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Code: 4G465

III B.Tech. II Semester Regular Examinations May 2017

**Computer System Architecture**

( Electrical &amp; Electronics Engineering )

Max. Marks: 70

Time: 3 Hours

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

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**UNIT-I**

1. a) Name four main components of a computer and give their functions. 8M  
 b) Describe a single bus structure with a suitable diagram. 6M

**OR**

2. a) Describe an error detection circuit for transmission of a 3-bit message using odd parity bit. 8M  
 b) Perform the subtraction with the following unsigned decimal numbers by taking the 10's complement of the subtrahend. 6M  
 i) 6255 – 1425      ii) 1754 – 8646      iii) 24 – 105      iv) 1357 – 240

**UNIT-II**

3. a) Explain Arithmetic Circuit with various operations. 10M  
 b) Discuss the operation of 4-bit Binary Incrementer with neat diagram. 4M

**OR**

4. a) Draw and explain the block diagram of control unit of a basic computer? 10M  
 b) Explain various computer Instructions? 4M

**UNIT-III**

5. a) Discuss the decoding of micro-operation fields with neat diagram. 7M  
 b) Explain  $X = (A + B) - (C + D)$  with different instruction formats? 7M

**OR**

6. a) Explain different addressing modes with example? 7M  
 b) Explain Multiplication algorithm with example 7M

**UNIT-IV**

7. a) Predict the usage of daisy chaining with neat diagram. 7M  
 b) What is DMA? What is the need for DMA? Explain the working of DMA. Also, mention its advantages. 7M

**OR**

8. a) Summarize the types of Mapping Techniques used in the usage of Cache Memory? Explain 7M  
 b) Discuss Block diagram of Associative Memory with suitable example. 7M

**UNIT-V**

9. a) Explain RISC pipeline with example 6M  
 b) Discuss pipeline for floating-point addition and subtraction with neat diagram 8M

**OR**

10. a) Explain the characteristics of multiprocessors 4M  
 b) Discuss Interconnection Structures in detail. 10M

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Hall Ticket Number :									
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<b>R-14</b>
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**Code: 4GA61**

*III B.Tech. II Semester Regular Examinations May 2017*

**Managerial Economics and Financial Analysis**

( Common to EEE & CSE)

Max. Marks: 70

Time: 3 Hours

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

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<b>UNIT-I</b>
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1. Define Managerial Economics and discuss the significance of Economic Analysis in Business Decisions. 14M

**OR**

2. a) Explain Elasticity of Demand and its various Types. 8M  
 b) Distinguish between Law of Demand and Elasticity of Demand. 6M

<b>UNIT-II</b>
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3. a) Explain the Law of Returns with appropriate examples. 6M  
 b) Discuss the Economies of scale that accrue to a firm. 8M

**OR**

4. Define Cost. Explain different Cost Concepts used in the process of Cost Analysis. 14M

<b>UNIT-III</b>
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5. a) Explain how the price is determined in case of Perfect Competition. Illustrate. 8M  
 b) Distinguish Features of Perfect, Monopoly & Monopolistic Markets. 6M

**OR**

6. What are the factors governing the choice of form of Business Organization and elaborate the steps involved in establishing the organization. 14M

<b>UNIT-IV</b>
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7. What is Capital? Explain different sources of raising capital. 14M

**OR**

8. What is Capital Budgeting? Calculate the Accounting Rate of Return (ARR) for Projects 'A' and 'B' from the following and suggest the best project with proper reasoning.

S.No	Particulars	Project 'A'	Project 'B'
1	Investment	Rs 20,000	Rs 30,000
2	Expected Life	4 Years	5 Years
3	Salvage Value	Nil	Nil

**Projected Net Income (After Depreciation and Taxes)**

Years	1	2	3	4	5	Total Amount (Rs)
<b>Project 'A'(Rs)</b>	2,000	1,500	1,500	1,000	-----	<b>6,000</b>
<b>Project 'B'(Rs)</b>	3,000	3,000	2,000	1,000	1,000	<b>10,000</b>

14M

## UNIT-V

9. a) What is Trial Balance?

