F 3126 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Electrical and Electronics Engineering

INDUSTRIAL MANAGEMENT AND ECONOMICS (E)

(Improvement / Supplementary / Mercy Chance)

Time : Three Hours Maximum : 100 Marks

Answer **all** *the questions.*

All questions carry equal marks.

Answer Part A and Part B in **separate** *answer books.*

188

Part A (Industrial Management)

1. (a) Explain the different procedural steps involved in the selection process of employees.

   (b) Explain in detail the different types of employment tests.

Or

2. (a) Explain the different training methods.

   (b) List the advantages of employee training.

3. (a) Explain the concept and objectives of labour welfare.

   (b) Explain in detail the labour welfare methods.

Or

4. (a) Explain PERT and steps involved in PERT planning technique.

   (b) Discuss about demand based pricing.

5. (a) What is functional organization ? List its advantages and disadvantages.

   (b) Briefly explain the functions of management.

Or

6. (a) What are the needs and scope of marketing research ?

   (b) Explain marketing research process.

Turn over

Part B (Engineering Economics)

7. (a) Diagrammatically explain the demand pull inflation.

   (b) Explain in detail cost pull inflation.

Or

8. (a) What is a bank? Explain in detail the functions of a bank.

   (b) Distinguish between Direct tax and Indirect tax.

9. (a) Discuss briefly about the black money and also discuss about the causes and consequences of it.

   (b) Explain in detail the factors of production.

Or

10. (a) Explain in detail the functions of stock market.

    (b) Discuss the difference between IDBI and ICICI banking policies.

11. (a) Explain in detail the inflationary process.

    (b) What are the merits and demerits of progressive taxation?

Or

12. (a) What is the importance of public sector enterprises in India?

    (b) Compare the price mechanisms based on cost and based on market.

F 3145 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Electrical and Electronics Engineering

POWER ELECTRONICS (E)

(Improvement/Supplementary/Mercy Chance)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 4 *marks.*

1. Compare an SCR, TRIAC and a GTO.
2. Explain the dynamic characteristics of SCR.
3. Discuss the di/dt and dv/dt protection of SCRs.
4. What is a pulse transformer ? Explain its application.
5. What is meant by phase control ? Explain with a typical circuit diagram.
6. Draw the circuit diagram and give the principle of operation of a 3-phase full wave rectifier.
7. What are the various commutation schemes for SCRs ?
8. What are the various types of PWM circuits used for voltage control of inverters ?
9. Explain the principle of operation of a class A chopper.
10. Discuss briefly on the generation of control pulses.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 12 *marks.*

11. (i) Discuss the characteristics, construction and application of MOSFETs.

    (ii) Discuss the two transistor analogy of SCRs.

Or

12. (i) Draw the gate characteristics of SCR.

    (ii) If $V_G - I_G$ characteristics of an SCR is assumed to be a straight line passing through the origin with a gradient of 3×10^3. Calculate the required gate-source resistance given that $V_S = 10V$ and allowable PG = 0.012 W.

Turn over

13. (i) What is the need for heat sink to power semiconductor devices ? Discuss the selection of heat sinks.

(ii) Explain the static and dynamic equalizing circuits for series connected SCRs.

Or

14. (i) Discuss the structure and characteristics of a UJT.

(ii) Draw and explain a UJT triggering circuit for SCR.

15. (i) With a neat circuit diagram explain the operation of a single-phase full converter with R load.

(ii) A single-phase full converter operating from 230 V, 50 Hz supply has a purely resistive load of R = 15 W. If average load current is 11.78 A calculate (a) delay angle α ; (b) r.m.s. output voltage and current.

Or

16. (i) Discuss the effect of free wheeling in controlled rectifiers with RL load.

(ii) What is a line commutated inverter ? Explain its operation with necessary waveforms.

17. (i) Explain complementary commutation scheme with a circuit diagram.

(ii) What are the performance parameters of inverters ?

Or

18. (i) Discuss with neat circuit diagram and waveforms, a bridge type voltage source inverter.

(ii) Discuss the methods for the improvement of voltage waveforms in inverters.

19. (i) Discuss the operation of a four Quadrant type E chopper circuit.

(ii) Explain the principle of operation of cycloconverters.

Or

20. Write short notes on the following :—

(i) Block schematic of firing circuits.

(ii) Digital firing scheme.

