T.E. V (old) (EXTC) 19/5/15

μp & μcontrollers-I

(OLD COURSE)

QP Code : 3876

(3 Hours) **[Total Marks : 100**

N.B: (1) Question No. 1 is compulsory
(2) From remaining answr any 4 questions.
(3) Draw neat diagram wherever necessary.

1. (a) Explain RIM instruction in 8085. **5**
   (b) Explain PSW in 8051 **5**
   (c) Explain interrupt in 8051 in brief. **5**
   (d) Describe the features of ARM7 processor. **5**

2. (a) Draw the block diagram of 8253 timer/Counter & briefly explain the control word. **10**
   (b) Draw and .explain the interfacing circuit of 7 segment LED display with 8255 for 8085 microprocessor. **10**

3. (a) Explain Internal data ram organization of 8051. **10**
   (b) Explain the following instructions of 8051. **10**
   1)MOVX 2)LCALL 3)MOV @RI,#OFFH 4)ADD 5)DJNZ

4. (a) Draw and explain the architecture of ARM processor. **10**
   (b) Explain the addressing modes of ARM processor with suitable example. **10**

5. (a) Draw internal structure of TCON and TMOD SFR and explain. **10**
   (b) Explain PSW of 8051Microcontroller with suitable example. **10**

6. (a) Compare features of 89C51,89C52,89C2051and 89C2052. **10**
   (b) Draw the Timing Diagram for INR M instruction of 8085. **10**

7. Write short notes on. **20**
   (a) Software Delay in 8085.
   (b) Flag register in 8085.
   (c) Modes of DMA data transfer
   (d) Interrupt in 8085.

RJ-Con. : 9595-15.

T.E. Sem II (old)

EXTC

RFCD

25|05|15

(OLD COURSE)

Q.P. Code : 3878

(3 Hours) **[Total Marks : 80**

N.B. : (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions from question no. 2 to 7.
(3) **Assume** suitable **data** if **necessary**, stating your **assumption**.

1. (a) Define standing wave ration (SWR). Show that **5**

$$SWR = \frac{1+|\Gamma|}{1-|\Gamma|}$$ where T is reflection coefficient

(b) Explain with the help of a diagram, the structure of a microstrip line. **5**

(c) A typical PCB substrate consists of dielectric constant of 2.2 and loss tangent of 0.001 at 6 GHz. Find the conductivity of the substrate. **5**

(d) Explain physical properties of semiconductor. **5**

2. (a) Calculate the input impedance of a 0.2 λ transmission line whose characteristics impedence is 50Ω and terminated with a load of 100 + j 50Ω. Use Smith chart. **10**

(b) Derive expressions for internal, external and loaded quality factors for the standard series and parallel resenant circuits. **10**

3. (a) Draw the equivalent circuits and explain the RF behaviour of resistor, capacitor & inductor. **10**

(b) Explain the construction and principle of operation of HEMT and RFFET. **10**

4. (a) Design a buterworth lowpass filter having a cut-off frequency of 200MHz and 20 dB attenuation of at 250 MHz. **10**

(b) State and prove any three Kuroda Indentities. **10**

5. (a) Discuss power consideration in transmission line when **10**

(i) Source and load impedances are matched.

(ii) load impdance is matched and source impedance in not matched.

(b) Show the RF small signal circuit model of BJT and equivalent model using miller effect. Find the value of Cm_1 and Cm_2 in terms of C_{cb}, V_{be} and V_{ce}. **10**

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10

6. (a) Explain Schottky diode using its cross sectional view and circuit model. 10

(b) An abrupt p-n function made of Si has acceptor and donar concentration of $N_A = 3 \times 10^{18}$ cm^{-3} and $N_D = 8 \times 10^{15}$ cm^{-3} respectively. Assuming the device at room temperature. Determine

(i) barrier voltage

(ii) the space charge width in the p and n type semiconductor

20

7. (a) Write short notes on following :

(a) Measurement of AC parameters of BJT

(b) Chebysher filter

(c) Realization of capacitor and inductor using transmission lines.

T.E. (EXTC)
SS Old(Old) V
29/05/15

Q.P. Code : **3882**

(OLD COURSE)

(3 Hours) [Total Marks : 100

N.B. : (1) Questions **No.1** is **compulsory**.
(2) Attempt any **five** questions in **all.**
(3) Assume **suitable** data, **if required** & **state** them clearly.

