Hall Ticket Number :										

R-14

Code : 4GC34

II B.Tech. I Semester Supplementary Examinations May/June 2016

Environmental Science

(Common to ECE & IT)

Max. Marks: 70 **Time: 03 Hours**

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

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UNIT-I

1. a) Explain the problems associated with ecosystem due to over exploitation 7M
   b) Describe in general the environmental crisis caused by population growth 7M

OR

2. a) Environmental pollution is a global issue, discuss. 7M
   b) Write a note on the role of institutions in protecting the environment. 7M

UNIT-II

3. a) What are the problems faced by forest and tribal people due to deforestation. 7M
   b) What are the causes for floods and how floods can be prevented 7M

OR

4. a) Write short notes on land degradation and soil erosion 7M
   b) Write in detail on alternative energy resources and their usage 7M

UNIT-III

5. a) Explain the concept of ecosystem and list the types of ecosystems 7M
   b) Explain the food chains, webs and ecological pyramids with suitable examples 7M

OR

6. a) Give a brief account of hot spots of biodiversity in India. 7M
   b) What are the threats to biodiversity? How it will be protected. 7M

UNIT-IV

7. a) What is pollution? Write a note on water pollution and its prevention. 7M
   b) Write short notes on noise pollution and soil pollution 7M

OR

8. a) What is meant by nuclear hazard? Discuss one case study on nuclear hazard 7M
   b) Discuss about the control measures of industrial wastes 7M

UNIT-V

9. a) Write a note on different methods of rain water harvesting observed by you 7M
   b) What is waste land reclamation? Explain 7M

OR

10. a) Explain in detail about the air act (prevention and pollution) 7M
    b) Discuss the human welfare with reference to HIV/AIDS 7M

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Hall Ticket Number :										

Code : 4GC32 **R-14**

II B.Tech. I Semester Supplementary Examinations May/June 2016

Engineering Mathematics

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

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

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UNIT-I

1. Find the half range cosine series for $f(x) = x(2-x)$ in $0 \le x < 2$ and hence find prove that $\frac{\pi^2}{12} = \frac{1}{1_2} - \frac{1}{2_2} + \frac{1}{3_2} - \frac{1}{4_2} + \frac{1}{5_2} - \frac{1}{6_2} + - - - - - - - - -$

OR

2. Find the Fourier cosine transform of $f(x) = \frac{1}{1+x^2}$. Hence, derive the Fourier sine transform of $\emptyset(x) = \frac{x}{1+x_2}$.

UNIT-II

3. a) Reduce the matrix $A = \begin{bmatrix} 8 & 1 & 3 & 6 \\ 0 & 3 & 2 & 2 \\ -8 & -1 & -3 & 4 \end{bmatrix}$ to the normal form and find its rank.

   b) Solve the equations $2x + y + z = 10; 3x + 2y + 3z = 18; x + 4y + 9z = 16$

OR

4. If $A = \begin{bmatrix} 3 & -2 & -5 \\ 4 & -1 & -5 \\ -2 & -1 & -3 \end{bmatrix}$ find the Eigen values and Eigen vectors of A.

UNIT-III

5. a) Find a real root of the equation $x^3 - 2x - 5 = 0$ using false position.

   b) Find the reciprocal of 18 using Newton-Raphson method.

OR

6. Apply the Fourth order Runge-Kutta method, to find an approximate value of y when $x = 1.2$ in steps of 0.1, given that: $y' = x^2 + y^2$, $y(1) = 1.5$

UNIT-IV

7. a) Find the cubic polynomial which takes the values:
   $y(0) = 1$, $y(1) = 0$, $y(2) = 1$ and $y(3) = 10$.

   b) Using Lagrange's formula find $f(4)$. Given

x	0	2	3	6
f(x)	-4	2	14	158

OR

8. Evaluate $\int_0^1 \sqrt{1+x^3}dx$ taking $h = 1$

   Using (i) Simpson's $\frac{1}{3}$rd rule (ii) Trapezoidal rule

UNIT-V

9. a) By the method of least squares, find the straight line that best fits the following data.

x	1	2	3	4	5
f(x)	14	27	40	55	68

b) Find the curve of best fit of the type $y = ae^{bx}$ to the following data by the method of least squares

x	1	5	7	9	12
y	10	15	12	15	21

OR

10. a) Form the partial differential equation by eliminating a, b from $ax^2 + by^2 + z^2 = 1$.

b) Solve $2\frac{\partial^2 u}{\partial x^2} - \frac{\partial u}{\partial y} = 0$.

