Hall Ticket Number :										

R-14

Code: 4G264

III B.Tech. II Semester Supplementary Examinations May 2019

Power System Operation and Control

(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)

****

UNIT–I

1. a) Explain the following
   i) incremental fuel rate curves,
   ii) Input–Output operational characteristics of thermal plant.
   iii) Input–Output operational characteristics of Hydro power plant 9M

   b) Incremental fuel cost in Rs/MWh for a plant consisting of two units are
   dc1/dPG1 = 0.2PG1 + 40, dc2/ dP/G2 = 0.25 PG2 + 30, find the savings in fuel cost in Rs/hr for the optimal scheduling of a total load of 130 MW as compared to equal distribution of the same load between the two limits. 5M

OR

2. a) Derive the mathematical determination of optimal allocation of total load among different units. 8M

   b) The fuel cost of two units are given by
   $C1 = 0.1\ PG^2 1 + 25\ PG1 + 1.6$ Rs/hr
   $C2 = 0.1\ PG^2 2 + 32\ PG2 + 2.1$ Rs/hr
   If the total demand on the generators is 250 MW, find the economical load distribution of the two units. 6M

UNIT–II

3. a) Explain the hydro- thermal scheduling 6M

   b) Write about incremental production costs for hydro power plants.. 4M

   c) Write classical methods for economic operation of systems plants. 4M

OR

4. a) A Two-plant system that has a thermal station near the load center and a hydro-power station at a remote location is shown in fig(1). The characteristics of both stations are:
   $C_1 = (26 + 0.045PG_T)\ PG_T$ …. Rs/hr
   $W_2 = (7 + 0.004PG_H)\ PG_H$ … m3/s
   and γ_2 = Rs. 4 X 10^{-4} / m^3
   The transmission loss coefficient B_{22}=0.0025MW^{-1}. Determine the power generation at each station and power received by the load when λ=65 Rs/MWh

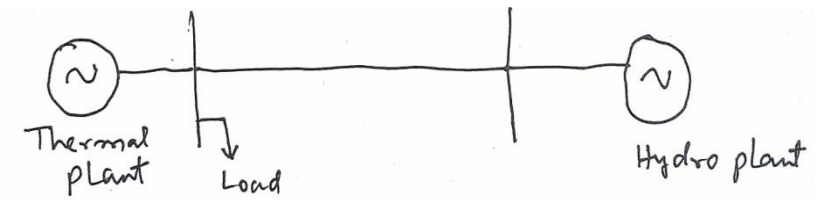


Fig 1 Two Plant System 8M

   b) Explain optimal power flows. 6M

UNIT–III

5. a) Derive the transfer function of a single area system with a block diagram. 8M

   b) Explain the flat frequency control. 6M

OR

6. a) Explain Turbine-speed governing system with a neat diagram? 8M

   b) Explain the modeling of excitation systems? 6M

UNIT–IV

7. a) Explain the LFC of an Isolated power system. 8M

   b) Two Turbo-alternators rated for 110 MW and 210 MW have governor droop characteristic of 5% from No load to Full load. They are connected in parallel to share a load of 250 MW. Determine the load shared by each machine assuming free governor action. 6M

OR

8. Explain LFC of a Two area system in both uncontrolled case and controlled case. 14M

UNIT–V

9. a) Describe the effect of connecting series capacitors in the transmission system. 6M

   b) Explain over voltages on sudden loss of loads. 4M

   c) List out various loads which require compensation. 4M

OR

10. Briefly write about any three of the following

    a) Shunt compensator

    b) Thyristor controlled reactor

    c) Thyristor switched capacitor

    d) Series compensator

    e) Unified power flow controller. 14M

****

Hall Ticket Number :										

R-14

Code: 4G465

III B.Tech. II Semester Supplementary Examinations May 2019

Computer System Architecture

(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)

****

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) What is meant by micro operation? Explain arithmetic micro operations in detail. 10M
   b) Discuss the operation of 4-bit Binary Incrementer with neat diagram. 4M

OR

4. a) Explain fetch and decode operations with a neat diagram. 10M
   b) Define interrupt. Explain BSA instruction 4M

