

Hall Ticket Number :										
----------------------	--	--	--	--	--	--	--	--	--	--

**R-17**

**Code: 7G332**

II B.Tech. I Semester Supplementary Examinations March 2021

**Digital Design**

( Electronics and Communication Engineering )

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )

\*\*\*\*\*

**UNIT-I**

1. a) Convert the given octal number 234.75 to Binary, Decimal and Hexadecimal form
- b) What is the difference between 1's and 2's compliments? Give one example.

**OR**

2. a) Perform  $a+b$ ,  $a*c$  and  $c/a$  operations in a given data  
 $a=1001, b=101, c=10001$
- b) With a suitable example explain associate and distribute laws in OR logic

**UNIT-II**

3. Simplify the following expression using K-map.  
 $Y = AB'C + A'BC + A'B'C + A'B'C'$

**OR**

4. a) Find the DUAL of the given functions
  - i)  $F = (1,3,7)$
  - ii)  $G = (0,2,4)$
- b) Find the complement of the given functions  
 $F = x+yz + x(y+z)$   
 $G = A'BD' + ACD + B'CD + A'C'D$

**UNIT-III**

5. a) Differences between PAL, PLA and ROM
- b) Realize given function using decoder and additional logic . $f = F = (0,2,4,6)$

**OR**

6. a) Design a circuit which generates the no of ones in a given 3-input binary data
- b) Construct BCD to excess-3 code converter using ROM

**UNIT-IV**

7. a) Differences between combinational and sequential circuits
- b) With a neat diagrams explain the operation of Ring counter

**OR**

8. Design a circuit which generate the following sequence 0,2,4,6,7,11,13,15, and repeat using T-FFs

**UNIT-V**

9. With a suitable example explain the partition technique used for state reduction

**OR**

10. Convert given Moore machine into Mealy machine

PS	NS		Z
	X=0	X=1	
a	c	a	1
b	b	d	0
c	a	b	1
d	d	c	1

\*\*\*

Hall Ticket Number :																			
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

<b>R-17</b>
-------------

**Code: 7G331**

II B.Tech. I Semester Supplementary Examinations March 2021

**Electronic Circuits**

( Electronics and Communication Engineering )

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )

\*\*\*\*\*

<b>UNIT-I</b>
---------------

1. a) Draw the Small signal model of BJT with h-parameters. 5M  
b) Compare various coupling schemes used in amplifiers. 9M

**OR**

2. a) Explain cascode amplifier operation with neat diagrams and mention its uses. 7M  
b) Derive the expressions of Millers theorem and its dual. 7M

<b>UNIT-II</b>
----------------

3. Plot the frequency response and explain the reasons for fall of gain at high and low frequencies in the case of a RC coupled CE amplifier 14M

**OR**

4. Explain the frequency response of amplifier at Low, Mid and High frequencies 14M

<b>UNIT-III</b>
-----------------

5. Derive the expression for input impedance and output impedance for the current series and current shunt feedback amplifiers. 14M

**OR**

6. What are the characteristics of negative feedback amplifier? Explain in detail. 14M

<b>UNIT-IV</b>
----------------

7. a) Explain the Barkhausen criteria for oscillations. 7M  
b) List out the types of oscillators. 7M

**OR**

8. What is Piezo electric effect? Draw ac equivalent circuit of a crystal and explain its working 14M

<b>UNIT-V</b>
---------------

9. Derive the expression for efficiency of series fed Class A power amplifier. 14M

**OR**

10. Explain about direct coupled class A power amplifier working with neat sketches. 14M

\*\*\*

**Code: 7G234**

II B.Tech. I Semester Supplementary Examinations March 2021

**Electrical Circuits and Technology**

( Electronics and Communication Engineering )

Max. Marks: 70

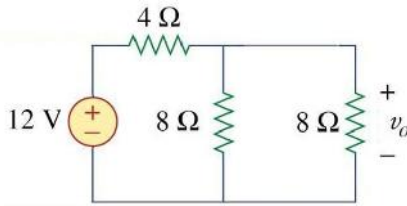
Time: 3 Hours

Answer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )

\*\*\*\*\*

**UNIT-I**

1. a) Explain source transformation and how can it be used to convert (i) a practical voltage source into a practical current source; (ii) a practical current source into a practical voltage source. 10M
- b) Use Source Transformation to determine  $V_0$



**OR**

2. Derive the expression for current in terms of steady state and transient part for RC series circuit excited by a DC voltage. Also find the voltage across the resistor and power absorbed by resistor. 14M