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Hall Ticket Number :										

Code : 4G235

R-14

II B.Tech. I Semester Supplementary Examinations May/June 2016

Electrical Circuit Theory

(Electronics and Communication Engineering)

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

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

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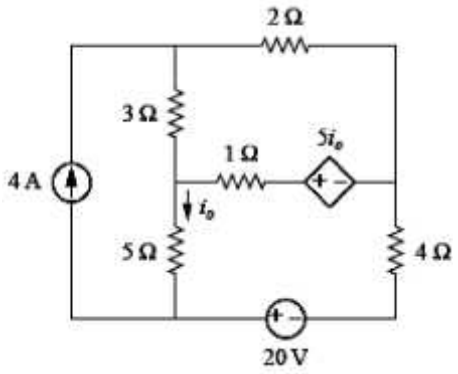
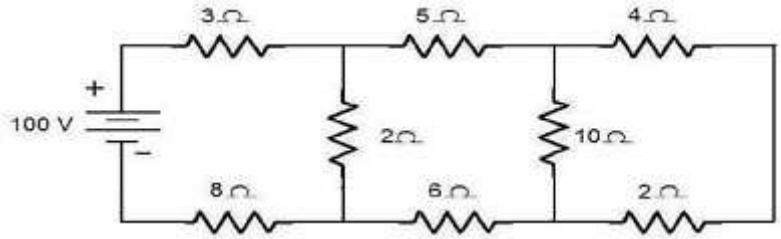
UNIT-I

1. a) Use mesh analysis to find i_0 in the circuit shown in below



7M

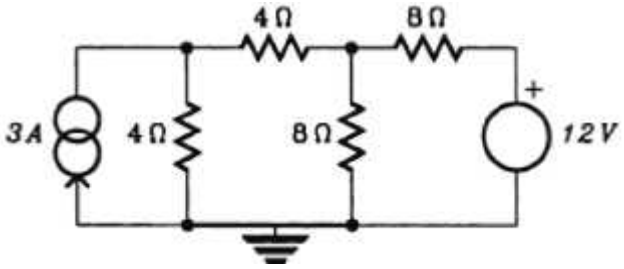
b) Find the current through each branch by network reduction technique.



7M

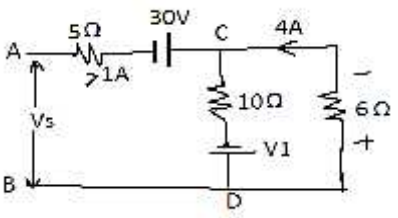
OR

2. a) Perform mesh analysis for the circuit shown below to determine all the branch voltages and currents.



7M

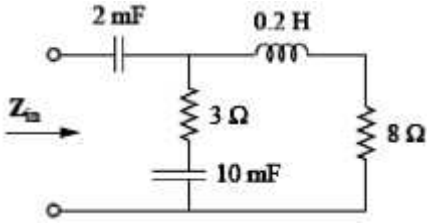
b) Find the current in the 10Ω resistance, V_1 and source voltage V_s for the circuit shown in figure



7M

UNIT-II

3. a) Find the input impedance of the circuit shown in below Figure. Assume that the circuit operates at ω = 50 rad/s.