1. Answer any four of the following: **20**

(a) A linear time invariant (LTI) system is characterized by the following difference equation.

$y(n) = ay(n-1) + b\,x(n)$ for $0 < a < 1$.

Find the magnitude & phase of the frequency response $H(e^{j\omega})$ of the system.

(b) Determine the z transform of the signal

$x(n) = n\,a^n u(n)$. Draw pole-zero plot & show ROC.

(c) Let $x(n) = u(n) - u(n-5)$.
Find & sketch even & odd parts of x (n).

(d) Determine the signal energy & signal power for the following signals:

(i) $x(t) = e^{-3|t|}$

(ii) $x(t) = e^{-3t}$

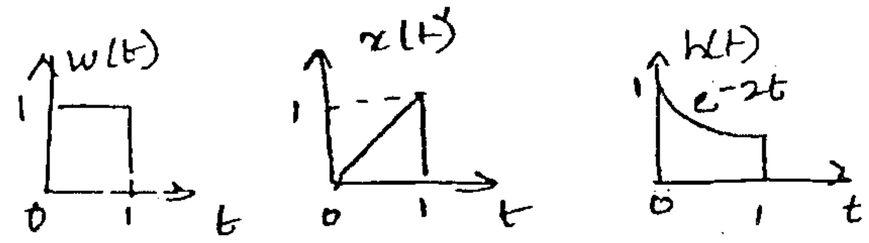
(e) State & explain convolution property of z transform.

2. (a) Find the Fourier series for the function $x(t)$ defined **10**

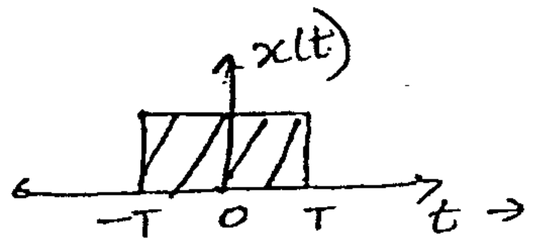
$$x(t) = \begin{cases} 0 & -T/2 < t < 0 \\ A\sin\omega_0 t & 0 < t < T/2 \end{cases}$$

and $x(t+T) = x(t)$, $\omega_0 = 2\pi/T$

(b) Find the Laplace transform of the signals shown below. **10**



3. (a) Obtain the Fourier transform of a rectangular pulse shown. **6**



(b) Determine the O/P response of the system $h(t) = u(t)$ to an input **8**

$x(t) = e^{-at}\,u(t)$, $a>0$.

(c) Explain & prove time shifting & frequency shifting property of Fourier transform. **6**

4. (a) Solve the following difference equation using z transform method. **10**

$x[n+2] + 3x[n+1] + 2x[n] = 0$

Where the initial conditions are x [0] = 0 & x [1] = 1.

(b) A system is defined by the following difference equation **10**

$$y(n) - \frac{1}{6} y(n-1) - \frac{1}{6} y(n-2) = x(n).$$

(i) Realize the system using direct form II & Parallel realisation.

(ii) Comment on the stability of the system.

5. (a) Obtain inverse z transform of the following X (z) **8**

$$X(z) = \frac{1}{(1+z^{-1})(1-z^{-1})}, \quad ROC|z|>1$$

(b) Prove that LTI system is stable if its impulse response is absolutely summable. **8**

(c) Compare discrete time Fourier transform & continuous time Fourier. **4**

6. (a) Determine the system function & unit sample response of the system describe by the difference equation. **6**

$$y[n] - \frac{1}{2} y[n-1] = 2x[n], \; y[-1] = 0.$$

(b) Explain the relationship between Laplace transform & Fourier transform. **7**

(c) The impulse response of LTI system is h [n] = {1, 2, 1, -1} **7**

Find out the response of the system to the input signal x [n] = {1, 2, 3, 1}

7. (a) The transfer function of the system is given as **8**

$$H(s) = \frac{s^2 + s + 5}{s^3 + 6s^2 + 8s + 4}$$

Obtain the sate variable model.

(b) Using a suitable method obtain the state transition matrix e^{At} for the following **8**

system $A = \begin{bmatrix} 0 & -3 \\ 1 & -4 \end{bmatrix}$.

(c) State properties of state transition matrix. **4**
