

III B. Tech I Semester Regular/Supplementary Examinations, October- 2016
STRUCTURAL ANALYSIS – II
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

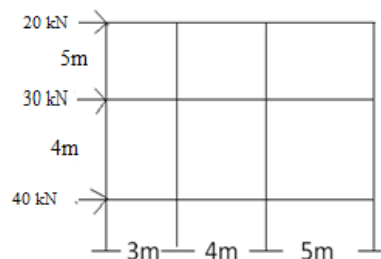
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

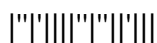
PART –A

- | | | |
|------|--|------|
| 1 a) | Define the term an arch? | [3M] |
| b) | State two assumptions made in the analysis of cables. | [4M] |
| c) | Define absolute stiffness of members? | [4M] |
| d) | Define carry over factor. | [3M] |
| e) | Mention the characteristics of the stiffness matrix? | [4M] |
| f) | Mention two advantages of Kani's method over moment distribution method. | [4M] |

PART –B

- | | | |
|------|--|-------|
| 2 a) | How are arches classified based on shape and end conditions? | [8M] |
| b) | State and prove Eddy's theorem. | [8M] |
| 3 a) | Obtain an expression to find the length of a cable, carrying u.d.l. of "w" per unit length supported from two points distance "L" apart not at the same level, the lowest point being h_1 below left support and h_2 below right support. | [8M] |
| b) | What will be the horizontal support reactions? | [8M] |
| 4 | Using moment distribution method analyze the two span continuous beam. The moment of inertia of AB = I while that of BC = 2I. The ends A and C are Fixed. Sketch the B.M. and S.F. diagram. Span AB carries a concentric load of 36 kN with a span of 6m and span BC carries an udl of 20 kN/m over a span of 8m. | [16M] |
| 5 | Using Kani's method, determine the support moments for the three-span continuous beam with fixed end supports, having spans AB, BC and CD. Span AB carries an eccentric point load of 80kN, 4m span and a load at 1m from point A. Span BC carries an udl of 20 kN/m of 6m span and span CD carries a concentric point load of 60 kN having a span of 4m (EI constant). Sketch the B.M. and S.F.D. | [16M] |
| 6 | Explain the difference between flexibility method and stiffness method when applying to analysis of continuous beam | [16M] |
| 7 | Analyse the portal frame by Portal method | [16M] |





III B. Tech I Semester Regular/Supplementary Examinations, October- 2016
STRUCTURAL ANALYSIS – II
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

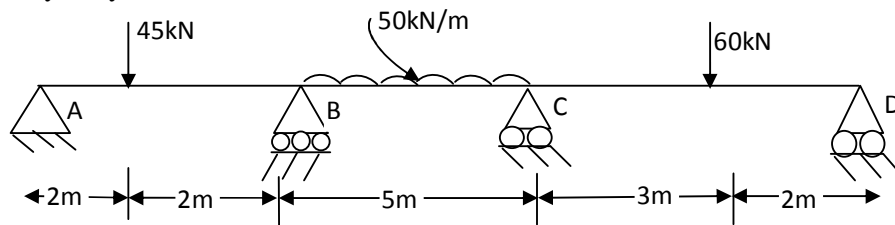
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

Part-B

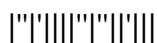
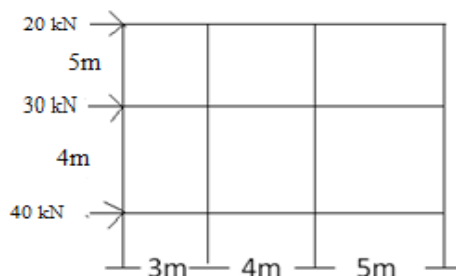
- 1 a) Define the term three hinged arch? [3M]
- b) State two assumptions made in the analysis of cables. [4M]
- c) Define stiffness factor for members? [4M]
- d) Define distribution factor at a joint. [3M]
- e) Mention the characteristics of the flexibility matrix? [4M]
- f) Write two advantages of Kani's method over moment distribution method. [4M]

PART - B

- 2 A three hinged parabolic arch has a span of 10m. The central rise of the arch is 2m. It is loaded with a uniformly distributed load of intensity 1 kN/m at the left 4m length. [16M]
 (a) Calculate the maximum positive and negative bending moments.
 (b) Calculate the bending moment, normal thrust and shear at 2m and 7.5m from left end.
- 3 A light cable 18m long is supported at two ends at the same level. The supports are 16m apart. The cable supports three loads 8, 10 and 12 N dividing the 16m distance in to four equal parts. Find the shape of the string and the tension in various portions. [16M]
- 4 Analyze the portal frame by moment distribution method. Draw the bending moment diagram and sketch the deflected shape of the structure. The two columns of AB and CD of 4m height with I, Beam BC of span 4m, with 2I. The beam BC carries an udl of 10 kN/m. The supports at A and D are fixed. [16M]
- 5 Analyze the portal frame using Kani's procedure. The two columns of AB and CD of 6m height, Beam BC of span 8m, with EI constant. The column AB carries an udl of 10 kN/m. The supports at A and D are fixed. [16M]
- 6 Analyze by stiffness method the beam shown below [16M]



- 7 Analyse the portal frame by Cantilever method [16M]



III B. Tech I Semester Regular/Supplementary Examinations, October- 2016
STRUCTURAL ANALYSIS – II
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

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

PART -A

- 1 a) Give an example for a statically indeterminate arch? [4M]
 b) State two assumptions made in the analysis of cables. [3M]
 c) State two assumptions made in the analysis of Portal method? [5M]
 d) Define distribution factor at a joint. [4M]
 e) Mention the characteristics of the flexibility matrix? [3M]
 f) Write two advantages of Kani's method over moment distribution method. [3M]

- 2 A parabolic arch rib, 20m span and 3m rise is hinged at the abutments and the crown end carries a point load of 10KN at 7.5m from the left hand hinge.
 a) Calculate the horizontal thrust and bending moment at a section 7.5m from right hand hinge. [8M]
 b) What is the value of the greatest bending moment in the arch? [8M]

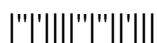
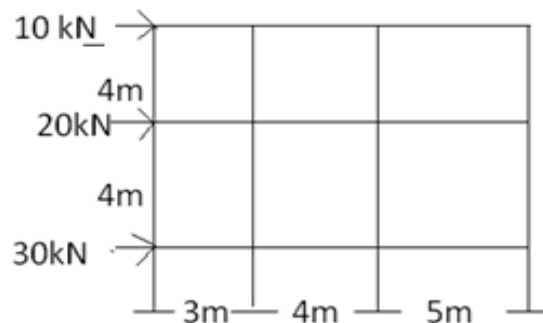
- 3 A cable is used to support five equal and equidistant loads over a span of 40m. Find the length of the cable required and its sectional area if the safe tensile stress is 150 N/mm^2 . The central dip is 3.0m and loads are 6kN each. [16M]