(5 × 12 = 60 marks)

F 3116 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Electrical and Electronics Engineering

COMMUNICATION ENGINEERING (E)

(Improvement / Supplementary / Mercy Chance)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. An AM signal is generated using carrier signal $A_c(t) = 5 \sin(2\pi \times 10^7 t)$ and modulating signal $A_m(t) = 3 \sin(2\pi \times 10^4 t)$. Determine the modulation index and the side band power of the modulated signal.
2. Compare FM and AM.
3. What is image frequency in the case of AM superheterodyne receivers? How the image frequency rejection is done?
4. Draw the block diagram of an AM transmitter.
5. In television systems, what is interlaced scanning and why it is required?
6. Define Luminance and represent it in terms of RGB components of a colour television signal.
7. Write down RADAR range equation and define the terms used in it.
8. What is best frequency related to CW RADAR? How it is related to target velocity?
9. Define Equivalent Isotropic Radiated Power (EIRP).
10. Explain the TDMA system used in satellite communications.

(10 × 4 = 40 marks)

Part B

Each full question carries 12 *marks.*

11. An amplitude modulated signal has total power equal to 10 KW. Find the modulation index and side band power if the carrier power is 8 KW. If the carrier power is increased to 10 KW, without changing the side band power, what will be the modulation index.

Or

12. Derive the expressions for frequency modulated signal using sinusoidal modulation. Express the spectrum of the above signal and comment on its bandwidth.

13. With neat block diagram, explain the working of FM transmitter.

Or

14. With suitable block diagram, explain the superheterodyne AM receiver.

15. With neat diagram, explain the components of composite video signal.

Or

16. In television systems, explain the methods used for :

(a) Colour signal transmission ; and (b) Audio transmission.

(6 + 6 = 12 marks)

17. With block diagram, explain the working of a pulsed RADAR system.

Or

18. With block diagram, explain the working of Moving Target Indication (MTI) RADAR system.

19. Explain the Geostationary orbit used for satellites. How the satellite is stabilized in a Geostationary orbit?

Or

20. Discuss any *two* multiple access technique used for satellites.

(5 × 12 = 60 marks)

F 3106 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Electrical and Electronics Engineering

DIGITAL CIRCUITS (E)

(Improvement/Supplementary/Mercy Chance)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Explain two's complement arithmetic with examples.
2. What is exclusive-OR operation ? Realize it by NAND gate only.
3. What are min terms and max terms? Explain.
4. Explain the operation of a full adder.
5. Draw the basic TTI current and explain its operation.
6. Compare DTI and TTI gates.
7. What is meant by totem-pole pair ?
8. Discuss the conversion of flip-flops from one type to another.
9. Distinguish between sequential and combinational currents.
10. Briefly explain the different types of shift registers.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (a) Obtain the standard product of sums for the logic functions in three variables $f(A, B, C) = A + \overline{B}C$.

(b) What is meant byK-map ? Explain.

(12 marks)

Or

12. Draw the discrete current of DTL gate and explain. Mention four typical specifications for DTI NAND gate.

(12 marks)

Turn over

13. Draw the internal current of TTI NAND gate and explain its working. What is meant by sourcing and sinking ? (12 marks)

Or

14. Draw the CMOs inverter and explain its working. Sketch the transfer characteristics. (12 marks)

15. Explain the operation of clocked 3R flip-flop. Sketch the waveforms. (12 marks)

Or

16. Explain the working of master-slave JK flip-flop. (12 marks)

17. Explain the operation of MOD-10 ripple counts using CLEAR and PRESET inputs. (12 marks)

Or

18. Explain the operation of A-bit synchronous up-down counter with waveforms. (12 marks)

19. Design a universal shift register using 8R flip-flop. (12 marks)

Or

20. Explain with diagrams the operation of twisted ring counter. Draw the waveforms and state diagram. (12 marks)

[5 × 12 = 60 marks]

F 3048 (Pages : 3) **Reg. No.....**

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Common to all Branches Except CS and IT

EN 010 501 A—ENGINEERING MATHEMATICS—IV

(Regular—New Scheme)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 marks.

1. For the conformal transformation $w = z^2$, find the coefficient of magnification at $z = (1 + i)$.
2. Expand $\cos z$ in a Taylor's series about $z = \pi/4$.
3. Using bisection method, find the negative root of $x^3 - x + 11 = 0$.
4. Solve $\frac{dy}{dx} = y - \frac{2x}{y}$, $y(0) = 1$ in the range $0 \le x \le 0.2$ using Euler's method.
5. Obtain the dual of :

   Minimize $Z = 8x_1 + 3x_2 + 15x_3$

   subject to $2x_1 + 4x_2 + 3x_3 \ge 28$

   $3x_1 + 5x_2 + 6x_3 \ge 30$

   $x_1, x_2, x_3 \ge 0$.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 marks.

