Tatyasaheb Kore Institute of Engineering & Technology, Warananagar
(An Autonomous Institute)

Final Year B. Tech (Electronics &Telecommunication Engg.) (Semester-VII)
END SEMESTER EXAMINATION (ESE), MAY 2024

Course Name: Computer Networks & Security   Course Code: ETC 701
Day and Date: Thursday, 30th May 2024   Max. Marks- 60
Time: 10.00 AM to 12.00 noon

Instructions:
i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following**	**12**		
a	What is Computer Network? What are advantages & drawbacks of computer Networks. ?.		1	L1
b	Draw & explain TCP/IP model		2	L2
c	What are design issues of Data link layer ?.		1	L1
2	**Attempt any Two from the following**	**12**		
a	Draw & explain SDLC frame format. ?.		1	L1
b	What are design issues of Network Layer?		2	L2
c	Explain working of Connection oriented service with diagram .		1	L1
3	**Attempt any Two from the following**	**12**		
a	Explain working of Stop & Wait protocol.		3	L1
b	What is Framing? Explain different Framing methods..		2	L2
c	Differentiate Virtual Circuit & datagram		3	L1
4	**Attempt any Two from the following**	**12**		
a	What are different shortest path algorithms? Explain Dijkstras shortest path algorithms.		4	L1
b	Draw & explain TCP.		4	L1
c	Draw & explain FTP		3	L1
5	**Attempt any Two from the following**	**12**		
a	What is topology? Explain different topology..		1	L1
b	Explain a)LAN b)MAN c)WAN.		2	L2
c	What is sliding window protocol? Explain a)Go back N b)Selective repeat.		3	L1
d	What are functions of transport layer ?		4	L1

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B.Tech.(E & TC Engg.) (Sem-VII)
End Semester Examination, May- 2024

Course Name : Microwave Engineering   Course Code   ETC702

Day & Date   : **Friday, 31-May-2024**   Max Marks   60 Marks

Time   : **10:00 am to 12:00 pm**

Instructions:
     a) All questions are compulsory
     b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)
        (L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)
     c) Use of non-programmable calculator is allowed
     d) Assume suitable data if required.

		Marks	**B.L**	**CO**
Q.1	**Attempt any two**	**12**		
a)	Explain with suitable equations TM mode equations for a rectangular waveguide		**L2**	**CO1**
b)	A rectangular waveguide measures 3 x 4.5 cm internally with 9 GHz signal propagated in it. Find for TE10 mode of operation (i) The cut off wavelength (ii) guide wavelength		**L5**	**CO2**
c)	Differentiate between Reflex Klystron and two cavity klystron amplifier		**L4**	**CO4**
Q.2	**Attempt any two**	**12**		
a)	With diagram explain Travelling wave Tube.		**L2**	**CO1**
b)	In H plane Tee junction 40 mW power is applied to H arm that is perfectly matched to junction. Calculate Power delivered to load 60 Ω and 75 Ω connected to side ports 1 and 2 Characteristics impedance of line is 50 Ω		**L5**	**CO2**
c)	With the help of suitable diagram explain the operation of Magic Tee.		**L1**	**CO1**
Q.3	**Attempt any two**	**12**		
a)	What is EMI and EMC? Explain.		**L3**	**CO3**
b)	With the help of suitable diagram explain the operation of E plane Tee and H plane Tee.		**L4**	**CO1**
c)	Explain two valley model theory in Gunn –effect diode		**L5**	**CO1**

Q.4   **Attempt any two**   12

a) Explain the importance of VSWR in impedance matching in microwave circuit   **L4**   **CO3**

b) Describe the procedure for measurement low microwave power in bridge circuit using thermistor.   **L2**   **CO1**

c) Explain slotted line technique for measurement of microwave frequency   **L4**   **CO2**

Q.5   **Attempt any two**   12

a) Define attenuation and insertion loss. Explain substitution method for attenuation   Measurement   **L1**   **CO2**

b) Explain the terms Anechoic Chamber and Quiet zone in microwave measurement   **L2**   **CO3**

c) Explain velocity modulation and electron bunching in reflex klystron with Applegate diagram   **L4**   **CO3**

d) Explain parabolic reflector and how gain of this antenna is determined   **L5**   **CO1**

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S.Y. B.Tech. (Electronics and Telecommunication) (Sem- III)
END SEMESTER EXAMINATION, MAY- 2024
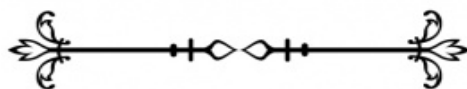
Course Name : Engineering Mathematics-III   Course Code: ETC-301
Day & Date :   31/05/2024   Max Marks : 60 Marks
Time   :   10.00 AM to 12.00 PM

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	**12**		
a	Solve $(D^2 + 4)y = sinx + e^x$		1	L2
b	Find $L\{e^{-2t}tcos2t\}$		2	L2
c	Find $L\left\{\frac{1}{t}e^{-t}sint\right\}$		2	L3
2	**Attempt any Two from the following**	**12**		
a	Find $L^{-1}\left\{\frac{2s+3}{s^2+2s+2}\right\}$		3	L2
b	Find $L^{-1}\left\{\frac{2s^2-4}{(s+1)(s-2)(s-3)}\right\}$		3	L2
c	Find the Fourier series for $f(x) = \begin{matrix} x - \pi & -\pi < x < 0 \\ \pi - x & 0 < x < \pi \end{matrix}$		4	L3
3	**Attempt any Two from the following**	**12**		
a	From a box containing 100 transistors 20 of which are defective,10 are selected at random. Find the probability that		5	L2
	i) All will be defective			
	ii) All are non defective			
	iii) At least one is defective			
b	Between 2 p.m. to 4 p.m. the average number of phone calls per minute coming into a switch board of a company is 2.5. Find the probability during a minute there will be		5	L2
	1) No phone call			
	2) Exactly 3 calls			

c	In a sample of 1000 students the mean and standard deviation of marks obtained by the students in a certain test are 14 and 2.5 . Assuming the distribution to be normal find the number of students getting marks	**5**	**L2**

      i)   Between 12 and 15

      ii)   Above 18

      iii)   Below 8

(Given: For S.N.V.Z area between z=0 and z=0.4 is 0.1554 , for z = 0 to z = 0.8 is 0.2881, for z = 0 to z =1.6 is 0.4452, for z = 0 to z =2.4 is 0.4918)

4	**Attempt any Two from the following**	**12**	
a	Find the directional derivatives of $\emptyset = x^2 + y^2 + z^2$ in the direction of the 3i+4j+5k at (1,2,3)	**6**	**L2**
b	If $\bar{f} = 3x^2i + 5xyj + xyz^3k$ then find div$\bar{f}$, curl$\bar{f}$ at (1,2,3)	**6**	**L2**
c	Find a,b,c if $\bar{f} = (axy + bz^{3)}i + (3x^2 - cz)j + (3xz^2 - y)k$ is irrotational and also find div$\bar{f}$	**6**	**L2**

5	**Attempt any Two from the following**	**12**	
a	Solve $(D^3 - D^2 - 6D)y = x^2 + 1$	**1**	**L2**
b	Evaluate the following integral by using Laplace Transform	**2**	**L2**

$$\int_0^\infty \frac{cos6t - cos4t}{t} dt$$

c	Find $L^{-1}\left\{\frac{1}{(s-3)(s+3)^2}\right\}$ by using convolution theorem	**3**	**L3**
d	Show that the vector $\bar{F} = (y^2cosx + z^3)i + (2ysinx - 4)j + (3xz^2 + 2)k$ is irrotational and find its scalar potential.	**6**	**L2**

