

II B. Tech II Semester Regular Examinations, May/June - 2015
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
 (Com. to CE, EIE)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART-A

1. a) Define Managerial Economics
- b) Define Isoquants
- c) What are the Pricing Objectives?
- d) Write a short note on Trade cycle
- e) Write a short note on Accounting cycle
- f) What do you mean by Payback period (3M+3M+4M+4M+4M+4M)

PART-B

2. a) Define the law of demand. What are its exceptions? Explain (8M+8M)
 b) Explain different methods of demand forecasting
3. a) Explain the laws of returns with appropriate examples (8M+8M)
 b) Discuss the different cost concepts used in the process of cost analysis
4. a) Differentiate between perfect and imperfect markets (7M+9M)
 b) Explain the Marris Managerial theory of Firm Growth Maximization Model
5. a) Enumerate the merits and demerits of partnership firm (8M+8M)
 b) Describe the different phases of a business cycle
6. a) Define accounting and discuss its functions (9M+7M)
 b) Calculate the earnings per share from the following data:
 Net profit before tax Rs.1,00,000
 Taxation at 50% of net profit
 10% Preference share capital (Rs.10 each) Rs.1,00,000
 Equity share capital (Rs.10 share) Rs.1,00,000
7. a) Explain the nature of capital budgeting proposals (9M+7M)
 b) Discuss the phases of capital expenditure decisions



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PART-A

1. a) What do you mean by Consumer equilibrium
- b) Write a note on Law of increasing returns
- c) Define Monopoly
- d) What are the types of companies?
- e) Write a note on Double-entry book keeping
- f) What do you mean by Profitability index (3M+4M+3M+4M+4M+4M)

PART-B

2. a) What do you understand by elasticity of demand? Explain the factors governing it
- b) Explain Demand forecasting in case of new products (8M+8M)
3. a) Discuss the economies of scale that accrue to a firm
- b) Kamal enterprises deals in the supply of hardware parts of computer. The following cost data is available for two successive periods:

Year I (Rs.)	Year II (Rs.)	
Sales	50,000	1,20,000
Fixed costs	10,000	20,000
Variable cost	30,000	60,000

 Determine a) Break-even point b) Margin of safety (7M+9M)
4. a) Illustrate the price determination in case of monopoly
- b) Discuss the factors those influence price decisions (8M+8M)
5. a) Define partnership. What are its essential features
- b) Discuss the various measures that may be taken by a firm to counteract the evil effects of a trade cycle (8M+8M)
6. a) Explain different accounting concepts and accounting conventions
- b) Calculate the net profit ratio from the following data:

Sales less returns	1,00,000	Selling expenses	10,000
Gross profit	40,000	Income from investment	5,000
Administration	10,000	Loss on account of fire	3,000

 (8M+8M)
7. a) Explain the significance of capital budgeting
- b) Discuss the merits and demerits of accounting rate of return (8M+8M)



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PART-A

1. a) Define Economics, as a science of wealth
 b) Compare accounting costs and economic costs
 c) Write a note on monopolistic competition
 d) What are the privileges of a private company?
 e) What are the rules for Debit and Credit?
 f) Define Capital rationing (3M+4M+3M+4M+4M+4M)

PART-B

2. a) Explain how do you measure elasticity of demand
 b) What is demand function? How do you determine it (8M+8M)
3. a) Explain how cost-output relationship helps the entrepreneurs in expansion decisions
 b) Discuss the significance of Break-even analysis (8M+8M)
4. a) What is Oligopoly? Explain the features of oligopoly market
 b) Explain Price discrimination and how it happens (8M+8M)
5. a) Explain the main characteristics of business in the modern world
 b) What are the problems faced by the public enterprises in India (8M+8M)
6. a) Explain the sources and applications of funds flow and cash flow statements
 b) Journalise the following transactions as on March 31,2010 and post it in ledger.
 March 1, Vamsi started business with Rs.20,000
 Purchased goods from Madan Rs.4,000
 Sold goods to Samuel Rs.4,000
 Rent paid Rs.500 (7M+9M)
7. a) Explain the traditional methods of Capital budgeting
 b) A project costs Rs.25,000 and is expected to generate cash inflows as

Year	Cash inflows
	10,000
	8,000
	9,000
	6,000
	7,000

Compute the NPV of the project and the cost of the capital is 12%. (Data book is required)
 (7M+9M)



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PART-A

1. a) Write the significance of the advertising elasticity of demand
- b) Write a note on Cobb-Douglas Production function
- c) Write a note on Market Skimming Pricing
- d) What do you mean by Memorandum of Association
- e) Write a note on Trading and Profit and loss account
- f) Define Internal rate of return (4M+4M+3M+3M+4M+4M)

PART-B

2. a) Illustrate. How do you interpret the different types of elasticity
- b) Differentiate extension in demand and increase in demand. Illustrate (8M+8M)
3. a) Explain the features of short-run average cost and long-run average cost curve
- b) How do you determine BEP. Show graphical presentation of BEA (8M+8M)
4. a) Explain the structure of markets
- b) Discuss Williamson's Managerial Discretionary theory (7M+9M)
5. a) In what circumstances, sole proprietorship is considered and why
- b) Explain the characteristics of Business cycle (8M+8M)
6. a) Stock turnover ratio is 2.5 times. Average stock is Rs.20,000. Calculate cost of goods sold and also sales if profit earned is 25% of cost.
- b) What is a trial balance? Explain the method of its preparation (8M+8M)
7. a) What are the merits and limitations of payback period
- b) Explain the significance of identification of investment opportunities in capital budgeting process (8M+8M)



II B. Tech II Semester Regular Examinations, May/June - 2015
PULSE AND DIGITAL CIRCUITS
 (Com. to EEE, ECC)

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PART - A

1. a) Differentiate High pass and Low pass RC circuits
 b) Describe the operation of an attenuator?
 c) How shall you observe diode and BJT switching action?
 d) Give the importance of clamping circuits.
 e) Relate Flip flop with binary.
 f) Write a brief note on Hysteresis effect.
 g) Obtain relation of time period for Monostable multivibrator.
 h) What is the difference between positive logic and negative logic?
 i) Draw the constant current sweep circuit. (3M+2M+3M+2M+3M+2M+3M+2M+2M)

PART - B

2. a) Compare the response of RC circuit taken across R and C for an exponential input.
 b) Write the steps involved in the design a BJT switch. (8M+8M)
3. a) Conclude clamping circuit operation by considering source resistance and diode resistance.
 b) Design a two level clipper for bias voltages $V_1=5V$ and $V_2=-5V$. Use practical diodes (8M+8M)
4. a) Write different steps involved in symmetrical and unsymmetrical triggering process
 b) Draw collector and base wave forms for collector coupled monostable multi and explain (8M+8M)
5. a) Compare DTL and TTL and conclude.
 b) Compare CMOS and NMOS and conclude. (8M+8M)
6. a) Obtain sweep speed error for bootstrap sweep circuit.
 b) List out various methods to generate time base waveforms and explain any two. (8M+8M)
7. a) Compare the process of synchronization of Astable and monostable multivibrators.
 b) With the help of a neat circuit diagram and waveforms, explain frequency division with respect to a sweep circuit. (8M+8M)



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PART – A

1. a) Relate High pass RC circuit with clipper.
 b) Relate clipper with an attenuator.
 c) What is the difference between transient and steady state responses?
 d) What is the difference between self bias binary and fixed bias binary?
 e) Draw the Hysteresis for PNP - BJT multivibrator.
 f) Obtain the relation of time period for an Astable multi.
 g) Mention differences between PMOS and NMOS logic.
 h) Define the different errors related to time base generators.
 i) What is a sampling gate? (3M+2M+3M+2M+3M+2M+3M+2M+2M)

PART – B

2. a) How RC circuit behaves as a differentiator and an Integrator? Discuss. (8M+8M)
 b) How BJT behaves as switch? Give details
3. a) Draw the circuit of BJT clipper and explain the operation. (8M+8M)
 b) Draw the circuit of emitter coupled clipper and explain the operation
4. a) What are the effects of commutating capacitors in a binary? Give reasons (8M+8M)
 b) Draw the circuit of emitter coupled binary and its wave forms with all details.
5. a) Draw the OR gate and AND gate with diodes and analyze. (8M+8M)
 b) List out the merits of ECL and its applications
6. a) Draw the circuit of UJT-time base generator and explain its operation wave forms. (8M+8M)
 b) Relate current sweep and voltage sweep with examples.
7. a) Explain in detail about synchronization of sweep circuit with symmetrical signals (8M+8M)
 b) Draw the circuit of bidirectional sampling gate using two BJTs and explain the operation of it.



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PART - A

1. a) Relate Low pass RC circuit with clipper.
 b) List out different attenuators.
 c) Define transition time and settling time.
 d) Draw the inverter circuit with BJT.
 e) Draw the circuit for monostable multi if Q1 is ON and Q2 is OFF.
 f) Mention differences between DTL and TTL.
 g) Mention the differences between CMOS and NMOS logic.
 h) What is the difference between miller and bootstrap sweep circuits?-3m
 i) Define pulse synchronization. (2M+2M+2M+2M+3M+3M+3M+3M+2M)

PART - B

2. a) Relate the operation of series clipper and shunt clipper with corresponding RC circuits and give reasons for it.
 b) Obtain the relation between junction temperature and reverse saturation current and give details. (8M+8M)
3. a) How to draw the transfer characteristics of a two level clipper having more than two diodes? Give an example and compare your answer.
 b) Prove clamping circuit theorem by including cut-in voltage of diode. (8M+8M)
4. a) Design Schmitt trigger circuit for $V_H=2.2V$ and assume all the other data reasonably.
 b) Compare waveforms of collector coupled Astable multi for NPN and PNP BJTs. (10M+6M)
5. Explain the following with neat diagrams,
 i) MOS inverter, ii) Two-input MOS NAND gate and iii) Two-input MOS NOR gate. (16M)
6. a) Draw the circuit diagram of BJT-boot strap time base generator and derive sweep speed error
 b) Obtain the relation between e_s , e_d and e_t . (10M+6M)
7. a) Explain the sine wave frequency division of a sweep circuit.
 b) With the help of neat diagram explain the working of a four-diode gate (8M+8M)



