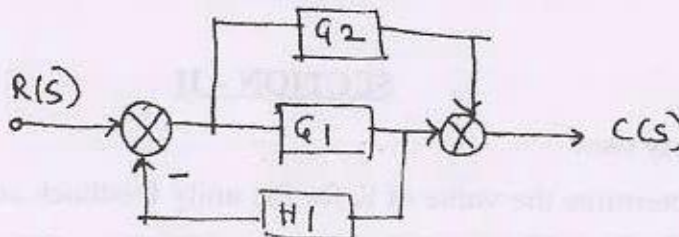
Q2) Solve any two: **[2×8=16]**

a)   The control system having unity feedback has $G(S) = \dfrac{20}{S(1+4S)(1+S)}$

     determine

     i)   Type of system

     ii)   Static error coefficient if input is $r(t) = 2 + 4t + \left(\dfrac{t^2}{2}\right)$.

P.T.O.

b) Explain with suitable equations analysis of second order systm to obtain

$\dfrac{C(S)}{R(S)} =$ in terms of ω_n, ξ, s

c) Define with expression transient response specifications - delay time, rise time, settling time, peak time

3) Solve any two: [2×8=16]

a) Closed loop transfer function of control system is given by

$G(S) = \dfrac{k(s+13)}{s(s+3)(s+7)}$ complete routh array find range of 'k' for system to be stable.

b) For the given control system $G(S) = \dfrac{k}{S(S^2 + 4S + 13)}$

Determine

i) Centroid, number and angle of asymptotes,

ii) Break away point

iii) Summarize steps to draw root locus of given system.

SECTION - II

4) Solve any two. [2×9=18]

a) Determine the value of K for the unity feedback control system having

open loop transfer function $G(S)H(S) = \dfrac{K}{s(s+2)(s+4)}$ using Bode plot,

Such that

i) Gain Margin = 20 dB

ii) Phase Margin = 60°

b) State and explain various frequency domain specifications.

c) Draw Nyquist plot and comment on stability of system

$G(S)H(S) = \dfrac{1}{(s+2)(s+4)}$.

5) Solve any two. [2×8=16]

a) Explain the desing procedure for a lead compensator.

b) Obtain the state model in Jordan's canonical form of system having

transfer function $\dfrac{Y(s)}{U(s)} = \dfrac{3s+4}{s^2+5s+6}$.

c) Explain state variable representation of control system

6) Solve any two. [2×8=16]

a) Derive the equation for transfer function from state model for continuous time system.

b) Derive state equations from transfer function of linear discrete time system.

c) Obtain the state model for RLC Network shown below.

● ● ●
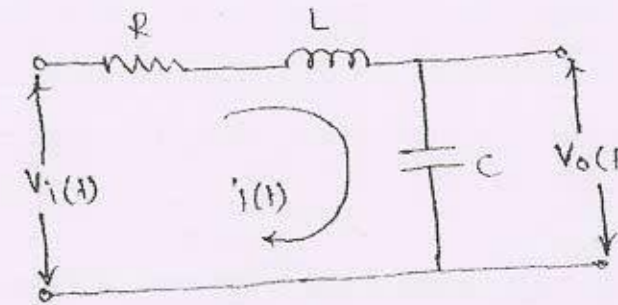
Seat
No.

**T.E (E&TC) (Part-III) (Semester - V)
Examination, November - 2019
ANTENNA & WAVE PROPAGATION
Sub. Code : 66314**

Day and Date :Friday , 22-11-2019

Time : 2.30 p.m.to 5.30 p.m.

Total Marks :100

Instructions :
1) All questions are compulsory
2) Figure to right indicate full marks.
3) Use of non programmable calculator is allowed
4) Assume suitable data if necessary.

SECTION-I

[16]

Q1) Attempt any two

a) With neat diagram, explain absolute gain measurement using:

  i) Two antenna method

  ii) Three antenna method.

b) Draw and explain frequency independant log periodic antenna.

c) A plane wave is incident on short dipole antenna and wave is linearly polarized with electric field in Y-direction It's terminal resistance is equal to radiation resistance and loss resistance is zero find the:

  i) Maximum effective aperture of dipole

  ii) Directivity of dipole.

[16]

Q2) Attempt any two

a) Transmitting and recieving antennas operating at 1GHz with gains of 20 & 15 respectively, are seperated by a distance of 1km.Find the max power delievered to 10ad when the IIP power is 150w.

P.T.O.

b) Design a rectangular microstrip antenna using a substrate (RT/duroid 5850) with dielectric constant of 2.2, h= 0.0625 inch (0.1588 cm) So as to resonate at 10 GHz Determine effective length of patch.

c) Explain with suitable example antenna pattern synthesis by pattern multiplication.

!3) Attempt any three [18]

a) What is required diameter of conical horn antenna operated at 3 GHz with 20dB gain.

b) With neat diagram explain construction, characteristics and limitations of microstrip antenna.

c) Write short note on Field from oscillating dipole.

d) Draw and explain infinite and finite biconical antennas.

SECTION-II

)4) Solve Any Two of the Following [16]

a) A broadcast Transmitter Supplies 100Kw to an antenna that radiates 50% of this power. Thae antenna has directional characteristics such that the field strength without ground loss is given by $E_0 = 300 *$ $1.28\sqrt{P_{kw}}$ mV/m at 1Km. Find the field strength of the ground wave at 100Km for following type Frequency = 500KHz

i) Cities, industrial areas:$\varepsilon_r = 5, \sigma = 10^{-5}$ (mho)/cm

ii) Medium Hills, Flat Sandy:$\varepsilon_r = 13, \sigma = 5* 10^{-5}$ (mho)/cm

b) With the Help of E_z and E_r Explain How Nortons has reduced the Complexity of space wave and Surface Wave

c) With the help of geometry of direct & Ground wave, obtain the equation for reflection factor for vertical & horizontal polarization.

