Code: 9A02401

R09

II B. Tech II Semester (R09) Supplementary Examinations, November/December 2012

PRINCIPLES OF ELECTRICAL ENGINEERING

(Common to EIE, E.Con.E, ECE & ECC)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 A coil having resistance of 10 Ω and inductance of 1 H is switched on to a direct voltage of 100 V. Calculate the rate of change of the current: (a) at the instant of closing the switch and (b) when t = L/R (c) Also find the steady state value of the current.

2 (a) Define open circuit parameters. Explain how the open circuit parameters can be obtained for a given two port network.

(b) A two port network has the following parameters: Z_{11}=6 Ω, Z_{12}=Z_{21}=3 Ω and Z_{22}=4 Ω. Calculate hybrid parameters.

3 Design an m-derived low pass filter having design resistance R_0=400 Ω, cut-off frequency f_c=1200 Hz and infinite attenuation frequency f_α=1600 Hz.

4 (a) What is an attenuator? Derive the design equations for Lattice attenuator.

(b) Design a T-pad attenuator to give an attenuation of 60 dB and to work in a line of 750 Ω.

5 (a) Explain the principle of operation of DC generator.

(b) A 6 – pole, Lap wound armature has 840 conductors and flux per pole of 0.018 Wb. Calculate the emf generated when the machine is running at 600 rpm.

6 Explain the characteristics of: (i) Shunt motor. (ii) Series motor.

7 (a) Discuss the constructional details of a single phase core type transformer.

(b) When a single phase transformer is supplied at 400 V, 50 Hz. The hysteresis loss is found to be 310 W and eddy current loss is 260 W. Determine the hysteresis loss and eddy current loss when the input voltage to the transformer is 800 V, 100 Hz.

8 Explain the principle of operation and characteristics of synchros.

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Code: 9A04401

R09

B. Tech II Year II Semester (R09) Supplementary Examinations, November/December 2012

SWITCHING THEORY & LOGIC DESIGN

(Common to EEE, EIE, E.Con.E, ECE & ECC)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 (a) Explain the ASCII code with table.

(b) Encode the following text in to 7-bit ASCII code

JNTU ANANTAPUR

2 (a) Prove that AND-OR network is equivalent to NAND-NAND network.

(b) Prove the identity of the following Boolean equations:

i) Y + X'Z + XY' = X + Y + Z

ii) X'Y' + Y'Z + XZ + XY + YZ' = X'Y' + XZ +YZ'

(c) Determine the canonical sum of minterms form of the following function:

F(X,Y,Z) = (XY+Z)(Y+XZ).

3 (a) Simplify the following Boolean function for minimal SOP form using K-map

F(A,B,C,D) = ∑(0,1,2,4,5,6,8,9,12,13,14).

(b) Simplify the following Boolean function for minimal POS form using K-map

F(X,Y,Z) = X'YZ + XY'Z' + XYZ + XYZ'

4 (a) Design BCD to gray code converter and realize using logic gates.

(b) Design 2*4 decoder using NAND gates.

5 (a) Realize the following function using a PROM of size 8 x 3

F_1= Σ m(0,3,6)

F_2= Σ m(1,4,6,7)

F_3= Σ m(1,2,6)

(b) Write short notes on PLDs.

6 (a) What do you mean by triggering? Explain the various triggering modes with examples.

(b) Draw the logic diagram of a JK flip flop using excitation table and explain its operation.

7 (a) Explain mealy model with logic diagram.

(b) Explain moore model with logic diagram.

8 (a) Draw the ASM chart for binary divider.

(b) Draw the state diagram for a full adder circuit and convert it to ASM chart.

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Code: 9A04402 R09

B.Tech II Year II Semester (R09) Supplementary Examinations November/December 2012

ELECTRONIC CIRCUIT ANALYSIS

(Common to Electronics & Instrumentation Engineering, Electronics & Control Engineering and Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1. (a) By using hybrid model derive performance characteristics for CB-transistor amplifier.
   (b) For emitter follower with Rs = 0.5 kΩ and R_L = 5 K Ω. Calculate A_i, R_i, A_V. Assume h_{fe} = 50, h_{ie} = 1 kΩ and h_{oe} = 25 μA/V.

2. (a) Explain the operation of transformer coupled transistor in detail.
   (b) How are the multistage amplifiers classified depending upon the type of coupling?

3. (a) Derive the expression for CE short circuit gain and explain the same for resistive load.
   (b) An amplifier rated at 60 W output is connected to a 5 Ω speaker.
      (i) Calculate the input power required if power gain is 25 dB.
      (ii) Calculate the i/p voltage if amplifier voltage gain is 40 dB.

4. (a) Explain the frequency response of common gate cascaded amplifier.
   (b) A common drain amplifier has r_d = 100 KΩ and $\mu = 10$. Calculate the o/p impedance and voltage gain for load resistance R_s = 100 KΩ.

