

Hall Ticket Number :

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R-11 / R-13

Code: 1G331

II B.Tech. I Semester Supplementary Examinations May 2018

Electronic Circuits

(Electronics & Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **Five** questions

All Questions carry equal marks (**14 Marks** each)

1. a) Describe the effects of different distortions in amplifiers 6M
b) Draw the small signal hybrid model of CB amplifier and derive expression for its A_v , A_i , and R_i & R_o . 8M
2. a) List the advantages and disadvantages of RC coupling. 4M
b) Explain cascode amplifier and derive voltage gain. 10M
3. a) Describe the emitter follower at high frequencies and also derive the equation for higher cutoff frequency. 7M
b) With hybrid equivalent circuit, derive the expressions for trans conductance. 7M
4. a) Why positive feedback is not suitable in amplifiers. 4M
b) Derive the feedback, input resistance, voltage gain and output resistance of current series feedback circuit 10M
5. a) Explain the operation of RC phase shift oscillator and derive the equation for frequency of oscillations. 7M
b) With neat diagram explain about amplitude stability of oscillator. 7M
6. a) Give the classification of large signal amplifiers 4M
b) Explain complementary symmetry push pull amplifier 10M
7. a) With neat circuit diagram, explain about stagger tuned amplifier. 4M
b) Derive the expression for gain in single tuned amplifier. 10M
8. a) List different 78xx and 79xx series voltage regulators. 4M
b) Explain 723-voltage regulator in detail. 10M

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II B.Tech. I Semester Supplementary Examinations May 2018

Engineering Mathematics

(Common to EEE & ECE)

Max. Marks: 70

Time: 3 Hours

 Answer any **five** questions
 All Questions carry equal marks (**14 Marks** each)

1. a) Find the rank of the matrix by reducing it to the echelon form given

$$A = \begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$$

7M

 b) Find the Eigen values and Eigen vectors of the matrix

$$\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$$

7M

 2. a) Find by Newton-Raphson method, the real root of the equation $3x = \cos x + 1$ correct to four decimal places.

7M

 b) Solve by Euler's method the equation $\frac{dy}{dx} = \log(xy)$ for $y(1.1)$ and $y(1.2)$, given $y(1) = 2$.

7M

3. a) Fit a second degree parabola to the following data:

x:	0	1	2	3	4
y:	1	1.8	1.3	2.5	6.3

7M

b) Calculate the coefficient of correlation between x and y for the following data.

x:	105	104	102	101	100	99	98	96	93	92
y:	101	103	100	98	95	96	104	92	97	94

7M

 4. a) Form the partial differential equation from $z = f(x + y)$.

4M

 b) Solve $(p^2 + q^2)y = qz$ using Charpit's Method.

10M

 5. a) Obtain the Fourier series for $f(x) = e^{-x}$ in the interval $0 < x < 2$

7M

 b) Obtain a half range cosine series for $f(x) = \begin{cases} kx, & 0 \leq x \leq l/2 \\ k(l-x), & l/2 \leq x \leq l \end{cases}$

 and hence deduce the sum of the series $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \dots \dots \infty$

7M

 6. a) Find the Fourier transform of $f(x) = \begin{cases} 1 - x^2, & |x| \leq 1 \\ 0, & |x| > 1 \end{cases}$

7M

 b) Find the Fourier cosine transform of $f(x) = \begin{cases} x, & 0 < x < 1 \\ 2 - x, & 1 < x < 2 \\ 0, & x > 2 \end{cases}$

7M

7. a) From the following data of marks obtained by 60 students of a class, calculate the arithmetic mean, median and mode.

Marks:	20	30	40	50	60	70	
No. of students:	8	12	20	10	6	4	7M

- b) X is a continuous random variable with probability density function given by

$$f(x) = kx \quad (0 \leq x < 2)$$

$$= 2k \quad (2 \leq x < 4)$$

$$= -kx + 6k \quad (4 \leq x < 6)$$

Find k .

7M

8. a) If the probability of a bad reaction from a certain injection is 0.001. Determine the chance that out of 2000 individuals more than two will get a bad reaction.

7M

- b) X is a normal variate with mean 30 and S.D. 5, find the probabilities that (i) $26 < X < 40$, (ii) $X > 45$.

7M

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II B.Tech. I Semester Supplementary Examinations May 2018

Pulse and Digital Circuits

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks each**)

1. a) Explain the RC integrator with neat input and output waveforms. 7M
b) Prove that for any periodic input waveform the average level of the steady state output signal for the RC high pass circuits is always Zero. 7M
2. a) Discuss series and shunt clipper using diode along with relevant waveforms. 7M
b) What is meant by comparator and explain diode differentiator comparator operation when ramp signal is applied as input signal. 7M
3. a) What do you mean by delay time of a transistor? What are the factors contribute to it? 7M
b) Write short notes on:
i) Diode Switching times ii) Switching characteristics of transistor. 7M
4. a) What is monostable multivibrator? Explain with the help of neat circuit diagram and derive an equation for pulse width. 7M
b) Draw the circuit diagram for Schmitt trigger and explain its operation. What are the applications of the above circuit? Derive the expressions for UTP and LTP. 7M
5. a) Explain the basic principle of Miller and bootstrap time base generators. 7M
b) What are the different methods of generating a time base waveform? Explain them briefly. 7M
6. a) What is meant by sampling gates? Explain the working of four diode sampling gate with the help of neat circuit diagram. 7M
b) Compare the unidirectional and bidirectional sampling gates. 7M
7. a) Explain the method of pulse synchronization of relaxation devices with examples 7M
b) Illustrate the terms Synchronization and Frequency Division of a Sweep Generator. 7M
8. a) Explain DTL and RTL circuits with suitable circuit diagrams. 7M
b) Realize a 2-input NOR gate using CMOS Logic and explain the same with help of Functional table. 7M