**UNIT-II**

3. a) What are the Advantages of AC Supply 6M
- b) Define Cycle, Time Period, Frequency & Amplitude 8M

**OR**

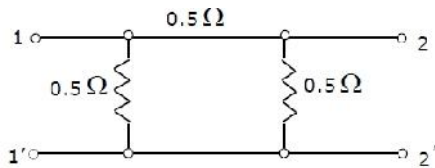
4. Define Average & RMS Value, Form Factor, Peak Factor, Peak Value, Peak to Peak Value 14M

**UNIT-III**

5. Give the relation between (a) y parameters and other types of parameters; (b) z parameters and other types of parameters. 14M

**OR**

6. Determine y parameters for the two port network shown below



**UNIT-IV**

7. With the help of sketches describe the main parts of a dc machine? Explain the main function of each. 14M

**OR**

8. a) Derive the torque equation of dc motor 6M
- b) What are the different methods of speed control of DC shunt motor? Give the advantages and disadvantages. 8M

**UNIT-V**

9. Explain the principle of operation, Types, Constructional Features of single phase transformer. 14M

**OR**

10. a) Explain Brake test on three phase induction motor with circuit diagram. 7M
- b) Define torque and give an expression for torque determination of three phase induction motor. 7M

\*\*\*

Hall Ticket Number :										
----------------------	--	--	--	--	--	--	--	--	--	--

<b>R-17</b>
-------------

**Code: 7GC32**

II B.Tech. I Semester Supplementary Examinations February 2021

**Engineering Mathematics-III**

( Common to All Branches )

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )

\*\*\*\*\*

<b>UNIT-I</b>
---------------

1. a) Find the real root of equation  $x^3 - x - 11 = 0$  by bisection method. 7M
- b) Using Taylor's series method, compute the value of  $y$  at  $x=0.2$  from  $\frac{dy}{dx} = x + y$ ; 7M  
 $y(0) = 1$ .

**OR**

2. a) Find a real root of the equation  $3x = \cos x + 1$  by Newton-Raphson's method correct to four decimal places. 7M
- b) Given  $\frac{dy}{dx} = \frac{y-x}{y+x}$  with initial condition  $y = 1$  at  $x = 0$ . Find  $y$  for  $x = 0.1$  by Euler's method. 7M

<b>UNIT-II</b>
----------------

3. a) Using Newton's forward interpolation formula and the given table of values 7M
- |      |      |      |      |      |      |
|------|------|------|------|------|------|
| x    | 1.1  | 1.3  | 1.5  | 1.7  | 1.9  |
| F(x) | 0.21 | 0.69 | 1.25 | 1.89 | 2.61 |
- Obtain the value of  $f(x)$  when  $x = 1.2$  7M
- b) Find the first and second derivatives of the function tabulated below at the point  $x = 1.5$  7M
- |   |       |     |        |      |        |      |
|---|-------|-----|--------|------|--------|------|
| x | 1.5   | 2.0 | 2.5    | 3.0  | 3.5    | 4.0  |
| y | 3.375 | 7.0 | 13.625 | 24.0 | 38.875 | 59.0 |

**OR**

4. a) Evaluate  $f(10)$  given  $f(x) = 168, 192, 336$  at  $x = 1, 7, 15$  respectively. Use Lagrange interpolation. 7M
- b) Evaluate  $\int_0^1 \frac{1}{1+x} dx$  by Simpson's 1/3 rule. 7M

<b>UNIT-III</b>
-----------------

5. a) By the method of least squares, find the straight line that best fits the following data. 7M
- |   |    |    |    |    |    |
|---|----|----|----|----|----|
| x | 1  | 2  | 3  | 4  | 5  |
| y | 14 | 27 | 40 | 55 | 68 |
- b) Form the partial differential equation by eliminating the arbitrary constants  $x^2 + y^2 + (z - c)^2 = a^2$  7M

**OR**

6. a) Form the partial differential equations (by eliminating the arbitrary constants and arbitrary functions) from  $z = f(x + ay) + g(x - ay)$  7M
- b) Solve  $p \tan x + q \tan y = \tan z$ . 7M

<b>UNIT-IV</b>
----------------

7. a) Find the Fourier series expansion for  $f(x) = f - x$  in  $0 < x < f$  7M  
 b) Expand  $f(x) = \cos x, 0 < x < f$  in half range sine series. 7M

