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Seat No.	

Total No. of Pages : 2

T.E. (Electronics and Telecommunication) (Semester - VI) Examination, May - 2018

OPTICAL COMMUNICATION AND NETWORKS (Revised)

Sub. Code : 66919

Day and Date : Saturday, 12 - 05 - 2018 **Total Marks : 100**

Time : 02.30 p.m. to 05.30 p.m.

Instructions:
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data if necessary and state it clearly.**
4) **Planck's constant h = 6.626×10^{-34}, speed of light c = 2.998×10^{8} charge of electron e = 1.602×10^{-19}.**

Q1) Attempt any two of the following : **[18]**

a) Explain with neat diagram the phenomenon of light propagation through optical fiber? Classify optical fibers on the basis of modes?

b) Briefly explain the names & designations of spectral bands used for optical communication?

c) Define numerical aperture? Show that the $NA = n_1\sqrt{2\Delta}$.

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

a) With the help of neat diagrams explain step index & graded index glass fiber?

b) A graded index fiber has a core with a parabolic refractive index profile which has a diameter of 60 μm. The fiber has a numerical aperture of 0.4. Estimate the total number of guided modes propagating in the fiber when it is operating at a wavelength of 1 μm.

c) What are the different chemical vapor deposition process? With neat diagram explain Modified chemical vapor deposition process?

Q3) Attempt any two of the following : **[16]**

a) Explain attenuation & absorption losses in optical fibers?

b) What do you mean by signal dispersion in optical fibers? With the help of neat diagram, briefly explain intermodal & polarization mode dispersion?

c) Explain in detail bending & scattering losses in optical fiber?

P.T.O.

Q4) Attempt any two of the following : [18]

a) The radiative and non-radiative recombination lifetimes of the minority carriers in the active region of a double-heterojunction LED are 80 ns and 120 ns respectively. Determine the total carrier recombination lifetime and the power internally generated within the device when the peak emission wavelength is 0.90 μm at a drive current of 45 mA.

b) With the help of neat diagram explain the construction & working of Vertical cavity surface emitting laser VCSEL? State its advantages?

c) With the help of neat diagrams & refractive index profile explain the construction & working of double hetero-structure LED?

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

a) When 3×10^{11} photons each with a wavelength of 0.85 μm are incident on a photodiode, on average 1.2×10^{11} electrons are collected at the terminals of the device. Determine the quantum efficiency and the responsivity of the photodiode at 0.85 μm.

b) What are the different types of noise sources at the receiver? Explain each in details?

c) Explain reach-through avalanche photodiode structure along with electric field distribution in the depletion and multiplication regions.

Q6) Attempt any two of the following : [16]

a) How the fiber Bragg grating can be used in optical filtering? Explain the procedure for formation of Braggs grating in a core of optical fiber?

b) Explain the methods used for adjusting the wavelength in Tunable optical filters?

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

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Total No. of Pages : 2

T.E. (Electronics and Telecommunication) (Semester - VI) Examination, May - 2018

OPTICAL COMMUNICATION AND NETWORKS (Revised)

Sub. Code : 66919

Day and Date : Saturday, 12 - 05 - 2018 **Total Marks : 100**

Time : 02.30 p.m. to 05.30 p.m.

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c) Explain in detail bending & scattering losses in optical fiber?

P.T.O.

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Total No. of Pages : 2

Seat No.	

T.E. (Civil) (Part - I) (Semester - V) Examination, April - 2018

TRANSPORTATION ENGINEERING - I

Sub. Code : 66239

Day and Date : Saturday, 28 - 04 - 2018 **Total Marks : 100**

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

Instructions :
1) **Solve Any THREE questions from each section.**
2) **Figures to the right indicates full marks.**
3) **Make assumptions wherever necessary.**

SECTION - I

Q1) a) Explain Sight distance & factors affecting Sight distance. **[8]**

b) State the objectives of Widening of Pavement on horizontal Curves. **[8]**

Q2) a) Explain the terms-- **[8]**

i) MSRDC

ii) NHDP

iii) Asian Highways

b) Explain the Necessity of Highway Planning. **[8]**

Q3) a) Explain how Surface Drainage is made effective. **[8]**

b) Enlist various Traffic Studies. Explain any one. **[8]**

P.T.O.