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**PART - A**

1. a) Define tilt.
- b) How do you draw the transfer characteristics to get square wave as output for a clipper?
- c) Define resolution time and resolving time.
- d) Define rise time and obtain the relation.
- e) Why clamping circuit is called as DC restorer circuit?
- f) Differentiate voltage and current sweep circuits.
- g) Draw the bootstrap BJT time base generator circuit.
- h) Mention the differences between ECL and AOI logic.
- i) Draw the four diode gate. (2M+3M+2M+2M+2M+3M+2M+3M+3M)

**PART - B**

2. a) Obtain the output voltage levels of RC low pass circuit for square wave input.
- b) List out the switching characteristics of diode and BJT (8M+8M)
3. a) What are practical clamping circuits? Differentiate with an ideal circuit.
- b) Compare series and shunt clippers with all possible cases. (8M+8M)
4. a) Draw the circuit of emitter coupled mono stable multi and explains the operation.
- b) Draw the circuit of emitter coupled Astable multi and explains the operation (8M+8M)
5. Explain the following with neat diagrams.
  - a) Dynamic MOS inverter, b) Dynamic NAND gate, and c) Dynamic NOR gate. (16M)
6. a) With the help of a circuit diagram and waveforms, explain frequency division by an astable multivibrator.
- b) Draw the circuit of bi-directional BJT gate and explain the operation. (8M+8M)
7. a) With the help of a neat diagram, explain the working of bi-directional gates using transistors.
- b) How pedestal shall be cancelled by sampling gate? Discuss. (8M+8M)



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PART -A

- | | | | |
|---|----|--|------|
| 1 | a) | List of different types of pattern used for casting? | (3M) |
| | b) | What is the function of risers in casting? | (4M) |
| | c) | Classify the welding processes? | (4M) |
| | d) | Define the term weldability with example? | (4M) |
| | e) | Explain hot working process? | (4M) |
| | f) | Define the process of blanking with a neat sketch? | (3M) |

PART -B

- | | | | |
|---|----|---|------|
| 2 | a) | Give in detail the flow chart followed in preparation of sand casting? | (8M) |
| | b) | Define gating ratio? Illustrate the steps involved in designing a gating system? | (8M) |
| 3 | a) | Define freezing ratio. Calculate the pouring time required for complete filling of mould? | (8M) |
| | b) | Calculate the size of a cylindrical riser(height and diameter equal) necessary to feed a steel slab casting 25 x 25 x 5cm with a side riser, casting poured horizontally in the mould. Use Chapeau's equation and take constants a=0.1, b=0.03, c=1.0 | (8M) |
| 4 | a) | Define welding. What are different welding joints and their characteristics? | (8M) |
| | b) | List out the advantages, limitations and applications of welding? | (8M) |
| 5 | a) | With neat sketch explain explosive welding and electron beam welding. | (8M) |
| | b) | What are the destructive and nondestructive methods of testing the welded joints with examples? | (8M) |
| 6 | a) | Explain briefly the mechanism of plastic deformation in metals and alloys? | (8M) |
| | b) | Derive the expression for power required in rolling process. | (8M) |
| 7 | a) | What are the various ways in which presses can be classified? Explain one press work in detail. | (8M) |
| | b) | What are thermoplastics? Explain with neat sketch injection molding process. | (8M) |



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PART -A

- 1 a) List out advantages of casting and its applications. (3M)
- b) Illustrate with example the functioning of chaplets in casting process. (4M)
- c) What are the different types of welding joints? (4M)
- d) Define HAZ in welding. (4M)
- e) Explain cold working process. (4M)
- f) Explain the process of bending. (3M)

PART -B

- 2 a) What are the steps involved in sand casting? What are different types of pattern allowances? (8M)
- b) Explain the principle of gating. Design a best gating ratio required for better casting. (8M)
- 3 a) Illustrate different methods of melting the materials. (8M)
- b) Calculate the sizes of riser for casting steel bar of 75 x 12.5 x 12.5cm with top riser placed at the center of the bar. Use modulus method (8M)
- 4 a) Distinguish gas welding and gas cutting. Illustrate with few examples. (8M)
- b) List out the advantages, limitations and applications of welding. (8M)
- 5 a) With neat sketch explain thermit welding and plasma welding. (8M)
- b) Explain the causes of welding defects and their remedies with neat sketch. (8M)
- 6 a) Define the term recrystallization. State its significance in metal forming. (8M)
- b) Define the process of extrusion and its characteristics with sketch and explain impact extrusion. (8M)
- 7 a) Explain briefly various press working operations. (8M)
- b) What are thermosetting plastics? What are different types of compression processes, explain any one with neat sketch? (8M)



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**PART -A**

- |   |    |                                                                            |      |
|---|----|----------------------------------------------------------------------------|------|
| 1 | a) | List out materials used for pattern making.                                | (3M) |
|   | b) | Illustrate with example the functioning of core prints in casting process. | (4M) |
|   | c) | What are different types of flames?                                        | (4M) |
|   | d) | What are the defects in welding?                                           | (4M) |
|   | e) | Explain extrusion process?                                                 | (4M) |
|   | f) | Define the process of coining?                                             | (3M) |

**PART -B**

- |   |    |                                                                                                 |      |
|---|----|-------------------------------------------------------------------------------------------------|------|
| 2 | a) | How many types of patterns are there? Explain them with neat sketches.                          | (8M) |
|   | b) | Define gating ratio? Illustrate the steps involved in designing a gating system.                | (8M) |
| 3 | a) | With neat sketch explain the principle and working of cupola furnace.                           | (8M) |
|   | b) | Illustrate with example the solidification process of pure metals and alloys.                   | (8M) |
| 4 | a) | Describe in detail all the types of arc welding with figures.                                   | (8M) |
|   | b) | List out the advantages, limitations and applications of welding.                               | (8M) |
| 5 | a) | Explain different types of resistant welding. Explain with neat sketch any one type.            | (8M) |
|   | b) | What are the destructive and nondestructive methods of testing the welded joints with examples? | (8M) |
| 6 | a) | Distinguish between hot working and cold working processes with suitable examples and figures.  | (8M) |
|   | b) | What is meant by bulk deformation? Explain different types of forgings with neat sketches.      | (8M) |
| 7 | a) | Derive an expression for forces and power required for piercing process.                        | (8M) |
|   | b) | List different types of Plastics, and processing methods of plastics.                           | (8M) |



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PART -A

- 1 a) What is sand casting? List out its applications. (3M)
- b) Illustrate the colour codes for patterns in casting process. (4M)
- c) Which of the flame is efficient while cutting of hard metals and why? (4M)
- d) Define soldering and brazing. (4M)
- e) Explain the process of deep drawing. (4M)
- f) Define the process of spinning with neat sketch. (3M)

PART -B

- 2 a) Explain the pattern allowance and their construction. (8M)
- b) Explain in detail the defects of casting? (8M)
- 3 a) With neat sketch explain the principle and working of crucible furnace and pit furnace. (8M)
- b) Discuss the casting defects which are attributed to the quality of sand. Explain the remedial measures. (8M)
- 4 a) Describe various welding positions with neat sketch and explain a practical phenomenon using those positions. (8M)
- b) List out the advantages, limitations and applications of welding. (8M)
- 5 a) What is solid state welding? What are different types of solid state welding explain one with neat sketch? (8M)
- b) Explain the causes of welding defects and their remedies with neat sketch. (8M)
- 6 a) State the advantages and limitations of Hot working and cold working processes and explain the HAZ in both the processes? (8M)
- b) What is compaction and sintering? Give advantages and its applications. (8M)
- 7 a) Derive an expression for forces and power required for blanking process. (8M)
- b) List different types of Plastics. Explain their properties and applications. (8M)



II B. Tech II Semester Regular Examinations, May/June - 2015
ANALOG COMMUNICATIONS
 (Electronics and communication Engineering)

Time: 3 hours

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PART-A

1. a) Explain the need of modulation in communication system?
 b) Describe VSB modulation and give its applications?
 c) Define the following terms?
 i) Carrier swing ii) Frequency Deviation iii) Percent Modulation
 d) What is threshold effect in an envelope detector? Explain?
 e) Write the main requirements of AM broadcast transmitters?
 f) Discuss the types of pulse Modulation. (3M+3M+4M+4M+4M+4M)

PART-B

2. a) Describe an expression for AM wave and sketch its frequency spectrum.
 b) Explain the square law detection of AM signals.
3. a) Prove that the balanced modulator produces an output consisting of sidebands only with the carrier removed.
 b) Explain the principle of coherent detector of DSB-SC modulated more with a neat block diagram.
4. a) For an FM modulator with a modulating signal $m(t) = V_m \sin 300\omega t$, the carrier Signal $V_c(t) = 8 \sin(6.5 \times 10^6)t$ and the modulator index $\beta = 2$. Find out the significant side frequencies and their amplitudes.
 b) Explain the difference between Narrow band FM and Wide band FM.
5. a) Calculate the figure of merit for a DSB-SC system.
 b) Prove that narrowband FM offers no improvement in SNR over AM.
6. a) Draw the block diagram of superhetrodyne receiver and the function of each block.
 b) Discuss the factors influencing the choice of intermediate frequency (IF) for a radio Receiver.
7. Write short notes on the following
 - i) Double polarity PAM
 - ii) Demodulation of PWM



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PART-A

1. a) Explain the need for modulator.
 b) Compare the DSB and SSB systems.
 c) Explain the terms of Narrow band FM and wide band FM
 d) Explain, how noise can be calculated in a communication system.
 e) What is the significance of Harmonic generator in transmitters?
 f) Write short notes on “ Time division multiplexing”. (3M+3M+4M+4M+4M+4M)

PART-B

2. a) Explain the generation of AM wave using square law modulator.
 b) A tone modulated AM-signal with a modulation index of “m” and base band signal Frequency of ω_m is detected using envelope detector, whose time constant is RC, for Effective demodulation, show that $(1/RC) \geq [m \omega_m / (\sqrt{1-m^2})]$.
3. a) Explain the concept of frequency translation using the spectrum of DSB-SC wave.
 b) In an AM-SC system, modulating signal is a single tone sinusoidal signal $4\cos 2\pi 10^3 t$, which Modulates carrier signal $6\cos 2\pi 10^6 t$. Write the equation of the modulated wave. Plot the two Sided spectrum of the modulated wave. Calculate the amount of power transmitted.
4. a) Give the phasor comparison of narrowband FM and AM waves for sinusoidal modulation.
 b) Compute the bandwidth requirement for the transmission of FM signal having a frequency Deviation of 75 kHz and an audio bandwidth of 10kHz. What will be the change in the Bandwidth, if modulating frequency is doubled? Determine the bandwidth when modulating Signal amplitude is also doubled.
5. a) Explain about pre-emphasis and de-emphasis.
 b) Explain the noise performance of SSB-SC receiver and prove its S/N ratio is unity.
6. a) List out the advantages and disadvantages of TRF receivers.
 b) What is an image frequency? How is image frequency rejection achieved?
7. a) Explain, how a PPM signal can be generated from PWM signal?
 b) Explain the generating and demodulation of PPM.