4M

b) Make a Trial Balance as on 31-03-2014 from the following information

S.No	Particulars	Amount(Rs)
1	Sundry Debtors	32,000
2	Stock (01-01-2014)	22,000
3	Cash in hand	35
4	Cash at Bank	1,545
5	Plant and Machinery	17,500
6	Sundry Creditors	10,650
7	Trade Expenses	1,075
8	Sales	2,34,500
9	Salaries	2,225
10	Carriage outwards	400
11	Rent	900
12	Bills payable	7,500
13	Purchases	2,18,870
14	Discount(Dr)	1,100
15	Capital	79,500
16	Business Premises	34,500

10M

OR

10. a) State different types of Ratios and explain their significance.

8M

b) A firms sales during the year was Rs 4,00,000 of which 60 percent were on credit basis. The balance of debtors at the beginning and end of the year were Rs 25,000 and Rs15,000 respectively. Calculate Debtors Turnover Ratio of the firm. Also find out Debit Collection Period.

6M

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Code: 4G263

III B.Tech. II Semester Regular Examinations May 2017

**Microprocessors and Microcontrollers**

( Electrical &amp; Electronics Engineering )

Max. Marks: 70

Time: 3 Hours

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

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**UNIT-I**

1. Explain the addressing modes of 8086 processor with suitable examples 14M
- OR**
2. Explain the function of the following instructions with suitable examples.  
DAA, DAS, AAM, AAD, XLAT, AAS, RET 14M

**UNIT-II**

3. a) Draw and discuss the architecture of 8257 DMA controller? 8M  
b) What is the advantage of DMA Controlled data transfer over interrupt driven data transfer? 6M
- OR**
4. a) Explain BSR mode of 8255 Programmable Peripheral Interface 8M  
b) Mention the ports placed in group a and group b of 8255. 6M

**UNIT-III**

5. a) Explain the vectored interrupt table of 8086 processor? 7M  
b) Describe all operation command words (OCW's) of 8259 Interrupt controller? 7M
- OR**
6. a) Illustrate the operational modes of 8259 PIC along with its block diagram? 8M  
b) List out the maskable and non maskable interrupts available in 8086? 6M

**UNIT-IV**

7. a) Distinguish between synchronous and asynchronous data formats? 6M  
b) With the help of flowchart, explain how synchronous serial data can be sent from a port line using software routine? 8M
- OR**
8. Explain the block diagram and the functions of each block of the 8251 USART 14M

**UNIT-V**

9. a) Explain addressing modes of 8051 microcontroller? 8M  
b) Explain the function of stack pointer in 8051 microcontroller? 6M
- OR**
10. Briefly explain 8051 microcontroller architecture? 14M

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**Code: 4G261**

III B.Tech. II Semester Regular Examinations May 2017

**Power System Analysis**

( Electrical and Electronics Engineering )