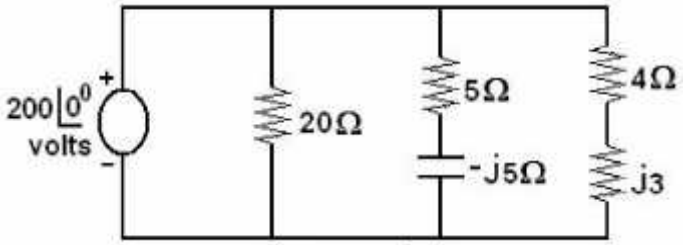


7M

b) Find RMS and average values for a sinusoidal alternating quantity having a peak value of V_m 7M

OR

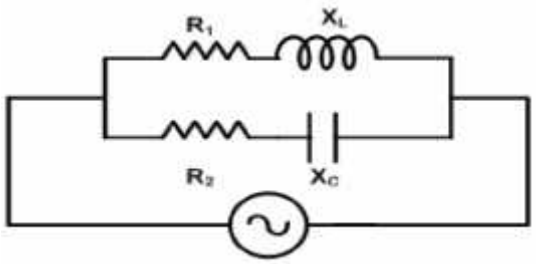
4. Determine the branch currents, total current and the power supplied by the source for the circuit shown in figure below. Also draw the phasor diagram.



14M

UNIT-III

5. a) Derive an expression for the resonant frequency for a parallel circuit shown below

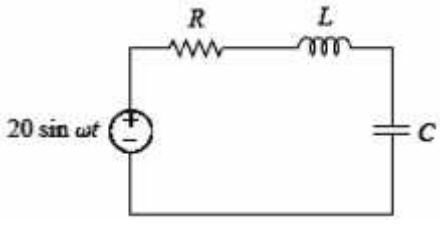


7M

b) Distinguish between self and Mutual inductance. Also explain the significance of coefficient of coupling 7M

OR

6. In the circuit shown in below Figure R = 2 ohms, L = 1 mH, and C = 0.4 μF.
   a) Find the resonant frequency and the half-power frequencies.
   b) Calculate the quality factor and bandwidth.
   c) Determine the amplitude of the currents at resonant and half-power frequencies ω_0, ω_1, and ω_2.



14M

UNIT-IV

7. a) Mention the advantages of 3-phase systems over single phase system. 7M

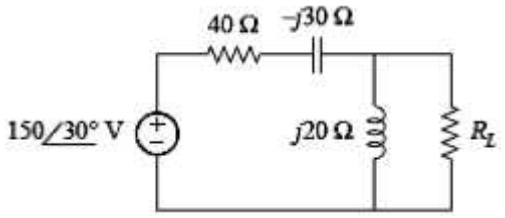
   b) The following star-connected impedances are connected to a 400 V, three phase system. Z_R= j30Ω, Z_Y= j3Ω and Z_B= -j3Ω. Calculate the line currents by using star-delta conversion method if the phase sequence is RYB. 7M

OR

8. Three star connected impedances, Z_1=15+j25Ω per phase are connected in parallel with three delta connected impedances Z_2= 20- j30Ω.The line voltage is 440 V. Find the line current, the power factor, the active power and the reactive power taken by the combination. 14M

UNIT-V

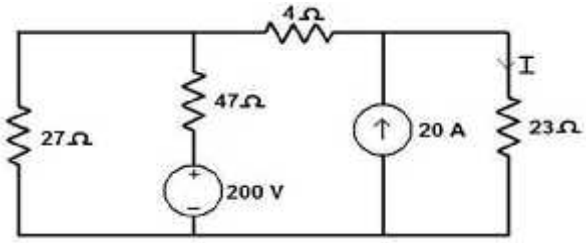
9. Find the value of R_L that will absorb the maximum average power. Calculate that power.



14M

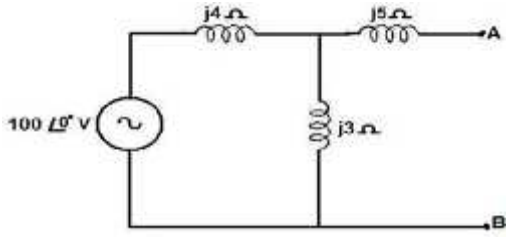
OR

10. a) Compute the current in 23 ohm resistor using super position theorem for the circuit shown below.



7M

   b) Determine the Thevenin's equivalent circuit.