- 4 Analyze the portal frame by moment distribution method. Draw the bending moment diagram and sketch the deflected shape of the structure. The two columns of AB and CD of 5m height with I, Beam BC of span 5m, with $2I$. The beam BC carries an udl of 15 kN/m. The supports at A and D are fixed. [16M]

- 5 Analyze the portal frame using Kani's procedure. The two columns of AB and CD of 6m height, Beam BC of span 10m, with EI constant. The column CD carries an udl of 20 kN/m. The supports at A and D are fixed. [16M]

- 6 Explain the matrix approach to structural analysis of continuous beams. [16M]

- 7 Analyse the portal frame by Cantilever method [16M]



III B. Tech I Semester Regular/Supplementary Examinations, October- 2016
STRUCTURAL ANALYSIS – II
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

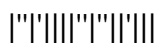
Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART –A

- | | | |
|---|---|------|
| 1 | a) State Eddy's theorem? | [3M] |
| | b) State two assumptions made in the analysis of cables. | [4M] |
| | c) State two assumptions made in the analysis of Cantilever method? | [4M] |
| | d) Define rotational factor at a joint. | [3M] |
| | e) Mention the characteristics of the flexibility matrix? | [4M] |
| | f) Mention two advantages of Kani's method over moment distribution method. | [4M] |

PART –B

- | | | |
|---|---|-------|
| 2 | Derive the expression for normal thrust, radial shear and horizontal thrust for a two hinged circular arch. | [16M] |
| 3 | A light cable 24m long is supported at two ends at the same level. The supports are 20m apart. The cable supports three loads 10, 12 and 14N dividing the 20m distance in four equal parts. Find the shape of the string and the tension in various portions. | [16M] |
| 4 | Analyze the portal frame by moment distribution method. Draw the bending moment diagram and sketch the deflected shape of the structure. The two columns of AB and CD of 4m height with 2I, Beam BC of span 5m, with I. The beam BC carries an udl of 20 kN/m. The supports at A and D are fixed. | [16M] |
| 5 | Analyze the portal frame using Kani's procedure. The two columns of AB and CD of 5m height, Beam BC of span 8m, with EI constant. The column AB carries an udl of 15 kN/m. The supports at A and D are fixed. | [16M] |
| 6 | Discuss the flexibility and stiffness method with specific application to continuous beam. | [16M] |
| 7 | Discuss the difference between Portal method and Cantilever method with an example. | [16M] |



III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
 (Comm to EEE, AME and MINE)

Time: 3 hours

Max. Marks: 70

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

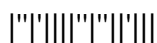
~~~~~

**PART -A**

- |   |    |                                        |      |
|---|----|----------------------------------------|------|
| 1 | a) | What is demand forecasting?            | [4M] |
|   | b) | Define Oligopoly.                      | [3M] |
|   | c) | Name Liquidity ratios.                 | [4M] |
|   | d) | What are the phases of Business Cycle? | [3M] |
|   | e) | Define Fixed cost and variable cost.   | [4M] |
|   | f) | Define capital budgeting.              | [4M] |

**PART -B**

- |   |    |                                                                                                                                                                                                                                                                   |      |
|---|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 2 | a) | Explain how managerial economics is linked with other disciplines.                                                                                                                                                                                                | [5M] |
|   | b) | What is meant by elasticity of demand? How do you measure it?                                                                                                                                                                                                     | [5M] |
|   | c) | Define law of demand. What are its assumptions and exceptions?                                                                                                                                                                                                    | [6M] |
| 3 | a) | Raju & Co., has supplied you the following information.<br>Fixed Cost Rs. 2,40,000; Variable Cost per Unit Rs.15; Selling Price per Unit Rs.30<br><b>Find out:</b> (a) BEP Units (b) BEP in Rupees (c) Margin of Safety (d) Sales to get a profit of Rs.2,00,000. | [6M] |
|   | b) | What are the economies of scale? Explain different types of economies of scale.                                                                                                                                                                                   | [5M] |
|   | c) | Explain the production function with reference to Law of variable proportions and substitutability of factors.                                                                                                                                                    | [5M] |
| 4 | a) | Define Monopoly. How are price and output determined under monopoly?                                                                                                                                                                                              | [8M] |
|   | b) | Define pricing and explain the various methods of pricing.                                                                                                                                                                                                        | [8M] |
| 5 | a) | What do you understand by Joint Stock Company? What are its salient features?                                                                                                                                                                                     | [8M] |
|   | b) | Differentiate between Sole trader and partnership.                                                                                                                                                                                                                | [8M] |
| 6 |    | Journalize the following transactions. [16M]                                                                                                                                                                                                                      |      |
|   |    | January 1. Commenced business with a capital of Rs. 1,00,000                                                                                                                                                                                                      |      |
|   | .. | 2. Cash deposited into bank Rs. 900                                                                                                                                                                                                                               |      |
|   | .. | 3. Bought Furniture for cash Rs. 3,000                                                                                                                                                                                                                            |      |
|   | .. | 4. Bought goods for cash from 'B' Rs. 5000                                                                                                                                                                                                                        |      |
|   | .. | 5. Sold goods for cash to 'A' Rs. 2,000                                                                                                                                                                                                                           |      |
|   | .. | 6. Purchased goods from 'C' on credit Rs.2000                                                                                                                                                                                                                     |      |
|   | .. | 7. Goods sold to 'D' on credit Rs. 1500                                                                                                                                                                                                                           |      |
|   | .. | 20. Received interest Rs. 500                                                                                                                                                                                                                                     |      |
|   | .. | 31. Paid rent Rs. 4000                                                                                                                                                                                                                                            |      |
|   | .. | 31. Paid salary to 'P' Rs.10,000                                                                                                                                                                                                                                  |      |



- 7 ABC Co. Ltd. is proposing to undertake one project. Two projects A and B are available. The initial cost of the Project in each case is Rs. 4, 00,000/-. A discount factor of 10% is used to compare the projects. Cash flows after taxes are likely to be as under [16M]

| <b>Cash flows after taxes (in Rs.)</b> |                  |                  |
|----------------------------------------|------------------|------------------|
| <b>Year</b>                            | <b>Project-X</b> | <b>Project-Y</b> |
| 1                                      | 1,50,000         | 50,000           |
| 2                                      | 2,00,000         | 1,50,000         |
| 3                                      | 2,50,000         | 2,00,000         |
| 4                                      | 1,50,000         | 3,00,000         |
| 5                                      | 1,00,000         | 2,00,000         |

Which one do you recommend under Net Present Value Index method?

\*\*\*\*\*



**III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016**  
**MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS**

(Comm to EEE, AME and MINE)

Time: 3 hours

Max. Marks: 70

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