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S.Y. B. Tech. (Electronics and Telecommunication) (Sem- III)
### END SEMESTER EXAMINATION, MAY- 2024

|			
Course Name :	**Electronic Devices and Circuit-I**	Course Code:	**ETC302**
Day & Date :	Saturday, 1st June, 2024	Max Marks :	60 Marks
Time :	10:00 am To 12:00 noon		

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	12		
a	Draw the circuit diagram of Zener shunt regulator and explain its operation for varying input as well as varying load resistance condition.	6	1	1
b	A 250 – 0 – 250 Vrms transformer is used with full wave center tapped rectifier with each diode having an internal resistance of 30Ω. If the load resistance is 2KΩ, find, i) r m s value of Ripple Voltage. ii) Rectification Efficiency.	6	1	5
c	Design an unregulated power supply with inductor filter to produce 12V, 25mA with ripple factor of 4%.	6	2	5
2	**Attempt any Two from the following**	12		
a	Explain the procedure of drawing the DC load Line.	6	2	2
b	Derive equation $t = \dfrac{0.35}{f2}$ ……rise time	6	3	2
c	Draw and explain Positive biased Clipper circuit with forward voltage using necessary waveform. Assume input sine wave = 10Vpp and biasing voltage = 3V DC.	6	3	5
3	**Attempt any Two from the following**	12		
a	Draw and explain collector to base bias circuit. Derive the equation for I_B, V_{CE} and I_C.	6	3	2
b	Define Stability Factor. Derive general expression for stability factor.	6	4	2
c	Design voltage divider biasing circuit for following specifications. V_{CC}=15V. V_{CE} = 8V, I_{CQ} = 4mA, β_{min} =100, S = 10.	6	4	5

4	**Attempt any Two from the following**	12		
a	Derive the stability factor of Self bias circuit.	6	5	1
b	Draw hybrid equivalent circuit of a CE transistor amplifier. State the name of each parameter and write its equation.	6	5	5
c	For the transistor connected in CE configuration, determine Av, Ai, Ri and Ro using the complete hybrid equivalent model given Rs=RL =1kΩ, hie = 1KΩ, hre = 2 X10 $^{-4}$, hfe = 100, hoe =20μ℧.	6	3	5

5	**Attempt any Two from the following**	12		
a	As sown in fig. below given β=100, V_{BE}=0.6V, V_{CE}=5V under quiescent condition. Calculate R_B and S.	6	5	3

24V

10 KΩ

R_BΩ

270Ω
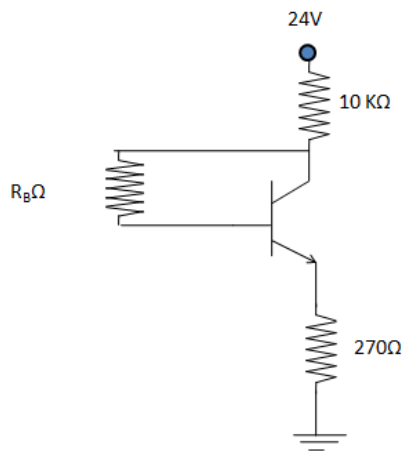
b	Draw the circuit diagram of Differentiator, State its conditions and derive the output equation.	6	1	2
c	Design a zener shunt voltage regulator to provide 5V output DC voltage at load with the load current of 10 mA. The input voltage is varies in between 6V to 8V.	6	3	2
d	Compare half wave; center tapped full wave and Bridge Rectifier. (Any six points.)	6	6	2
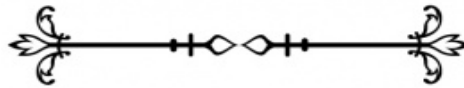
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S.Y./T.Y./Final Year B.Tech. (Branch Name) (Sem- III)
END SEMESTER EXAMINATION, MAY- 2024

Course Name :Digital Electronics & Microprocessor   Course Code:ETC303
Day & Date   :Monday, 03/06/ 2024   Max Marks 60 Marks
Time   : 10:00am to 12:00pm

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	**12**		
a	Perform the conversions:-		2	**Apply**
	i) $(23.125)_8 = (\quad)_2$			
	ii) $(AA.11C)_{16} = (\quad)_{10}$			
	iii) $(110000111)_B = (\quad)_{10}$			
b	Why NOR Gate is called as universal Gate? Justify.		1	**Remember**
c	Implement Half adder using NAND gate only.		1	**Apply**
2	**Attempt any Two from the following**	**12**		
a	Explain 4 bit BCD adder with logic diagram.		2	**Understand**
b	Draw 16:1 multiplexer and explain all signals with Truth Table.		3	**Understand**
c	For any 4 bit data, explain with logic circuit odd parity generator and checker.		3	**Remember**
3	**Attempt any Two from the following**	**12**		
a	Draw Function tables and excitation tables of all flip flops.		1	**Understand**
b	Implement using suitable decoder:- i) F1 = ∑m (2,4,6,7)		3	**Apply**
	i i) F1 = ∑m (0,4,5,)			
c	Design Mod-6 ripple counter and draw waveforms.		2	**Apply**
4	**Attempt any Two from the following**	**12**		
a	Derive T FF using JK FF. Why SR FF not used for T FF.		1	**Apply**
b	What are types of registers? Explain serial shift register using logic diagram.		1	**Understand**
c	Explain instructions in detail:- i) SDA C200h i) DCX B		4	**Understand**
5	**Attempt any Two from the following**	**12**		
a	Draw flowchart and write a program to find smallest number from given array of 6 bytes.		6	**Create**
b	Draw timing diagram of :- ADD B		4	**Understand**
c	Draw and explain Flag register of 8085 Microprocessor.		5	**Understand**
d	With examples explain operand addressing modes in 8085 microprocessor.		5	**Understand**

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S.Y. B.Tech. (Electronics & Telecommunication Department) (Sem- III)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : ELECTRICAL CIRCUITS   Course Code: ETC304
Day & Date   : Tuesday, 04-06-2024   Max Marks   :   60 Marks
Time   : 10.00 AM TO 12.00 PM

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	12		
a	If the current flowing through the given circuit is 0.5A, then find the values of resistors R & 3R.		**CO-1**	1

b	Find current flowing through 3 Ω resistor using superposition theorem.		**CO-1**	1

c	Use source transformation to convert given circuit to single current source and single resistor between terminal A & B.		**CO-1**	1

2	**Attempt any Two from the following**	12		
a	Express Y (Admittance) parameters in terms of H (Hybrid) parameters.		**CO-3**	2
b	Design m-derived T and π-networks low pass filter having nominal characteristic impedance Ro=900 Ω, cut-off frequency fc = 0.9kHz and infinite attenuation (or resonant) frequency Fin=1000 Hz.		**CO-2**	3
c	Explain the composite filter with the help of block diagram.		**CO-2**	2
3	**Attempt any Two from the following**	12		
a	How does a commutator contribute to the operation of a DC motor?		**CO-4**	1
b	Differentiate between DC shunt, series, and compound motors.		**CO-4**	2
c	A 240 V series motor takes 40 amperes when giving its rated output at 1500 r.p.m. Its resistance is 0.3 ohm. Find what resistance must be added to obtain rated torque (i) at starting (ii) at 1000 r.p.m.		**CO-4**	3

4   **Attempt any Two from the following**   12

a   Differentiate between AC servo motor and an DC servo motor.   **CO-4**   **1**

b   Draw construction and explain working of Reluctance Stepper Motor.   **CO-4**   **2**

c   Draw construction and explain the operation of Single phase permanent split   **CO-4**   **2**
capacitor type Induction motor with speed vs torque characteristics.