Max. Marks: 70

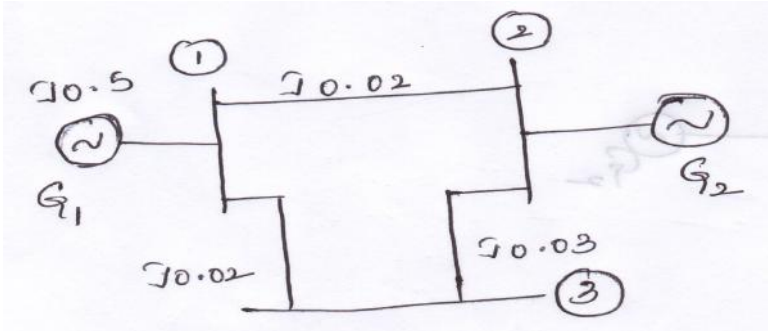
Time: 3 Hours

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

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**UNIT-I**

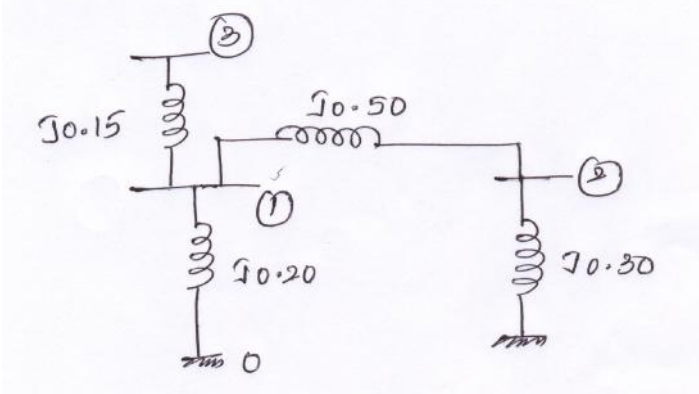
1. a) Define a tree and co-tree.  
 b) Write the Bus - Branch incidence matrix for the network shown in fig 1 and formulate  $Y_{Bus}$  Select arbitrary directions



14M

**OR**

2. a) Explain merits and demerits of building  $Z_{Bus}$  algorithm. 4M  
 b) Formulate the  $Z_{Bus}$  for the network shown in figure 2 using bus building algorithm



10M

**UNIT-II**

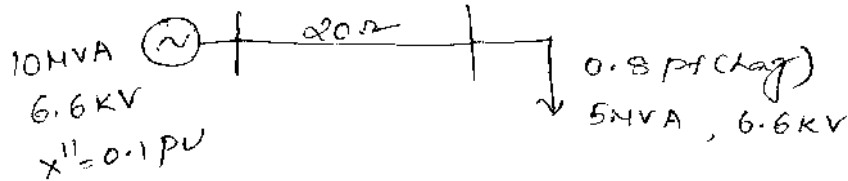
3. a) Derive the basic equation for load flow studies and also write the assumptions and approximations made to get simple equation 4M  
 b) Write an algorithm and draw flowchart for the load flow analysis using G-S method considering PV buses 10M

**OR**

4. a) Draw the flowchart for the load flow analysis using N-R polar coordinates method 10M  
 b) Explain the classification of buses 4M

**UNIT-III**

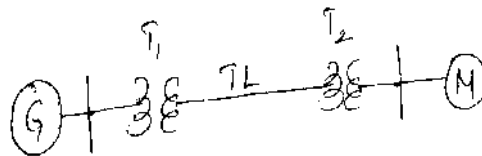
5. a) What are the advantages of Per unit system of representation? Define and explain the impedance and reactance diagrams with an example. 7M
- b) For the network shown in figure 3 draw the PU impedance diagram and mark the values in PU



7M

**OR**

6. a) Derive the expression for the fault current of an unloaded alternator when it is subjected to a Double -line to Ground fault 5M
- b) A synchronous generator and a motor each rated at 30MVA, 11KV having 10% reactance each are connected through transformers and transmission line as shown in figure 4. The transformers are rated for 30MVA. 11/66KV with a leakage reactance of 10% each The line has a reactance of 0.12PU on the base of 30MVA, 66KV. The motor is drawing 15MW at 0.8PF lead at 10KV. When a 3 fault occurs at motor terminals find the sub transient current in the generator , motor and fault considering a base of 30MVA, 11KV



9M

**UNIT-IV**

7. a) Derive the expression for steady state stability power limit 7M
- b) Derive the condition for maximum power transfer in a power system 7M

**OR**

8. a) Differentiate between steady state, dynamic and transient state stability 6M
- b) Explain the methods to improve steady state stability 8M

**UNIT-V**

9. a) What are the assumptions made in deriving the swing equation 7M
- b) Explain point by point method of solving swing equation 7M