6. Prove that the function $\sinh z$ is analytic and find its derivative.
7. Find the sum of the residues of the function $f(z) = \frac{\sin z}{z \cos z}$ at its poles inside the circle $|z| = 2$.
8. Find the real root of $x^4 - x - 9 = 0$ using Newton-Raphson method, correct to three decimal places.
9. Using Runge-Kutta method, find y when $x = 1.2$ in steps of 0.1, if $\frac{dy}{dx} = x^2 + y^2$ and $y(1) = 1.5$.

Turn over

10. By graphical method or otherwise,

Maximise $Z = x_1 + \frac{3}{5}x_2$

subject to $5x_1 + 3x_2 \leq 15$

$3x_1 + 4x_2 \leq 12$

$x_1,\ x_2 \geq 0.$

(5 × 5 = 25 marks)

Part C

Answer any one **full** *question from each module.*
Each full question carries 12 *marks.*

Module 1

11. (a) Show that the function $u = e^{-2xy} \sin(x^2 - y^2)$ is hormonic. Find the conjugate function v and express $u + i$ V as an analytic function of z.

(7 marks)

(b) Determine the analytic function whose real part is $e^{2x}(x \cos 2y - y \sin 2y)$. (5 marks)

Or

12. (a) Under the transformation $w = \frac{z-i}{1-iz}$, find the map of the circle $|z| = 1$ in the w-plane.

(6 marks)

(b) Find the bilinear transformation which maps the points $z = 1, -i, -1$ into the points $w = i, 0, -i$.

(6 marks)

Module 2

13. (a) Evaluate by contour integration $\int_0^{2\pi} \frac{\cos 2\theta\, d\theta}{1 - 2p\cos\theta + p^2}$, $0 < p < 1$. (7 marks)

(b) Obtain the Laurent's series expansion of $f(z) = \frac{1}{(z-1)(z-2)}$ valid in the region $|z-1| < 1$.

(5 marks)

Or

14. (a) Evaluate $\int_0^{2+i} (\bar{z})^2\, dz$ along

(i) the real axis to 2 and then vertically to $2 + i$.

(ii) along the line $2y = x$.

(9 marks)

(b) Evaluate $\oint_C \frac{(2z-1)}{z(z+1)(z-3)}\, dz$, where C is the circle $|z| = 2$. (3 marks)

Module 3

15. Find the real root of :

(a) $xe^x = 3$ and

(b) $x^6 - x^4 - x^3 - 1 = 0$

by Regular-Falsi method, correct to three decimal places.

Or

16. Solve the following system of linear equations by Gauss-Seidel iterative method

$9x + 2y + 4z = 20$

$x + 10y + 4z = 6$

$2x - 4y + 10z = -15.$

Module 4

17. Using Runge-Kutta method of fourth order solve for $y(0.1)$, $y(0.2)$ and $y(0.3)$ if $y^1 = xy + y^2, y(0) = 1.$

Or

18. Solve by Milne's predictor-corrector method, $\frac{dy}{dx} = y - x^2$ with starting values : $y(0) = 1$, $y(0.2) = 1.12186$, $y(0.4) = 1.4682$, $y(0.6) = 1.7379$ and find the value of y when $x = 0.8$.

Module 5

19. Using Big M method, solve the LPP :

Minimize $Z = 10x_1 + 3x_2$

subject to $x_1 + 2x_2 \geq 3$

$x_1 + 4x_2 \geq 4$

$x_1,\ x_2 \geq 0.$

Or

20. Goods have to be transported from sources S_1, S_2 and S_3 to destinations D_1, D_2 and D_3. The TP cost per unit capacities of the sources and requirements of the destinations are given in the following table. Determine a TP schedule so that the cost is minimized.

	D_1	D_2	D_3	Capacity
S_1	8	5	6	120
S_2	15	10	12	80
S_3	3	9	10	80
Requirement	150	80	50	

(5 × 12 = 60 marks)

F 3051 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Aeronautical Engineering/Computer Science/Electrical and Electronics Engineering

EN 010 502 – PRINCIPLES OF MANAGEMENT (AN, CS, EE)

(Regular – New Scheme)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 3 *marks.*

1. Define span of control. List the factors affecting it.
2. Mention the operative functions of HR management.
3. List the different stages of a product life cycle.
4. What are the objectives of financial management?
5. Write down the importance of marketing research.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*

Each question carries 5 *marks.*

6. Explain MBO process using flow-chart. What are the advantages and limitations of MBO process?
7. What are the objectives of recruitment? List and describe the sources of recruitment.
8. What is meant by network? What purposes are served by including dummy activities in network analysis?
9. Explain different types of variances? How they are used in costing?
10. Define advertising. What are the different steps to be followed while choosing the advertising message?