5. (a) Discuss the merits of negative feedback in amplifiers in detail.
   (b) An amplifier has A_V=1000±50; determine the feedback needed to keep the gain with in ±0.1 %. Find A_{vf}.

6. Draw the Hartely oscillator. Explain its operation. Derive the condition for sustained oscillation.

7. (a) Draw the circuit diagram of class-B push-pulled amplifier and explain the operation.
   (b) What is a phase inverter? How is it employed in class-B power amplifier?

8. (a) Explain the effect of cascading single tuned amplifier on band width.
   (b) Distinguish between single tuned, double tuned and stagger tuned amplifiers.

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Code: 9A04404

R09

B. Tech II Year II Semester (R09) Supplementary Examinations, November/December 2012

PULSE & DIGITAL CIRCUITS

(Common to EIE, E.Con.E, ECE,ECC and MCT)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 (a) Explain how a low pass RC circuit acts as an integrator.
(b) Explain RC double differentiator circuit.

2 (a) What is synchronized clamping and explain?
(b) Design a diode clamper circuit to clamp the positive peaks of the input signal at zero level. The frequency of the input signal is 500 Hz.

3 Sketch neatly the wave forms of currents & voltages for a transistor switch with capacitance loading circuit.

4 Explain about various switching conditions of Schmitt trigger.

5 (a) What are sweep circuits?
(b) Explain how you generate a saw tooth waveform with a neat circuit diagram.

6 (a) Why sampling gates are called selection circuits?
(b) What are the advantages of unidirectional sampling gates?

7 (a) How astable multi can be synchronized? Illustrate with neat waveforms.
(b) Explain how monostable multi is used as frequency divider.

8 (a) What is the difference between floating and grounded inputs?
(b) Design and explain the concept of discrete type of gates.

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Code: 9A04406

R09

B. Tech II Year II Semester (R09) Supplementary Examinations, November/December 2012

ELECTROMAGNETIC THEORY & TRANSMISSION LINES

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 (a) Derive an expression for the electric field E due to infinite line charge.

(b) Determine the electric field intensity at a distance 'x' from the center due to uniformly charged sphere of radius 4 cm, and charge density $1\ C/m^2$ for $x = 2\ cm,\ x = 4\ cm,\ x = 6\ cm$.

2 What is electric dipole? Derive the relation between polarization vector and electric field in dielectrics.

3 State and prove all the Ampere's laws applied to magnetic field.

4 Discuss the boundary conditions for a boundary between two arbitrary media, indicating appropriately the Maxwell's equations in integral form from which they are derived.

5 (a) Show that a linearly polarized wave can be written as the sum of two circularly polarized wave in opposite directions but at the same angular rate.

(b) Determine the polarization of the following uniform plane waves.

(i) $E = \cos(\omega t + \beta z)\, a_x + \sin(\omega t + \beta z)\, a_y$

(ii) $E = \cos(\omega t + \beta z)\, a_x - \sin(\omega t + \beta z)\, a_y$

(iii) $E = \cos(\omega t + \beta z)\, a_x - 2\sin(\omega t + \beta z - 45^0)\, a_y$

6 (a) An EM wave in free space with a power density of $3w/m^2$ impinges normally on a loss less dielectric boundary, causing a SWR of 2.2. What is the power density of the wave transmitted in to the dielectric?

(b) In the cases of total internal reflection and incident wave polarized linearly at 45^0 to the plane of incidence can be transformed in to a circular polarized wave after reflection. Find the angle of incidence at which this occurs for a given value of ($\varepsilon_1/\varepsilon_2$). Also find the minimum value of ($\varepsilon_1/\varepsilon_2$) required to produce the specified change in polarization.

7 (a) Explain the procedure to measure characteristic impedance of the line practically.

(b) Explain that infinite line is equivalent to a finite line terminated in Z_0.

8 Derive the equation for input impedance of a distortion less line and plot the impedance curves for open and short circuited transmission lines.

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Code: 9AHS401

R09

II B. Tech II Semester (R09) Supplementary Examinations, November/December 2012

MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

(Common to EIE, E.Con.E & ECE)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 What are the contributions and limitations of managerial economics to business managers?

2 What is the significance of elasticity of demand? Explain different types of elasticity of demand.

3 What is production function? How is it useful to the manufacturer?

4 What is price discrimination? What are the essential conditions for price discrimination?

5 Discuss about the short-comings of the public sector enterprises in India and what is their future.

6 (a) What is the significance of capital? Explain the types of capital requirements.
(b) Explain different kinds of capital investment proposals.

7 Briefly explain the following:
(a) Tangible Assets.
(b) Fixed Assets.
(c) Intangible Assets.
(d) Inventory.

8 Explain the significance and utility of ratio analysis in financial decision making.

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