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PART-A

1. a) Derive P_t in Amplitude modulation.
 b) Discuss Quadrature null effect of DSB-SC and SSB-SC.
 c) Write short notes on Pre-emphasis and de-emphasis.
 d) Define noise figure, noise equivalent temperature.
 e) define sensitivity, selectivity, fidelity.
 f) Distinguish between TDM and FDM. (3M+3M+4M+4M+4M+4M)

PART-B

2. a) What is modulation? Why is modulation used in communication system?
 b) What do you understand of modulation index? What is its significance?
3. a) With a neat block diagram explain the demodulation process of DSB-SC signal.
 b) Prove that the balanced modulator produces an output consisting of sidebands only with the carrier removed.
4. a) An angle modulated signal has the form $v(t) = 100\cos[2\pi f_c t + 4 \sin 2000\pi t]$ where $f_c = 5\text{MHz}$
 i) Determine the average transmitted power ii) Determine the peak phase deviation
 iii) Determine the peak frequency deviation iv) Is this FM or a PM signal? Explain
 b) Explain the detection of FM wave using balanced frequency discrimination.
5. a) Prove that the figure of merit for SSB-SC is 1.
 b) Discuss the threshold effect for AM with envelope detector.
6. a) Mention the advantages of superhetrodyne receiver over TRF receiver
 b) Distinguish between simple AGC and delayed AGC
 c) Draw the block Schematic for FM broad cast receiver and explain the function of each unit.
7. Write short notes on
 i) Single polarity PAM ii) Generation of PWM



II B. Tech II Semester Regular Examinations, May/June - 2015
ANALOG COMMUNICATIONS
 (Electronics and communication Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

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**PART-A**

1. a) Explain the need for modulator.  
 b) Discuss Quadrature null effect of DSB-SC and SSB-SC  
 c) Explain the terms of Narrow band FM and wide band FM  
 d) What is threshold effect in an envelope detector? Explain?  
 e) Write the main requirements of AM broadcast transmitters?  
 f) Distinguish between PAM & PWM. (3M+3M+4M+4M+4M+4M)

**PART-B**

2. a) Describe an expression for AM wave and sketch its frequency spectrum.  
 b) Explain the square law detection of AM signals.
3. a) Explain the generation of double side band suppressed carrier (DSB-SC) modulator. Write the necessary equations,  
 b) Discuss the effect of frequency and phase error in demodulation of DSB-SC wave using synchronous detector.
4. a) Give the phasor comparison of narrowband FM and AM waves for sinusoidal modulation.  
 b) Compute the bandwidth requirement for the transmission of FM signal having a frequency deviation of 75 kHz and an audio bandwidth of 10kHz. What will be the change in the bandwidth, if modulating frequency is doubled? Determine the bandwidth when modulating signal amplitude is also doubled.
5. a) Derive an expression for the S/N ratio for an FM System.  
 b) Explain the difference between DSB & SSB system.
6. a) Draw the block diagram of superhetrodyne receiver and the function of each block.  
 b) Discuss the factors influencing the choice of intermediate frequency (IF) for a radio receiver.
7. a) Explain the PPM generation from PWM with a neat block diagram and necessary figures.  
 b) Draw the circuit of PPM demodulator and explain the operation.



**II B. Tech II Semester Regular Examinations, May/June - 2015**  
**ADVANCED DATA STRUCTURES**  
 (Com. to CSE, IT)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **THREE** Questions from **Part-B**

**PART-A**

1. a) The elements 32, 15, 20, 30, 12, 25 and 16 are inserted one by one in the given order into a max-heap. What is the resultant Max-heap?  
 b) Compare quicksort and radix sort.  
 c) Calculate the big-O notation of  $5n^2 + n^{3/2}$   
 d) Differences between AVL tree and Binary search tree.  
 e) Discuss the Problems associated with Quadratic probing.  
 f) What are the Applications of minimum cost spanning trees? (4M+4M+4M+4M+3M+3M)

**PART-A**

2. a) How will you handle overflow and collision detection in a hash table? Discuss methods.  
 b) Construct the open hash table and closed hash table for the input:  
 30, 20, 56, 75, 31, 19 using the hash function  $h(k) = k \text{ mod } 11$  (8M+8M)
3. What is an AVL tree? Explain the need for rotation of AVL trees. Construct an AVL Tree for the list 8,9,11,6,5,7,10 by using successive insertion. Illustrate the steps Clearly. (16M)
4. a) Write an algorithm to insert an element in to a heap. Explain with a suitable example.  
 b) Explain the concept of priority queue with suitable example. (8M+8M)
5. a) Explain single source shortest path problem with an example.  
 b) How Wars hall's algorithm and Floyd's algorithm will find the shortest paths? (8M+8M)
6. a) Use heap sort for the data: 26,5,77,1,61,11,59,15,48,9 for sorting  
 b) Work out the time complexity of merge sort in the worst case. (8M+8M)
7. a) What is a binary trie? Construct a binary trie with elements: 0001, 0011, 1000, 1001, 1100, 0010, 1101, 1010.  
 b) Draw the flowchart for Knuth-Morris-Pratt algorithm (8M+8M)



**II B. Tech II Semester Regular Examinations, May/June - 2015**  
**ADVANCED DATA STRUCTURES**  
 (Com. to CSE, IT)

Time: 3 hours

Max. Marks: 70

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **THREE** Questions from **Part-B**
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**PART-A**

1. a) Differentiate between best, average, and worst case complexities  
 b) Height balancing in AVL tree.  
 c) What is a height balanced tree? How rebalancing is done in a height balanced tree?  
 d) Define the terms: file, record, field.  
 e) Write the Differences between spanning tree and minimum spanning tree.  
 f) Discuss the Advantages of hashing.

(4M+4M+4M+4M+3M+3M)

**PART-B**

2. a) Explain the linear probing method in hashing. Discuss its performance analysis.  
 b) What is a dictionary? Give the applications of dictionary or dictionary with duplicates in which sequential access is desired. (8M+8M)
3. a) Construct AVL tree for the days of week on their lexicographical order. Initial order of the days is as they occur in a week from Sunday to Saturday  
 b) Explain the concept of 2-3 tree. How can keys be inserted into it. Comment on the efficiency of search operations on a 2-3 tree (8M+8M)
4. a) Construct a heap using the following list of numbers: 12,9,8,3,7,5,10,18  
 b) What is a priority queue? List and explain different ways of representing them. (8M+8M)
5. What is a minimum spanning tree? Explain with an example, Krushkal's algorithm for constructing a minimum cost spanning tree. (16M)
6. a) Sort the following data using merge sort. Discuss the time complexity of the algorithm if the data size is n. 15, 10, 2, 11, 17, 12, 5, 8, 9, 1, 3, 13, 6.  
 b) Discuss about the lower bound on complexity for sorting methods. (8M+8M)
7. a) Explain the differences between sequential files and indexed sequential files.  
 b) Explain the main features of Boyer-Moore algorithm (8M+8M)



**II B. Tech II Semester Regular Examinations, May/June - 2015**  
**ADVANCED DATA STRUCTURES**  
 (Com. to CSE, IT)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **THREE** Questions from **Part-B**

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PART-A

1. a) What are tries? Give their advantages.
 b) What are the Applications of graphs?
 c) Explain about the delete procedure of the Binary search tree
 d) Give the properties of binomial heaps.
 e) Differences between hashing and skip lists.
 f) Define and give an example of a Minimum Cost Spanning Tree. (4M+4M+4M+4M+3M+3M)

PART-A

2. a) What is hashing with chains? Explain. Compare this with linear probing.
 b) Describe the skiplist representation of dictionary with an example. (8M+8M)
3. a) What is an AVL tree? Write the algorithm to search for an element of an AVL search tree.
 b) Construct a 2-3 tree for 4, 6, 3, 2, 1, 7, 9 (8M+8M)
4. a) Discuss the insertion and deletion operations in a priority queue.
 b) Illustrate the algorithm for deletion of an element from heap with an example. (8M+8M)
5. Develop an algorithm to compute the shortest path using Dijkstra's algorithm. Validate the algorithm with a suitable example. (16M)
6. a) Show the outcome of different passes for sorting the following sequence of data using quick sort algorithm Choose the first element as pivot. 8, 11, 3, 15, 6, 9, 12, 39
 b) How to derive the lower bounds from decision trees for sorting algorithms? Explain. (8M+8M)
7. a) Which pattern matching algorithm avoids the repeated comparison of characters? Discuss with suitable example.
 b) What is a record? What are the ways in which records can be organized in a file? (8M+8M)



II B. Tech II Semester Regular Examinations, May/June - 2015
ADVANCED DATA STRUCTURES
 (Com. to CSE, IT)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

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**PART-A**

1. a) Discuss about special characters in files.
- b) Draw a sequence of rotations required to perform a single right rotation and a LR rotation in an AVL tree
- c) Discuss about lazy binomial queues.
- d) Compare Closed hashing Vs Open hashing.
- e) Describe the three main steps in Quicksort.
- f) Write the Applications of priority queues. (4M+4M+4M+4M+3M+3M)

**PART-B**

2. a) With a procedure and a relevant example discuss separate chaining in hashing.
- b) Define Dictionary and Dictionary with duplicates. List the operation performed on dictionary. (8M+8M)
3. a) What is an AVL search tree? How do we define the height of it? Discuss about the balance factor associated with a node of an AVL tree.
- b) Construct a 2-3 tree for the list 9, 5, 8, 3, 2, 4 and by successive insertion. (8M+8M)
4. Explain the implementation of a binomial heap and its operation with suitable example. (16M)
5. What is transitive closure? Which algorithm uses transitive closure in calculating shortest path? Explain it with an example. (16M)
6. An array contains the following elements [17 46 5 23 20]. Use the heap sort method to sort the elements in increasing order. Draw the heap trees as you move through each step (16M)
7. a) Which pattern matching algorithm scans the characters from right to left? Explain it with suitable example.
- b) State different file organizations and discuss their advantages and disadvantages. (8M+8M)