**5**   **Attempt any Two from the following**   12

a   Using Millman's theorem replace the given circuit by single source and single resistor   **CO-1**   **2**
between terminals A & B.
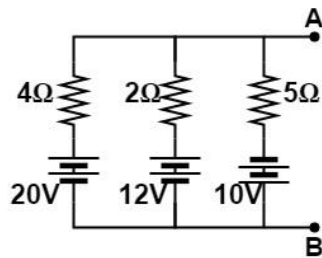
b   Find the Node voltages V1 & V2 using Nodal analysis.   **CO-1**   **2**
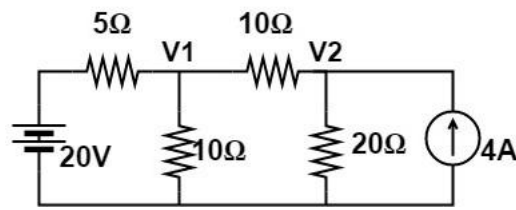
c   A 500 V shunt motor runs at its normal speed of 250 r. p.m. when the armature   **CO-4**   **3**
current is 200 A. The resistance of armature is 0.12 ohm. Calculate the speed when a
resistance is inserted in the field reducing the shunt field to 80% of normal value and
the armature current is 100 Ampere.

d   Illustrate the construction and explain the operation of a Brushless DC (BLDC)   **CO-4**   **2**
Motor.
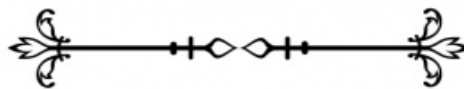
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S.Y. B. Tech. (Electronics and Telecommunication) (Sem- IV)
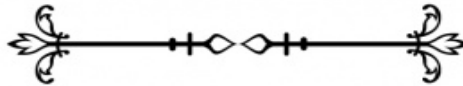## END SEMESTER EXAMINATION, MAY- 2024

Course Name :	**Electronic Devices and Circuit-II**	Course Code:	**ETC401**
Day & Date :	Friday, 17th May, 2024	Max Marks :	60 Marks
Time :	2:00pm To 4:00pm		

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	**12**		
a	In Amplifier Ri=1KΩ, Ro=50KΩ, Av= 40, 10% negative feedback, Calculate Avf, Rif.	**6**	**1**	**5**
b	Compare Characteristics of all negative types of feedback Amplifier. (Draw table)	**6**	**1**	**2**
c	i) If A_{V1}=10dB, A_{V2} = 15dB, A_{V3} =25dB are the stage gains, then what is the overall voltage gain in dB of the circuit? ii) If A_{I1}= 21, A_{I2}=31, A_{I3}=40 are the stage gains, then what is the overall current gain of the circuit?	**6**	**2**	**5**
2	**Attempt any Two from the following**	**12**		
a	Design a two stage RC coupled amplifier to meet the following specifications. Load resistance-2kΩ, Source resistance-600Ω, Frequency range-20Hz to 20KHz, Supply voltage-15V.	**6**	**2**	**5**
b	Compare Class A, B, AB and C power amplifier.	**6**	**3**	**3**
c	Derive the expression for efficiency of Class A power amplifier	**6**	**3**	**1**
3	**Attempt any Two from the following**	**12**		
a	Draw the circuit diagram of Class A power amplifier, its output characteristics stating 'Q' point location. Explain in brief.	**6**	**3**	**2**
b	Explain in detail Barkhusen Criteria and its conditions.	**6**	**4**	**1**
c	Draw and explain Hartley oscillator. State its output frequency equation.	**6**	**4**	**2**
4	**Attempt any Two from the following**	**12**		
a	With waveform, explain Monostable Multivibrator.	**6**	**5**	**2**
b	Design a Collector coupled astable multivibrator for the frequency of 1 KHz to give output voltage of 5V.	**6**	**5**	**5**
c	In a Quartz crystal L=125µH, C=0.022pF, R=7.5KΩ and $C_m=C_{SH}$=0.36µF. Determine series and parallel resonant frequencies and Selectivity Q at each frequency.	**6**	**4**	**5**

5	**Attempt any Two from the following**	12		
a	Compare Astable, Monostable and Bistable Multivibrator.	6	5	3
b	An amplifier has mid frequency gain of 100 and a bandwidth of 200 KHz. i) What will be the new bandwidth and gain if 5% feedback is introduced? ii) What should be the amount of negative feedback if the bandwidth is to be restricted to 1 MHz?	6	1	5
c	With waveform, explain Crossover distortion. How to avoid it?	6	3	2
d	State important features of IC 78XX and 79XX regulator.	6	6	2

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S.Y. B.Tech. (ETC) (Sem- IV)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : COMMUNICATION ENGG. Course Code: **ETC402**
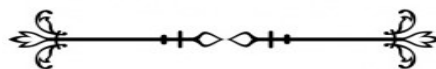Day & Date : MONDAY 20/5/2024 Max Marks : 60 Marks
Time : 2.00 pm - 4.00 pm

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	12		
a	Explain Basic block diagram of communication system.		1	2
b	In an FM system, when the audio frequency (AF) is 800 Hz, and the AF voltage is 4.4 V, the deviation is 6.8 kHz. If the AF voltage is now increased to 9.2V, what is the new deviation? If the AF voltage is further raised to 15 V while the AF is dropped to 100 Hz, what is the deviation? Find the modulation index in each case.		1	3
c	Compare AM and FM		2	4
2	**Attempt any Two from the following**	12		
a	Calculate the noise voltage at the input of a television RF amplifier, using a device that has a 200Ω equivalent noise resistance and a 300Ω input resistor. The bandwidth of the amplifier is 6MHz, and the temperature is 17°C.		4	3
b	Explain Noise figure, Signal to Noise ratio.		4	2
c	Explain in detail AGC.		3	2
3	**Attempt any Two from the following**	12		
a	Explain Ratio detectors.		2	2
b	Explain FM demodulator		2	2
c	Explain slope detector.		2	2
4	**Attempt any Two from the following**	12		
a	Describe following types of sampling techniques- Natural, Flat-Top.		3	2
b	Explain generation of PAM.		2	2
c	Explain comparison between PAM,PPM.		2	4
5	**Attempt any Two from the following**	12		
a	Write a note on Amplitude Modulation.		1	2
b	Calculate the noise figure of the amplifier where Resistor equivalent is 2518Ω, if it is driven by a generator whose output impedance is 50Ω.		4	3
c	Explain block diagram of Super heterodyne receiver in detail.		2	2
d	Explain PWM.		2	2

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S.Y. B.Tech. (Electronics & Telecommunication) (Sem- IV)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : Linear Integrated Circuits   Course Code: ETC403
Day & Date   : Wednesday, 22-May-24   Max Marks :   60 Marks
Time   : 02.00 PM TO 04.00 PM

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	12		
a	Explain block diagram of an operational amplifier (op-amp).		1	1
b	Elucidate the functioning of a level shifter circuit using a detailed circuit diagram to illustrate its operational principles.		1	2
c	Classify in Detail Open loop Op-Amp Configurations.		2	1
2	**Attempt any Two from the following**	12		
a	Draw Circuit Diagram of V to I and I to V converter and derive the equations to it.		2	2
b	What are Precision Rectifiers explain its types with diagrams		3	1
c	Design a Second order low pass filter at High cut off frequency of 1kHz and draw frequency Response of it. (Assume C=0.0047uF, R1=27kΩ)		3	3
3	**Attempt any Two from the following**	12		
a	Explain Triangular wave Generator with its waveform and circuit diagram.		4	2
b	Design RC phase shift Oscillator where fo=200Hz. (Let c=0.1uf)		4	3
c	Explain Quadrature Oscillator with its waveform and circuit diagram.		4	2
4	**Attempt any Two from the following**	12		
a	With the help of block diagram and pinout Explain function generator IC8038 also write its features and applications.		5	2
b	With the help of block diagram and pinout Explain IC565 also write its features and applications.		5	2
c	With the help of block diagram and pinout explain timer IC555 also write its features and applications.		5	3
5	**Attempt any Two from the following**	12		
a	The following specifications are given for the dual-input, balanced-output differential amplifier, where Rc =: 2.2kΩ, RE= 4.7kΩ, Rin1= Rin2 =50Ω, +Vcc=10V, -VEE =- 10 V and the transistor is the CA3086 with βdc = βac =100 and VBE =0.715 V typical. 25mV. (a) Determine the Ico and VCEQ values. (b) Determine the voltage gain. (c) Determine the input and output resistances.		1	3