~~~~~

PART -A

- | | | |
|------|----------------------------------|------|
| 1 a) | Explain Isoquants. | [3M] |
| b) | Discuss interest coverage ratio. | [3M] |
| c) | Joint stock company. | [4M] |
| d) | Priority pricing. | [4M] |
| e) | Law of Demand. | [4M] |
| f) | Need for capital budgeting. | [4M] |

PART -B

- | | | |
|------|--|------|
| 2 a) | Define managerial economics. Explain the nature and scope of managerial economics. | [6M] |
| b) | Explain different methods of demand forecasting? | [6M] |
| c) | Briefly explain elasticity of demand. | [4M] |
| 3 a) | Explain briefly Cobb-Douglas production function. | [5M] |
| b) | If Sales are 10,000 Units and selling price is Rs.15 per unit, Variable cost is Rs.8 per unit and fixed cost is Rs.70,000.
Find out BEP in terms of Rupees and Units. What is the profit Earned?
What should be the sales for earning a profit of Rs.50,000. | [6M] |
| c) | Explain determinants of Break Even Point. | [5M] |
| 4 a) | What do you understand by pricing and equilibrium of pricing? How do you calculate equilibrium of pricing in competitive market? | [8M] |
| b) | Explain how price is determined under perfect competition. | [8M] |
| 5 a) | Outline the types of partners and explain the limitations of partnership business. | [8M] |
| b) | Differentiate between sole trader and partnership. | [8M] |



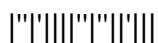
- 6 From the following information, calculate: [16M]
 (i) Gross Profit Ratio; (ii) Net Profit Ratio (iii) Inventory Turnover Ratio;
 (iv) Net worth to Debt Ratio.

Particulars	Amount (Rs.)
Sales	25,20,000
Cost of Goods Sold	19,20,000
Net Profit	3,60,000
Stock	8,00,000
Current Assets	7,60,000
Fixed Assets	14,40,000
Net worth	15,00,000
Debt	19,00,000
Current Liabilities	6,00,000

- 7 Prepare Trading and Profit & Loss Account and Balance sheet for the year ended [16M]
 31st March 2014 from the following Trial Balance of XYZ Co. Ltd.

	Dr, Rs.	Cr, Rs.
Furniture	6500	
Plant and machinery	60000	
Buildings	75000	
Capital		125000
Bad debts	1750	
Reserve for bad debts		3000
Sundry debtors	40000	
Sundry creditors		24000
Stock(1.1.2001)	34600	
Purchases	54750	
Sales		154500
Bank over draft		28500
Sales returns	2000	
Purchase returns		1250
Advertising	4500	
Interest	1180	
Commission received		3750
Cash in hand	6500	
Salaries	33000	
General expenses	7820	
Car expenses	9000	
Taxes and insurance	3500	
	340000	340000

Closing stock valued at Rs. 50,000



III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
 (Comm to EEE, AME and MINE)

Time: 3 hours

Max. Marks: 70

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

~~~~~

**PART -A**

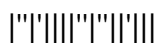
- |      |                                                |      |
|------|------------------------------------------------|------|
| 1 a) | Explain Implicit Cost                          | [4M] |
| b)   | What is Net Present Value method?              | [4M] |
| c)   | Limit Pricing                                  | [4M] |
| d)   | Discuss the significance of Debt-Equity Ratio. | [4M] |
| e)   | Phases of Business cycle                       | [3M] |
| f)   | What are the duties of partners?               | [3M] |

**PART -B**

- |      |                                                                                                                                                                                                                                                                                                                                                                                                   |       |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 2 a) | What do you mean by demand? Explain its determinants.                                                                                                                                                                                                                                                                                                                                             | [8M]  |
| b)   | Explain the different types of elasticity of demand.                                                                                                                                                                                                                                                                                                                                              | [8M]  |
| c)   | How do you forecast demand for a new product?                                                                                                                                                                                                                                                                                                                                                     | [8M]  |
| 3 a) | Explain the concepts of cost and explain their contribution to managerial decisions.                                                                                                                                                                                                                                                                                                              | [7M]  |
| b)   | Explain production function.                                                                                                                                                                                                                                                                                                                                                                      | [5M]  |
| c)   | What is contribution? Explain its significance in cost-volume profit analysis.                                                                                                                                                                                                                                                                                                                    | [4M]  |
| 4 a) | What do you understand by monopolistic competition? How is price determined under it?                                                                                                                                                                                                                                                                                                             | [8M]  |
| b)   | Differentiate between determination of price in the short-run and long-run.                                                                                                                                                                                                                                                                                                                       | [8M]  |
| 5 a) | Define sole trader. What are its advantages and disadvantages?                                                                                                                                                                                                                                                                                                                                    | [8M]  |
| b)   | Explain about the various state/ public enterprises and their form.                                                                                                                                                                                                                                                                                                                               | [8M]  |
| 6    | A company is considering an investment proposal to install new milling control at a cost of Rs. 55,000/-. The facility has a life expectancy of 5 years and no salvage value. The tax rate is 30%. Assume the firm uses single line depreciation and the same is allowed for tax purposes. The estimated cash flow before depreciation and tax (CFBT) from the investment proposal are as follows | [16M] |

| Year | CFBT   |
|------|--------|
| 1    | 13,600 |
| 2    | 16,590 |
| 3    | 14,769 |
| 4    | 13,660 |
| 5    | 24,855 |

Calculate Payback Period, ARR and IRR



7

The following is the Trial Balance of ABC Co. Ltd., was prepared on 31<sup>st</sup> March 2014. Prepare Trading and Profit & Loss Account and Balance Sheet. [16M]

|                                     | Debit Rs.     | Credit Rs.    |
|-------------------------------------|---------------|---------------|
| Capital                             | -----         | 22000         |
| Opening stock                       | 10000         | -----         |
| Debtors and Creditors               | 8000          | 12000         |
| Machinery                           | 20000         | -----         |
| Cash at Bank                        | 2000          | -----         |
| Bank overdraft                      | -----         | 14000         |
| Sales returns and Purchases returns | 4000          | 8000          |
| Trade expenses                      | 12000         | -----         |
| Purchases and Sales                 | 26000         | 44000         |
| Wages                               | 10000         | -----         |
| Salaries                            | 12000         | -----         |
| Bills payable                       | -----         | 10600         |
| Bank deposits                       | 6600          | -----         |
| <b>TOTAL</b>                        | <b>110600</b> | <b>110600</b> |

Closing Stock was valued at Rs.60, 000

\*\*\*\*\*



**III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016**  
**MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS**  
 (Comm to EEE, AME and MINE)

Time: 3 hours

Max. Marks: 70

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

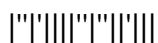
~~~~~