Q4) SHORT NOTE (ANY THREE): **[18]**

a) SDBC ROAD.

b) Duties of Traffic Engineering.

c) Types of pavements, functions of pavement components.

d) Traffic Characteristics.

SECTION - II

Q5) a) Define & Explain the type of Brakewaters. **[8]**

b) Define Fenders & explain any one with sketch. **[8]**

Q6) a) Enlist the importance & types of Signals in Harbours. Explain any one. **[8]**

b) Explain the importance of Airport Planning. **[8]**

Q7) a) Explain the importance of Ventilation & Dust Control in Tunnel. **[8]**

b) Enlist the methods of tunnelling in Hard Rock. Explain any. **[8]**

Q8) SHORT NOTE (ANY THREE): **[18]**

a) Runway Patterns.

b) Mucking & Muck Haulage.

c) Blast Fences.

d) Wind Rose Diagram.

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Seat No.	

Total No. of Pages : 2

T.E. (Electronics & Telecommunication) (Semester - V)

Examination, April - 2018

POWER ELECTRONICS (Revised)

Sub. Code : 66317

Day and Date : Friday, 27 - 04 - 2018 **Total Marks : 100**

Time : 10.00 a.m. to 01.00 p.m.

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

SECTION - I

Q1) Solve any two. **[16]**

a) Draw & explain construction & characteristics of power MOSFET.

b) Explain with example series & parallel connections of SCR.

c) Draw and explain overvoltage and overcurrent protection of SCR.

Q2) Solve any two. **[16]**

a) With circuit diagram & waveform explain VJT triggering circuit of SCR.

b) With circuit diagram & waveform explain class-B commutation method for SCR.

c) Explain construction, characteristics & application of GTO.

Q3) Solve any two **[18]**

a) The single phase half wave controlled rectifier is connected with 230V, 50Hz supply with R-load. If delay angle is 60°. find out. ($R_{Load} = 13\Omega$)

i) I_{dc} ii) V_{dc}

iii) Displacement factor iv) P_{dc}

b With neat circuit diagram & waveforms explain single phase half wave controlled rectifier.

c) Explain source and load inductance effect on controlled rectifier. suggest & explain the method of decreasing effect of source & load inductance.

P.T.O.

SECTION - II

Q4) Solve any two of the following : **[16]**

a) Explain with circuit diagram and waveforms operation of MOSFET based single phase bridge inverter.

b) With the help of circuit diagram explain operation of morgan's chopper.

c) Explain PWM techiques used for harmonic elimination in inverter.

Q5) Solve any two of the following : **[16]**

a) Discuss principle of operation of dielectric heating. Also explain applications.

b) Explain speed control of D.C. Motor using chopper

c) Explain with architecture & applications of PLC.

Q6) Solve any three of the following **[18]**

a) SMPS

b) SCADA

c) Static circuit breaker

d) Step-down chopper.

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Seat No.	

Total No. of Pages : 2

T.E. (ETC) (Semester - VI) (Revised) Examination, May - 2018

VLSI Design

Sub. Code : 66917

Day and Date : Saturday, 05 - 05 - 2018 **Total Marks : 100**

Time : 02.30 p.m. to 05.30 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Assume suitable data whenever necessary.**
3) **Neat diagrams must be drawn whenever necessary.**
4) **Figures to the right indicate full marks.**

Q1) Solve any three. **[18]**

a) Explain concurrent statements in VHDL with example.

b) Briefly elaborate with suitable example, the significance of 'configuration' in VHDL.

c) Explain briefly the different levels of abstraction.

d) Explain positive edge D type flip-flop. Write a VHDL code for same using 'wait' statement.

Q2) Solve any two. **[16]**

a) Which are the different types of 'Operators' that operator on signals, variables and constants in VHDL? Summarize all types and with suitable examples elaborate 'Shift' kind of operators.

b) With the help of neat block diagram explain VLSI system design flow.

c) Explain 4 bit comparator? Write VHDL code for the same.

P.T.O

Q3) Solve any two : **[16]**

a) Write a VHDL code for 4-bit up counter with enable and Asynchronous reset.

b) Explain 'Transport' and 'Inertial' delay with suitable examples and respective timing diagrams.

c) Using 2 to 4 decoder draw 4 to 16 decoder? Write VHDL code for same.