(5 × 5 = 25 marks)

Turn over

Part C

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

MODULE I

11. (a) Explain the elements of directing.

(b) What are the benefits of delegation? Explain.

Or

12. Explain different organisational structures. Describe the matrix organisation in detail and comment on its merits and demerits.

MODULE II

13. Explain the effects of industrial fatigue. Explain any two cases of causes and elimination of fatigue.

Or

14. Define training. What are the needs for training? Explain different types of training?

MODULE III

15. Explain the concept and objectives of network analysis. What are its different stages? Discuss its advantages and limitations.

Or

16. (a) Explain the different factors of production.

(b) Explain PERT and its importance in network analysis?

MODULE IV

17. Clearly explain the functions of financial management? Describe the challenges faced by a finance manager.

Or

18. The financial details of a company is as below:

Variable cost per unit is Rs. 30

Selling price per unit is Rs. 40

Fixed expenses are Rs. 1,00,000

Calculate (i) the break-even point units ; (ii) the selling price per unit, if BEP is brought down to 8000 units.

MODULE V

19. Explain four different types of markets in which organisations operate. Explain the major decisions in sales promotion?

Or

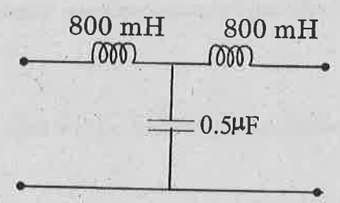
20. (a) What are the different strategies used in stimulating demand in the market? Explain with examples.

(b) Discuss the different steps in marketing research.

(5 × 12 = 60 marks)

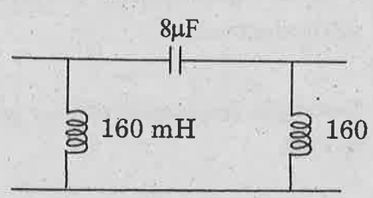
20. (a) Determine the nominal characteristic impedance and the cut-off frequency for the filter shown in the following :

(i)



and

(ii)



(6 marks)

(b) Design and draw a constant-K high pass filter having cut-off frequency $f_C = 10\,kHz$ and nominal characteristic impedance $R_0 = 600\,\Omega$.

(6 marks)

[5 × 12 = 60 marks]

F 3064 (Pages : 4) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Electrical and Electronics Engineering

EE 010 503—SIGNALS AND SYSTEMS (EE)

(Regular—New Scheme)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 3 *marks.*

1. If $x(t) = V(t) + V(-t)$, where $V(t) = \sin t\,[u(t)]$, determine whether the signal is periodic.

2. Find the Fourier Transform of the rect function which is unity over the interval –0.5 to +0.5 and zero elsewhere.

3. Find the energy and power of the signal $x[n] = u[n]$.

4. Specify the Nyquist rate for the signal $g(t) = \sin c^2(200t) + \sin c(200t)$.

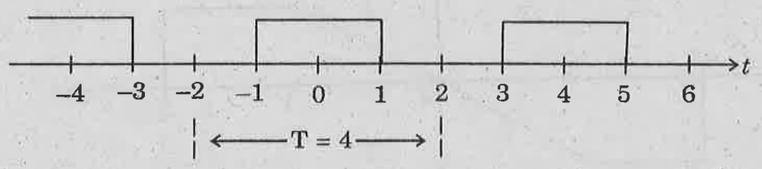
5. Find the image parameters of the T network with $\frac{Z_1}{2}$ each in series branch and Z_2 in shunt branch.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Obtain the Fourier series representation of the following signal ?



7. Find the inverse Fourier Transforms of $X(jw) = \frac{jw + 2}{(jw)^2 + 5jw + 6}$.

8. Convolute the following two continuous time signals $x_1(t) = e^{-2t}u(t)$ and $x_2(t) = x(t+2)$.

9. Show that if the sampling rate is equal to or greater than twice the highest message frequency, then the message $m(t)$ can be recovered from natural sampled signal by low pass filtering. Sketch the relevant waveform and spectrum.

10. From basics, realize a constant-K low pass filter to cut-off at 1.4 kHz with a terminating resistance of 450Ω. State the assumptions made.

(5 × 5 = 25 marks)

Part C

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

MODULE 1

11. Determine the complex exponential Fourier series expansion of the periodic signal :

$$x(\theta) = \begin{cases} A\sin\theta\,; & 0 \le \theta \le \pi \\ 0 \quad ; & \pi \le \theta \le 2\pi. \end{cases}$$

Or

12. Find the Fourier series co-efficients of periodic signal $x(t) = \begin{cases} 1, & |t| < T_1 \\ 0, & T_1 < |t| < \dfrac{T}{2}. \end{cases}$

Also draw its spectrum.