**II B. Tech II Semester Supplementary Examinations May/June - 2015**  
**MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS**

(Com. to CE, MM)

Time: 3 hours

Max. Marks: 75

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Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) Define Managerial Economics and explain its characteristics.
b) What is demand? And explain law of demand and its exceptions. (7M+8M)
2. a) Define Elasticity of demand and its types and significance.
b) Describe any four methods of demand forecasting. (7M+8M)
3. a) Explain the salient features of Cobb-Douglas Production Function.
b) Describe the importance and limitations of Break-even analysis. (7M+8M)
4. a) Explain salient the features of perfect competition and monopoly.
b) Describe the conditions of Oligopoly and Kinked demand curve. (7M+8M)
5. Explain Importance of pricing policies and describe any five methods of pricing. (15M)
6. a) Describe the salient features of private limited company.
b) Explain the phases and features of business cycles. (7M+8M)



7. a) Explain the importance of ratio analysis and objectives of solvency ratio.
 b) The following trial balance was drawn from the books of Zig-Zag Traders: (5M+10M)

Trial Balance

Debit	Rs.	Credit	Rs.
Building	60,000	Capital	73,600
Machinery	17,000	Fixtures	5,600
Returns outward	2,600	Sales	1,04,000
Bad debts	2,800	Debtors	60,000
Cash	400	Interest received	2,600
Discount received	3,000		
Bank Overdraft	10,000		
Creditors	50,000		
Purchases	1,00,000		
	2,45,800		2,45,800

Even though the debit and credit sides agree, the trial balance contains mistakes. Redraft the Trial Balance.

8. a) Explain the meaning and need for capital budgeting.
 b) Find out the IRR of the following investment proposal. (5M+10M)
- Initial Investment Rs. 70,000
 Expected annual cash inflow Rs. 24,000
 Economic life of the project 4 years
 Present value of annuity of Re. 1 for 4 years.
 @ 10% 3.170, 12% 3.037, @ 14% 2.914, @ 16% 2.798.



II B. Tech II Semester Supplementary Examinations May/June - 2015
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Com. to CE, MM)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) Explain the basic economic tools using in Managerial Economics.  
b) What is demand? And explain law of demand and its limitation. (7M+8M)
  
2. a) Define Elasticity of demand and explain its types and measurement of Price Elasticity of demand.  
b) What is demand forecasting? And explain any three methods of demand Forecasting. (7M+8M)
  
3. a) Explain the law of diminishing returns.  
b) A factory manufacturing sewing machines has the capacity to produce 500 Machines per year. The marginal (variable) cost of each machine is Rs.200 and Each machine is sold for Rs.250. Fixed overheads are Rs.12,000 per year. Calculate the break-even points for output and sales and show what profit will Result if output is 90% of capacity? (5M+10M)
  
4. a) Explain the salient features Monopoly and monopolistic competition  
b) Describe any four methods of Pricing. (7M+8M)
  
5. a) Explain the salient features of Partnership.  
b) Describe the meaning and salient features of business cycles (7M+8M)
  
6. a) Explain the importance financial accounting and list out the differences Between Journal and Ledger.  
b) What is double-entry system? And explain the limitations of financial Statements. (7M+8M)



7. a) What is a ratio? And explain briefly different types of ratios.  
 b) From the following Balance Sheet of XYZ Co. Ltd., calculate liquidity ratios. (8M+7M)

**Balance Sheet of XYZ Co. Ltd.****as on 31.12.20XX**

(Rs .in thousand)

| Liabilities              | Rs.  | Assets                 | Rs.  |
|--------------------------|------|------------------------|------|
| Preference share capital | 100  | Land and Buildings     | 225  |
| Equity share capital     | 150  | Plant and Machinery    | 250  |
| General reserve          | 250  | Furniture and Fixtures | 100  |
| Debentures               | 400  | Stock                  | 250  |
| Creditors                | 200  | Debtors                | 125  |
| Bills payable            | 50   | Cash at Bank           | 250  |
| Outstanding expenses     | 50   | Cash in hand           | 125  |
| Profit and loss account  | 100  | Prepaid expenses       | 50   |
| Bank Loan<br>(Long-term) | 200  | Marketable securities  | 125  |
|                          | 1500 |                        | 1500 |

8. a) Explain the meaning and importance of capital building.  
 b) Two projects, costing Rs 20,000 each, have the following cash inflows. Both (7M+8M)  
 Have the same payback period. Which one do you choose and why?  
 Same total cash inflows with a difference in size and timing.

(Figures in Rupees)

| Year  | Project A | Project B |
|-------|-----------|-----------|
| I     | 8,000     | 12,000    |
| II    | 12,000    | 8,000     |
| III   | 10,000    | 12,000    |
| IV    | 9,000     | 7,000     |
| V     | 7,000     | 7,000     |
| Total | 46,000    | 46,000    |



**II B. Tech II Semester Supplementary Examinations May/June - 2015**  
**MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS**

(Com. to CE, MM)

Time: 3 hours

Max. Marks: 75

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Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) Define Managerial Economics and its characteristics.
b) What is demand? And explain the law of demand and its limitations. (7M+8M)

2. a) Define elasticity of demand and explain any two methods of measurement of Elasticity of demand.
b) Explain the significance demand forecasting and describe any three methods of demand forecasting. (7M+8M)

3. a) Describe the law of returns to scale.
b) Explain the significance, usefulness and limitations of Break-even analysis. (7M+8M)

4. a) What is a market? And explain the salient features perfect competition.
b) What is monopoly? And explain the price and output determination monopoly. (7M+8M)

5. Describe any five methods of pricing. (15M)

6. a) Briefly explain the salient features of Private and Public limited companies.
b) What is business cycle? And explain the phase and features of business cycles. (7M+8M)



7. a) Explain the limitations of financial statements.

b) From the following Trial Balance and adjustments of Swaraj Emporium, (5M+10M)
Prepare trading and profit and loss account for the year ended
December, 31, 2013 and a Balance Sheet as on that date.

	Rs.	Rs.
Sundry debtors	64,000	
Stock (1.1.2013)	44,000	
Cash in hand	70	
Plant and machinery	35,000	
Sundry creditors		21,300
Trade expenses	2,150	
Sales		2,69,000
Salaries	4,450	
Carriage outwards	800	
Rent	1800	
Bills payable		
purchases	2,37,740	15,000
Discounts	2,200	
Business premises	69,000	
Capital (1.1.2013)		
Cash at bank	3090	1,59,000

	4,64,300	-----
		4,64,300

Adjustments:

The stock as on December 31,2013 was Rs. 24,900.

Rent was unpaid to the extent of Rs. 170.

Outstanding trade expenses were Rs. 300.

Write off for bad debts Rs. 800.

Provide 5% for doubtful debts.

Depreciate plant and machinery @ 10% per annum.

Business premises are to be depreciated by 2% per annum.

8. a) What is ratio analysis? And briefly explain the salient features of different ratio analysis.

b) Explain the meaning of capital Budgeting and briefly describe the different methods of
Capitalbudgeting. (7M+8M)



II B. Tech II Semester Supplementary Examinations May/June - 2015
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
 (Com. to CE, MM)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks
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1. a) Describe the importance of managerial Economics and explain the basic economic tools Used in Managerial Economics.  
 b) Describe the demand analysis? And the salient features and limitations of demand law. (7M+8M)
2. a) Define elasticity of demand. And explain different methods of price elasticity of demand.  
 b) Explain the importance of demand forecasting. And describe different methods of demand Forecasting. (7M+8M)
3. a) Explain the salient features of Cobb-Douglas production function.  
 b) Describe the significance, assumptions and limitations of Break- even analysis. (7M+8M)
4. a) Explain the conditions of perfect competition and monopoly.  
 b) Explain the importance of pricing policy and describe any three methods of pricing. (7M+8M)
5. a) What is business? And explain the salient features of partnership.  
 b) Define business cycle and explain phases and features of business cycle. (7M+8M)
6. a) Explain the salient features Journal and ledger and their differences.  
 b) Explain the significance of trial balance and limitations of financial statements. (7M+8M)
7. a) What is ratio analysis? And briefly explain the salient features of different ratio analysis.  
 b) Calculate the funds from operations from the following particulars. (7M+8M)

|                                    | March 31, 2013 | March 31, 2014 |
|------------------------------------|----------------|----------------|
|                                    | Rs.            | Rs.            |
| Profit and loss account            | 7,50,000       | 10,50,000      |
| General reserve                    | 5,00,000       | 6,00,000       |
| Goodwill                           | 30,000         | 20,000         |
| Patents                            | 25,000         | 15,000         |
| Preliminary expenses               | 10,000         | ----           |
| Provision for depreciation account | 30,000         | 40,000         |
| Funds flow statement               |                |                |

8. a) What is the meaning of capital budgeting? And explain its need for capital decisions.  
 b) Explain the various methods of capital budgeting and their advantages. (7M+8M)



**II B. Tech II Semester Supplementary Examinations May/June - 2015**  
**PULSE AND DIGITAL CIRCUITS**  
 (Com. to EEE, ECE, ECC, BME, EIE)

Time: 3 hours

Marks: 75

Answer any **FIVE** Questions  
 All Questions carry **Equal** Marks

1. a) Draw the circuit of a double differentiator and derive the output for input  $v_i = V e^{-t/\tau}$  and also plot the response and also locate maxima and minima.
- b) Derive the expressions for the output of a RC Low pass circuit and also draw the input and output waveforms for the following: (i) ramp input. (ii) sinusoidal input.
2. a) For the circuit shown in Figure 1, draw the transfer characteristics when diodes are ideal diodes.