b	What is slew rate Derive its equation.	2	2
c	Write a note on Comparators.	3	2
d	Determine the low cutoff frequency fL of the filter shown in figure and draw the frequency response plot of the filter.	3	3
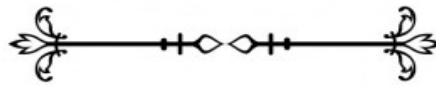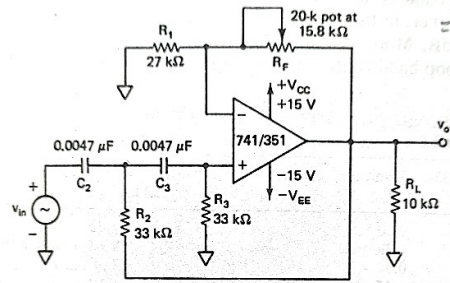
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S.Y.B.Tech.(E&TC) (Sem-IV)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : **Control System**   Course Code ETC 404
Day & Date   : Friday 24/5/2024   Max Marks   60 Marks
Time   : 2.00pm to 4.00pm

Instructions: a) All Questions are compulsory
b) Figures to the right indicates full marks
c) Use of non-programmable calculator is allowed

		Marks	CO	BL

Q.1   **Attempt any two**   12

a) Explain mathematical modeling of Translational . mechanical system   1   1

b) FindC(S)/R(S)usingblockdiagram   rules   1   2

c) Explain Define Compensator Lead Compensator   4   3

Q.2   **Attempt any two**   12

a) Explain SFG Terminology   1   1
b) Find C(S)/ R(S) using block diagram rules   1   2

c) Define Compensator and Explain Lead -Lag Compensator   4   3

Q.3   **Attempt any two**   12
a) Explain block diagram reduction rules   3   2
b) Find error constants for unity feedback system **G(s)H(s)=k(s+2)/s^2(s^2+7s+12)**   2   2
c) Explain PLC Controller with neat block diagram   4   2

Q.4   **Attempt any two**   **12**

   a) Define Time Response .Explain of 1st order System for impulse input   **3**   **3**

   b) Explain steady state error an error constants   **4**   **3**

   c) Unity Feedback System is G(s)=1/s(s+1) calculate   **4**   **3**
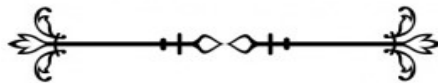
      Rise Time, Peak Time, Maxium overshoot, Settling time

Q.5   **Attempt any two**   **12**

   a) Write Rules of Root Locus   **3**   **2**

   b) Explain lead-lag compensator   **4**   **3**

   c) Explain PID Controller with neat block diagram   **4**   **2**

   d) Comment on system stability using routh's criterion   **3**   **3**

      $S^6+2S^5+8S^4+15S^3+20S^2+16S+16=0$

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S.Y.B.Tech. (E & TC) (Sem-IV)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : **Data Structure & Algorithms**   Course Code: ETC 405

Day & Date   :   **Monday, 27th May 2024**   Max Marks :   60 Marks

Time   :   **2.00 PM to 4.00 PM**

Instructions: a) All Questions are compulsory

b) Figures to the right indicates full marks

c) Use of non-programmable calculator is allowed

d) Assume suitable data if required

		Marks	CO	BL
Q.1	**Attempt any two**	12		
a)	What is algorithm? Draw all flowchart symbols.		1	L1
b)	What is inserting techniques in arrays? How inserting algorithm works		2	L2
c)	What is Linear searching? How linear searching algorithm works ?		1	L1
Q.2	**Attempt any two**	12		
a)	Explain Data structure .Classify data structures..		2	L2
b)	What is deleting techniques in arrays? How inserting algorithm works ?		1	L1
c)	Explain data structure operations.		2	L2
Q.3	**Attempt any two**	12		
a)	Explain Linked list? How to represent linked list in memory ?.		3	L1
b)	Sketch & explain Stack? What are different operations on stack ?		2	L2
c)	What is Queue? How to represent queue in memory?		3	L1
Q.4	**Attempt any two**	12		
a)	Explain an algorithm for traversing Linked list.		4	L2
b)	Write an algorithm for PUSH & POP operation .		3	L1
c)	Explain inserting & deleting operation on Queue		4	L2
Q.5	**Attempt any two**	12		
a)	Explain complete Binary trees .		1	L1
b)	What are different traversal algorithms in trees?		3	L1
c)	What is Graph? How to represent graphs in memory?		4	L2
d)	Explain different terminology used in graphs.		2	L2
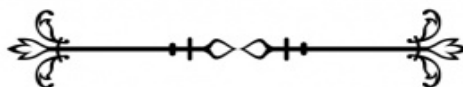
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T.Y. B.Tech. (Electronics & Telecommunication Engg.) (Sem- V)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : VLSI Design   Course Code: ETC501
Day & Date   :   Friday, 31/05/2024   Max Marks   : 60 Marks
Time   :   10.00 am to 12.00 noon

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	12		
a	Draw and explain VLSI design flow.		1	2
b	Explain working of delay models in VHDL.		1	2
c	Explain with example of modeling styles of VHDL.		1	2
2	**Attempt any Two from the following**	12		
a	Write VHDL code for Full Adder using structural modeling.		2	2
b	Write VHDL code for 1:4 De-multiplexer using with select statement.		2	2
c	Write VHDL code for 2-bit Comparator using when else statement		2	2
3	**Attempt any Two from the following**	12		
a	Write VHDL code for T latch and T Flip-flop.		3	2
b	Write VHDL code for positive edge triggered JK Flip-flop.		3	2
c	Write VHDL code for 8 bit SISO shift register.		3	2
4	**Attempt any Two from the following**	12		
a	Write VHDL code for synchronous up counter.		4	2
b	Write VHDL code for 4-bit Ring counter.		4	2
c	Write VHDL code for 4-bit Johnson counter.		4	2
5	**Attempt any Two from the following**	12		
a	What is mean by PLD? Compare different Filed Programmable Devices.		4	1
b	Draw and explain architecture, features of XC95xx series CPLD.		3	2
c	Write VHDL code for ALU with select statement.		2	2
d	Draw and explain Finite State Machine.		4	2
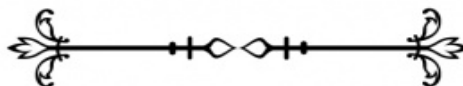
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B.Tech.(E & TC Engg.) (Sem-V)
End Semester Examination, May- 2024

Course Name : Electromagnetic Engineering   Course Code: ETC504
Day & Date   : **Wednesday, 5-Jun-2024**   Max Marks   60 Marks
Time   : **2:00 pm to 4:00 pm**

Instructions:
    a) All questions are compulsory
    b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)
       (L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)
    c) Use of non-programmable calculator is allowed
    d) Assume suitable data if required.