Q4) Solve any three : **[18]**

a) Explain loop statements used in Verilog with example.

b) Explain 3:8 decoder design using Verilog.

c) Explain following with reference to MOSFET

i) Velocity Saturation

ii) Mobility degradation.

d) Explain Hot Electron effect.

Q5) Solve any two : **[16]**

a) Explain dynamic power dissipation in CMOS circuit.

b) Draw and explain architectural block diagram of XC9572 CPLD.

c) Which are the different fault models used while testing combinational logic circuits? Explain any one in detail.

Q6) Solve any two : **[16]**

a) Explain briefly boundary scan methodology used for testing circuit boards with many ICs.

b) Draw and explain general architectural block diagram of Spartan III family FPGA.

c) Explain how the voltage transfer characteristic for the CMOS inverter can be obtained.

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Total No. of Pages : 2

T.E. (Electronics and Telecommunication Engineering)
(Semester - VI) Examination, May- 2018
MICROPROCESSOR & MICROCONTROLLER (Revised)
Sub. Code : 66918

Day and Date : Tuesday, 08 - 05 - 2018 **Total Marks : 100**

Time : 02.30 p.m. to 05.30 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) Explain various Addressing modes of 8085 with two examples each.

b) Draw and Explain Machine Cycle of Instruction LXI H 3050H.

c) Explain what is Stack and subroutine and mention its use and also explain how conditional CALL instructions are executed by 8085.

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

a) Differentiate between Memory mapped I/O and I/O Mapped I/O.

b) Interface and Explain 8K×8 RAM to 8085 using 4K×8 RAM chip with starting address C000H.

c) Interface four common anode seven segment displays to 8085 using 8255 and write a program to display continuously "HELP" on it.

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

a) Draw and Explain Functional Pin out diagram of 8051.

b) Draw and Explain PSW of 8051 and also explain Reset circuit and oscillator circuit of 8051.

c) Explain various types of Conditional and Unconditional JUMP instructions in 8051. What is difference between CALL and JMP instruction execution?

P.T.O.

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

a) Explain in detail the alternate functions of port 3. Also draw the internal structure of any port pin of 8051.

b) Write an assembly language program for 8051, to transmit data stored at RAM location 50H serially at baud rate 9600. Assume crystal frequency = 11.0592MHz.

c) Draw and explain block diagram of mode 0 of timer 1 in 8051. Also draw the format of TMOD SFR.

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

a) Draw 8051 based detailed interfacing diagram of Temperature Displaying system using LM35 sensor. Write the detail algorithm to display the temperature on LCD.

b) Draw the interfacing diagram of DAC 0808 to 8051. Write a program to generate trapezoidal waveform.

c) Interface 8k × 8 ROM to 8051 using memory chips of 8k × 4 capacity. Write the use of each pin used for interfacing. Also mention the start and end address of the memory.

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

a) Write an embedded C program to send out the value 22H serially one bit at a time via P1.2. The LSB should go out first.

b) Write an embedded C program to generate a square wave of 1 KHz on pin P1.0 of 8051 using Timer 0.

c) How to access code ROM space in 8051 using embedded C explain with example.

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Total No. of Pages : 2

Seat No.	

T.E. (Electronics Engineering) (Part-III) (Semester - VI) (Revised) Examination, May - 2018

VIDEO ENGINEERING

Sub. Code : 66852

Day and Date : Saturday, 05 - 05 - 2018 **Total Marks : 100**

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

Instructions :
1) **All questions are compulsory.**
2) **Use suitable assumptions if required.**
3) **Draw necessary figures on right side of answer sheet.**

SECTION-I

Q1) Solve any three: **[18]**

a) Explain positive and negative modulation with suitable waveforms.

b) Draw the block diagram of PAL decoder and write function of each blocks.

c) Explain aspect ratio, horizontal and vertical resolution, and video bandwidth for TV.

d) Explain the factors on which Channel Bandwidth for video broadcasting depends.

e) Draw suitable diagram and explain microphone and speaker.

Q2) Solve any two: **[16]**

a) What is equalizer & mixer. Explain with suitable application.

b) What is Scanning? State and explain advantages of Interlace scanning.

c) Draw and explain Composite video signal for chess board pattern.

Q3) Solve any two: **[16]**

a) Explain optical recording and reproduction.

b) Compare NTSC and SECAM T.V. system.

c) Draw suitable diagram and explain different elements of Colour picture tube.