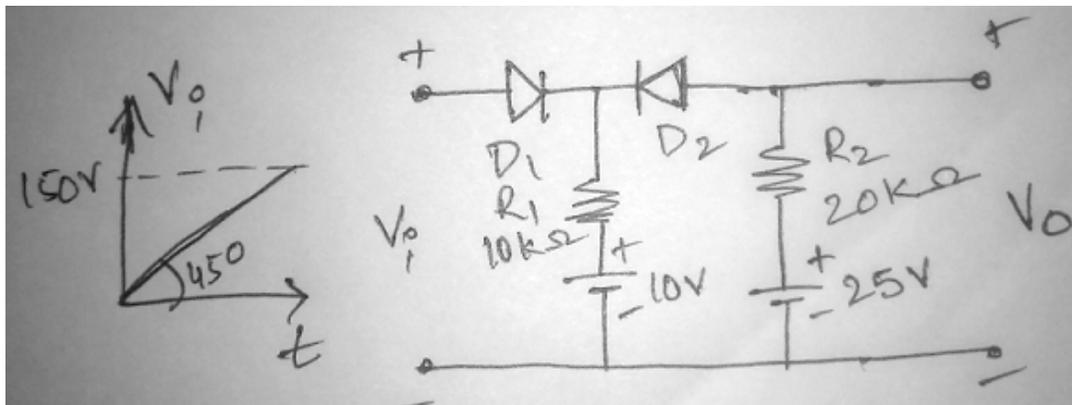


Figure 1

- b) Derive the expression for steady state output of a clamper circuit when excited by a square wave input and also sketch the steady state output to scale.
3. a) A transistor has  $f_T = 50 \text{ MHz}$ ,  $h_{FE} = 40$ ,  $c_{b'c} = 3 \text{ pF}$  and operates with  $V_{cc} = 12 \text{ V}$  and  $R_c = 500 \Omega$ . The transistor is operating initially near to cut-in point. What base current must be applied to drive the transistor to saturation in  $1 \mu\text{sec}$ ?
- b) Draw the circuit of a two input ECL NOR gate and explain its operation.



4. a) Explain the hysteresis that exists in Schmitt trigger circuit.  
b) Draw the circuit diagram of a Schmitt trigger circuit and explain its operation.
  
5. a) Design a collector coupled transistor monostable multivibrator to produce a time delay of  $50 \mu \text{ sec}$ . Given that  $h_{FE} = 100$  and driven by  $\pm 15\text{V}$  power supply,  $V_{CE \text{ sat}} = 0.3\text{V}$ ,  $V_{BE \text{ sat}} = 0.7 \text{ V}$ ,  $V_{BE \text{ cut off}} = 0 \text{ V}$ .  
b) Explain how an Astable multivibrator can be used as voltage to frequency converter.
  
6. a) In a bootstrap time base generator, find the values of  $R_B$  and  $C_s$  to generate a  $15 \text{ V}$  sweep in  $250 \mu \text{ s}$ .  
b) Draw the circuit of current time base generator and explain its operation.
  
7. a) With the help of waveforms, show that the frequency division is by a factor of two in a sweep generator.  
b) Compare sine wave synchronization with pulse synchronization.
  
8. a) Explain the operation of a blocking oscillator and also enlist the applications of the blocking oscillator.  
b) Draw the circuit of a triggered transistor monostable blocking oscillator with base timing and explain its operation and derive expression for its output pulse width.



**II B. Tech II Semester Supplementary Examinations May/June - 2015**  
**PULSE AND DIGITAL CIRCUITS**  
 (Com. to EEE, ECE, ECC, BME, EIE)

Time: 3 hours

Marks: 75

Answer any **FIVE** Questions  
 All Questions carry **Equal** Marks

1. a) Derive the expressions for the output of a RC High pass circuit and also draw the input and output waveforms for the following : (i) sinusoidal input. (ii) pulse input.  
 b) A 10V step input is applied to an RC low pass circuit with  $R = 22k\Omega$  and  $C = 300 \text{ pF}$ . Calculate the rise time of the capacitor voltage, the time required for the capacitor to charge up to 63.2% of its maximum charge. And the time taken for the capacitor to become completely charged.
  
2. a) Explain the principle of clamping, and discuss the effects of source impedance, load resistance and cut-in voltage on clamping.  
 b) Draw the transfer characteristics for the circuit shown in Figure 1.

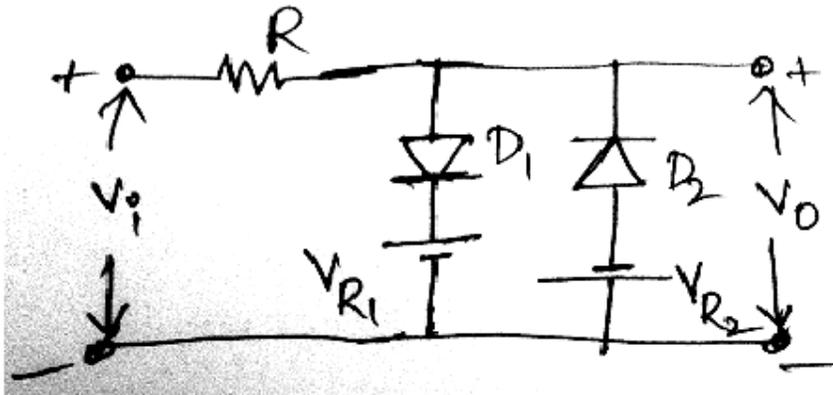


Figure 1

3. a) Explain the reverse recovery of a semiconductor diode and also explain how the diode speed is affected by the recovery time.  
 b) Compare the DTL, ECL, TTL and CMOS logic families.



4. a) Draw the circuit diagram of fixed amplitude sweep circuit and explain its operation.  
b) Design a collector coupled bistable multivibrator to operate from a  $\pm 6V$  power supply.  
Using npn transistor having  $h_{fe} = 70$  and  $I_{CE\text{ sat}} = 2\text{ mA}$
5. a) In a collector coupled astable circuit using pnp transistor  $V_{CC} = 15\text{ V}$ ,  $R_c = 3\text{ K}\Omega$ ,  $R_1 = 40\text{ K}\Omega$ ,  $R_2 = 20\text{ K}\Omega$ ,  $h_{fe} = 30$ ,  $r_{bb'} = 0$  and neglect all forward biased junction voltages. Calculate and plot the waveforms at the base and collector of one transistor and also find the value of coupling capacitor when the circuit is working at 5 KHz, assuming  $C_1 = C_2$ .  
b) Explain how a monostable multivibrator works as a voltage to time converter using suitable waveforms and circuit.
6. a) Enlist and explain the general features of a time-base signal. And also explain why time base generators are called sweep circuits.  
b) With help of neat sketches explain the working of a bootstrap time base generator.
7. a) Explain how a sinusoidal oscillator can be used as a frequency divider.  
b) Using suitable sketches explain the process of synchronization of monostable multivibrator.
8. With the help of circuit diagram and relevant waveforms explain the operation of a triggered transistor blocking oscillator with base timing. Derive the expression for the pulse width at the output. Also explain the disadvantages of the circuit and state how they can be overcome.



**II B. Tech II Semester Supplementary Examinations May/June - 2015**  
**PULSE AND DIGITAL CIRCUITS**  
(Com. to EEE, ECE, ECC, BME, EIE)

Time: 3 hours

Marks: 75

Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) In a RC high pass circuit, derive the expression for percentage tilt.
b) A 5 KHz idle square wave is applied to a RC circuit whose output has $t_r = 250$ ns and percentage tilt of 5%. Determine the upper and lower 3 – dB frequencies of the circuit.
2. a) With the help of a neat circuit diagram, explain the working of an emitter – coupled clipper.
b) With the help of a neat circuit diagram, explain the working of a simple diode comparator. Draw the output waveform for a ramp input.
3. a) Briefly explain about transistor switching times.
b) With the help of neat diagrams explain the working of a TTL NAND gate.
4. a) Design a fixed bias Bistable multivibrator using npn silicon transistor for the following specifications: $V_{CC}=V_{BB}=12V$, $h_{fe(min)}=20$, $i_{c(sat)}=5mA$, $V_{CEsat}=0.3V$, $V_{BE sat}= 0.7V$
b) Explain how Schmitt trigger can be used as a comparator using relevant sketches.
5. a) Explain how Astable multivibrator can be used as voltage controlled oscillator.
b) Design a collector coupled monostable multivibrator with an output amplitude of 10 V of time period 20 μ sec , $I_{C(sat)} = 8$ mA, the base drive required for the ON transistor is 1.5 times $i_{B(min)}$, $V_{CE(sat)} = 0.1V$, $V_{BE(sat)} = 0.3V$, $h_{fe(min)} = 20$.
6. a) What are the reasons for nonlinear sweeps and also explain the different methods of improving linearity in these circuits.
b) Design a bootstrap sweep generator using following transistor parameters, $h_{fe(min)} = 20$, $V_{cc} = 15V$, $i_c = 1$ mA
7. a) Using suitable sketches explain the process of synchronization of astable multivibrator.
b) Write short notes on the following:
i) Phase delay. (ii) phase jitters
8. a) Draw the circuit of a four diode sampling gate and explain its operation.
b) Explain the working of astable transistor blocking oscillator with wave forms.



II B. Tech II Semester Supplementary Examinations May/June - 2015
PULSE AND DIGITAL CIRCUITS
 (Com. to EEE, ECE, ECC, BME, EIE)

Time: 3 hours

Marks: 75

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks

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1. a) Explain in detail with suitable waveforms about how an RC High –pass circuit can be used as differentiator.
 b) Derive the expression for the output of a series RLC circuit when excited by step input and also draw the output waveforms.
 2. a) For a diode shunt clipper with ideal diode characteristics and $V_R = 15\text{ V}$ and $V_i = 30 \sin \omega t$, draw to scale the input and output waveforms and label the maximum and minimum values for the following cases: (i) $R = 10\text{ k}\Omega$, (ii) $R = 20\text{ K}\Omega$
 b) Explain the principle of clamping. What is the need for a shunting resistor R in parallel with the diode in the basic clamping circuit?
 3. a) Explain in detail the various switching times of the transistor supported by their expressions.
 b) With help of neat sketch explain the operation of a two input CMOS NAND gate.
 4. a) Explain the transfer characteristics of Schmitt Trigger. Explain how hysteresis can be eliminated.
 b) Discuss in detail about the symmetrical and asymmetrical triggering of bistable multivibrator.
 5. a) Derive an expression for the output gate width of a transistor monostable multivibrator.
 b) Design a collector coupled astable multivibrator for the following specifications, $f = 10\text{ KHz}$, $V_{cc} = 9\text{ V}$, $h_{fe} = 20$, $i_{C(\max)} = 2\text{ mA}$.
 6. a) Design a transistor bootstrap time base generator triggered by a negative pulse of amplitude 5 V and duration 2 m sec separated by 0.2 msec , generating an output of 10 V with time period of 2 m sec . The load resistance is $2\text{ K}\Omega$ and the ramp is linear within 1% . Supply voltage is $\pm 12\text{ V}$ and $h_{fe(\min)} = 120$.
 b) Compare voltage time base generator circuits and current time base generator circuits.
 7. a) Explain the principle of synchronization and synchronization with frequency division.
 b) A Symmetrical astable multivibrator using transistor operates from 10 V supply has a period of 1 m sec . Triggering pulses of spacing $750\text{ }\mu\text{ sec}$ are applied to one base through a small capacitor from a high impedance source. Find the minimum triggering pulse amplitude required to achieve 1:1 synchronization.
 8. a) Compare monostable triggered transistor blocking oscillator (base timing) and monostable triggered transistor blocking oscillator (emitter timing).
 b) Why is the pulse width of transistor blocking oscillator (employing base timing) highly sensitive