7M

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Hall Ticket Number :										

Code : 4G331

R-14

II B.Tech. I Semester Supplementary Examinations May/June 2016

Electonic 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 = 70Marks)

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UNIT-I

1. a) Sketch the h parameter model for CE configuration 4M

   b) A CE amplifier has the H-parameters given as h_{ie}=1000Ω h_{re}=2x10^{-4} and h_{oe}=25μmho both the load and source resistance are 1kΩ determine current gain and voltage gain. 10M

OR

2. a) List the characteristics and applications of common collector amplifier. 4M

   b) Explain common drain amplifier with circuit diagram. 10M

UNIT-II

3 a) What is half power bandwidth? 4M

   b) What is the effect of coupling capacitor on low frequency response? 10M

OR

4. Explain Emitter follower at high frequency in detail 14M

UNIT-III

5. a) Prove that negative feedback increases the bandwidth and decreases distortion. 6M

   b) An amplifier has an open loop gain 1000 and a feedback ratio of 0.04.if the open loop gain change by 10% due to temperature find the percentage change in gain of the amplifier with feedback. 8M

OR

6. a) Explain current series feedback in detail 6M

   b) The current series feedback transistor amplifier has R_1=20kΩ, R_2=20kΩ, h_{ie}=2kΩ,R_L=1kΩ,R_e=100Ω and h_{fe}=80.caluclate A,ß,R_{if},A_f and the loop gain in dB. 8M

UNIT-IV

7. a) What is the condition for oscillations? 4M

   b) In a transistorized Hartley oscillator, the two inductances are 2mH and 20 mH while the frequency is to be changed from 950 KHz to 2050 KHz. Calculate the range over which the capacitor is to be varied. 10M

OR

8. a) Classify the oscillators based on circuits used. 4M

   b) Explain the crystal oscillator and give its advantages. 10M

UNIT-V

9. a) Give the classification of large signal amplifiers 4M

   b) Derive the expression for efficiency in class B amplifier 10M

OR

10. a) What is Q factor and what is it significance. 4M

    b) Explain single tuned capacitive coupled amplifier 10M

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Hall Ticket Number :										

Code: 4G332 **R-14**

II B. Tech. I-Semester Supplementary Examinations May/June 2016

Pulse and Digital 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 = 70Marks)

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UNIT-I

1. a) Define linear wave shaping? Discuss the response of RC low-pass circuit with step and pulse inputs along with output waveforms. 8M

   b) A 1KHz square wave output from an amplifier has rise time tr = 200ns and percentage of tilt is 10%, determine lower and upper frequencies. 6M

OR

2. a) Explain the RC differentiator with input and output waveforms. 7M

   b) What is RC low-pass circuit? What is meant by ringing circuit? 7M

UNIT-II

3. a) What do you mean by delay time of a transistor? What are the factors contribute to it? 9M

   b) What are applications of a comparator? 5M

OR

4. a) Explain the response of the clamping circuit when a square wave input is applied under steady state conditions. 8M

   b) Design a diode clamper to restore the positive peaks of 1KHz input signal to a voltage level equal to 5v. Assume the voltage drop across the diode is 0.7v 6M

UNIT-III

5. a) Draw the circuit diagram and waveforms of a transistor boot strap time base generator and explain principle of operation 7M

   b) What are the different methods of generating a time base waveform? Explain them briefly 7M

OR

6. a) With the help of neat waveforms, explain frequency division with respect to a sweep circuit. 7M

   b) Explain the method of pulse synchronization of relaxation devices with examples 7M

UNIT-IV

7. a) With the help of a circuit diagram, explain the working of an astable multivibrator 8M

   b) Design a self biased symmetrical binary with the help of following specifications. Vcc=10V, Rc=1KΩ, V_{BE}(sat)=0.3V, β_{on}=20, operating frequency is 80KHz and impedance of the triggering source is 250Ω. 6M