**OR**

8. Determine the Fourier series for  $f(x) = x \sin x$  in the interval  $0 < x < 2f$  14M

<b>UNIT-V</b>
---------------

9. a) Find the finite Fourier sine and cosine Transforms of  $f(x)$  defined by  $f(x) = 1$  where  $0 < x < f$  7M  
 b) Find the Fourier sin and cosine transform of  $f(x) = \frac{e^{-ax}}{x}, a > 0$  7M

**OR**

10. Find the Fourier cosine transform of  $f(x) = \frac{1}{1+x^2}$ , hence, derive the Fourier sine transform of  $w(x) = \frac{x}{1+x^2}$  14M

\*\*\*

Hall Ticket Number :

--	--	--	--	--	--	--	--	--	--	--

**R-17**

**Code: 7GC31**

II B.Tech. I Semester Supplementary Examinations March 2021

**Environmental Science**

( Electronics and Communication Engineering )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit ( 5 x 14 = 70 Marks )

\*\*\*\*\*

**UNIT-I**

- 1 Define environment and explain briefly about the various segments of environment. 14M

**OR**

2. a) Illustrate the various methods to propagate environmental awareness in the society. 7M  
b) Explain the scope and importance of environmental studies. 7M

**UNIT-II**

3. a) Describe the major causes and consequences of deforestation. 7M  
b) How can you as an individual conserve different natural resources? 7M

**OR**

4. Discuss in detail about renewable energy resources. 14M

**UNIT-III**

5. a) What are food chain and food web? Give example and discuss their significance. 8M  
b) Discuss the salient features of an estuarine ecosystem 6M

**OR**

6. Describe the in situ and ex situ conservation methods of biodiversity. Give examples. 14M

**UNIT-IV**

7. a) Enumerate various methods for control of air pollution. 7M  
b) Define radioactivity. Mention the sources and effects of radioactivity. 7M

**OR**

8. Briefly describe the sources, effects and control measures of noise pollution 14M

**UNIT-V**

9. a) What are greenhouse gases and greenhouse effect? Discuss the potential and contribution of these gases to global warming. 10M  
b) Illustrate the various measures to conserve water. 4M

**OR**

10. a) Discuss the influence of environmental parameters and pollution on human health. 7M  
b) What are the objectives and elements of value education? How can the same be achieved? 7M

\*\*\*

Code: 7G333

II B.Tech. I Semester Supplementary Examinations March 2021

**Signals and Systems**

( Electronics and Communication Engineering )

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )

\*\*\*\*\*

**UNIT-I**

1. a) Write the Classification of systems based on certain properties.
- b) Determine whether the following signals are energy signals or power signals and calculate their energy or power
  - i)  $x(n) = \left(\frac{1}{2}\right)^n u(n)$  ii)  $x(t) = \cos^2 \omega_0 t$

**OR**

2. a) Check whether the following systems are time invariant or not
  - i)  $y(t) = t^2 x(t)$  ii)  $y(t) = x(-2t)$  iii)  $y(n) = x(n)$  iv)  $y(n) = x^2(n-2)$
- b) Obtain the expressions to represent trigonometric Fourier coefficients in terms of exponential Fourier coefficients.

**UNIT-II**

3. Obtain Fourier transforms and spectrums of following signals
  - i)  $x(t) = \cos \omega_0 t$  ii)  $x(t) = \sin \omega_0 t$

**OR**

4. a) Find the Fourier transform of  $x(t) = u(2t)$ , where  $u(t)$  is the unit step function
- b) Determine the Fourier Transform for double exponential pulse whose function is given by  $y(t) = e^{-a|t|} u(t)$ . Also draw its magnitude and phase spectra

**UNIT-III**

5. a) Find the impulse response of series RC limit. Explain the difference between causal and non-causal systems.
- b) Explain the Filter characteristics of linear systems

**OR**

6. a) State and prove the sampling theorem for a band limited signals
- b) Compare different types of sampling techniques

**UNIT-IV**

7. a) State and prove any four properties of Auto correlation function
- b) Determine the auto correlation function and energy spectral density of  $x(t) = e^{-at} u(t)$

**OR**

8. a) With an example explain the Graphical representation of convolution.
- b) Prove that auto correlation function and energy/power spectral density function forms Fourier Transform pair.

**UNIT-V**

9. State and prove the following properties of z-transform.
  - i) Time shifting ii) Time reversal iii) Differentiation iv) Scaling in z-domain

**OR**

10. Find the Laplace Transform of the following:
  - i)  $t e^{-at} u(t)$  ii)  $\cos t u(t)$

\*\*\*