PART -A

- | | | |
|------|--|------|
| 1 a) | Explain the scope of Managerial Economics. | [3M] |
| b) | What is double entry system? | [4M] |
| c) | Explain about Economies of scale. | [4M] |
| d) | Define break-even point. | [3M] |
| e) | What do you understand by joint stock company? | [4M] |
| f) | What do you understand by capital budgeting. | [4M] |

PART -B

- | | | |
|------|--|------|
| 2 a) | Explain the basic economic tools in managerial economics. | [6M] |
| b) | Illustrate demand schedule. Explain assumption to the law of demand. | [5M] |
| c) | What is cross elasticity of demand? Explain. | [5M] |
| 3 a) | Discuss various types of isoquants. | [5M] |
| b) | What is meant by breakeven analysis? Explain its advantages. | [5M] |
| c) | Critically evaluate the law of diminishing marginal return. | [6M] |
| 4 a) | Define market and explain the various market structures with examples. | [8M] |
| b) | Explain about Maris and Williamson's models. | [8M] |
| 5 a) | Discuss briefly the various phases of business cycle. | [8M] |
| b) | Define partnership. What are its features? | [8M] |



- 6 From the following information, prepare trading, profit and loss account and balance sheet. [16M]

Particulars	Debit Rs.	Credit Rs.
Purchases	30,000	
Sales		70,000
Returns	1,400	1,600
Opening Stock	20,000	
Wages	1,000	
Salaries	1,400	
Depreciation	2,000	
Rent Received		10,000
Buildings	30,000	
Capital		60,000
Debtors	21,800	
Creditors		14,000
Bank Over Draft		10,000
Cash	58,000	
Total	1,65,600	1,65,600

Adjustments:

Closing Stock was valued at Rs.30,000

Outstanding Wages Rs.1,000

Appreciation on Buildings @ 10%.

- 7 A company is considering an investment proposal to install new milling controls at a cost of Rs.50,000. The facility has a life expectancy of 5 years and no salvage value. The tax rate is 35 percent. Assume the firm uses straight line depreciation and the same is allowed for tax purposes. The estimated cash flows before depreciation and tax (CFBT) from the investment proposal are as follows: [16M]

Year	CFBT
1	10,000
2	10,692
3	12,769
4	13,462
5	20,385

Calculate the following: payback period, ARR and Profitability index at 10 percent discount rate.(5+5+6)



III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
METAL CUTTING & MACHINE TOOLS
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

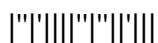
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
- ~~~~~

PART -A

- | | | |
|------|---|------|
| 1 a) | Name the factors that contribute to the formation of segmental chips. | [4M] |
| b) | Why two sets of guide ways are required in lathe machine. | [3M] |
| c) | Why reaming operation is performed. | [3M] |
| d) | Explain the relative characteristics of climb milling and up milling. | [4M] |
| e) | How are the grit size and surface finish related in grinding? | [4M] |
| f) | What is the purpose of clamping? | [4M] |

PART -B

- | | | |
|------|---|------|
| 2 a) | In an orthogonal cutting process, following data were observed; chip length of 80 mm was obtained with an uncut chip length of 200 mm and the rake angle used was 20° and depth of cut is 0.5mm. The horizontal and vertical components of cutting force were 2000 N and 200 N respectively. Determine the shear angle, friction angle and resultant cutting force. | [6M] |
| b) | Describe the tool represented by 10, 10, 6, 6,8,8,1 mm in ASA system. | [6M] |
| c) | How does a lubricant and cutting fluid differ from each other? | [4M] |
| 3 a) | Name the different work holding devices or methods in capstan and turret lathes. Describe any one with neat sketch. | [8M] |
| b) | Explain the principle of operation of a Multi-spindle progressive action type horizontal automatic machine. | [8M] |
| 4 a) | Explain with the help of neat sketch open belt and cross belt drive mechanism used in planer machine. | [8M] |
| b) | Explain with neat sketch the construction and working principle of radial drilling machine. | [8M] |
| 5 a) | List the various types of milling cutters. With a neat sketch explain cutter geometry. | [8M] |
| b) | Draw a neat sketch of universal dividing head and explain its working. | [8M] |
| 6 a) | What are the various factors to be considered in selection of a grinding wheel? Discuss each in detail. | [8M] |
| b) | Describe the continuous broaching machines. | [8M] |
| 7 a) | Explain the principle of six point location. | [8M] |
| b) | What are the advantages and disadvantages of CNC machines? | [8M] |



III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
METAL CUTTING & MACHINE TOOLS
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

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

~~~~~

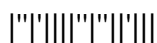
**PART -A**

- |      |                                                        |      |
|------|--------------------------------------------------------|------|
| 1 a) | What are main functions of cutting fluids?             | [4M] |
| b)   | List commonly used attachments on lathe?               | [3M] |
| c)   | Why reaming operation are is performed?                | [3M] |
| d)   | Why is milling a versatile machining process?          | [4M] |
| e)   | Write any two advantages and limitations of broaching? | [4M] |
| f)   | Differentiate between a jig and fixture.               | [4M] |

**PART -B**

- |      |                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 2 a) | Draw a neat sketch of a single point cutting tool indicating its complete geometry on it.                                                                                                                                                                                                                                                                                                                                            | [8M] |
| b)   | An experiment was conducted on a M.S. tube of 200 mm diameter and 3 mm thick. An orthogonal cut was taken with a cutting speed of 80 m/sec and 0.15 mm/rev. feed with a cutting tool having back rake angle of $-10^{\circ}$ . It was determined that cutting force= 150 kg, feed force = 40 kg, net horse power for cutting was 3 h.p. and chip thickness was 0.25 mm. calculate the shear strain and shear energy per unit volume. | [8M] |
| 3 a) | Describe, with the help of a neat sketch, working of a collet chuck.                                                                                                                                                                                                                                                                                                                                                                 | [6M] |
| b)   | Draw a tool layout for production of hexagonal button using capstan lathe.                                                                                                                                                                                                                                                                                                                                                           | [6M] |
| c)   | Describe the characteristics of jig boring machine.                                                                                                                                                                                                                                                                                                                                                                                  | [4M] |
| 4 a) | How will you adjust the length of stroke and ram position in shaper?                                                                                                                                                                                                                                                                                                                                                                 | [8M] |
| b)   | Describe the construction and working of jig boring machine.                                                                                                                                                                                                                                                                                                                                                                         | [8M] |
| 5 a) | With the help of a simple diagram explain the role of each element of milling cutter.                                                                                                                                                                                                                                                                                                                                                | [8M] |
| b)   | Explain different types of indexing methods with example.                                                                                                                                                                                                                                                                                                                                                                            | [8M] |
| 6 a) | What is the difference between lapping and honing?                                                                                                                                                                                                                                                                                                                                                                                   | [8M] |
| b)   | Describe the centre less grinding process. What are the various feeding methods used in centre less grinding.                                                                                                                                                                                                                                                                                                                        | [8M] |
| 7 a) | Explain any one milling fixture with neat sketch                                                                                                                                                                                                                                                                                                                                                                                     | [8M] |
| b)   | Describe the following tool positioning systems:<br><b>(a)</b> Point to point system <b>(b)</b> Straight line system <b>(c)</b> Contouring system                                                                                                                                                                                                                                                                                    | [8M] |

