[B17 EC 3101]

SAGI RAMAKRISHNAM RAJU ENGINEERING COLLEGE (A)
III B. Tech I Semester (R17) Regular Examinations, November 2019
PULSE AND DIGITAL CIRCUITS
ELECTRONICS AND COMMUNICATION ENGINEERING

Time: 3 Hrs. **Max. Marks: 70**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
*****

UNIT – I

1. (a) Explain how RC high pass circuit acts as differentiator and obtain its expression. 7M
   (b) A symmetrical square wave whose peck to peck amplitude is 2V and whose average value is zero is applied to an RC integrating circuit. The time constant equals the half period of the square wave. Find the peak to peak value of the output amplitude. 7M

(OR)

2. (a) Sketch the output response of RC low pass circuit for a step input and obtain as expression for rise time. 7M
   (b) Derive the expression for output of RC high pass circuit with a ramp input. 7M

UNIT - II

3. (a) Derive the relation between tilts is the forward and reverse direction of the output of a clamming circuit excited by a square wave input. 7M
   (b) Explain how a sine wave may be converted into a square wave using a clipping circuit. 7M

(OR)

4. (a) State and prove the clamping circuit theorem. 7M
   (b) With the help of a neat circuit diagram and waveforms, explain the working of positive clamping circuit. 7M

UNIT - III

5. (a) Explain the operation of Schmitt Trigger and derive the expression for upper trigger point. 7M
   (b) A collector coupled fixed – bias binary uses n-p-n transistor with h_{fe}=20, the circuit parameters are V_{CC}=12V, V_{BB}=3V, R_C=1kΩ, R_1=5kΩ, R_2=10kΩ, V_{CEsat}=0.4V and V_{Besat}=0.8V. Find the stable state voltage and currents. 7M

(OR)

6. (a) Explain the operation of collector coupled monostable multivibrator with neat waveforms and derive the expression for pulse width of the vibrator. 10M
   (b) Design a free running Astable multivibrator to generate a square of amplitude 10V and frequency 1KHz with 60% duty cycle consider n-p-n transistor with h_{fe}=25, I_{Csat}=5mA 4M

UNIT - IV

7. (a) Explain the basic principles of miller and Bootstrap time base generators. 7M
   (b) Explain the working of a simple current Sweep circuit with necessary waveforms. 7M

(OR)

8. (a) Define and derive the expression for the slope error, transmission error and displacement error for the exponential Sweep circuits. 9M
   (b) Why CB configuration is the most suitable for Sweep voltage generator. 5M

UNIT - V

9. (a) With a neat circuit diagram explain the operation of RTL logic gate. 7M
   (b) Draw the circuit of a CMOS, NAND and NOR gate explain the operation. 7M

(OR)

10. (a) Explain the operation of DTL logic gate with neat diagram. 8M
    (b) Explain the TTL open-collector logic gate. 6M

[061119]

[R17EC 3101]

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[061119]

[B17 EC 3102]

SAGI RAMAKRISHNAM RAJU ENGINEERING COLLEGE (A)

III B. Tech I Semester (R17) Regular Examinations, November 2019

LINEAR ICs AND APPLICATIONS

ELECTRONICS AND COMMUNICATION ENGINEERING

Time: 3 Hrs. **Max. Marks: 70**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
*****

UNIT - I

1. (a) Derive the expression for frequency of oscillations of asquare wave generator. Explain its operation with a neat circuit diagram. 7M
   (b) Draw the circuit diagram and explain the operation of precision full wave rectifier and derive the output expression. 7M

(OR)

2. (a) With a neat circuit diagram describe how an op-amp acts as a sample and hold circuit. 6M
   (b) Draw the block schematic of an op-amp and explain. 8M

UNIT - II

3. (a) Explain the principle of switched capacitor filters and list their advantages. 6M
   (b) Design a single stage band pass filter to have a voltage gain of unity and a pass band from 300Hz to 30KHz. 8M

(OR)

4. (a) Design a first order high-pass filter to give a high cutoff frequency off$_o$ = 5KHz with a pass band gain of 10. 8M
   (b) What is an all pass filter? Show that the magnitude response of the all pass filter is unity. 6M