**OR**

10. a) Explain the methods to improve transient stability 4M
- b) A salient pole synchronous generator is connected to an infinite bus via a line. Derive an expression for electrical power output of the generator and draw p-  
Curve 10M

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Hall Ticket Number :

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R-14

Code: 4G264

III B.Tech. II Semester Regular Examinations May 2017

**Power System Operation and Control**

( Electrical & Electronics Engineering )

Max. Marks: 70

Time: 3 Hours

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

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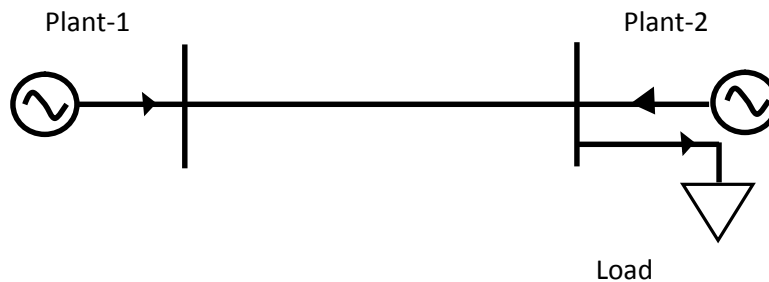
**UNIT-I**

1. a) Give algorithm for economic allocation of generators of thermal system taking transmission losses into account. Give steps for implementing this algorithm with necessary equations. 7M

- b) If 100 MW is transmitted from plant-1 to load, which is located at plant-2, loss will be 10 MW. Find required generation and Power received by load when  $\lambda = 25$  Rs/MWhr.

$$\frac{dC_1}{dP_1} = 16 + 0.02P_1 \text{ Rs/MWhr}$$

$$\frac{dC_2}{dP_2} = 20 + 0.04P_2 \text{ Rs/MWhr}$$



OR

2. a) Explain the need of economic load dispatch for a given power system 4M
- b) Derive the transmission loss formula for a system consisting of n-generating plants supplying several loads inter connected through a transmission networks. State any assumptions are made. 10M

**UNIT-II**

3. a) Derive the cost function of hydrothermal scheduling problem. 7M
- b) A two plant system having a thermal station near the load centre and a hydro power station at remote location. The characteristics of both stations are:

$$C_1 = (26 + 0.045 P_{GT}) P_{GT} \text{ Rs/hr}$$

$$W_2 = (7 + 0.004 P_{GH}) P_{GH} \text{ m}^3/\text{Sec}$$

$$\text{and } \lambda = \text{Rs. } 4 \times 10^{-4} / \text{m}^3$$

The transmission loss coefficient,  $B_{22} = 0.0025 \text{ MW}^{-1}$ . Determine the power generation at each station and the power received by the load when  $\lambda = 65 \text{ Rs/MWhr}$ . 7M

OR

4. a) Obtain the condition for economic generation of steam and hydro plants for short term scheduling. State any assumptions are made. 7M
- b) Discuss the optimal power flow procedures with its inequality constraints and how to handle dependent variables with penalty function. 7M

UNIT-III
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5. a) Derive Small signal transfer function of speed governing system of steam turbine with a rough sketch. 7M
- b) Explain the effect of varying excitation of a synchronous generator. 7M

**OR**

6. a) Develop the Linearized model of the hydraulic turbine. 7M
- b) Making suitable assumptions derive the transfer function of synchronous generator and the steam turbine set. 7M

UNIT-IV
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7. a) Explain the necessity of maintaining a constant frequency in power system operation 7M
- b) Draw the block diagram of single area LFC system with integral control and prove that the steady state change in frequency is zero. 7M

**OR**

8. Draw the block diagram for two area load frequency control with integral controller blocks and explain each block. 14M