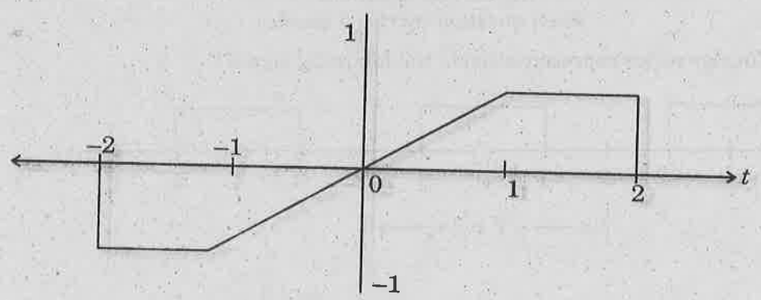
MODULE 2

13. (a) Find the Fourier Transform of $f(t) = e^{-\alpha t^2}$. (7 marks)

(b) Explain the transmission of rectangular pulse through an ideal low pass filter. (5 marks)

Or

14. (a) Find the Fourier Transform of the following signal :



(9 marks)

(b) What is the physical significance of causality of LTI system ? (3 marks)

MODULE 3

15. Find the autocorrelation of $x(t) = \text{rect}(t)$ and verify the relation between autocorrelation and power spectrum. (12 marks)

Or

16. Determine the autocorrelation, power spectral density and power of $x(t) = 6\sin(2t)$. Also plot its PSD. (12 marks)

MODULE 4

17. (a) Assume that the bandlimited signal $x(t) = \dfrac{\sin(20\pi t)}{(\pi t)}$ is sampled at 19 samples/second using ideal sampling. The sampled waveform forms the input to a Low Pass filter with cut-off frequency of 10Hz. Represent mathematically and diagrammatically the waveform obtained at the output of LPF in frequency domain. Comment on the result. (7 marks)

(b) Determine the convolution sum of two sequences $x(n) = \{1, \underset{\uparrow}{4}, 3, 2\}$, $h(n) = \{1, 3, 2, 1\}$. (5 marks)

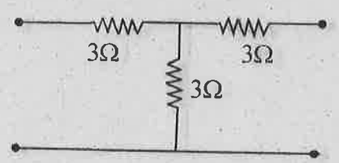
Or

18. (a) Obtain the convolution of the sequences $x(n) = u(n) - u(n-7)$, $h(n) = u(n-1) - u(n-4)$. (6 marks)

(b) Find the cross-correlation of two finite length sequences $x(n) = \{1, 2, 1, 1\}$, $y(n) = \{1, 1, 2, 1\}$. (6 marks)

MODULE 5

19. (a) Obtain the image impedance of the network shown below,



(6 marks)

(b) Draw the circuit and find the component valves of a constant-K low pass filter having nominal characteristic impedance of $R_0 = 500\Omega$ and cut-off frequency of $f_c = 500$ Hz. (6 marks)

Or

F 3075 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Electrical and Electronics Engineering

EE 010 504 – POWER ELECTRONICS (EE)

(Regular – New Scheme)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 3 *marks.*

1. Explain the method of turning on of SCR using UJT triggering circuit.
2. Explain the phenomenon of half waving on a single-phase symmetrical connected half controlled bridge rectifier.
3. List three control strategies used in choppers.
4. Write the differences between Current Source Inverter (CSI) and Voltage Source Inverter (VSI).
5. SMPS involves multistage conversion, yet it is very commonly used. Why?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Explain the switching characteristics and merits of IGBT.
7. With a neat circuit diagram and waveforms, describe the operation of a half-controlled bridge converter.
8. With neat diagrams, explain the working of a two-quadrant type A chopper.
9. Explain sinusoidal PWM technique of varying the magnitude of output voltage in a single-phase inverter.
10. A back regulator has an input voltage of V_s = 12 volt. The required average output voltage is $V_o = 5V_oH$ and the peak-to-peak ripple voltage is 20mV. The switching frequency is 25 kHz. If peak-to-peak ripple current of inductor is 0.8A, find (i) the filter inductance L and (ii) the filter capacitance C.

(5 × 5 = 25 marks)

Turn over

Part C

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

MODULE I

11. (a) Explain the reverse recovery characteristics of a power diode.

(b) Discuss the significance of dv/dt and di/dt in SCR.