Q5) Solve Any Two of the Following [16]

a) Explain the following terms

i) Virtual Height

ii) Maximum usable frequency (MUF)

b) An HF radio Communication is to be established between two points on the earth surface. The points are at a distance of 2600Km. The height of the ionosphere layer is 200Km and Critical Frequency is 4MHz, Find Maximum Usable Frequency.

c) Find out the Relative permittivity of D,E and F Layer of ionosphere foir an EM wave of Frequency of 50MHz. The Electron Density of D layer layer = 400 electronics/cm^3.

i) The electron density of E layer = 5* 10^5 electronics/cm^3

ii) The electron density of F layer = 2* 10^5 electronics / cm^3

)6) Solve Any Two of the Following [18]

a) Draw the block diagram and explain the operation of an CW Doppler Radar using an intermediate frequency in the receiver. How have the drawbacks of the basic CW radar been overcome.

b) With a CW Transmit frequency of 5GHz, Calculate the Doppler frequency seen by stationary radar when the target radial velocity is 100km/h (62.5mph).

c) Calculate the maximum range of deep space radar operating at 2.5 GHz and using a peak pulse power of 25MW. The antenna diameter is 64m, the target cross section 1m^2 and because a master amplifier is used, the receiver noise figure is only 1.1. The receiver bandwidth is only 5KHz.

Seat
No.

T.E. (E&TC) (Semester - VI) Examination, November - 2019
INDUSTRIAL MANAGEMENT
Sub. Code: 66920

Day and Date : Wednesday, 20 - 11 - 2019   **Total Marks : 100**
**Time : 10.00 a.m. to 1.00 p.m.**

Instructions :   1)   **Question 4 and 8 are compulsory.**
                 2)   **Attempt any 2 questions from remaining each section.**
                 3)   **Figures to the right indicate full marks.**

SECTION - I

Attempt any three questions.

Q1) a)   Define management and discuss various functions of management. **[8]**

   b)   What is forecasting? Explain importance of forecasting in business. **[8]**

Q2) a)   Define marketing mix. Discuss 4Ps in marketing mix.   **[8]**

   b)   What is entrepreneurship? Discuss qualities required for entrepreneur.**[8]**

Q3) a)   Define marketing. Distinguish between marketing concept and selling
       concept.   **[8]**

   b)   What is the importance of inventory control? Explain EOQ analysis.**[8]**

Q4) Write short note on (any three):   **[3 × 6 = 18]**
   a)   Performance appraisal methods.
   b)   Advertising need & types.
   c)   Purchase policies.
   d)   Forms of business organization.

P.T.O.
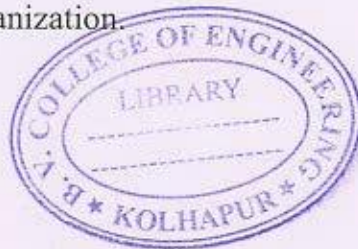
SECTION - II

Attempt any three questions.

Q5) a)   Solve following unbalanced assignment problem. There are four machines
       W,X,Y,Z. three jobs A, B, C are to be assigned to the 3 machines out of
       total 4 machines. The cost of assignment is given below. Find out the
       optimal assignment.   **[8]**

	W	X	Y	Z
A	18	24	28	32
B	8	13	17	18
C	10	15	18	22

And Test optimality

   b)   Write a short note on prohibitive type assignments. Explain with example?
                                                                        [8]

Q6) a)   Information on the activities required for a project is as follows: **[8]**

   Name   :   A   B   C   D   E   F   G   H   I   J   K
   Activities node : 1-2 1-3 1-4 2-5 3-5 3-6 3-7 4-6 5-7 6-8 7-8
   Duration (Days):   2   7   8   3   6   10   4   6   2   5   6

   Draw the network and calculate the earliest start (ES), earliest finish (EF),
   latest start (LS) and latest finish (LF) times of each of the activities.

   b)   What are different methods to obtain initial basic feasible solution to
       transportation problem? Explain any one method with example.   **[8]**

Q7) a)   Formulate mathematical model of the following LPP, and solve it by
       graphically. A manufacturer produces two types of toys i.e. A and B.
       Each toy of type A requires 4 hours of molding and 2 hours of polishing
       where as each toy of type B requires 3 hours of molding 5 hours of
       polishing. Molding works for 80 hours in a week and polishing works
       for 180 hours in a week. Profit on a type A is Rs. 3 and on toy of type B
       is Rs. 4. In what way manufacturer allocates his production capacity for
       the two types of toys so that he make the maximum profit per week.**[8]**

b) Find the feasible solution of the transportation problem using northwest corner method/VAM and Least cost method. [8]

To FROM	W1	W2	W3	W4	Supply
F1	14	25	45	5	6
F2	65	25	35	55	8
F3	35	3	65	15	16
Requirement	4	7	6	13	

Q8) a) Solve the following LPP by simplex method [9]

Maximize, $Z = 6x + 8y$

Subject to $5x + 10y \leq 60$,

$4x + 4y \leq 40$,

$x, y \geq 0$

b) Solve following LPP by graphical method [9]

Maximize, $Z = 60x_1 + 90x_2$

Subject to $x_1 + 2x_2 \leq 40$

$2x_1 + 3x_2 \leq 90$

$x_1 - x_2 \leq 10$

$x_1, x_2 \geq 0$

⌘⌘⌘