UNIT-V
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9. a) Explain about the losses that occur due to VAR flow I power system. 7M
- b) Explain how the generators act as VAR sources in a power network 7M

**OR**

10. What is a static compensator? Explain with diagrams working principles of various types of static compensators. 14M

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Code: 4G262

III B.Tech. II Semester Regular Examinations May 2017

**Utilization of Electrical Energy**

(Electrical and Electronics Engineering)

Max. Marks: 70

Time: 3 Hours

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

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**UNIT-I**

1. a) Outline the factors governing the size and rating of motor for a particular service. 7M
- b) A 25 HP, 3-phase, 10-pole, 50 Hz induction motor provided with a flywheel has to supply a load torque of 800 N-m for 10 seconds followed by a no-load period during which the flywheel regains the full speed. The full-load slip of the motor is 4% and the torque-speed curve may be assumed linear over the working range. Find the moment of inertia of the flywheel, if the motor torque is not to exceed twice the full-load torque. 7M

**OR**

2. a) Discuss how the type and size of motors for intermittent loads is determined. 7M
- b) Discuss different types of drives available for transmission of power from the driving mechanisms to the loads. 7M

**UNIT-II**

3. a) Explain the design procedure of the heating elements when the power and voltage of the oven is known. 6M
- b) Describe the methods of electric resistance welding. Give its merits and demerits with respect to arc welding. 8M

**OR**

4. a) Derive an expression for heat produced in a dielectric material. Discuss the factors influencing dielectric heating. 8M
- b) Which type of DC generator is best suitable for electric welding? Justify your answer. 6M

**UNIT-III**

5. a) What is flood lighting and where it is used? Explain briefly the principles employed in the design of flood lighting installations. 6M
- b) Two lamp posts are 14 meters apart and are fitted with 200 C.P. lamp each at a height of 5 meter above the ground. Calculate
- (i) Illumination mid-way between them.
- (ii) Illumination under each lamp 8M

**OR**

6. a) State and describe various types of lighting schemes. 4M
- b) Compare Fluorescent, Mercury vapour and Sodium vapour lamps on the following aspects
- (i) Starting
- (ii) Colour of light
- (iii) Installation and running cost
- (iv) Stroboscopic effect
- (v) Applications 10M

UNIT-IV
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7. a) Explain the process of regenerative braking in  
 (i) Induction motor  
 (ii) DC Series motor 8M
- b) Derive an expression for the distance travelled by an electric train using quadrilateral speed-time curve. 6M

**OR**

8. A train is required to run between two stations 1.6 km apart at the average speed of 40 kmph. The acceleration, retardation during coasting and braking are 2 km/hr/sec, 0.16 km/hr/sec and 3.2 km/hr/sec respectively. Assuming quadrilateral approximation of speed-time curve, determine  
 (i) The duration of acceleration, coasting and braking periods  
 (ii) The distance covered during these periods 14M

UNIT-V
--------

9. a) What is Specific Energy Consumption? Derive the expression for Specific Energy Consumption in propelling a train. Comment on the factors influencing the Specific Energy Consumption. 8M
- b) A train is required to run between two stations 2 km apart at a schedule speed of 36 km/hr, the duration of stops being 20 seconds. The braking retardation is 2.7 km/hr/sec. Assuming a trapezoidal speed-time curve, calculate the acceleration if the ratio of maximum speed to average speed is 1.2. 6M

**OR**

10. A 100-tonne electric train has a rotational inertia of 10%. This train while running between two stations which are 2.5 km apart has an average speed of 50 kmph. The acceleration and retardation during braking are 1 km/hr/sec and 2 km/hr/sec respectively on simplified trapezoidal speed-time curve. The percentage gradient between two stations is 1% and the train is to move up the gradient. The track resistance is 40 N/Tonne. If the combined efficiency of electric train is 65%, determine  
 (i) Total energy output at the driving axles.  
 (ii) Total energy consumption  
 (iii) Specific energy consumption 14M

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