		Marks	B.L	CO
Q.1	**Attempt any two**	12		
a)	Three points P1, P2, P3 are given by (3, 2, 2),(8,5,3) and (6,5,2) respectively. Obtain vector from P1 to P2 and distance between P2 to P3.Also Find unit vector P2 to P3		L2	CO1
b)	Find gradient if f(X, Y, Z) =X^2 Y+ e^z What is the magnitude and gradient at point (1,5,-2)		L5	CO2
c)	Find the Electric field intensity E at (0, 3, 4) m due to point charge Q= 0.5 µC placed at origin.		L4	CO4
Q.2	**Attempt any two**	12		
a)	Derive Expression to find magnetic field intensity due to infinite long straight filament		L2	CO1
b)	A current filament of 3 amps along X axis. Find H component at p(-1,3,2)		L5	CO2
c)	Explain the inconsistency in Ampere's law for time varying fields. How it is modified to overcome this?		L1	CO1
Q.3	**Attempt any two**	12		
a)	Moist soil has a conductivity of 10^{-3} S/m and $\dot{\varepsilon}_{r} =$ 2.5 Find Jc and Jd where E=6.0 x 10^{-6} Sin 9.0 x 10^9 t (V/m).		L3	CO3
b)	Derive the wave equation for conducting media		L4	CO1

c) Write Maxwell's equations in point form and integral form. Also write word statements on the basis of Gauss's law **L5** **CO1**

Q.4 **Attempt any two**   **12**

a) Explain (i) characteristic impedance (ii) Propagation Constant **L4** **CO3**

b) A 10000 Mhz uniform wave in sea water $\sigma = 4$, $\dot{\varepsilon}_r = 2.56$.If amplitude of electric field intensity is 20 v/m and material assumed to be lossless, Find (i) Velocity of propagation (ii) Wave length (iii) Intrinsic impedance η **L2** **CO1**

c) In free space $H(x,t)=1.0\ e^{\ j\ (1.5x10^8t+\beta x)}ay(a/m)$.Obtain expression for $E(x,t)$ and determine the propagation direction **L4** **CO2**

Q.5 **Attempt any two**   **12**

a) Derive Expression to find magnetic field intensity on the axis of circular loop **L1** **CO2**

b) Find the amplitude of the displacement current density adjacent to an automobile antenna ,where the magnetic field intensity of an F.M. Signal is
$H_x=0.2\ Cos\ [2.10(3x10^8t-x)]\ az\ A/m$ **L2** **CO3**

c) Write Maxwell's equations for harmonically varying fields. **L4** **CO3**

d) Find D at point $p(3,-4,5)$ in the field of (i) a point charge of 0.23 µc at origin (ii) a uniform surface charge of $0.07\ \pi\ nC\ /\ m^2$ at a plane X=5 **L5** **CO1**

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T.Y.B.Tech.(E & TC Engg.) (Sem-VI)
End Semester Examination, May-2024

Course Name : ANTENNA AND WAVE PROPAGATION   Course Code: ETC603
Day & Date   : **Saturday, 25-May-2024**   Max Marks   60 Marks
Time   : **2:00 pm to 4:00 pm**

Instructions:
    a) All questions are compulsory
    b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)
       (L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)
    c) Use of non-programmable calculator is allowed
    d) Assume suitable data if required.

		Marks	**B.L**	**CO**
Q.1	**Attempt any two**	12		
a)	Define radiation pattern of antenna. What is difference between field pattern and power pattern?		L2	CO2
b)	Derive Friss formula of radio communication link		L5	CO2
c)	What will be the maximum power received at distance of 0.5 Km over a free space 3 GHz circuit consisting of transmitting antenna with 25dB gain and receiving antenna 20dB gain. Transmitting antenna input is 200 Watts?		L5	CO4
Q.2	**Attempt any two**	12		
a)	What is antenna ranges? What are the limitations of indoor ranges?		L1	CO1
b)	Explain Wheatstone bridge method for measurement of impedance of antenna		L4	CO2
c)	Explain broad side array and end fire array.		L1	CO1
Q.3	**Attempt any two**	12		
a)	Differentiate between ground wave and space wave propagation		L3	CO3
b)	Derive an expression to find the relation between skip distance and maximum usable frequency		L4	CO1
c)	Describe the major factors which affects ionosphere propagation		L2	CO1
Q.4	**Attempt any two**	12		
a)	Derive RADAR range equation		L4	CO3
b)	Explain basic principle of RADAR		L2	CO1
c)	List out the various applications of RADAR.		L4	CO2

Q.5   **Attempt any two**   **12**

    a)   Differtiate the terms antenna bandwidth and antenna beam width   **L2**   **CO2**

    b)   With diagram explain Log periodic antenna and its radiation pattern.   **L4**   **CO3**

    c)   Calculate effective aperture of antenna which is operating at wavelength   **L4**   **CO3**
        of 5 m directivity 75

    d)   What is pattern multiplication? What are its applications?   **L3**   **CO2**

Seat No.	

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T.Y.B.Tech.(E & TC Engg.) (Sem-VI)
End Semester Examination, May2024

Course Name :	Embedded Systems		Course Code	ETC-604
Day & Date :	**Tuesday, 28-May-2024**		Max Marks	60 Marks
Time :	**2:00 pm to 4:00 pm**			

Instructions:
    a) All questions are compulsory
    b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)
       (L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)
    c) Use of non-programmable calculator is allowed
    d) Assume suitable data if required.

		Marks	**CO**	**BL**
Q.1	**Attempt any two**	**12**		
a)	Differentiate Von Neuman & Harward architecture		**1**	**L1**
b)	Draw & explain CPSR register		**2**	**L2**
c)	Draw & explain ARM core data flow model.		**1**	**L1**
Q.2	**Attempt any two**	**12**		
a)	Draw & explain memory organization of LPC 2148		**3**	**L3**
b)	Draw & explain RS-232.		**2**	**L2**
c)	Write Arithmetic & logical instruction set of ARM.		**1**	**L1**
Q.3	**Attempt any two**	**12**		
a)	What are features of LPC 2148 ?		**6**	**L6**
b)	What are features of ADC used in LPC 2148		**4**	**L4**
c)	What are Features of GPIO used in LPC 2148		**1**	**L1**
Q.4	**Attempt any two**	**12**		
a)	Write a program for DC motor interfacing .		**2**	**L2**
b)	Draw & explain SPI bus		**5**	**L5**
c)	Draw & explain IIC bus.		**6**	**L6**
Q.5	**Attempt any two (Unit 1 to Unit 6)**	**12**		
a)	Differentiate RISC & CISC architecture..		**1**	**L1**
b)	What is Embedded system ? What are types of Embedded systems ?		**2**	**L2**
c)	What is barallel shifter ?Write barallel shifter instructions		**4**	**L1**
d)	What are different ARM operating modes ?		**6**	**L2**

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T.Y. B.Tech. (ETC) (Sem- VI)
END SEMESTER EXAMINATION, MAY- 2024

Course Name :	MICROCONTROLLER	Course Code:	ETC502
Day & Date :	MONDAY,3/6/2024	Max Marks :	60 Marks
Time :	2.00 pm-4.00 pm		

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	**12**		
a	Explain Reset Circuits of 8051 and use of same		1	2
b	Explain TMOD Format		2	1
c	Illustrate Functions of Program Counter and Data Pointer		1	2
2	**Attempt any Two from the following**	**12**		
a	Develop programme for 16-bit addition of two numbers		3	2
b	Explain data types used in Embedded		2	1
c	Develop Program on Embedded C to toggle all the bits of P1 Continuously.		1	2
3	**Attempt any Two from the following**	**12**		
a	Explain features of PIC 18 in details.		1	2
b	Explain Memory Organization of PIC 18 Microcontroller		2	1
c	Explain PIC Instruction Format (Byte Oriented Operations)		5	2
4	**Attempt any Two from the following**	**12**		
a	Explain instruction pipeline.		1	2
b	Explain arithmetic Instruction of PIC18		2	1
c	Explain Timers of PIC 18 Microcontroller(Timer 0,1)		4	2
5	**Attempt any Two from the following**	**12**		
a	Explain Properties of 8051		2	2
b	Explain TCON format		2	1
c	Explain Addressing Modes of PIC 18 Microcontroller		3	2
d	Develope Programme using 8051 Embedded C to send hex values for ASCII characters of 0, 1, 2,3,4,5,6,7,8,9, A, B, C, D and E to port P1.		3	2
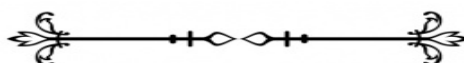
SEAT NO :