P.T.O.

SECTION-II

Q4) Answer any three sub Questions: **[18]**

a) Describe briefly the merits of digital TV receivers that are not achievable in analog receivers.

b) Draw the structure of the plasma display panel (PDP) used for Television and explains it's working.

c) Explain the Multiple sub-Nyquist sampling encoding developed for HDTV.

d) Draw the basic block diagram of an up-link setup and explain how the signals are Compressed, packetized and multiplexed before modulation and transmission.

Q5) Answer any two sub Questions: **[16]**

a) Draw the block diagram of video codec VCU 2134 and explain digital signal processing carried out in it (I T T).

b) Draw and explain the working of different types of LCD Matrix used for television.

c) Describe the merits and applications of CATV system. Draw a typical layout of this system of signal distribution. Why are the amplifiers and equalizers required along trunk distribution lines?

Q6) Answer any two sub Questions: **[16]**

a) Draw and explain D_2 MAC baseband signal waveform for normal unscrambled picture transmission.

b) Draw and explain the construction of LCD panels used for the television.

c) What are the features and functions of CCTV with suitable diagram? Explain any one application of the CCTV?

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Total No. of Pages : 2

Seat No.	

T.E. (Electronics) (Semester - V) (Revised) Examination, April - 2018

VLSI DESIGN

Sub. Code :66283

Day and Date : Friday, 27- 4 - 2018 **Total Marks : 100**

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

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

SECTION - I

Q1) Attempt any three. **[3×6=18]**

a) Write a VHDL description to implement with D-FF with synchronous reset.

b) Write a VHDL description to implement 4-bit 2-input multiplexer.

c) Explain the syntax for physical literals. Describe Current (nA, μA, mA, A) as physical type.

d) What is meta stability and synchronizer failure? Explain in brief with neat diagrams.

Q2) Attempt any two. **[2×8=16]**

a) What is concurrent statement? List and explain the syntax of 'when-else' and 'with select' statement.

b) Write VHDL description for 8: 1 Mux using 'with select' statement

c) Write a VHDL structural description to implement 4:1 mux using 2:1 mux.

P.T.O.

Q3) Attempt any two. **[2×8=16]**

a) Design a Moore machine to detect non overlapping sequence '101' sequence and describe it using VHDL.

b) Design a 4 bit shift register with shift enable and shift left or shift right controls and describe it using VHDL.

c) Design a FSM to produce a sequence 1.3,7,9,11,13,15,17 describe it using VHDL.

SECTION - II

Q4) Attempy any three. **[3×6=18]**

a) Explain 'block' and 'arrayl' attributes with example.

b) Explain with example WAIT statements in VHDL.

c) Explain with example fault models for testing.

d) What is JTAG? Explain the JTAG standard and interface.

Q5) Attempt any two. **[2×8=16]**

a) Explain with neat diagram structure of IOB spartan - II FPGA.

b) Write a algorithm and design the datapath for n Factorial and list control words.

c) Design a control unit for simple IF – THEN–ELSE algorithm.

Q6) Attempt any Two. **[2×8=16]**

a) List various features of spartan - II LUT and details of BLOCK RAM.

b) With neat diagram explain boundary scan testing technique.

c) Draw and explain architecture, features of XC95xx series CPLD.

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Seat No.	

Total No. of Pages : 3

T. E. (Electronics and Telecommunication) (Semester -V)
Examination, April - 2018
CONTROL SYSTEMS (Revised)
Sub. Code : 66315

Day and Date : Wednesday, 25 - 04 - 2018 **Total Marks : 100**
Time : 10.00 a.m. to 01.00 p.m.

Instructions: 1) **All questions are comulsory.**
2) **Assume data wherever necessary.**
3) **Figures to the right indicate full marks.**

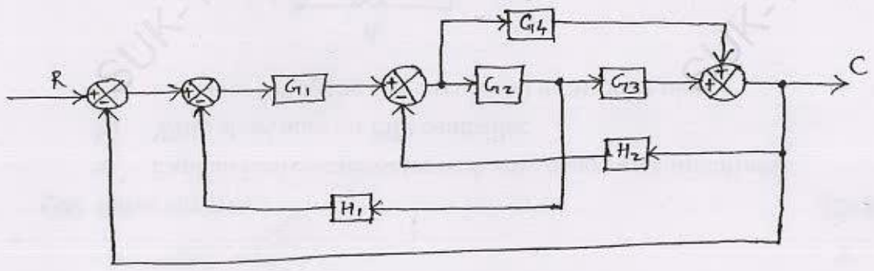
SECTION- I

Q1) Solve any two: **[2×9=18]**

a) Write mathematical model of mass, spring and damper element.

b) Compare open loop and closed loop system.

c) Using block diagram reduction rules find the closed loop transfer function for the following system.