II B. Tech II Semester Supplementary Examinations May/June - 2015
DATA BASE MANAGEMENT SYSTEMS

(Com. to CSE, IT)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) Discuss various functions of the database administrator. And also discuss about various types of database users.  
b) Explain Relational Data Model? Discuss its advantages and disadvantages?
2. a) Define ER diagram. Explain various symbols used in ER diagram  
b) Explain the following kinds of constraints with examples  
i) Key constraint ii) Participation constraint
3. What is meant by Tuple relational calculus? State and explain various types of queries in it. And also compare it with Domain relational calculus.
4. a) What aggregate operators does SQL support? Explain  
b) What are nested queries? What is the correlation with nested queries? How would you Use the operators IN, EXISTS, UNIQUE and ALL in writing nested queries?
5. Explain
  - i) Functional dependencies
  - ii) Multi valued dependencies
  - iii) Explain fourth normal form
6. a) Write a detailed note on transaction state?  
b) Explain implementation of atomicity and durability?
7. a) How is data organised in hash based index? When would you use a hash based index?  
b) Explain various multilevel indices in detail
8. What are the main differences between ISAM and B+ tree indexes?

**II B. Tech II Semester Supplementary Examinations May/June - 2015**  
**DATA BASE MANAGEMENT SYSTEMS**

(Com. to CSE, IT)

Time: 3 hours

Max. Marks: 75

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Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) Explain different levels of abstractions?
b) What is meant by Data abstraction? Discuss about DDL and DML

2. a) Draw an ER-diagram corresponding to customers and loans and Explain various roles used in it?
b) What is a class hierarchy? Explain Aggregation with examples?

3. a) What is meant by Domain relational calculus? State and explain various types of Queries in it.
b) Explain Translating relationship set with key constraint

4. What is a trigger? Explain it's structure? What are the differences between row-level and statement level triggers?

5. a) Explain 1NF, 2NF, 3NF with suitable example?
b) Consider the relational scheme R (A, B, C), which has the F: A-->B. If A is a candidate key for R, is it possible for R to be in BCNF? If so under what conditions if not explain why not?

6. a) Explain the following
 - i) Serializable schedule
 - ii) Recoverable schedule
 - iii) Strict scheduleb) Explain various types of lock based concurrency techniques with example

7. What is clustered index? What is a primary index? How many clustered indexes can u build on a file? How many unclustered indexes can you build?

8. What is the order of a B+ tree? Describe the format of nodes in B+ tree? Why nodes at the leaf are level linked?



II B. Tech II Semester Supplementary Examinations May/June - 2015
DATA BASE MANAGEMENT SYSTEMS

(Com. to CSE, IT)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) Explain instances & schema in detail  
b) Compare the Database management system and File management system?
2. a) Name the main steps in database design? What is the goal of each step?  
b) Why is designing a database for a large enterprise especially hard?
3. a) What is a join? Explain variants of join operation with suitable examples?  
b) Explain tuple relational calculus in detail?
4. a) Write following queries in SQL using aggregate operators for following Schema.  
Sailors (sid: integer, sname: string, rating: integer, age: real)  
Boats (bid: integer, bname: string, color: string)  
Reserves (sid: integer, bid: integer, day: date)  
i) Find each red boat, find the number of reservations for this boat.  
ii) Find the average age of sailors for each rating level that has at least two sailors.  
iii) Find the average age of sailors who are of age at least 20 for each rating level that has at least two sailors.  
b) State and explain with suitable examples the comparison operators and NULL values in SQL.
5. a) Explain the following with suitable example  
i) BCNF ii) Lossless join decomposition  
b) Explain schema refinement in data Base design
6. a) Explain in detail about serializability with example?  
b) Discuss about concurrent executions?
7. a) What is file organisation? What of index? What is the relationship between files and indexes?  
b) "Can we have several indexes on single file of records can an index itself store data records that are act as a file" -Justify
8. How many nodes must be examined for equality search in B+ tree? How many for a range selection? Compare this with ISAM



**II B. Tech II Semester Supplementary Examinations May/June - 2015**  
**DATA BASE MANAGEMENT SYSTEMS**

(Com. to CSE, IT)

Time: 3 hours

Max. Marks: 75

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Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) List and Explain various data models with suitable example
b) Explain Database system architecture with neat sketch?
2. a) What is an attribute? Explain types of attributes with suitable examples
b) Explain types of relationships based on their degree with suitable examples?
3. a) Discuss various selection and projection set operations.
b) Explain Domain constraints, Referential integrity constraint with suitable examples?
4. a) Explain about Nested queries and set comparison operators in SQL with examples?.
b) What operations does SQL provide over sets of tuple's and how would you use these in writing queries?
5. a) Define normalization. Explain different forms of normalization?
b) What is anomaly? Explain different types of anomalies?
6. a) Define Atomicity, Consistency, Isolation as and Durability and illustrate with examples?
b) Explain recovery algorithm?
7. Where does a DBMS store persistent data? How does it bring data into main memory for processing? What DBMS component reads and writes data from main memory and what is the unit of I/O?
8. Explain why is tree – structured indexes good for searches especially range selections



II B. Tech II Semester Supplementary Examinations, May/June - 2015
LINEAR DIGITAL IC APPLICATIONS
 (Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks

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- 1 a) Draw the equivalent circuit of practical non inverting Op-Amp and derive its gain? [8]
 - b) In an Ideal inverting Op-Amp, $R_1 = 10K\Omega$, $R_f = 100K\Omega$, $v_i = 1V$, A load of $25k\Omega$ is connected to the output terminal. Calculate i) i_1 ii) v_o iii) i_L and total current i_o into the output pin [8]
 - 2 a) Design a practical integrator circuit to properly process input sinusoidal waveform upto 1 kHz. The input amplitude is 10mv [7]
 - b) Explain the principle of operation of a precision full wave rectifier with waveforms. [9]
 - 3 a) Design a second order lowpass filter at cut off frequency of 1.2 kHz [8]
 - b) Using a 741 op-amp design triangular / rectangular waveform generator to have a output frequency of 1 KHz, a triangular output amplitude of $\pm 6V$ and a square wave output amplitude of approximately $\pm 10V$. [8]
 - 4 a) Give the working principle and operation of monostable multivibrator using 555 timer with neat circuit diagrams and wave forms? [9]
 - b) Explain how a monostable multivibrator will work as frequency divider and pulse stretcher? [7]
 - 5 a) List various A/D conversion techniques? which is the fastest ADC and why? [7]
 - b) Explain the operation of A/D converter with parallel comparator (Flash) method? [9]
 - 6 a) List the advantages and disadvantages of MOS technology over bipolar? [7]
 - b) Explain the operation of TTL NAND gate? [9]
 - 7 a) Draw the logic diagram of Decimal to BCD priority Encoder and explain its operation using truth table? [8]
 - b) Explain the operation of parity generator? [8]
 - 8 a) Design a Mod-6 synchronous counter using J-K flip flops [8]
 - b) With the help of a circuit diagram, explain the read and write operations of a dynamic RAM cell. [8]



II B. Tech II Semester Supplementary Examinations, May/June - 2015
LINEAR DIGITAL IC APPLICATIONS
 (Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks

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- 1 a) Briefly explain the size and complexity chronology of Integrated Circuit Chip? [6]
- b) List Six characteristics of an Ideal op-amp [4]
- c) What are different linear IC packages? explain in detail? [6]
- 2 a) Design a differentiator circuit that will differentiate input signal with  $f_{\max} = 100\text{Hz}$ . [7]
- b) Draw the circuit and explain the working of a instrumentation amplifier and derive the expression for its output. [9]
- 3 a) Design a second order high filter at cut off frequency of 1 kHz [8]
- b) With neat circuit diagrams explain the Design criteria of triangular wave generator ? [8]
- 4 a) Give the working principle and operation of astable multivibrator using 555 timer with neat circuit diagrams and wave forms ? [9]
- b) Explain how a astable multivibrator will work as square wave oscillator and free running ramp generator ? [7]
- 5 a) Explain the important specifications of D/A and A/D converters ? [7]
- b) Explain the operation of A/D converter with successive approximation method ? [9]
- 6 a) Explain the concept of IC interfacing ? [8]
- b) What are the effects of circuit when TTL logic is driving by CMOS Logic ? [8]
- 7 a) Draw and explain the operation of 3 line to 8 line decoder ? [8]
- b) Give any two applications of multiplexers and explain their operation in detail? [8]
- 8 a) Explain the working of JK flip-flop. What is race around condition? How is it overcome? Explain these concepts with relevant timing diagrams. [8]
- b) Explain with suitable diagram the internal structure of a DRAM cell. [8]



**II B. Tech II Semester Supplementary Examinations, May/June - 2015**  
**LINEAR DIGITAL IC APPLICATIONS**  
 (Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions  
 All Questions carry **Equal** Marks  
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- 1 a) Explain the meaning of open loop and closed loop operation of an op-amp [8]
- b) Define common mode rejection ratio. [4]
- c) Classify Integrated Circuits in detail? [4]
- 2 a) Design a summing amplifier to add three DC input voltages. The output of this circuit must be equal to two times the negative sum of the inputs. [5]
- b) Explain with a neat circuit diagram the working of voltage to current converter with floating load. [7]
- c) Design an averaging circuit for four DC inputs? [4]
- 3 a) Introduce Oscillators with its basic principle of operation? [8]
- b) Design a Wien bridge oscillator that will Oscillate at 2 kHz [8]
- 4 a) Introduce PLL with its operating principles ? [8]
- b) Draw the block diagram of NE/SE565 PLL block diagram and explain its operation? [8]
- 5 a) Give the conversion time for i) counting ADC ii) successive approximation ADC iii) dual slope ADC [7]
- b) Explain the operation of D/A converter with R to 2R resistors ? [9]
- 6 a) With neat circuit diagrams explain the operation of CMOS bilateral switch? [6]
- b) Define and explain the following terms [10]
 - i) Noise Margin
 - ii) FanIn
 - iii) FanOut
 - iv) Current sourcing
 - v) Current sinking
- 7 a) Draw the logic diagram of Decimal to BCD decoder and explain its operation using truth table? [8]
- b) Draw the logic diagram of 4 bit parallel adder and subtractor circuit and explain its operation? [8]
- 8 a) Compare synchronous & Asynchronous circuits ? [8]
- b) Write a brief note on "RAM Architecture". [8]