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T.Y.B.Tech.(E&TC) (Sem-VI)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : **Power Electronics** Course Code: ETC602

Day & Date :Tuesday 21/5/2024 Max Marks : 60 Marks

Time : 2.00pm to 4.00pm

Instructions: a) All Questions are compulsory

b) Figures to the right indicates full marks

c) Use of non-programmable calculator is allowed

		Marks	CO	BL
Q.1	**Attempt any two**	**12**		
a)	Explain Construction and V-I characteristics of SCR		1	1
b)	Define Commutation and Explain class A and Class F commutation.		1	2
c)	Explain single phase full bridge inverter		3	2
Q.2	**Attempt any two**	**12**		
a)	Explain Turn ON and Turn OFF characterstics of SCR		1	1
b)	Explain construction and working of IGBT.		1	1
c)	Explain Step down chopper.		4	2
Q.3	**Attempt any two**	**12**		
a)	Define controlled rectifiers and explain Mid point converter with neat diagram and waveforms for R load.		3	2
b)	Explain single phase half bridge inverter		3	2
c)	Explain Time ratio control(TRC) in choppers.		4	1
Q.4	**Attempt any two**	**12**		
a)	Explain Semiconverter with neat diagram and waveforms for R and RL load		3	2
b)	A Highly inductive load requires 12Aat 150v from a 230v supply G ive design details for this requirement using M-2 Connection.		3	3
c)	Explain parameters of inverters.			
Q.5	**Attempt any two**	**12**		
a)	Explain Fully controlled rectifier with neat diagram and waveforms for R load		3	2
b)	A single phase semiconverter is operated from 120 v,50 Hz ac supply load resistance is 10 ohm.If average output vg is 25% of the max possible average o/p vg Determine a)Firing angle b)rms and average o/p current c)Rms SCR current		3	3
c)	Explain Jones chopper with neat diagram.		5	2
d)	Explain Morgans chopper			
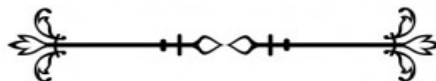
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T.Y B.Tech. (ETC) (Sem- VI)
END SEMESTER EXAMINATION, MAY- 2024

Course Name :	MOBILE TECHNOLOGY (OE-II)	Course Code:	ETC605
Day & Date :	Thursday 30 May 2024	Max Marks :	60 Marks
Time :	2.00 pm-4.00pm		

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	**12**		
a	Explain Principles of Mobile Computing		1	1
b	Write a note on – Limitations of Mobile Computing		1	2
c	Explain Hexagonal Geometry cell structure with neat-labelled diagram.		2	1
2	**Attempt any Two from the following**	**12**		
a	Explain characteristics of GSM standards.		2	1
b	Write a note on- a) GSM Services b) Call routing architecture		1	2
c	Explain need of Mobile IP			
3	**Attempt any Two from the following**	**12**		
a	Write a note on 1) selective retransmission 2) Transaction oriented TCP.		3	1
b	Explain Indirect TCP, Snoop TCP, Mobile TCP.		3	2
c	Describe Fast recovery.		2	2
4	**Attempt any Two from the following**	**12**		
a	Describe WAP architecture and its applications.		4	2
b	Explain WAP in detail.		4	2
c	Explain challenges in WAP.		4	1
5	**Attempt any Two from the following**	**12**		
a	Explain different propagation modes.		1	1
b	Describe Channel Assignment strategies		1	2
c	Explain Agent Discovery.		2	1
d	Explain –IP Handoff in detail			

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Final Year B.Tech. (Electronics & Telecommunication Engg.) (Sem- VIII)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : Power Electronics & Drives   Course Code: ETC703
Day & Date   :   Saturday, 01/06/2024   Max Marks : 60 Marks
Time   : 10.00 am to 12.00 noon

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	**12**		
a	Explain with diagram and waveform 3 phase half wave controlled rectifier at Resistive load. Find expression for average load voltage for continuous mode.		1	1
b	Explain operation of three phase fully controlled rectifier R load. Find expression for average load voltage. Also draw output voltage and current waveforms at 90 degree.		1	1
c	A 3 phase semiconverter is operated from 3-phase, 400V, 50 Hz mains supply and delivers power to sufficiency large inductive load having resistance of 10 Ω. If is required that the average output voltage should be 50% of maximum possible output voltage. Find Firing angle, Average load current & Average load current. State whether conduction will be continuous or not?		1	4
2	**Attempt any Two from the following**	**12**		
a	Explain in detail 120 degree mode of conduction of 3 phase IGBT based inverter. Also draw output waveforms.		1	1
b	3 phase bridge inverter is fed from 500 V DC source. The inverter is operated in 180-degree conduction mode & it is supplying a purely resistive star connected load. Determine: i) RMS value of output line & phase voltage. ii) RMS value of fundamental component of the line & phase voltage.		1	4
c	State and explain selection criteria of electric drives.		2	2
3	**Attempt any Two from the following**	**12**		
a	Explain the operation of single phase to single phase cycloconverter (Bridge type) feeding R load. Draw the waveforms for frequency divide by three.		2	2
b	Explain the operation of 3 phase to 1 phase Cycloconverter with circuit diagram and waveform.		2	3
c	Write different speed control methods of D.C. motor. Explain any one briefly.		2	1
4	**Attempt any Two from the following**	**12**		
a	Explain speed-troque characteristics DC motor.		3	2
b	Explain speed control of separately excited DC motor using chopper controlled DC drives with appropriate waveforms		3	2
c	Explain different speed control methods of induction motor. Explain any one briefly.		3	1

5	**Attempt any Two from the following**	12		
a	Comparison of VSI and CSI inverter.		**4**	**3**
b	Compare circulating and non- circulating mode operation of Cycloconverter.		**4**	**3**
c	What is mean by slip? Draw & explain static scherbius drive.		**4**	**1**
d	Name different braking methods used in induction motor? Explain dynamic braking system in detail with circuit diagram.		**4**	**1**

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Final Year B.Tech. (Electronics & Telecommunication Engg.) (Sem- VIII)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : Wireless Communication   Course Code: ETC801
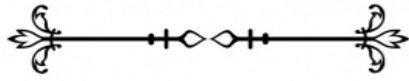Day & Date   :   Friday 17/05/2024   Max Marks : 60 Marks
Time   :   10.00 am to 12.00 noon

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	**12**		
a	List-out different challenges in wireless communication. Explain any one briefly.		1	1
b	Differentiate fixed and dynamic channel assignment strategies.		1	2
c	Explain with neat diagram handoff scenario at cell boundary.		1	1
2	**Attempt any Two from the following**	**12**		
a	Explain the concept of the ground reflection (two-ray) model.		1	1
b	What are the key factors considered in indoor propagation modeling, and how do they differ from outdoor models?		1	1
c	Assume a receiver is located 10 km from a 50 W transmitter. The carrier frequency is 900 MHz, free space propagation is assumed, Gt = 1, and Gr = 2. Find (a) Power at the receiver (b) Magnitude of the E-field at the receiver antenna (c) RMS voltage applied to the receiver input, assuming that the receiver antenna has a purely real impedance of 50 ohm and is matched to the receiver.		2	3
3	**Attempt any Two from the following**	**12**		
a	Draw and explain impulse response model of a multipath channel.		2	1
b	Consider a transmitter, which radiates a sinusoidal carrier frequency of 1850 MHz. For a vehicle moving 60 mph, compute the received carrier frequency if the mobile is moving (a) directly towards the transmitter (b) directly away from the transmitter (c) in a direction which is perpendicular to the direction of arrival of the transmitted signal.		2	3
c	Write different small-scale multipath measurements systems. Explain any one briefly.		2	1
4	**Attempt any Two from the following**	**12**		
a	Draw and explain hierarchy of X.25 in OSI model.		3	1
b	Differentiate development of wireless networks.		3	2
c	Explain Wireless Application Environment.		3	1
5	**Attempt any Two from the following**	**12**		
a	Draw and explain Integrated Services Digital Network (ISDN).		4	1
b	Illustrate a typical cellular system in wireless communication.		4	4
c	Write note on Bluetooth technology.		4	1
d	Explain Wireless Application Protocol architecture.		4	1