UNIT - III

5. (a) Draw the circuit of quadrature oscillator and explain its operation? 7M
   (b) Design a Wien bridge oscillator with gain of 5 and 1 KHz frequency. 7M

(OR)

6. (a) Draw the internal block diagram of voltage controlled oscillator and explain its working. 7M
   (b) Draw the circuit diagram of RC phase shift oscillator and derive expression for frequency of oscillations. 7M

UNIT - IV

7. (a) Design an Astable multivibrator having an output frequency of 10KHz with a duty cycle of 75%. 6M
   (b) With a neat circuit diagram explain how an IC 555 timer can be used as a liner ramp generator and missing pulse detector. 8M

(OR)

8. (a) Explain about the free running range, capture range and lock range in PLL with necessary equations. 8M
   (b) Draw the fixed voltage 3 terminal IC regulator circuit and explain its operation. 6M

UNIT - V

9. (a) What are the limitations of simultaneous type A/D converter? With a neat circuit diagram explain the operation of counter type A/D converter? 8M
   (b) Explain the operation of Weighted resistor DAC with the help of relevant diagrams and sketches. 6M

(OR)

10. (a) Explain the operation of an 8-bit tracking type Analog to Digital converter 8M
    (b) List different types of A/D converters and compare their merits and demerits. 6M

[081119]

[B17 EC 3103]

SAGI RAMAKRISHNAM RAJU ENGINEERING COLLEGE (A)
III B. Tech I Semester (R17) Regular Examinations, November 2019
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
ELECTRONICS AND COMMUNICATION ENGINEERING

Time: 3 Hrs. **Max. Marks: 70**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
*****

UNIT - I

1. (a) What is the significance of the number of significant figures in a stated quantity? Give some examples. 6M
   (b) A basic D' Arsonval moment with a full scale deflection of 50 μA and an internal resistance of 1800 Ω is available. It is to be converted into a 0-1 V, 0-5 V, 0-25 V and 0-225 V multi range voltmeter using individual multipliers for each range. Calculate the values of the individual resistors. 8M

(OR)

2. (a) What are the different types of errors in measurement? Explain. 6M
   (b) The accuracy of five digital voltmeters is checked by using each of them to measure a standard 1.0000 V from a calibration in instrument. The voltmeter readings are as follows: V1 = 1.001 v, V2 = 1.002 v, V3 = 0.999 v, V4 = 0.998v and V5 = 1.0000v. Calculate the average measured voltage and the average deviation. 8M

UNIT - II

3. (a) Describe the working of bonded strain gauge for the measurement of force. 7M
   (b) An ac LVDT has the following data: 7M
   Input = 6.3 V, Output = 5.2 V, range ± 0.5 in. Determine
   (i) Calculate the output voltage vs Core position for a core moment going from + 0.45 in. to – 0.30 in.
   (ii) The output voltage when the core is -0.25 in. from the centre.

(OR)

4. (a) With neat sketch explain the principle of operation of Displacement measurement. 7M
   (b) A capacitive Transducer has a plate separation of 0.01mm. It's capacitance under static condition is 10pF.If the change in capacitance as displacement Transducer is accurately measured to be +1pF, Evaluate the displacement. 7M

UNIT - III

5. (a) Explain the measurement of frequency, time and phase difference using CRO. 6M
   (b) An electro statically deflected CRT has plates which are 2.5 cm long and 0.5 cm apart and the distance from their centre to the screen is 20 cm. The electron beam is accelerated by a potential difference of 2500 volts and is projected centrally between the plates. Calculate the deflecting voltage required to cause the beam to strike a deflecting voltage and find the corresponding deflection of the screen. 8M

(OR)

6. (a) Explain the Measurement procedure of Lissajous patterns with one example. 6M
   (b) A sinusoidal voltage of 83.3 kHz from a standard signal generator gave nine free waves on the screen starting from the X-axis when connected to 'y'-terminal of a CRO, while the tenth wave was slightly short of being a full wave, the end of the trace being at a position that was half the amplitude away from X-axis. If the time base is internally synchronized, determine the rise and decay time of the saw tooth time base voltage. 8M

UNIT - IV

7. (a) List out different sources of errors and explain the precautions and elimination methods in A.C bridges. 6M