II B. Tech II Semester Supplementary Examinations, May/June - 2015
LINEAR DIGITAL IC APPLICATIONS
 (Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks

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- 1 a) What is practical op-amp? Draw its equivalent circuit? [7]
 - b) Explain with figures how two supplies V^+ and V^- are obtained from a single supply? [5]
 - c) Design an amplifier with gain of +5 using one op-amp? [4]
 - 2 a) Design a subtractor circuit whose output is equal to the difference between the two inputs. Use a basic differential op-amp configuration? [5]
 - b) Draw and explain the working of an op amp with offset-voltage Compensating network. [6]
 - c) Design a peaking amplifier circuit to provide a gain of 5 at a peak frequency of 10 kHz. [5]
 - 3 a) With neat circuit diagrams explain the operation of Voltage controlled Oscillator? [8]
 - b) Design a square wave generator to operate at a frequency of 2 kHz [8]
 - 4 a) List important features of 555 timer ? [5]
 - b) Briefly explain differences between the two operating modes that 555 timer works ? [6]
 - c) List two applications each in which 555 timer can be used as monostable and astable multivibrators ? [5]
 - 5 a) What is the conversion time of a 10 bit successive approximation ADC if its input clock is 5 MHz ? [7]
 - b) Explain the operation of D/A converter with binary weighted resistors ? [9]
 - 6 a) What are the effects of circuit when CMOS logic is driving by TTL Logic ? [8]
 - b) Draw and explain the operation of Tristate TTL inverter ? [8]
 - 7 a) Explain the operation of BCD to 7 segment Decoder with neat circuit diagrams? [8]
 - b) Give details of Liquid Crystal Displays ? Explain how to drive LCDs ? [8]
 - 8 a) Differentiate between static and dynamic RAM ? [8]
 - b) Write a brief note on "ROM Architecture". [8]



II B. Tech II Semester Supplementary Examinations, May/June - 2015
SWITCHING THEORY AND LOGIC DESIGN
 (Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks

1. A 12-bit Hamming code word containing 8-bits of data and 4 parity bits is read from memory. What was the original 8-bit data word that was written in to memory if 12-bit words read out are as follows?
 i) 001111000010 ii) 010110010110 iii) 110010110100 iv) 011001010111

2. a) Simplify the following Boolean expressions:
 i) $A'C' + ABC + AC'$ to three literals
 ii) $(x'y' + z)' + z + xy + wz$ to three literals
 iii) $A'B(D' + C'D) + B(A + A'CD)$ to one literal
 iv) $(A' + C)(A' + C')(A + B + C'D)$ to four literals
 b) Briefly describe about the standard form and canonical form of switching functions with suitable examples

3. a) Reduce the following expression using K-map and implement it in NAND gates.
 $\sum m(0,1,4,5,6,7,9,11,15) + d(10,14)$
 b) Obtain the minimal expression using the tabular method.
 $\sum m(0,2,3,6,7,8,10,11,12,15)$

4. a) Implement the following logic function using an 8:1 Mux $F(x,y,z,w) = \bar{x}y + z\bar{w} + x\bar{z}$
 b) Implement a full adder using a 3 line to 8 line decoder.

5. a) List the PLA programming table for the BCD to excess-3 code converter.
 b) Realize $f = \sum m(0,2,3,7,9,11,15,16)$ using PAL

6. a) Draw the circuit diagram of a positive edge-triggered JK flip-flop and explain its operation with the help of a truth table. How is the race around condition eliminated?
 b) Convert T flip-flop into
 i) S R flip-flop ii) Jk flip-flop iii) D flip-flop.



7. a) What are the capabilities and limitations of finite state machines?
 b) For the state table of the machine given below. Find the equivalent partition and a corresponding reduced machine in standard form.

Present State	Next State Z	
	x=0	x=1
A	D,0	H,1
B	F,1	C,1
C	D,0	F,1
D	C,0	E,1
E	C,1	D,1
F	D,1	D,1

8. a) Construct an ASM block that has 3 input variables (x,y,z), 4 outputs (A,B,C,D) and 2 exit paths. For this block, output D is always 1 and A is 1 if x & y are both 1, if Z = 1 and x = 0 C = 1 and exit path 1 is taken. If z = 0 or x=1 B = 1 and exit path 2 is taken.
 b) Realize the above using the one flip-flop per state.



II B. Tech II Semester Supplementary Examinations, May/June - 2015
SWITCHING THEORY AND LOGIC DESIGN
 (Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks

1. a) Convert the following decimal numbers to Gray code
 i) 98 ii) 432.
 b) Convert the following octal numbers to hexadecimal.
 i) 3215 ii) 5307.253.
 c) Generate a Hamming code for the given 4 bit message word 1010 and rewrite the entire message in Hamming code.

2. a) Simplify the following Boolean expressions to minimum number of literals.
 i) $x'y'+xy+x'y$ ii) $xy'+y'z'+x'z'$
 iii) $x'+xy+xz'+xy'z'$ iv) $(x+y)(x+y')$
 b) Obtain the complement of the following Boolean expressions.
 i) $AB+A(B+C)+B'(B+D)$ ii) $A+B+A'B'C$
 iii) $A'B+A'BC'+A'BCD+A'BC'D'E$ iv) $ABEF+ABE'F'+A'B'EF$

3. a) Obtain essential prime implicants for the following function using tabulation method.
 $f(x,y,z,w) = \Sigma m (0,2,3,4,5,7,8,9,13,15)$
 b) Simplify the following function using K-map method
 $f(a,b,c,d) = \Sigma m (3,4,5,7,9,13,14,15)$

4. a) Design a 3 to 8 decoder using 2 to 4 decoders and other required gates.
 b) Draw and explain with the truth table the logic diagram of a 1 line to 8 line Demultiplexer.

5. a) Use a 32x4 ROM to convert 4 bit binary number to 4 bit grey code converter
 b) Write a brief note on:
 i) Architecture of PLDs
 ii) Capabilities and the limitations of threshold gates.

6. a) Design a detector to detect the sequence 10110 with overlap.
 b) Design a BCD counter with RS Flip Flops.



7. a) Convert the following Mealy machine into a corresponding Moore machines

PS	NS,Z	
	X = 0	X = 1
A	C,0	B,0
B	A,0	D,0
C	B,1	A,1
D	D,1	C,0

- b) For the machine given below, find the equivalent partition and a corresponding reduced machine in standard form.

PS	NS,Z	
	X = 0	X = 1
A	F,0	B,1
B	G,0	A,1
C	B,0	C,1
D	C,0	B,1
E	D,0	A,1
F	E,1	F,1
G	E,1	G,1

8. a) Draw the ASM chart for the following state transition, start from the initial state T1, then if $xy = 00$ go to T2, if $xy = 01$ go to T3, if $xy=10$ go to T1, otherwise go to T3.
 b) Show the exit paths in an ASM block for all binary combinations of control variables x, y and z, starting from an initial state.



II B. Tech II Semester Supplementary Examinations, May/June - 2015
SWITCHING THEORY AND LOGIC DESIGN
 (Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks
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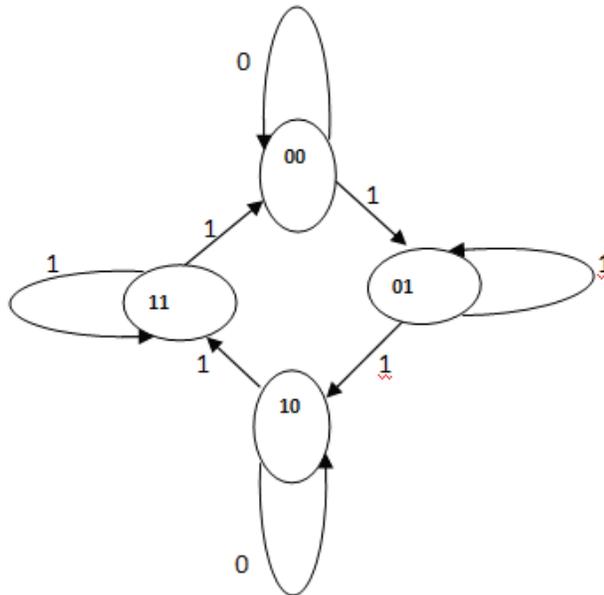
1. a) Give the Gray – code equivalent of the octal number 574.  
 b) Perform the subtraction using 2'S complement.  
     (i) 11010 - 10010              (ii) 110110 - 101010  
 c) A 4 bit data is encoded using Hamming code and is then transmitted. The received bit stream is 1001100. Find the error in the code and correct it. What are the data bits.
  
2. a) Determine the canonical sum of products representation of the functions.  
 $f(A,B,C) = B + (\bar{A} + \bar{B})(A + C)$   
 $f(A,B,C) = A + (\bar{B}\bar{C} + \bar{A}\bar{C})$   
 b) Realize EX – OR and EX – NOR gates with minimum number of NAND and NOR gates.
  
3. Simplify the following using Tabulation method.  
 $F(A, B, C, D, E) = \sum(0,2,4,5,6,7,8,10,14,17,18,21,29,31) + \sum d(11,20,22)$
  
4. Implement the following Boolean function by a Hazard free OR-AND Network  
 $f = \sum m(0, 2, 6, 7)$  and explain in detail what are the Hazards encountered in implementing the above function.
  
5. a) Implement the following Boolean functions using PLA  
 $f_1(x,y,z) = \sum m(0,1,3,5)$ .       $f_2(x,y,z) = \sum m(0,3,5,7)$ .  
 b) Realize  $f = \sum m(0,1,3,5,7,8,9,10,12,13)$  using PAL.
  