\*\*\*\*\*



**III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016**  
**METAL CUTTING & MACHINE TOOLS**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

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

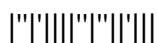
**PART -A**

- 1 a) What are the main factors that contribute the tool life [3M]
- b) Explain the functions of the saddle on a lathe. [4M]
- c) Find the time required for drilling a 18 mm hole in work piece having thickness 50 mm. Assume cutting speed 12 m/min and feed 0.2 mm/revolution. Neglect the length of approach. [4M]
- d) Differentiate between up milling and down milling. [4M]
- e) Differentiate between grit and grade of a grinding wheel. [4M]
- f) Give the complete classification of jigs? [3M]

**PART -B**

- 2 a) Explain why studying the types of chips produced is important in understanding metal cutting operation. [6M]
- b) When cutting mild steel at 50 mpm, a carbide tool, had a life of 2 hrs. Calculate the tool life if the same tool is used at a speed 25% higher than previous one. Also compute V if the tool is require to have tool life of 3 hrs. Take  $n=0.27$ . [6M]
- c) What are the major properties required of cutting tool materials? [4M]
- 3 a) Distinguish between the turret lathe and capstan lathe with the help of suitable sketches. [6M]
- b) Briefly describe the steps in cutting a V thread on an engine lathe. [6M]
- c) What do you understand by parallel action and progressive action in multi-spindle lathes? [4M]
- 4 a) How to do you adjust the length of the stroke in shaper? Explain with diagram. [8M]
- b) How do you carry deep hole drilling? Discuss in detail. [8M]
- 5 a) Describe the different types of cutters used in milling operations and give an application of each type. [8M]
- b) How will you cut T-slots and keyways in a milling machine? [8M]
- 6 a) State the merits and demerits of honing and give some applications of this process [8M]
- b) Explain the external centre less grinding process with sketch. [8M]
- 7 a) What are the essential characteristics in the proper design of jigs and fixture? [8M]
- b) With the help of a neat diagram, explain the constructional features of CNC machines. [8M]

\*\*\*\*\*



**III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016**  
**METAL CUTTING & MACHINE TOOLS**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

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

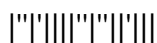
**PART -A**

- 1 a) What assumptions were made by Merchant in arriving at his famous Merchant's theory? [4M]
- b) What are mandrels and why are they used? [4M]
- c) State the functions of clapper box in shaper. [3M]
- d) Explain Why milling is such a versatile machining operation. [4M]
- e) Write any two advantages and limitations of broaching? [4M]
- f) What is the best method to locate a rough surface? [3M]

**PART -B**

- 2 a) Draw a Merchants circle diagram and derive expressions to show relationships among the different forces acting on the cutting tool and different parameters involved in metal cutting. [10M]
- b) The lives of two cutting tools governed by equation [6M]  
 $VT^{0.125} = 2.5$  and  $VT^{0.25} = 7$   
 Respectively in certain machining operation, where V is cutting speed in m/s and T is the tool life in seconds. Find out the speed at which both tools have the same tool life. Also calculate the corresponding tool life.
- 3 a) Draw a neat sketch of taper turning by taper turning attachment method. [8M]
- b) Describe the advantages and applications of having a hollow spindle in the headstock of a lathe? [4M]
- c) How the total production time on a turret lathe is minimized? [4M]
- 4 a) Explain about the table feed mechanism of a shaper machine with neat sketch? [8M]
- b) Draw a neat sketch of a standard twist drill and indicate the nomenclature of various parts and angles. [8M]
- 5 a) What is compound indexing? How it is done? [8M]
- b) Explain the method of carrying out the following milling operations: [8M]  
 (a) Milling flat surface (b) Squaring stock by milling  
 (c) Gang milling (d) Profile milling
- 6 a) Describe the process of hand lapping. [8M]
- b) How is center less grinding different from cylindrical grinding? [8M]
- 7 a) Differentiate between a jig and fixture. Explain the principle of 3-2-1 location. [10M]
- b) What are the applications of CNC? [6M]

\*\*\*\*\*





**III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016**  
**LINEAR IC APPLICATIONS**  
 (Comm to ECE, EIE and E.Comp.E)