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Final Year B.Tech. (E & TC) (Sem-VIII)

END SEMESTER EXAMINATION, MAY- 2024

Course Name : Audio & Video Engg.   Course Code:ETC802

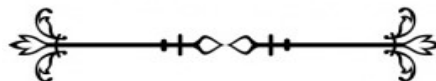Day & Date : Monday, 20ᵗʰ May, 2024   Max Marks : 60 Marks

Time : 10:00 am To 12:00 noon

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	12		
a	Draw and explain block diagram of B/W TV.	6	1	2
b	Prove that maximum video frequency in TV system is 5MHz in interlace scanning.	6	1	2
c	Draw & explain types of colour mixing systems.	6	2	2
2	**Attempt any Two from the following**	12		
a	Draw CVS for following patterns. (For single Line) i) Luminance ii) Chess-board iii) Circle	6	2	2
b	Draw & explain Chromaticity diagram with colour pyramid.	6	2	3
c	Explain with diagram compatibility of TV system.	6	3	3
3	**Attempt any Two from the following**	12		
a	Draw & explain basic principle used in Vidicon camera tube.	6	3	3
b	Draw & explain block diagram of PAL-Decoder to generate RGB output.	6	3	3
c	Draw construction diagram of deflection Yoke.	6	4	3
4	**Attempt any Two from the following**	12		
a	Explain construction of Trinitron picture tube.	6	4	2
b	How does HDTV differ from conventional TV.	6	5	3
c	Explain video processing of camera pick-up signal to generate CVS.	6	5	
5	**Attempt any Two from the following**	12		
a	Explain CCTV system with diagram.	6	5	2
b	Compare LCD & LED Television.	6	6	3
c	Define following terms. i) Forward Scan time ii) Retrace period iii) Scanning	6	6	3
d	Explain merits of digital technology with advantages.	6	6	3

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

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Final Year B.Tech. (ETC) (Sem- VII)
END SEMESTER EXAMINATION, MAY- 2024

Course Name :	IMAGE PROCESSING	Course Code:	ETC7041
Day & Date :	MONDAY 03/06/2024	Max Marks :	60 Marks
Time :	10:00 AM to 12:00PM		

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	**12**		
a	Explain concept of digital image processing.		1	1
b	Explain image sensing & acquisition in detail		1	1
c	Explain steps in image processing in detail.		2	1
2	**Attempt any Two from the following**	**12**		
a	Explain three categories of spatial domain in detail.		3	1
b	Explain basic grey level transformations		1	2
c	write a note on Histogram Processing		2	1
3	**Attempt any Two from the following**	**12**		
a	Explain need for Morphological Processing.		2	1
b	Explain structuring elements.		2	2
c	Explain region filling.		2	2
4	**Attempt any Two from the following**	**12**		
a	Explain Point detection.		1	2
b	Explain Line detection.		2	1
c	Explain detection of discontinuities.		1	2
5	**Attempt any Two from the following**	**12**		
a	Explain component of image processing system with necessary diagram		1	2
b	Explain Region Based Segmentation.		2	1
c	Explain application, advantages, and disadvantages of image processing.		2	2
d	Explain basic relation between pixels.		1	2

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar
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Final Year B.Tech. (Electronics & Telecommunication Department) (Sem- VII)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : PLC AND AUTOMATION   Course Code: ETC7052

Day & Date   : Tuesday, 4-Jun-24   Max Marks :   60 Marks

Time   : 10.00 AM TO 12.00 NOON

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	**12**		
a	How does the size of a PLC influence its application in various industrial settings?		1	1
b	Describe the program scan cycle in a PLC.		2	2
c	Explain in Brief relay instructions in PLC programming.		2	3
2	**Attempt any Two from the following**	**12**		
a	Describe the construction and wiring symbols for contactors.		2	3
b	Provide a procedure for directly translating a narrative description into a Ladder Logic Program.		2	2
c	Illustrate the application of Incremental Encoder-Counter with examples and explanations.		3	2
3	**Attempt any Two from the following**	**12**		
a	Describe how jump and label instructions operate within a ladder logic program.		2	1
b	Describe the functioning of the Master Control Reset instruction within a ladder logic program.		2	2
c	Elaborate on the Subtraction instruction within the context of a ladder logic program.		2	2
4	**Attempt any Two from the following**	**12**		
a	Describe Preventive Maintenance tasks during short shutdown periods.		4	3
b	Explain Program Editing and Commissioning, and provide the general steps involved in Commissioning.		4	2
c	Explain the troubleshooting process within the input Malfunctions of a PLC.		4	2

5   **Attempt any Two from the following**   12

a   Differentiate PLCs and conventional computers.   1   1

b   With help of PLC Ladder logic Programming illustrate Cascading Timers.   2   1

c   Classify with Flow chart programming languages used in PLC programming.   3   2

d   Figure shows the sketch of a drilling process that requires the drill press to turn on only if there is a part present and the operator has one hand on each of the start switches. This precaution will ensure that the operator's hands are not in the way of the drill. The sequence of operation requires that switches 1 and 2 and the part sensor all be activated to make the drill motor operate.   2   3
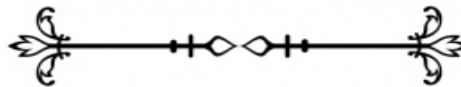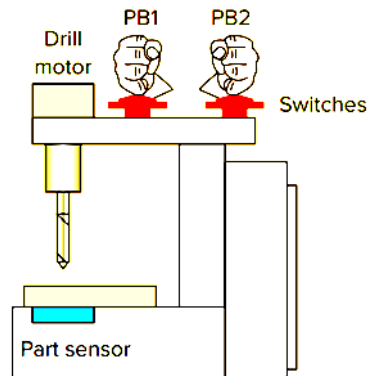
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Tatyasaheb Kore Institute of Engineering and Technology, Warananagar
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B.Tech.(E & TC Engg.) (Sem-II)
End Semester Examination, May- 2024

Course Name : Satellite Communication Course Code ETC8031
Day & Date   : **Wednesday, 22-May-2024** Max Marks   60 Marks
Time   : **10:00 am to 12:00 pm**

Instructions:
   a) All questions are compulsory
   b) Figures to the right indicates full marks, Course Outcome (CO) & Bloom's Taxonomy Level (BL)
   (L1-Remembering, L2- Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 - Creating)
   c) Use of non-programmable calculator is allowed
   d) Assume suitable data if required.