Q2) Solve any two **[2×8=16]**

a) Derive the relations for rise time, peak time, delay time and peak overshoot.

b) For unity feedback system $G(s) = \frac{K}{s(s+10)}$

Find gain K with damping ratio of 0.5 and then determine t_s, M_p, t_p.

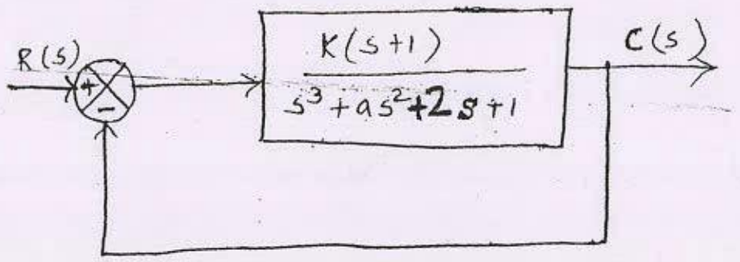
c) Derive expression for time response of first order system.

P.T.O.

Q3) Solve any two **[2×8=16]**

a) Explain limitations of Routh array.

b) A system oscillates with frequency ω, if it has poles at $s = \pm j\omega$ and no poles in R.H.S plane. Determine values of K and 'a', so that system shown in fig oscillates at a frequency 2 rad/sec.



c) By means of routh criterion determine stability of the systems represented by following characteristic equations. For unstable system determine the number of roots in right half S-plane.

i) $s^4+2s^3+8s^2+4s+3=0$

ii) $s^4+2s^3+s^2+4s+2=0$

SECTION - II

Q4) Solve any two: **[2×9=18]**

a) State and explain Nyquist stability criteria with suitable example.

b) State and explain various frequency domain specifications.

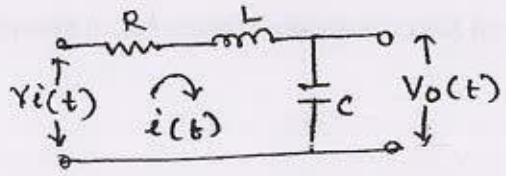
c) Sketch bode plot and determine gain crossover and phase crossover frequency for the system with unity feedback for following forward path transfer function $G(s).H(s)=\frac{100(S+3)}{S(S+1)(S+5)}$

Q5) Solve any two: **[2×8=16]**

a) Give state variable representation of control system.

b) Explain the terms state, state variable, state vector and state space of the system.

c) Obtain state model for the given RLC circuit.

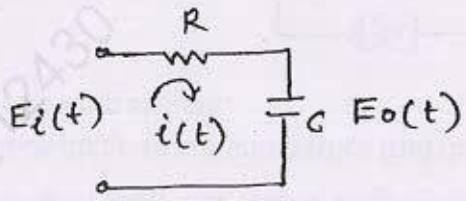


Q6) Solve any two **[2×8=16]**

a) Explain lead compensator with advantages and limitations

b) Write short note on PID controller

c) Consider following RC circuit and draw polar plot.



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Total No. of Pages : 3

Seat No.	

T.E. (E & TC) (Semester - V) Examination, April - 2018

ANTENNA AND WAVE PROPAGATION

Sub. Code : 66314

Day and Date : Tuesday, 24 - 04 - 2018 **Total Marks : 100**

Time : 10.00 a.m. to 01.00 p.m.

Instructions : 1) **All questions are compulsory.**

2) **Figures to the right indicate full marks.**

3) **Use of non-programmable calculator is allowed.**

4) **Assume suitable data, if necessary.**

SECTION - I

Q1) Attempt any two : **[16]**

a) The radiation intensity of antenna is :

$$U(0.\phi)=\begin{cases}\cos^3\theta; & 0°\le\theta\le90° \\ 0 \quad ; & 90°\le\theta\le180°\end{cases}$$

with $0°\le\phi\le360°$

Determine maximum effective aperture of antenna if f= 10GHz.

b) Explain single wire and double wire radiation mechanism of antenna.

c) Derive the equation for normalized electric field due to linear arrays of n - isotropic point sources of equal amplitude and spacing.