Time: 3 hours

Max. Marks: 70

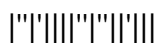
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answering the question in **Part-A** is compulsory  
 3. Answer any **THREE** Questions from **Part-B**

~~~~~  
PART -A

- 1 a) What is the main advantage of constant current bias over emitter bias in differential amplifiers? [4M]
 b) What are the temperature grades of integrated circuits? [3M]
 c) What are the effects of voltage series feedback in Op-amp? [4M]
 d) Draw a sample and hold circuit. [3M]
 e) What is the purpose of low pass filter in a phase locked loop? [4M]
 f) Define settling time and stability of data converters. [4M]

PART -B

- 2 a) Draw the ac equivalent circuit of dual input balanced output differential amplifier and derive the expressions for small signal voltage gain, input resistance and output resistance. [10M]
 b) Compare the above results with a dual input unbalanced differential amplifier. [6M]
- 3 a) List out the ideal characteristics of an operational amplifier. [3M]
 b) Define slew rate of an Op-amp and explain its significance in the dynamic characteristics of an Op-amp. [8M]
 c) An op-amp has a slew rate of $2V/\mu s$. What is the maximum frequency of an output sinusoid of peak value 5V at which the distortion sets in due to the slew rate limitation [5M]
- 4 a) Design a practical op-amp differentiator circuit for the frequency of 1KHz and explain its frequency response. [8M]
 b) Design a Schmitt trigger circuit for UTP and LTP of +3V and -3V respectively. Explain its hysteresis curve. [8M]
- 5 a) Design a first order band pass filter with lower cutoff frequency of 100Hz and a higher cutoff frequency of 1KHz. The pass band gain should be 4. Calculate the 'Q' of the filter. [12M]
 b) Compare butterworth and chebyshev filter responses. [4M]
- 6 a) Explain the operation of Monostable multivibrator using 555 timer. Derive the expression for quasi stable state time period of a Monostable multivibrator using 555 timer. [10M]
 b) Draw the block diagram of PLL and explain importance of each block [6M]
- 7 a) Describe the operation of successive approximation type analog to digital converter. [8M]
 b) Draw the circuit of weighted resistor DAC and derive expression for output-analog voltage. [8M]



III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
LINEAR IC APPLICATIONS
 (Comm to ECE, EIE and E.Comp.E)

Time: 3 hours

Max. Marks: 70

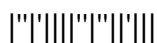
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

- | | | | |
|---|----|---|------|
| 1 | a) | What is the importance of DC coupling in Op-amp internal structure? | [4M] |
| | b) | Define slew rate? Give typical value for 741C Op-amp. | [3M] |
| | c) | Draw and explain voltage transfer characteristics of an ideal Op-amp. | [4M] |
| | d) | Explain relationship between Q and bandwidth of a bandpass active filter. | [4M] |
| | e) | What is the purpose of reset pin in a 555 timer IC? | [4M] |
| | f) | Explain monotonicity of a D/A converter | [3M] |

PART -B

- | | | | |
|---|----|---|-------|
| 2 | a) | Draw the ac equivalent circuit of dual input unbalanced output differential amplifier and derive the expressions for small signal voltage gain, input resistance and output resistance. | [10M] |
| | b) | Compare the above results with a dual input balanced differential amplifier. | [6M] |
| 3 | a) | Explain the basic internal block diagram of a typical operational amplifier. | [8M] |
| | b) | Explain the measurement procedure for input and output offset voltages of a practical Op-amp. | [8M] |
| 4 | a) | Explain the operation of a grounded load V to I converter using op-amp. | [8M] |
| | b) | Design any stable multi vibrator circuit using 741 op-amp for the frequency of 10KHz square wave. Assume necessary data. | [8M] |
| 5 | a) | Classify the filters based on range of frequencies, frequency response, type of components used and type of input signal. | [8M] |
| | b) | Design a first order low pass filter with cutoff frequency of 1KHz and pass band gain of 11. Also draw its frequency response. | [8M] |
| 6 | a) | Define lock-in range and capture range of a PLL | [6M] |
| | b) | Draw the internal diagram of a 555 timer IC and explain significance of each pin. | [10M] |
| 7 | a) | With a clear block diagram explain the data conversion procedure for dual slope ADC. | [8M] |
| | b) | List the advantages of dual slope ADC compared to other ADC models. | [8M] |



III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
LINEAR IC APPLICATIONS
 (Comm to ECE, EIE and E.Comp.E)

Time: 3 hours

Max. Marks: 70

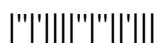
Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) What is the use of level translator in the Op-amp internal structure? [3M]
- b) What is CMRR? Give an ideal value for an Op-amp. [4M]
- c) Explain why an open-loop Op-amp is unsuitable for linear applications? [4M]
- d) Classify band pass active filters according to their Q values. [4M]
- e) Draw the dc output voltage of VCO versus frequency characteristic of a PLL indicating the capture and lock range clearly. [4M]
- f) Explain linearity with respect to data converters [3M]

PART -B

- 2 a) What is an op-amp? Draw the equivalent circuit of a typical op-amp and explain. [6M]
- b) Draw the ac equivalent circuit of single input balanced output differential amplifier and derive the expressions for small signal voltage gain. [10M]
- 3 a) With suitable sketches, explain the measurement procedure for the slew rate and CMRR. [8M]
- b) What is input bias current and explain the bias current compensation in an inverting and non-inverting amplifier circuits? [8M]
- 4 a) Design an Opamp based circuit to produce an output $-(V_1+2V_2-5V_3)$, where V_1 , V_2 and V_3 are the input voltages. [8M]
- b) What is the difference between conventional rectifier and precision rectifier? [8M]
- 5 a) Design a first order high pass filter with a cutoff frequency of 1KHz and pass band gain of 11. Also draw its frequency response. [10M]
- b) List the differences between the frequency responses of first order filters and second order filters. [6M]
- 6 a) Design a symmetrical square wave generator with 1KHz frequency and 5V peak value using 555 timer IC. Assume necessary data. [8M]
- b) Explain the application of PLL as a FSK demodulator. [8M]
- 7 a) Explain in detail with a neat circuit diagram the operation of 3-bit parallel ADC. [8M]
- b) List the advantages and disadvantages of flash type ADC. [8M]



III B. Tech I Semester Regular/Supplementary Examinations, October/November – 2016
LINEAR IC APPLICATIONS
 (Comm to ECE, EIE and E.Comp.E)

Time: 3 hours

Max. Marks: 70

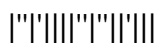
Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) Draw the configuration of single input unbalance out put differential amplifier. [3M]
- b) What is the importance of Gain-Bandwidth product of an Op-amp? [4M]
- c) What are the effects of voltage shunt feedback in Op-amp? [4M]
- d) What are the advantages of active filter over a passive filter? [4M]
- e) Illustrate the pin configuration of 555 timer IC mentioning the name of each pin. [4M]
- f) Define resolution of a D/A converter. [3M]

PART -B

- 2 a) Explain the operation of Level translator with relevant diagrams and expressions. [6M]
- b) Draw the small signal equivalent circuit of differential amplifier circuit and obtain the expressions for common mode gain and differential mode gain. [10M]
- 3 a) An OP-AMP has a differential gain equal to 90 dB and CMRR is 100 dB. If the two input voltages are $3\mu\text{V}$, and $2\mu\text{V}$ respectively, calculate the differential mode output and common mode output voltages. [8M]
- b) What is thermal drift and mention the techniques to minimize the effect of thermal drift? [8M]
- 4 a) Design a Schmitt trigger circuit to convert 5V, 1 KHz sinusoidal signal to square wave using 741C. Draw its transfer characteristics, Input and output waveforms. [8M]
- b) Draw the circuit diagram of a practical log amplifier and obtain an expression for its output voltage. [8M]
- 5 a) Explain the term frequency scaling with a suitable example. [6M]
- b) Design a wide band-pass filter with $f_H=200\text{Hz}$, $f_L=1\text{KHz}$ and a pass-band gain=4. Draw the frequency response and calculate Q factor for the filter. [10M]
- 6 a) Explain the operation of an astable multivibrator using 555 timer. Derive the expression for on and off state time periods. [8M]
- b) With a clear block diagram explain frequency multiplier using PLL. [8M]
- 7 a) Explain in detail with a neat circuit diagram the operation of an R-2R ladder, DAC digital to analog converter. [8M]
- b) List the advantages of R-2R ladder DAC compared to weighted resistor DAC [8M]



III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016**DATA COMMUNICATION**

(Common to CSE and IT)

Time: 3 hours

Max. Marks: 70

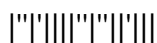
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) Give the differences between Data Communication and Networks. [3M]
- b) Describe the Losses in Optical Fiber Cables. [4M]
- c) Discuss the Linear PCM Codes. [4M]
- d) What are the Optical Properties of Radio Waves? [4M]
- e) Explain Paging Systems. [4M]
- f) Define Hamming Distance? Describe any four Error Detection Schemes. [3M]

PART -B

- 2 a) Define Open Systems Interconnection. [4M]
- b) Explain about the OSI seven-layer International Protocol hierarchy. [8M]
- c) Define Signal analysis. Give a brief description of periodic signals. [4M]
- 3 a) Define Metallic Transmission Lines. Explain about types of metallic transmission lines. [8M]
- b) Explain about the Optical Fiber Communications System with a block diagram. [8M]
- 4 a) Explain about the Synchronous Optical Network. [8M]
- b) Explain briefly about Frequency- Division Multiplexing. [8M]
- 5 a) Explain about Skip distance and Free-space path loss. [8M]
- b) Describe in detail about Satellite Communication Systems [8M]
- 6 a) Explain about in detail about Mobile Telephone services. [8M]
- b) Explain briefly about first generation Analog Cellular Telephone Systems. [8M]
- 7 a) Explain about Digital and Channel Service Units. Also distinguish between them. [8M]
- b) Determine the Checksum for the following data - and CRC-generating polynomials : [8M]
 $G(x) = x^7 + x^4 + x^2 + x^0$, $P(x) = x^5 + x^4 + x^1 + x^0$



III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016**DATA COMMUNICATION**

(Common to CSE and IT)

Time: 3 hours

Max. Marks: 70

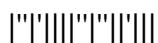
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

- | | | | |
|---|----|---|------|
| 1 | a) | Define the terms :i) Bit Rate ii) Baud iii) Noise Voltage Ratio | [3M] |
| | b) | Discuss the Non - Linear PCM Codes. | [4M] |
| | c) | What are the disadvantages in Optical Fiber Cables? | [4M] |
| | d) | Describe the different categories of Satellites. | [4M] |
| | e) | What is Subscriber Loop? | [3M] |
| | f) | Define Cable Modems? Give its main advantages. | [4M] |

PART -B

- | | | | |
|---|----|--|------|
| 2 | a) | Discuss briefly about Data Communications Circuits | [4M] |
| | b) | Explain about various network topologies. Also give a brief description of network classification | [8M] |
| | c) | Discuss briefly about Analog Modulation Systems. | [4M] |
| 3 | a) | Explain about wave propagation on metallic transmission lines and metallic transmission line losses. | [8M] |
| | b) | Discuss in-detail about the construction of Optical fiber. Also list the advantages of Optical fiber cables. | [8M] |
| 4 | a) | Define Pulse code modulation. Explain briefly about Pulse code modulation with suitable diagrams. | [8M] |
| | b) | Define Multiplexing. Explain briefly about Time-Division Multiplexing. | [8M] |
| 5 | a) | Explain briefly about Spherical Wave front and the Inverse Square Law. | [8M] |
| | b) | Describe in detail about Terrestrial Propagation of Electromagnetic Waves. | [8M] |
| 6 | a) | Write short notes on Cordless Telephones and Electronic Telephones. | [8M] |
| | b) | Explain about Personal Communication System. Give its advantages and disadvantages | [8M] |
| 7 | a) | Explain in detail about Error-Detection mechanisms with suitable examples. | [8M] |
| | b) | Write short notes on : i) Asynchronous Voice-Band Modems and ,
ii) Synchronous Voice-Band Modems | [8M] |



III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016**DATA COMMUNICATION**

(Common to CSE and IT)

Time: 3 hours

Max. Marks: 70

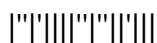
Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) Distinguish between Serial and Parallel Data Transmission. [4M]
- b) List out any four Advantages of Optical Fiber cables. [4M]
- c) What is meant by Frequency- Division Multiplexing? Give the Applications. [3M]
- d) Discuss the Electromagnetic Radiation properties. [3M]
- e) Explain call Progress Tones and Signals. [4M]
- f) Describe the Voice –Band Modem Classifications. [4M]

PART -B

- 2 a) Discuss briefly Quadrature, Amplitude modulation. [4M]
- b) Explain in detail about Layered Network Architecture. [8M]
- c) Discuss briefly about Digital Modulation Systems. [4M]
- 3 a) Define Electromagnetic Waves. Describe the Characteristics of Electromagnetic Waves. [8M]
- b) Explain briefly about the losses in Optical Fiber cables. [8M]
- 4 a) Explain briefly about Signal Voltage-to-Quantization Noise Voltage Ratio. [8M]
- b) Define Carrier Systems and explain in detail about T-Carrier Systems. [8M]
- 5 a) Explain in detail about Electromagnetic Polarization and Optical properties of radio waves. [8M]
- b) Explain in detail about Microwave Communication Systems. [8M]
- 6 a) Define Subscriber Loop? Explain briefly about working of standard Telephone Set. [8M]
- b) Explain about the architecture of Global System for Mobile Communications. [8M]
- 7 a) Explain in detail about Error-Correction mechanisms with suitable examples. [8M]
- b) Define Voice- Band Modem. Draw and discuss the Voice- Band Modem Block Diagram. [8M]



III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016**DATA COMMUNICATION**

(Common to CSE and IT)

Time: 3 hours

Max. Marks: 70

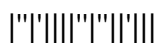
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**
- ~~~~~