		Marks	B.L	CO
Q.1	**Attempt any two**	12		
a)	Explain the terms Perigee and Apogee in satellite communication		L2	CO1
b)	Explain how the satellite is launched in orbit. Explain types of launch vehicles		L5	CO2
c)	Explain the terms centrifugal and centripetal mean with regard to satellite in orbit around the earth		L4	CO4
Q.2	**Attempt any two**	12		
a)	What are the main types of antennas used on satellite? Explain any one type with respect to gain and beam width		L2	CO1
b)	With block schematic explain double conversion transponder		L5	CO2
c)	Explain how link budget in satellite system is calculated		L1	CO1
Q.3	**Attempt any two**	12		
a)	A 4 GHz receiver with following gains and noise temperatures Tin=25 k, Trf=50k,Tif=1000k,Tm=500k, Grf=23 dB,Gif=30 dB. Calculate system noise temperature assuming that mixer has gain Gm=0 dB		L3	CO3
b)	Explain how link budget in satellite system is calculated		L4	CO1
c)	Explain why LNA of receiver system is placed at the antenna end of feeder cable		L5	CO1
Q.4	**Attempt any two**	12		
a)	Explain on board connectivity with Transparent processing		L4	CO3
b)	Write in detail about Delay and Throughput consideration		L2	CO1
c)	Explain Satellite constellation		L4	CO2
Q.5	**Attempt any two**	12		
a)	Explain attitude and orbit control system. (AOCS)		L1	CO2
b)	What are the advantages of satellite communication over terrestrial communication		L2	CO3
c)	Explain working of GPS navigation system		L4	CO3
d)	Explain Digital DBS TV		L5	CO1

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar
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Final Year B.Tech. (Electronics & Telecommunications Department) (Sem-VIII)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : Biomedical Instrumentation (Elective -IV)   Course Code: ETC8041

Day & Date   : Friday, 24-05-2024   Max Marks   :   60 Marks

Time   : 10.00 AM TO 12.00 NOON

Instructions: a) All Questions are compulsory

b) Figures to the right indicates full marks

c) Use of non-programmable calculator is allowed

d) Assume suitable data if required

		Marks	CO	BL
Q.1	**Attempt any two**	**12**		
a)	What are the fundamental components of a cell?		1	1
b)	Classify Biomedical Equipment in Detail with Examples.		2	2
c)	Write a note on Bio signal Acquisition: Noise, Power line, Baseline, Skin Impedance and Motion Artifacts.		1	2
Q.2	**Attempt any two**	**12**		
a)	What is resting potential and action potential in cells?		1	1
b)	With the help of Circuit Diagram Explain ECG Amplifier and Pre amplifier.		4	3
c)	What is function of the respiratory system?		1	1
Q.3	**Attempt any two**	**12**		
a)	Explain the Electrical Activity of the Heart.		3	2
b)	Explain the working principles of LVDT (Linear Variable Differential Transformer). How does a LVDT contribute to the measurement and analysis of muscle movement?		4	3
c)	Draw and Explain Construction of Piezoelectric Transducers.		3	1
Q.4	**Attempt any two**	**12**		
a)	Classify Electrodes used for measurement of ECG.		3	2
b)	How does a photoelectric transducer function in the context of blood pressure measurement.		3	1
c)	With the help of Diagram Explain in Detail Standard ECG Lead System.		2	2
Q.5	**Attempt any two**	**12**		
a)	With the help of Block Diagram Explain Bedside Monitor.		3	2
b)	With help of Diagram Explain Blood Pressure Monitoring system.		3	2
c)	Classify Pacemakers and explain anyone in detail.		4	1
d)	Explain Biological Effects and Precautions Related to X-Rays.		4	2
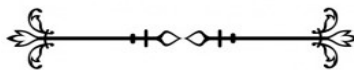
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T.Y. B.Tech. (Electronics & Telecommunication Engineering) (Sem-VI)
END SEMESTER EXAMINATION, MAY- 2024

Course Name : Cyber Security & Law   Course Code: ETC-H-601
Day & Date   :   Saturday,1June 2024   Max Marks : 60 Marks
Time   :   2.00 pm. to 4.00 pm.

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	**12**		
a	Explain how to evaluate cyber stalking?		1	2
b	Describe how is spyware delivered to target system?		1	2
c	Explain different passive scanning techniques used by hacker.		2	1
2	**Attempt any Two from the following**	**12**		
a	Explain different major types of attacks on CPS.		2	2
b	Explain advantages of Blockchain Architecture.		2	2
c	Explain general guidelines to follow in any forensic examination.		2	1
3	**Attempt any Two from the following**	**12**		
a	Why do we need cyberlaws?		3	2
b	Explain sections 65, 66 of the Indian ITA 2000.		3	2
c	Explain positive aspects of the ITA 2000.		3	1
4	**Attempt any Two from the following**	**12**		
a	Explain about different cyber security awareness tips.		4	2
b	Discuss countermeasures in CPS.		3	2
c	Explain challenges to Indian Law and cybercrime scenario in India.		4	2
5	**Attempt any Two from the following**	**12**		
a	Explain spyware & legal uses of spyware.		1	2
b	Describe SQL Script Injection attack and how to prevent it?		2	2
c	Discuss different Challenges and Issues in Virtual Currency.		2	2
d	How to get back deleted files on PC?		2	2

T.Y. B.Tech. (Electronics & Telecommunication Engineering) (Sem-VI)

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)

Final Year B.Tech. (Electronics & Telecommunication Engineering) (Sem-VIII)

END SEMESTER EXAMINATION, MAY- 2024

Course Name : Internet of Things & Embedded Security   Course Code: ETC-H-801

Day & Date   :   Monday, 27/05/2024   Max Marks   : 60 Marks

Time   :   2.00PM. to 4.00PM.

Instructions:

i. **All Questions are compulsory**
ii. Figure to the right indicates full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO	BL
1	**Attempt any Two from the following.**	12		
a	Discuss attack trees. Explain building an attack tree of Unmanned Aircraft Systems (UAS).		1	1
b	Describe safety impact assessment in safety and security design.		2	2
c	Explain security in agile developments.		2	2
2	**Attempt any Two from the following**	12		
a	Describe typical anomalies to look for within an IOT system in security monitoring.		2	2
b	Describe symmetric encryption in the IOT device.		4	2
c	Describe cryptography and its role in the IOT.		4	1
3	**Attempt any Two from the following**	12		
a	Describe Bluetooth IOT communication protocol.		3	2
b	Explain cryptographic hashes used in a variety of security functions.		4	2
c	Explain in brief about authentication credentials.		3	1
4	**Attempt any Two from the following**	12		
a	Explain the classic pillars of information assurance.		2	1
b	Describe penetration test in the IOT system.		2	2
c	Explain identity management in internet of things.		3	2
5	**Attempt any Two from the following**	12		
a	Explain in brief primer on threats, vulnerability and risks (TVR) in IOT implementations.		1	2
b	Discuss the role of cryptographic security APIs.		2	2
c	Discuss forensics and secure device disposal and zeroization of IOT devices.		3	1
d	Explain asymmetric encryption in the IOT device		4	2

Tatyasaheb Kore Institute of Engineering & Technology Warananagar
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F. Y. M. Tech (Electronics & Telecommunication) (Semester-I)

END SEMESTER EXAMINATION, May 2024

Course Name: Computer Vision   **Course Code: PCC ETC-2011**

Day and Date: Friday, 17-05-2024

Time: 2 hrs   10.00 am to 12.00 pm   **Max. Marks- 60**

Instructions:

i. All Questions are compulsory
ii. Figure to the right indicate full marks.
iii. Assume suitable data if missing.
iv. Use of non-programmable calculators is allowed.

Q. No.		Marks	CO
Q. No. 1	Attempt any one/		
	a) Explain working of Haar transform with example..	**10**	1
	b) What is wavelet function ? How it is used in one dimensional & two dimensional system ?		2
Q. No. 2	Attempt any one/		
	a) What is Fat wavelet Transform ? How it is used in image processing ?	**10**	3
	b) Draw & Explain Boundary segments, Skeletons...		2
Q. No. 3	Attempt any one/		
	a) Draw & Explain Boundary descriptors	**10**	2
	b) Draw & Explain Relational descriptors		2
Q. No. 4	Attempt any one/		
	a) Explain Pattern recognition techniques.	**10**	2
	b) Explain pattern classes .		2
Q. No. 5	Attempt any one/		
	a) Explain applications of Pattern recognition techniques in image processing.	**10**	2
	b) Draw & Explain Minimum distance classifier...		2
Q. No. 6	Attempt any one/		
	a) Explain Matching by correlation. ...	**10**	4
	b) Draw & Explain Nearest neighbor classifier.		2