OR

8. a) Explain the operation of bistable multivibrator with circuit diagram and waveforms 7M

   b) Design an astable multivibrator to generate a 5KHz square wave with a duty cycle of 60% and amplitude 12V. Use NPN Si transistor with h_{fe}(min) = 70, Vce (sat) = 0.3V, V_{BE}(sat)=0.7V, V_{BE}(Cutoff)=0.7V and Rc = 2 KΩ. Draw the waveforms seen from Base and Collector. 7M

UNIT-V

9. a) What is meant by sampling gates? Explain the working of four diode sampling gate with help of neat circuit diagram. 7M

   b) What is pedestal? How pedestal can be reduced in a sampling gate circuit? 7M

OR

10. a) Explain DTL and RTL circuits with suitable circuit diagrams 8M

    b) Compare the logic families 6M

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Hall Ticket Number :										

R-14

Code : 4G333

II B.Tech. I Semester Supplementary Examinations May/June 2016

Signals and Systems

(Electronics & Communication Engineering)

Max. Marks: 70 Time: 3 Hours

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

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UNIT-I

1. a) Examine whether the following signals are Periodic or not. If periodic determine the fundamental Time period.

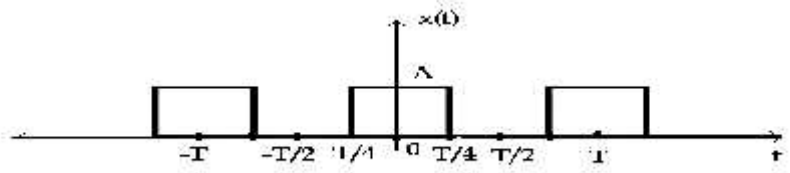
$(i) sin\left(\frac{4\pi n}{3}\right) + cos\left(\frac{2n}{3}\right)$ $(ii)\ 2u(t) + 3cos2\pi t$ 7M

b) Determine whether the following signals are Energy signals (or) Power signals.

(i) $sin^2\omega_0 t$ $(ii)\ x(n) = \left(\frac{1}{2}\right)^n u(n)$ 7M

OR

2. a) Find the Exponential Fourier Series for the following signal.



7M

b) State and Prove the Time Shifting and Convolution properties of Fourier series. 7M

UNIT-II

3. a) Find the Fourier transform of the signals

$(i)\ sgn(t)$ $(ii)\ e^{-t}sin5tu(t)$ 7M

b) Find the Inverse Fourier Transform of $X(\omega) = \frac{j\omega}{(2+j\omega)^2}$ 7M

OR

4. a) Define Hilbert Transform of a signal and Find the Hilbert Transform of $sin\omega_0 t$ 7M

b) State and prove the properties of Hilbert Transform 7M

UNIT-III

5. a) Discuss Causality and Stability of LTI system? 7M

b) Find the Frequency Response of an LTI system described by differential equation

$$\frac{d^3y(t)}{dt^3} + 6\frac{d^2y(t)}{dt^2} + 5\frac{dy(t)}{dt} + 4y(t) = 3x(t)$$ 7M

OR

6. a) Explain ideal filters? 7M

b) Obtain the conditions for distortion less transmission through a system. 7M

UNIT-IV

7. a) Find the convolution of the following sequences
$(i)\ x(n) = \{1, 2, 3, 1\}$ & $h(n) = \{1, 2, 1, -1\}$ $(ii)\ x(n) = \{1, 1, 2, 2\}$ & $h(n) = \{1, -2, 1, -1\}$ 7M

b) What is aliasing? Explain its effect on sampling? 7M

OR

8. a) State and Prove Parseval's power theorem. 7M

b) Write the properties of Auto Correlation for periodic signals. 7M

UNIT-V

9. a) State and Prove the Time Reversal and Frequency Shifting properties of Laplace Transform 7M

b) Find the Impulse & Step response of the following system.

$$X(s) = \frac{5}{s^2 + 4s + 5}$$ 7M

OR

10. a) State and prove Initial and Final value theorems of Z-Transform. 7M

b) Find the Inverse Z-transform of

$$X(z) = \frac{z(z+1)}{(z+1)^3(z+2)} \quad ; ROC\ |z| > 2$$ 7M

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