PART -A

- 1 a) Define the Multiplexing? Describe the goals of Multiplexing. [3M]
- b) What is the use of Cladding in an Optical Fiber? Give limitations of Optical Fiber. [4M]
- c) List 3 different techniques in serial transmission and explain the differences. [4M]
- d) Discuss the Electromagnetic Polarization. [3M]
- e) Define the terms: **i)** Cell Splitting, **ii)** Sectoring, **iii)** Segmentation and **iv)** Dualization [4M]
- f) Distinguish between Synchronous and Asynchronous Voice-Band Modems. [4M]

PART -B

- 2 a) Discuss briefly about Signal-to-Noise Ratio. [4M]
- b) Explain in detail the two-station data communication circuit with suitable diagrams. [8M]
- c) Discuss briefly parallel and serial data transmission with suitable diagrams. [4M]
- 3 a) Define Transverse Electromagnetic waves. What are the characteristics of electromagnetic waves? [8M]
- b) Explain about the Optical Fiber Modes and give their classifications [8M]
- 4 a) Differentiate between Delta Modulation PCM and Differential PCM. [8M]
- b) Explain in detail about Wavelength-Division Multiplexing. [8M]
- 5 a) Explain in detail Optical Properties of Radio Waves. [8M]
- b) Discuss briefly Satellite Communications Systems. [8M]
- 6 a) Give a detailed description of Paging Systems. [8M]
- b) Explain in detail about Basic Telephone Call Procedures. [8M]
- 7 a) Explain Voice-Band Modem with block diagram and also discuss its classifications. [8M]
- b) Distinguish between 56K Modems and Cable Modems. [8M]