(2 × 6 = 12 marks)

Or

12. Explain in detail the following as applied to an SCR:

(i) average ON current. (ii) r.m.s. ON current.

(iii) surge current rating. (iv) I^2t rating

(v) holding current. (vi) latching current.

MODULE II

13. With neat waveforms and circuit diagrams describe the working of a single-phase full wave controlled rectifier connected to R load and derive the relationship between average output voltage and input voltage.

Or

14. Explain the working of a three-phase full converter, connected to a highly inductive load with ripple-free load current, along with the associated waveforms.

MODULE III

15. (a) Explain the working of a step-down chopper with relevant circuit diagram and waveforms.

(b) A step-up chopper having a pulse width of 90 μS has a d.c. input voltage of 230 V. If the blocking period of the chopper switch in 50 μS, calculate the average output voltage.

(7 + 5 = 12 marks)

Or

16. (a) Explain the working of cycloconverter with its equivalent circuit. (6 marks)

(b) A step-down chopper is operating from a 220 V d.c. source. The load has R = 5Ω, E = 22V and a very large inductance so that the load current may be assumed to be constant at 22A. If the chopper frequency is 250 Hz, calculate the ON period, OFF period and the duty cycle of the chopper. (6 marks)

MODULE IV

17. (a) Explain the phase displacement technique of varying the magnitude of output voltage in a single-phase inverter. (6 marks)

(b) A single-phase full bridge inverter employs single PWM technique to control the output voltage. What should be the pulse-width for the r.m.s. value of the fundamental component of the output voltage to be 60% of the d.c. input voltage? (6 marks)

Or

18. (a) Explain the working of a thyristorised single-phase current source inverter?

(b) A three-phase bridge inverter having thyristors as switches, supplies a Y-connected balanced load having 5Ω in each phase. If the d.c. supply voltage is 230V, Calculate the average and r.m.s. values of thyristor current for (i) 180° conduction and (ii) 120° conduction.

(6 + 6 = 12 marks)

MODULE V

19. With neat circuit diagram and waveforms, explain the working of a Buck-boost regulator?

Or

20. Explain design steps of a SMPS circuit.

[5 × 12 = 60 marks]

F 3087 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Electrical and Electronics Engineering

EE 010 505 – LINEAR INTEGRATED CIRCUITS (EE)

(Regular – New Scheme)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 3 *marks.*

1. Write any three properties of an ideal and practical op-amp along with values.
2. Draw the voltage transfer curve of a regenerative comparator using op-amp.
3. A 4 bit DAC produces output voltage of 0.1 V for a digital input of 0001. Find the value of V_O for maximum input?
4. Draw the internal functional block diagram of 565.
5. Compare the merits and demerits of switching voltage regulator with series regulator.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. A square wave of peak-to-peak amplitude of 750 mV has to be amplified to a peak - to - peak amplitude of 4.0 V, with a rise time of 4.5μsec or less. Can IC 741 op-amp be used?
7. Draw the circuit of sample - and - hold and explain its working.
8. Draw the circuit of a 2-bit weighted resistor DAC and explain.
9. Draw the block circuit diagram of a frequency translator and show how the frequency change is obtained?
10. Draw a power amplifier circuit using LM 380, designed to provide a power gain of 200 using positive feedback.

(5 × 5 = 25 marks)

Turn over

Part C

Answer any **one** *full questions from each module.*
Each full question carries 12 *marks.*

MODULE I

11. (a) Draw and explain the voltage transfer characteristics of an op-amp.

(b) For an op-amp PSRR = -70 dB (min), CMRR = 10^5 and differential mode gain $A_d = 10^5$. The output changes by 20 V in 4μsec. Calculate

(i) numerical value of PSRR.

(ii) common mode gain.

(iii) slew rate.

Or

12. Three voltages V_1, V_2 and V_3 are available as output from three transducers. It is desired to get output voltage $V_0 = V_1 + 2V_2 - V_3$. Draw and design the circuit and derive the above gain formula used for your circuit.

MODULE II

13. Using an integrator and comparator, draw the op-amp circuit to generate a sweep of ±6volt peak-to-peak amplitude, 600 Hz, 60% duty cycle. Design the circuit values.

Or

14. Draw the circuit of an astable multivibrator using op-amp 741 and design it to generate square waves of ±6V peak-to-peak amplitude, 600 Hz, 60% duty cycle. Design your circuit values.

MODULE III

15. Draw the circuit of a second order active butterworth high pass filter and design it for a cut off at 1.6 kHz.

Or

16. With a block circuit diagram describe the working of a successive approximation ADC. Explain the help of a suitable example.