(b) An unbalanced wheat stone bridge has the following resistances with R1=1 KΩ, R2=2.5 KΩ, R3=3.5 KΩ, R4=10 KΩ with a battery voltage of 6V and a galvanometer resistance of Rg=300 Ω. Calculate the current through the galvanometer? 8M

(OR)

8. (a) Draw the circuit diagram of Maxwell's bridge, explain its operation and derive the equations for unknown variables. 7M

(b) A balanced ac bridge has the following constants. 7M
Arm AB- R= 1KΩ in parallel with C=0.047 μF
Arm BC- R= 2KΩ in series with C=0.047 μF
Arm CD- unknown
Arm DA- C=0.25 μF
The frequency of the oscillator is 1000Hz. Determine the constants of arm CD.

UNIT - V

9. (a) Discuss the important specifications for sine/square wave generators and Function generators. 7M

(b) What is the minimum detectable signal (MDS) of a spectrum analyzer with a (i) N.F of 25 dB using/KHz 3-dB filter? (ii) If N.F is increased to 40 dB using same filter as above, Estimate MDS and write the inference from the above two cases. 7M

(OR)

10. (a) Draw the circuit diagram of Sweep generator and explain its operation in detail. 8M

(b) What are the various applications of Digital Fourier Analyzers? 6M

[111119]

[B17 EC 3104]

SAGI RAMAKRISHNAM RAJU ENGINEERING COLLEGE (A)

III B. Tech I Semester (R17) Regular Examinations, November 2019

DIGITAL COMMUNICATION

ELECTRONICS AND COMMUNICATION ENGINEERING

Time: 3 Hrs. **Max. Marks: 70**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
*****

UNIT - I

1.	(a)	State and prove the sampling theorem for band pass signals.	7M
	(b)	A signal $m(t)=\cos(200\pi t) + 2\cos(320\pi t\ t)$ is ideally sampled at $f_s = 300$Hz. If the sampled signal is passed through a low pass filter with a cutoff frequency of 250Hz, what frequency components will appear in the output?	7M

(OR)

2.	(a)	Define and explain the necessity of a compander. State different types of companders.	7M
	(b)	Explain the working of delta modulation system with a neat block diagram	7M

UNIT - II

3.	(a)	Draw and explain the power spectra and geometrical representation of BPSK.	7M
	(b)	The bit stream 11011100101 is to be transmitted using DPSK. Determine the encoded sequence and the transmitted phase sequence. Also find demodulated signal	7M

(OR)

4.	(a)	Write down the modulation waveform for transmitting binary information over base band channels, for the following modulation schemes: ASK, PSK, FSK and DPSK	7M
	(b)	Bring out the comparisons between MSK and QPSK.	7M

UNIT - III

5.	(a)	Find the power spectral density of the quadrature components of the noise	7M
	(b)	Derive the expression for the output power spectral density of response of a filter.	7M

(OR)

6.	(a)	What is noise bandwidth. Explain with necessary equations	7M
	(b)	Define available gain, Effective input noise temperature and Noise figure	7M

UNIT - IV

7.	(a)	Discuss the probability of error of the matched filter.	7M
	(b)	Explain the calculation of error probability of PSK	7M

(OR)

8.	(a)	What is optimum filter? Derive the expression for error probability of optimum filter	7M
	(b)	With the help of a block diagram, explain the principle and working of correlation receiver	7M

UNIT - V

9.	(a)	Derive an expression for channel noise and quantization noise in DM system.	7M
	(b)	Compare PCM and DM systems	7M

(OR)

10.	(a)	Explain in detail about the model of spread spectrum digital communication system	7M
	(b)	What is a PN sequence and explain its characteristics	7M

[131119]

[B17 EC 3105]

SAGI RAMAKRISHNAM RAJU ENGINEERING COLLEGE (A)

III B. Tech I Semester (R17) Regular Examinations, November 2019

ANTENNAS AND PROPAGATION

ELECTRONICS AND COMMUNICATION ENGINEERING

Time: 3 Hrs. **Max. Marks: 70**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
*****

UNIT - I

1. (a) Derive the expression for power radiated by quarter wave monopole and prove that its radiation resistance is 36.5 Ω — 8M
   (b) Define the following: — 6M
   i) Radiation intensity ii) Directivity iii) Gain iv) Beam efficiency v) Half Power Beamwidth vi) First Null Beamwidth