UNIT–III

5. a) What is a control unit? Explain control memory with a block diagram? 6M
   b) Analyze Booths multiplication algorithm with example? 8M

OR

6. a) Explain addition and subtraction with signed magnitude data? 6M
   b) What are the major components of CPU? Explain the Register Organization with a block diagram? 8M

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 in detail instruction pipeline 10M
   b) What are the characteristics of multiprocessors? 4M

OR

10. a) Compare and contrast tightly coupled and loosely coupled multiprocessor. 4M
    b) Explain about multi stage memory inter connection structure. 10M

***

Hall Ticket Number :										

R-14

Code: 4GA61

III B.Tech. II Semester Supplementary Examinations May 2019

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)

****

UNIT–I

1. Define managerial economics? Explain nature and scope.

OR

2. What is demand? State and explain law of demand. Are there any exceptions to the law?

UNIT–II

3. How cost out-put relationship helps the entrepreneurs in expansion decisions.

OR

4. Discuss the economics and dis- economics of scale in detail.

UNIT–III

5. Evaluate sole trader form of organization

OR

6. a) Features of perfect market
   b) market skimming
   c) penetration pricing

UNIT–IV

7. The following are the detail pertaining to accompany which is considering of acquiring a fixed cost.

   Rate of return 10% both projects

   Project A : cost of the proposal Rs 42000

   Life 5 years

   Each year Avg after tax annual cash inflow Rs 14000(constant)

   Project B: cost of the proposal Rs 45000

   Life 5 years

   Avg after tax annual cash inflow 1 YEAR Rs 28000
   2 YEAR Rs 12000
   3 year Rs 10000
   4 year Rs 10000
   5 year Rs 10000

   Determine NPV Which projects do you recommended.

OR

8. Explain capital budgeting techniques and advantages, disadvantages.

UNIT–V

9. Briefly discuss accounting concepts and conventions with examples.

OR

10. Write basics of accounts and classifications accounts debit, credit rules with examples.

***

Hall Ticket Number :										

R-14

Code: 4G263

III B.Tech. II Semester Supplementary Examinations May 2019

Microprocessors and Microcontrollers

(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)

****

UNIT–I

1. a) Draw the pin diagram of 8086 microprocessor and explain the functions of the following pins.
   (i) ALE (ii) NMI (iii) INTR (iv) HOLD (v) HLDA (vi) BHE (vii) LOCK 8M
   b) What is a procedure? What are different types of procedures in 8086? Discuss each type of procedure with examples. 6M

OR

2. a) Distinguish between maximum and minimum modes of operation of 8086. 6M
   b) What do you mean by addressing mode? What are the different addressing modes supported by 8086? Explain each of them with suitable examples. 8M

UNIT–II

3. a) Draw the functional block diagram of 8253 programmable interval timer/counter and explain its modes of operation. 7M
   b) Describe the interfacing of D/A converter to 8086 microprocessor with a neat sketch. 7M

OR

4. a) Explain the A/D converter interface to 8086 microprocessor. 7M
   b) Interface an Analog to Digital converter ADC with an 8086 microprocessor using 8255 ports. Use port A of 8255 for transferring digital data output of ADC to the CPU and port C for control signals. Assume that an analog input is present at input 5 of the ADC and a clock input of suitable frequency is available for ADC. Draw the schematic and write the required assembly language program. 7M

UNIT–III

5. a) Discuss about EPROM interfacing with 8086 microprocessor. 6M
   b) What are the important features of 8257 DMA controller. Describe the internal architecture and signal description for the same. 8M

OR

6. a) Explain the procedure to interface 8257 with 8086. Draw the interfacing diagram and explain. 7M
   b) Explain the functions of the following signals of 8257: (i) $\overline{IOR}$ (ii) $\overline{IOW}$ (iii) HRQ (iv) HLDA (v) $\overline{MEMR}$ (vi) $\overline{MEMW}$ (vii) TC (viii) AEN (ix) ADSTB (x) MARK 7M

UNIT–IV

7. a) Draw the internal architecture of the 8251 USART and explain each block. 8M
   b) Why the synchronous serial data communication much more efficient than asynchronous serial data communication explain in detail. 6M