MODULE IV

17. Draw the FSK demodulator circuit using 565 and explain the working.

Or

18. With the help of internal functional diagram, explain the working of a 555 timer used as astable multivibrator. Complete the circuit diagram to generate 0 to 6 V, amplitude, 600 Hz, 60% duty cycle square waves. Design the circuit values.

MODULE V

19. Draw the internal functional diagram of 723 regulator and explain its working. Show the connection diagram to regulate the output voltage at 4.5 Volt, to deliver a maximum of 80mA current. Design the regulator circuit.

Or

20. Draw the block circuit diagram of SMPS and explain the principle of voltage regulation. Where it is usually used.

(5 × 12 = 60 marks)

F 3097 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Electrical and Electronics Engineering

EE 010 506 – MICROPROCESSORS AND APPLICATIONS (EE)

(Regular – New Scheme)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 3 *marks.*

1. Indicate the function of the following pins of 8085?
   (i) RESET ; (ii) INTR ; (iii) HLDA.
2. Explain the following instructions:
   (i) XTHL ; (ii) DAD H ; (iii) CMA.
3. What do you mean by masking the input? How it is achieved in 8085?
4. Why the maximum size of keyboard is $8 \times 8 = 64$ when interfaced with 8279?
5. What is the purpose of BHE signal in 8086? Explain.

($5 \times 3 = 15$ marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Draw and explain : (i) memory read ; and (ii) memory write cycles of 8085?
7. Compare the following pairs of instructions with their op-codes, operations, instruction bytes, addressing modes, affected flags and results:
   (i) MVI A, 00H and XRA A ; (ii) JMP 2700 H and PCHL.
8. List and explain all the hardware interrupts and how 8085 responds to them?
9. Interface 8×4 key matrix keyboard to the 8085 using 8255. Draw the circuit and write an ALP to initialise 8255 and to read the key code.
10. Write an 8086 ALP to find the largest of n number of bytes?

($5 \times 5 = 25$ marks)

Turn over

Part C

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

MODULE I

11. (a) List all the internal registers in 8085, their abbreviations and lengths. Describe the function of each register? (7 marks)

(b) Explain the necessity of S_0 and S_1 with appropriate examples. (5 marks)

Or

12. (a) Define and explain (i) instruction cycle, (ii) machine cycle, (iii) T-state. (3 marks)

(b) Explain the different timing and control signals, with appropriate waveforms, used by 8085. (9 marks)

MODULE II

13. Write an 8085 ALP to multiply the 8 bit unsigned number in memory location 6200 H by the 8 bit unsigned number in memory location 6201 H. Store the 8 least significant bits of the result in memory location 6300 H and the 8 most significant bits in memory location 6301 H. (12 marks)

Or

14. (a) What do you mean by looping, counting and indexing? Explain with suitable examples. (6 marks)

(b) What are the addressing modes used in the following instructions? Explain (i) MVI M, 04FH, (ii) IN 3, (iii) PUSH D, (iv) RET. (6 marks)

MODULE III

15. (a) What is a subroutine? How is it useful? Explain the use of stack in CALL and RETURN instructions, with suitable examples. (7 marks)

(b) Explain restart as a software instruction. Describe the implementation of RST_5. (5 marks)

Or

16. (a) Explain the instructions RIM and SIM with examples. (5 marks)

(b) Explain how software delays can be implemented using counters? Illustrate with an example. (7 marks)

MODULE IV

17. Interface a 16 keys keyboard and four 7 segment LED's to 8085 using 8279. Write a program to read the keyboard and store the key read in the location KEYBUF. (12 marks)

Or

18. (a) Write a program to generate 1MHz square wave using 8255? (7 marks)

(b) Describe the important features and applications of 8275. (5 marks)

MODULE V

19. Explain various addressing modes of 8086 with appropriate examples. (12 marks)

Or

20. (a) Explain the register organisation of 8086? (6 marks)

(b) Explain the memory segmentation of 8086? What are its merits and demerits? (6 marks)

[5 × 12 = 60 marks]

F 3101 (Pages : 4) **Reg. No**.....

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Common to all branches except Computer Science and Engineering/Information Technology

ENGINEERING MATHEMATICS—IV (CMELPASUF)

(Improvement/Supplementary/Mercy Chance)

Time : Three Hours Maximum : 100 Marks

Answer any **one** *question from each module.*
All questions carry equal marks.

Module I

1. (a) Evaluate $\int_C z^2 dz$ where C is given by :

(i) The line $x = 2y$ from (0, 0) to (2, 1).

(ii) The line segment along the real axis from (0, 0) to (2, 0) and then vertically to (2, 1).