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

a) Two space crafts are separated by 3 mm, each has antenna with D = 200 & operating frequency is 2 GHz. If craft A's receiver requires 20dB over 1pw, what transmitter power is required on craft B's receiver to achieve this signal level?

b) Draw & explain with field patterns :

i) Broadside array ii) Ordinary end - fire array

iii) Scanning array

c) What is frequency independent antenna? Explain Rumsey's principle. Draw and explain conical spiral antenna.

P.T.O

3) Attempt any two : [18]

a) Give experimental set up & measurement procedure of Beamwidth & Directivity measurement of antenna.

b) With neat diagram explain four different feeding methods of microstrip patch antenna.

c) Design a rectangular microstrip antenna using a substrate with dielectric constant of 2.2, h = 0.1588cm, So as to resonate at 10 GHz.

SECTION - II

4) Attempt any two :

a) Explain ground wave attenuation factor in detail. [8]

b) Explain effective ϵ and σ of an ionized gas. [8]

c) A low power, short range RADAR is solid - state throught, including a low noise RF amplifier which gives it an overall noise figure of 5.77 dB. If antenna diameter is 1m, the IF bandwidth is 500 kHz, the operating frequency is 9 GHz and radar set is supposed to be capable of detecting targets of $5m^2$ cross sectional area at maximum distance of 12 km, what must be peak transmitted pulse power? [8]

5) Attempt any two :

a) For ionosphere define and obtain equations of, [8]

i) Refractive index

ii) Plasma frequency

iii) Critical frequency

iv) Phase and group velocities

b) Draw and explain functional block diagram of pulsed RADAR set. [8]

c) A transmitter operating at F = 1.0 MHz is required to provide ground wave field strength of 1.0 mV/m at a distance of 20 km. A short vertical antenna has as efficiency of 60%. $\sigma = 4 \times 10^{5}$ ʊ/cm, $\epsilon = 15$. Determine transmitter power required. [8]

6) Attempt any two :

a) Write a note on RADAR performance factor. [9]

b) Explain Faradays Rotation and measurement of total electron density. [9]

c) A communication system is to be established at a frequency of 60MHz with transmitter power of 1 kW. The field strength of directive antenna is 3 times that of a half - wave antenna Ht = 50m, hr = 5m. A field strength of 80μV/m is required to give satisfactory reception. Find the range of the system. [9]

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Total No. of Pages : 3

Seat No.	

T.E. (E & TC) (Semester-V) (Revised) Examination, April-2018
SIGNALS AND SYSTEMS
Sub. Code : 66316

Day and Date : Thursday, 26 - 04 - 2018 **Total Marks : 100**

Time : 10.00 a.m. to 01.00 p.m.

Instructions : 1) **All questions are compulsory.**
2) **Figure to the right indicates full marks.**

Q1) Solve any two **[16]**

a) Explain unit impulse, unit step, unit ramp and exponential signals.

b) Sketch the discrete signal $x(n) = \begin{cases} 1 & for \quad -1 \le n \le 2 \\ \frac{1}{2} & for \quad 3 \le n \le 5 \\ 0 & elsewhere \end{cases}$

And evaluate Odd and Even Signals.

c) Sketch following signals

i) $x(t) = tu(t)$

ii) $x(t) = (t-1)u(t)$

iii) $x(t) = t.\ u(t-1)$

iv) $x(t) = (t-1)u(t-1)$

Q2) Solve any two **[18]**

a) Prove that any CT signal can be represented as a sum of shifted scaled unit impulse sequences. Also explain convolution integral.

b) Convolve the sequences x(n)={2,3,1,4} and h(n)={–1,2,3} using graphical method.

P.T.O.

c) Check following systems for time variant or invariant

i) $y(n) = x(-n)$

ii) $y(t) = x^2(t)$

iii) $y(t) = x(t^2)$

iv) $y(n) = x(n).x(n-2)$

3) Solve any Two [16]

a) Explain sampling theorem in time domain.

b) Explain Interpolation techniques and Aliasing.

c) Explain reconstruction of signals from its samples.