Code No: **R31022**

R10

Set No. 1

III B.Tech I Semester Supplementary Examinations, October/November - 2016

ELECTRICAL MEASUREMENTS

(Electrical and Electronics Engineering)

Time: 3 hours

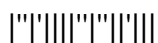
Max. Marks: 75

Answer any FIVE Questions

All Questions carry equal marks

- 1 a) Discuss how deflecting torque in analog instruments is produced. State the examples. [7M]
b) Explain the constructional details of PMMC instrument with neat sketch. [8M]
- 2 a) Explain the constructional details of current transformers. [7M]
b) A potential transformer, ratio of 1000/100V, has the following values: primary resistance = 94.5Ω , secondary resistance = 0.86Ω , primary reactance = 66.2Ω , total equivalent reactance referred to primary = 110Ω , magnetizing current = 0.02A at 0.4 power factor. Calculate: (i) Phase angle error at no load
(ii) Load in VA at unity power factor at which the phase angle will be zero [8M]
- 3 Explain the construction and working of a single phase induction type energy meter. Show that the total number of revolutions made by its disc during a particular time is proportional to the energy consumed. [15]
- 4 a) What is standardization? Explain how this potentiometer is standardized. [7M]
b) Explain with the help of neat diagram the principle and working of A.C potentiometer. [8M]
- 5 a) Explain how insulation resistance of a cable can be measured with a help of loss of charge method. [7M]
b) The four arms of a Wheat shone bridge are as follows: $AB = 100\Omega$; $BC = 10\Omega$; $CD = 4\Omega$; $DA = 50\Omega$. The galvanometer has a resistance of 20 ohms and is connected across BD. A source of 10V d.c. is connected across AC. Find the current through the galvanometer. What should be the resistance in the arm DA for no current through the galvanometer? [8M]
- 6 a) Explain the functioning and merits of DeSauty's bridge. [7M]
b) A Maxwell's inductance capacitance bridge is used to measure unknown inductance in comparison with capacitance. The various values at balance are R_2 of arm **AD** = 400Ω ; R_3 of arm **BC** = 600Ω ; R_4 and C_4 of arm **CD** = 1000Ω , $0.5\mu\text{F}$; Calculate the values of R_1 and L_1 of arm **AB**. Also calculate the value of storage factor of coil if the frequency is 1000Hz . [8M]
- 7 a) Explain the operation of any one method of determining B-H loop of a magnetic material. [7M]
b) Explain the "Lloyd Fisher square "method of measuring iron losses in ferromagnetic material. [8M]
- 8 a) Explain the operating principle of ramp type digital voltmeter. [7M]
b) Explain the functioning of a digital frequency meter. [8M]

-000-



Code No: R31032

R10

Set No. 1

III B.Tech I Semester Supplementary Examinations, October/November - 2016

OPERATIONS RESEARCH

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

- 1 Apply Simplex method to
Max $Z=3X_1+2X_2+5X_3$ Subject to
 $X_1+2X_2+X_3 \leq 430$
 $3X_1+2X_3 \leq 460$
 $X_1+4X_2 \leq 420$
 $X_1, X_2, X_3 \geq 0$

- 2 Find the minimum transportation cost for the following data:

Warehouse

	A	B	C	D	E	F	Available
1	9	12	9	6	9	10	5
2	7	3	7	7	5	5	6
3	6	5	9	11	3	11	2
4	6	8	11	2	2	10	9
Requirement	4	4	6	2	4	2	

- 3 A computer contains 10,000 resistors. When any one of the resistor fails, it is replaced. The cost of replacing a single resistor is Rs.1 only. If all resistors are replaced at the same time, the cost per resistor would be reduced to 35 paise. The percent surviving by the end of month is as follows.

Month	0	1	2	3	4	5	6
% Surviving by the end of month	100	97	90	70	30	15	0

What is the optimum plan?



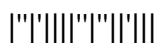
- 4 a) Solve the following payoff matrix. Determine the optimal strategies and the value of game.

		B	
		5	1
A	5	1	
	3	4	

- b) What is a rectangular game? Define pure strategy and mixed strategy in a game.
- 5 a) Describe the fundamental components of a queuing process and give suitable examples.
- b) At what average rate a clerk at a super market work in order to ensure a probability of 0.90 that the customer will not have to wait longer than 12 minutes? It is assumed that there is only one counter to which customers arrive in a poisson fashion at an average rate of 15 per hour. The length of service by the clerk has an exponential distribution.
- 6 The consumption of an item is known to be fixed at 4,800 units per year. The cost of processing an order of this item is Rs.400 and the inventory carrying charges work out to 24% per annum of the cost of the item. The cost of the item depends on the purchase lot size as per schedule given below. Determine the optimum ordering policy.

Quantity	Unit cost (Rs)
Up to 999	20.00
1000-1499	18.50
1500 and above	17.00

- 7 a) State and explain Bellman's principle of optimality in dynamic programming.
- b) What are the essential characteristics of dynamic programming problem?
- 8 Explain the typical features of a simulation package.



Code No: **R31042**

R10

Set No. 1

III B.Tech I Semester Supplementary Examinations, October/November - 2016
DIGITAL IC APPLICATION
(Common to ECE, EIE, BME, ECC)

Time: 3 hours

Max. Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

- 1 a) Explain the concept of CMOS dynamic electrical behavior in detail. [8M]
b) Draw the transfer characteristics of CMOS inverter and explain its operation. [7M]
- 2 a) Explain sinking current and sourcing current of TTL gate. Which of the [8M]
parameters decide the fan-out and how?
b) Expand HC, HCT, VHC and VHCT in connection with CMOS family? [7M]
- 3 a) Design the procedure for converting Gray code to binary and draw its logic [8M]
diagram.
b) Draw the two bit comparator circuit and explain its operation. [7M]
- 4 a) Design a 16-bit ALU using 74x381 and explain its operation. [8M]
b) Draw and explain the Dual priority encoder in detail. [7M]
- 5 a) Draw the logic diagram of 74x74 IC and explain its operation. [8M]
b) With the help of logic diagram discuss PAL16R8? [7M]
- 6 a) Design a serial in and parallel out shift register and explain its operation. [7M]
b) Explain basic sequential logic design steps of a counter in detail. [8M]
- 7 a) Compare between PROM, PLA and PAL? [8M]
b) Explain briefly about design considerations of PLD's along with circuit diagram? [7M]
- 8 Write short notes on the following terms in detail. [15M]
(a) RAM (b) SRAM (c) DRAM (d) SDRAM.

-000-