Can you expect path independency for the above integrals ? Give reason. (12 marks)

(b) Find the Laurents series expansion of $f(z) = \frac{z}{(z^2-1)(z^2+3)}$ in $|z| > 4$. (8 marks)

Or

2. (a) Using contour integration, evaluate $\int_0^{2\pi} \frac{d\theta}{5+4\cos\theta}$. (10 marks)

(b) Using contour integration, evaluate $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)^2} dx$. (10 marks)

Module II

3. (a) Find by Newton-Raphson method, the positive root of the equation $x^3 + x^2 + x = 100$. (10 marks)

(b) Find by method of false position, the root of the equation $xe^x = 1$. (10 marks)

Turn over

	D	F	G	H	Supply
A	19	30	50	10	7
B	70	30	40	60	9
C	40	8	70	20	18
Demand	5	8	7	14	34

(10 marks)

F 3137 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, DECEMBER 2012

Fifth Semester

Branch : Electrical and Electronics Engineering

LINEAR INTEGRATED CIRCUITS (E)

(Improvement/Supplementary/Mercy Chance)

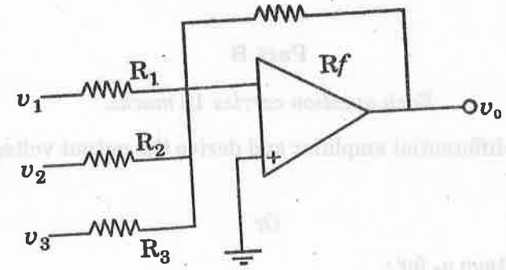
Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

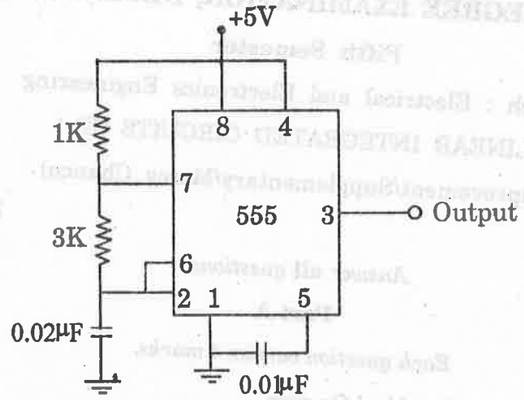
1. Explain the characteristics of an ideal Op-amp.
2. Draw the circuit of an inventing amplifier and derive the equation for closed loop gain.
3. Design an amplifier with a gain of + 5 using one Op-amp.
4. For the circuit shown below, R_f = 100 K, R_1 = 20 K , R_2 = 10 K and R_3 = 5 K. Write an equitation for v_0 in terms of the input voltages v_1 = – 2V, v_2 = – 1.5 v and v_3 = 0.8 V.



5. Explain with waveforms the astable multivibrator using Op-amp.
6. Draw the circuit diagram and sketch the frequency response of a first order high-pass filter.
7. Draw the block diagram of A/D conversion system. Give brief explanation.
8. Discuss the applications of PLL.

Turn over

9.



For the circuit shown above, determine :

(i) High-state-time interval. (ii) Low-state time interval.

(iii) Period. (iv) Frequency and duty cycle.

10. Explain with diagram the functioning of Zener voltage regulator.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Draw the circuit of a differential amplifier and derive the output voltage v_0 in terms of the input voltages v_1 and v_2.

Or

12. Obtain the output voltage v_0 for :

(a) Inverting summing amplifier.

(b) Non-inverting summing amplifier.

(12 marks)

13. (a) Explain with circuit diagram and waveforms the operation of a Schmitt trigger Using Op-amp.

(8 marks)

(b) Using a 741 Op-amp with supply ± 12, design an inverting Schmitt trigger circuit to have trigger points 08 ± 2V .

(4 marks)

14. (a) Explain with circuit diagram and waveforms the operation of a monostable multivibrator using an Op-amp.

(7 marks)

(b) What is a zero-crossing detector ? Explain. (5 marks)

15. Briefly explain with diagrams :

(a) First order low pass filter.

(b) High pass filter.

(c) Band reject filter.

Or

16. Explain the working of a dual-slop converter. (12 marks)

17. (a) Explain the basic principle of PLL. (8 marks)

(b) What are the applications of PLL ? (4 marks)

Or

18. Explain with functional block diagram the operation of IC 555 timer. (12 marks)

19. Explain the astable and monostable operation of IC 555.

Or

20. Explain with diagram the operation of 723 regulator.

(12 marks)

[5 × 12 = 60 marks]