6. a) Explain the operation of 5 - stage twisted ring counter with circuit diagram, State transition diagram & state table.  
 b) Compare synchronous & Asynchronous circuits



7. a) Define successor, terminal state and strongly connected machines  
 b) Find the equivalent partition for the machine given below.

| Present State | Input, w   |   |                |   |
|---------------|------------|---|----------------|---|
|               | Next State |   | Next Output, z |   |
|               | 0          | 1 | 0              | 1 |
| A             | B          | E | 0              | 0 |
| B             | E          | D | 0              | 0 |
| C             | D          | A | 1              | 0 |
| D             | C          | E | 1              | 0 |
| E             | B          | D | 0              | 0 |

8. The state diagram of control unit is shown below. Draw the equivalent ASM chart and implement using JK flip flops.



**II B. Tech II Semester Supplementary Examinations, May/June - 2015**  
**SWITCHING THEORY AND LOGIC DESIGN**  
 (Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions  
 All Questions carry **Equal** Marks  
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1. a) Design single error correcting hamming code for standard BCD and explain how the error is detected and corrected
 b) Describe the following
 Discuss about the representation of negative numbers.
 $(547)_{10} - (325)_{10}$ using Excess -3 code with 10's complement method
2. a) Expand $x + yz + xyw + xyzw$ to min.terms and max. terms.
 b) Prove that
 i) $A + B = \overline{\overline{A} + \overline{B}}$ ii) $\overline{A + B} = \overline{A} + \overline{B} = A + \overline{B}$ iii) $\overline{ABC} = \overline{A} \overline{B} \overline{C}$
 c) Simplify the following Boolean expressions to a minimum number of literals.
 i) $(\overline{x} + z)(\overline{x} + \overline{z})(\overline{x} + y + zw)$ ii) $\overline{xz} + \overline{y}z + y\overline{z} + xyz.$
3. a) Reduce the following function using K- map and implement it in NOR logic as well as NAND logic.
 $F = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 10, 12, 13)$
 b) Reduce using K-maps
 $F1 = \pi M(4, 5, 6, 7, 8, 12, 13) . d(1, 15)$
4. a) $F(w,x,y,z) = \sum m(0,1,4,7,9,12,14)$ Realize using 1:16 de-Mux
 b) What is meant by hazards in combinational circuits? How do you design hazard free circuit explain with suitable example.
5. Write a brief note on
 a) Architecture of PLDs b) capabilities and the limitations of threshold gates.
6. a) Design a Mod-6 synchronous counter using J-K flip flops.
 b) What is meant race around condition? Explain how it is avoided in master and slave JK flip flop.
7. a) What are the capabilities and limitations of Final State Machines?
 b) A clocked sequential circuit is provided with a single input x and single output Z.
 Whenever the input produce a string of pulses 1 1 1 or 0 0 0 and at the end of the sequence it produce an output Z = 1 and overlapping is also allowed. Find equivalence classes using partition method & design the circuit using D - flip-flops.
8. a) Differentiate between an ASM Chart and a conventional flow chart.
 b) Draw and explain the ASM chart for a binary multiplier.



II B. Tech II Semester Supplementary Examinations, May/June - 2015
DATA BASE MANAGEMENT SYSTEMS
 (Com. to CSE, IT)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks
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1. a) What are the advantages and disadvantages of using DBMS over file system? Explain taking a real time situation?  
 b) What are levels of abstraction in DBMS? Explain the core items in details. (8M+8M)
2. a) Explain how DBMS was evolved. How it is different from earlier days of inception and write comparison.  
 b) Explain the design process of Database? (8M+8M)
3. a) What are integrity constraints. How do we enforce integrity constraints in a Database?  
 b) Explain the primary and foreign key constraint. Explain their differences and how they are used in database. (8M+8M)
4. a) What are aggregate functions in SQL. Explain them.  
 Using the following tables write the sql queries.

Table 1

| R_id | region_id | Sales | T_date   |
|------|-----------|-------|----------|
| 1    | 10        | 1500  | 1/1/2014 |
| 2    | 16        | 250   | 1/1/2015 |
| 3    | 10        | 300   | 8/9/2014 |
| 4    | 16        | 7000  | 9/1/2014 |
| 5    | 14        | 500   | 2/1/2014 |
| 6    | 15        | 400   | 6/1/2014 |

Table 2

| Region_id | Region_loc |
|-----------|------------|
| 10        | Mumbai     |
| 11        | Hyderabad  |
| 12        | Pune       |
| 13        | Chennai    |
| 14        | Banglore   |

- b) Using subquery, write a query to find sales in region location= Mumbai
- c) Write a query to display the region loc, Region\_id, Sales, T\_date (6M+5M+5M)
5. a) What is Schema refinement? Explain why it is important?  
 b) What is redundancy? Explain the problems faced because redundancy. (8M+8M)

6. a) What is a transaction? Explain the two main issues that need to be dealt with transaction.  
b) What are the four properties that need to be maintained for data concurrency. (8M+8M)
  
7. a) Explain the functionality of log in database recovery?  
b) Write a brief note on the transaction manager of DBMS. Explain the functions of it. (8M+8M)
  
8. a) Explain file organization in DBMS?  
b) What is indexing? How does it affect the performance of a database? (8M+8M)



**II B. Tech II Semester Supplementary Examinations, May/June - 2015****DATA BASE MANAGEMENT SYSTEMS**

(Com. to CSE, IT)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) What is the structure of DBMS? Explain its components.  
b) What are DDL and DML Commands? List and explain them in detail? (8M+8M)
  2. a) What are data models? Explain ER model in detail?  
b) What are the steps involved in ER Model. Draw the ER Model for students database. (8M+8M)
  3. a) What are Tables and Views. How they are created and explain how they can be used in RDBMS.  
b) Explain the importance of views in context of data security in DBMS. (8M+8M)
  4. a) What are the different types of joins available in SQL. Explain them in details.  
Using the following tables write the sql queries.
 

| ID | Name   | Location  | Age |
|----|--------|-----------|-----|
| 1  | Kumar  | Mumbai    | 45  |
| 2  | Anil   | Hyderabad | 34  |
| 3  | Kiran  | Mumbai    | 30  |
| 4  | Yadhav | Delhi     | 65  |
| 5  | Sachin | Vizag     | 45  |
| 6  | Raju   | Delhi     | 34  |
  - b) Write SQL statement to display records for whoser age is greater than 30 but not more than 45.  
c) Write SQL statements to display the maximum, minimum and average age of each location. (5M+6M+5M)
  5. a) What is decomposition. Explain it with a example. What are the problems associated with Decomposition.  
b) Explain the properties of decomposition. (8M+8M)
  6. a) Explain how Durability and Atomicity is maintained in DBMS.  
b) Explain the various isolation levels with suitable examples (8M+8M)
  7. a) Explain the three phases of error recovery?  
b) What is check pointing? Explain its functionality in detail. (8M+8M)
  8. a) What is indexed file organization? Explain in detail.  
b) Differentiate between Clustered and Unclustered Indexes. (8M+8M)

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1. a) What is transaction management? Explain the functionality in real time situations.  
b) What are the different mechanism used in transaction management concerning control and recovery?. (8M+8M)
2. a) Explain the features of ER model.  
b)What are the advantages of UML over ER Model. (8M+8M)
3. a) What are domain variable? Explain system and semantics of domain relational calculus with suitable example.  
b) What are the different types of joins. List and explain in detail. (8M+8M)
4. a) What are SQL Constraints? What are the commonly used constraints? Explain any three of them.

Using the following tables write the sql queries.

**Sales**

| R_id | region_id | sales | T_date   | region_loc |
|------|-----------|-------|----------|------------|
| 1    | 10        | 1500  | 1/1/2014 | Mumbai     |
| 2    | 16        | 250   | 1/1/2015 | Delhi      |
| 3    | 10        | 300   | 8/9/2014 | Mumbai     |
| 4    | 16        | 7000  | 9/1/2014 | Delhi      |
| 5    | 14        | 500   | 2/1/2014 | Banglore   |
| 6    | 15        | 400   | 6/1/2014 | Vellore    |

**Orders**

| Order_id | Date     | Customer_Id | Sales_id | Amount  |
|----------|----------|-------------|----------|---------|
| 201      | 1/1/2014 | 301         | 101      | 800,000 |
| 202      | 2/2/2014 | 302         | 102      | 900,000 |
| 203      | 3/1/2015 | 303         | 103      | 500,000 |
| 204      | 6/1/2015 | 304         | 101      | 650,000 |

**Customers**

| Customer_id | Customer_name | City      |
|-------------|---------------|-----------|
| 301         | Birla         | Mumbai    |
| 302         | Tata          | Hyderabad |
| 303         | Relaince      | Cochin    |
| 304         | Essar         | Delhi     |

- b) Write a sql statements that will calculate the total bonus earned by sales person.
- c) List the persons who did not sell the product to Customer = "tata". (8M+5M+3M)



5. a) What are the problems related to decomposition? How can these problems be solved?  
b) Define functional Dependencies. Explain the three rules that can be applied for a set F of FD's.  
c) What is normalization and De-normalization. (6M+5M+5M)
6. a) Explain how consistency and Isolation is maintained in DBMS.  
b) What is transaction in relational DBMS. Explain in details in SQL commands used for this purpose. (8M+8M)
7. a) What is buffer management? Explain its importance in database recovery.  
b) Explain Analysis phase in database recovery and its functions. (8M+8M)
8. a) What is Index data Structures? Explain in detail about hash based Indexing.  
b) Explain Indexed sequential Access Method. (8M+8M)



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1. a) What is a semantic data model? Explain the components of a schema.
b) Explain relational data model in detail. (8M+8M)
2. a) Describe relationship between entities, attributes and entity sets.
b) Describe ternary relationship set and its features. (8M+8M)
3. a) What is tuple relation calculus? Explain how it is different from relational algebra?
b) What are the advantages of using joins? (8M+8M)
4. a) What is Data Integrity? Explain various categories in detail.
b) List SQL Comparison Operators. Explain them with an example.
c) List all the logical operators. Explain them with an example. (6M+5M+5M)
5. a) What is a normal form? Explain the first, second and third normal forms.
b) Explain database design using multivalued dependencies. Explain the kinds of redundancy that can be deducted using multivalued dependencies. (8M+8M)
6. a) Explain the three anomalies that can occur when two transactions conflict with each other.
b) What do you understand by serializability schedule? Explain with an example. (8M+8M)
7. a) Explain the importance of transactions table and dirty page table in database recovery.
b) Explain fuzzy check point. What are its advantages? (8M+8M)
8. a) Explain tree based indexing. How does it differ from hash based indexing?
b) Explain the main differences between ISAM and B+ trees indexes. (8M+8M)