(OR)

2. (a) Present a brief report on functions and properties of antennas. — 7M
   (b) Calculate the directivity of an antenna with unidirectional cosine power pattern. — 7M

UNIT - II

3. (a) Derive FRISS transmission equation and explain the significance of each term in the equation. — 7M
   (b) Find the basic transmission loss between a ground based antenna and an airborne antenna when the distance between the antenna is 160 km at a frequency of 3 GHz. — 7M

(OR)

4. (a) Why there are no side lobes in binomial array? What are the excitation levels in binomial array? — 7M
   (b) Find the null – to – null beam width of a broadside array of length 50λ and with 100 elements. — 7M

UNIT - III

5. (a) What are the advantages of Helical antenna over other wire antennas? Explain the axial mode operation of helical antenna. — 7M
   (b) Make a comparison in the performances of long wire, V and Rhombic antennas. — 7M

(OR)

6. (a) What is the significance of input impedance of a Folded dipole? How does this aspect useful in Yagi-Uda antenna? — 7M
   (b) Compare Isotropic, Omni Directional and Directional antennas based on their radiation characteristics. Give at least two applications for each of the antennas. — 7M

UNIT - IV

7. (a) What is spillover with reference to parabolic reflectors? Explain the remedial measures to reduce spill over. — 9M
   (b) Distinguish parabolic reflector from corner reflector. — 5M

(OR)

8. (a) How do you measure the impedance of an unknown antenna? Use necessary sketches. — 7M
   (b) What is the significance of antenna radiation pattern? Explain antenna radiation pattern measurement with necessary sketches. — 7M

UNIT - V

9. (a) Explain reflection and refraction mechanisms in ionospheric propagation of EM waves. — 7M
   (b) Briefly explain about ionospheric abnormalities. — 7M

(OR)

10. (a) Explain how different layers are formed in ionosphere? Is the height of the layers constant during a typical day and/or night timings? Justify your answer. 7M

(b) A radio link has to be established between two earth stations at a distance of 25000km. If the height of ionosphere is 200km and its critical frequency is 5MHz. Calculate the MUF for the given path. Also calculate the electron density in the ionosphere layer. 7M

[151119]

[B17 EC 3106]

SAGI RAMAKRISHNAM RAJU ENGINEERING COLLEGE (A)

III B. Tech I Semester (R17) Regular Examinations, November 2019

COMPUTER NETWORK ENGINEERING

ELECTRONICS AND COMMUNICATION ENGINEERING

Time: 3 Hrs. **Max. Marks: 70**

Answer **ONE Question** from **EACH UNIT.**

All questions carry equal marks.

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UNIT - I

1.	(a)	What is the principle difference between connection less communication and connection oriented communication.	7M
	(b)	Explain the functions of ATM reference model.	7M
		(OR)	
2.	(a)	Draw and explain the layers of a TCP model	7M
	(b)	What is the difference between bottom-up and top-down approaches? Does it make any difference if we choose one approach over another?	7M

UNIT - II

3.	(a)	What is the importance of physical layer and discuss its main functions.	7M
	(b)	What is a machine port and why addressing is needed at the physical layer.	7M
		(OR)	
4.	(a)	Differentiate between time division multiplexing and frequency division multiplexing.	7M
	(b)	List and explain the role of different transmission media used in the physical layer.	7M

UNIT - III

5.	(a)	What are sliding windows and how are they used in data communications?	7M
	(b)	Duplicate frames are a serious issue in stop n wait protocol. Why?	7M
		(OR)	
6.	(a)	Explain the go-back-n protocol	7M
	(b)	Differentiate between go-back-n and selective repeat	7M

UNIT - IV

7.	(a)	Give an example to show how multiplexing and demultiplexing is done at transport layer	7M
	(b)	Explain about leaky bucket algorithm	7M
		(OR)	
8.	(a)	What is reverse path forwarding? Explain with an example	7M
	(b)	What is flooding and explain how it can be avoided	7M

UNIT - V

9.	(a)	What is the necessity of having flow control in the transport layer	7M
	(b)	What are the primary duties of transport layer	7M
		(OR)	
10.	(a)	Explain about DNS	7M
	(b)	Write about world wide web	7M

[181119]