4) Solve any Two [16]

a) Find Z-transform of following signals

i) $x[n] = a^n u[n]$

ii) $x[n] = \sin [n\omega T]u[n]$

b) Determine the DT sequence associated with Z.T. given below using P.F.E. method $x(z) = \frac{10z}{(z-1)(z-2)}$.

c) Explain properties of Z-transform in detail.

5) Solve any Two [18]

a) Find trigonometric Fourier series and Plot Fourier spectrum of time domain signal x(t) shown in figure. 1

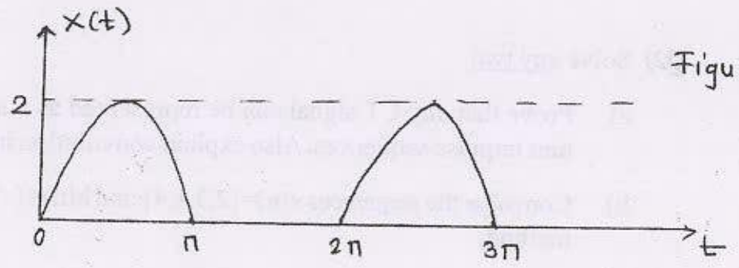

Figure.1

b) Explain properties of Fourier series in detail.

c) Compute the exponential Fourier series and plot the magnitude and phase spectrum time domain signal shown in figure.2.

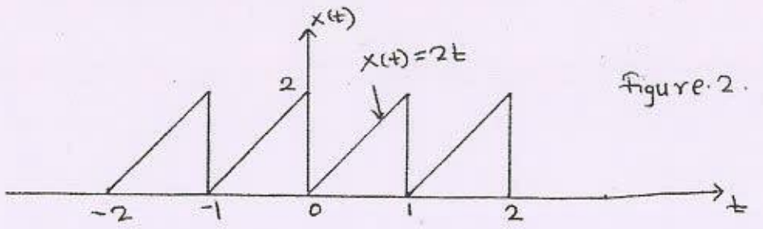

figure.2.

6) Solve any Two [16]

a) Find the continuous spectrum of a non periodic signal m(t) shown in figure.3.

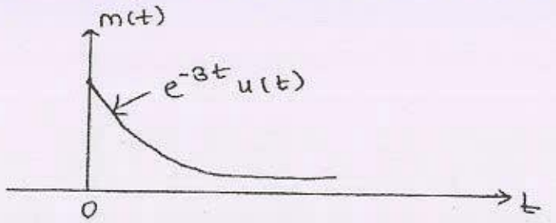

Figure.3.

b) Explain properties of Fourier transform in detail.

c) Find the F.T. of signal x(t) given in equation using frequency shifting property, $x(t) = \sin \omega_0 t$.

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Total No. of Pages : 3

Seat No.	

T.E. (ETC) (Semester - VI) Examination, May - 2018

INDUSTRIAL MANAGEMENT

Sub. Code : 66920

Day and Date : Tuesday, 15 - 05 - 2018 **Total Marks : 100**

Time : 02.30 p.m. to 05.30 p.m.

Instructions : 1) **All sections are compulsory.**

2) **Figures to the right indicate full marks.**

SECTION - I

(Attempt any three questions)

Q1) a) What is planning? Write the importance of planning function. **[8]**

b) Define motivation. Explain Mc'Gregor's Theory X and Theory Y. **[8]**

Q2) a) Describe the advantages and limitations of advertising. **[8]**

b) What is inventory control? Explain theABC analysis. **[8]**

Q3) a) With suitable examples, explain the various elements of costs. **[8]**

b) Describe the step wise procedure to start a S.S.I. unit. **[8]**

Q4) Write short notes on any three of the following : **[3 × 6 = 18]**

a) Control techniques

b) Performance appraisal methods

c) Importance of purchasing

d) Social responsibility of modem industry

P.T.O

SECTION - II

(Attempt any three questions)

25) a) Solve following unbalanced assignment problem. There are four machines W, X, Y, Z. three jobs A, B, Care 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	19	22

And Test optimality

b) Define Operational research. Explain it's methodology and characteristics. **[8]**

26) a) Consider the details of a project involving activities as shown **[8]**

Activity	Immediate predecessors	Duration in months
A	--	3
B	--	5
C	--	7
D	B	6
E	A	4
F	A	3
G	B	8
H	C,D	7
I	C,D	3
J	E	4
K	F,G,H	5
L	F,G,H	4
M	I	12
N	J,K	8

i) construct the CPM network,
ii) Determine the critical path and project completion time
iii) compute total float

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

27) 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]**

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b) Draw a network corresponding to the following information. Obtain the early and latest start and completion times and determine critical activities. Also find the maximum duration of the project. **[8]**

Activity :	1-2	1-3	2-6	3-4	3-5	4-6	5-6	5-7	6-7
Duration :	4	6	8	7	4	6	5	19	10

28) Write short notes on (any three) **[18]**

a) Vogel's approximation method
b) Methodology of OR,
c) PERT
d) Least cost method

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Total No. of Pages : 3

Seat No.	

T.E. (ETC) (Semester - VI) (Revised) Examination, May - 2018

DIGITAL SIGNAL PROCESSING

Sub. Code : 66916

Day and Date : Thursday, 03 - 05 - 2018 **Total Marks : 100**

Time : 02.30 p.m. to 05.30 p.m.

Instructions : 1) **All questions are compulsory.**

2) **Figures to the right indicate full marks.**

Q1) Solve any three. **[18]**

a) What is FFT? Why FFT is needed? How can we calculate IDFT using FFT algorithm.

b) Find the circular convolution of the sequence x(n) [1,3,5,3], h(n)=[2,3,1,1].

c) Find the DFT of the given sequence x(n) = {1,–1,–1,–1,1,1,1,–1} using DIT FFT algorithm.

d) An FIR digital filter has the input impulse response sequence h(n)={2,2,1}. Determine the output sequence in response to the output sequence in response to the input sequence x(n) = {3,0,–2,0,2,1,0,–2,–1,0} using overlap add method.

Q2) Solve any two. **[16]**

a) Explain Gibb's Phenomenon.

b) Find Fourier transform of $x(n) = n \quad -3 \leq n \leq 3$

$= 0 \quad$ Otherwise

c) Find inverse Fourier transform of

i) $X(e^{j\omega}) = 1 + 2e^{-j\omega} + 2e^{-j2\omega} + 3e^{-j3\omega}$

ii) $X(e^{j\omega}) = e^{-j\omega}$ for $-\pi \leq \omega \leq \pi$

P.T.O

Q3) Solve any two : **[16]**

a) Design a linear phase FIR low pass filter of order seven with cut-off frequency 1 rad/sec. Use rectangular window.

b) Design a filter with

$$H_d(e^{j\omega}) = e^{-j3\omega} \quad \frac{-\pi}{4} \le \omega \le \frac{\pi}{4}$$

$$= 0 \quad \frac{\pi}{4} \le \omega \le \pi$$

Using Hanning Window for N = 7.

c) Explain windowing method of filter design.

Q4) Solve any three : **[18]**

a) What is bilinear transformation? Explain frequency warping and prewarping procedure in BLT.

b) Analog filter has a transfer function $(s) = \frac{10}{s^2+7s+10}$. Design a digital filter equivalent to this using impulse invariant method for T= 1 sec.

c) Design a single pole low pass digital filter with a 3-dB bandwidth of 0.2π by use of bilinear transformation applied to the analog filter $H(s) = \frac{\Omega c}{s+\Omega c}$ where Ω_c is 3-dB bandwidth.

d) Design the second order high-pass digital Butterworth filter whose cut-off frequency is 1KHz at sampling frequency of 10^4 sample/sec. Use BLT method.

Q5) Solve any two : **[16]**

a) Realize the system with system function $H(z) = \frac{1+2z^{-1}+z^{-2}}{1-\frac{3}{4}z^{-1}+\frac{1}{8}z^{-2}}$ in cascade form.

b) Obtain parallel form realization of a system with transfer function

$H(z) = 1 + 4z^{-1} - 3z^{-2} + 6z^{-3} - 9z^{-4} + 5z^{-5} + 7z^{-6}$

c) Explain methods of FIR filter realization.

Q6) Solve any two : **[16]**

a) Explain general DSP processor with block diagram.

b) Compare microprocessor and DSP processor.

c) Explain TMS320C67XX.