OR

8. a) Interface 8251 with 8086 at address 40H. Initialize it in asynchronous transmit mode, with 7 bit character size, baud rate factor 16, one start bit, one stop bit, even parity enable. Further transmit a message “BEST OF LUCK” in ASCII from to a modem? 7M
   b) Draw the functional block diagram of 8259 programmable interrupt controller and explain its operation. 7M

UNIT–V

9. a) Explain internal and external memory organization of 8051. 7M
   b) Explain the following pins of 8051:
   (i) AD_0 - AD_7 (ii) T_0 and T_1 (iii) INT0 and INT1 (iv) TxD and RxD 7M

OR

10. a) Explain the procedure for interfacing of DC motor with 8051 microcontroller. 7M
    b) Discuss the various modes of operation of timer in 8051 microcontroller. 7M

****

Hall Ticket Number :										

R-14

Code: 4G261

III B.Tech. II Semester Supplementary Examinations May 2019

Power System Analysis

(Electrical and Electronics Engineering)

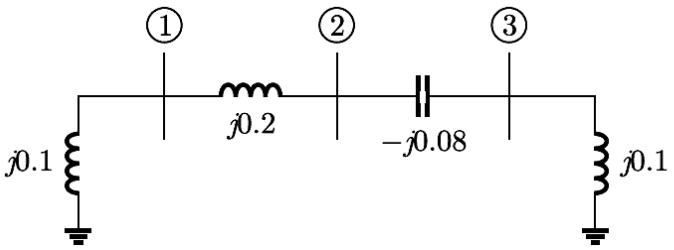
Max. Marks: 70 Time: 3 Hours

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

****

UNIT–I

1. a) Form z-bus and y-bus matrix for the following system



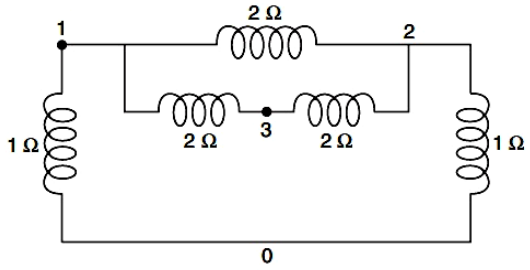
7M

b) Define the primitive network in impendence form and admittance form with network element representation and expression 7M

OR

2. a) Consider a power system network with at least 3 bus and find y-bus matrix using singular transformation 7M

b) Develop z-bus matrix for the network shown below



7M

UNIT–II

3. a) The following is the system data for a load flow solution:

Determine the voltages at the end of first iteration using newton Raphson method.

Load data				
BUS CODE	**P**	**Q**	**V**	**REMARKS**
1	-	-	1.06	SLACK
2	0.5	0.2	1+j0	PQ
3	0.4	0.3	1+j0	PQ
4	0.3	0.1	1+j0	PQ

LINE DATA	
Bus code	**Admittance**
1-2	2-j8
1-3	1-j4
2-3	0.66-j2.66
2-4	1-j4
3-4	2-j8

10M

b) Compare the Gauss-Seidel method, Newton Raphson method for load flow solution 4M

OR

4. a) Write an algorithm for the load flow solution using NR method polar co-ordinates 7M

b) Explain why load flow studies are performed and its significance in power system analysis & discuss about the classification of buses 7M

UNIT–III

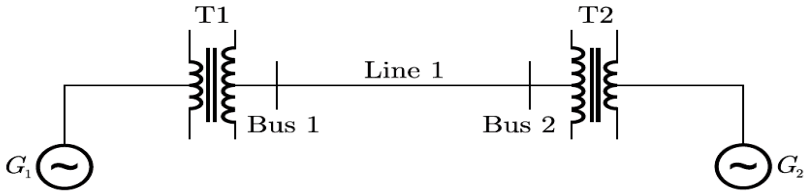
5. a) Draw the impedance diagram for the power system shown in the figure below, the specifications of the components are the following :

*G*1: 25 kV, 100 MVA, *X* = 9%

*G*2: 25 kV, 100 MVA, *X* = 9%

*T*1: 25 kV/220 kV, 90 MVA, *X* = 12%

*T*2: 220 kV/25 kV, 90 MVA, *X* = 12%



Line 1: 200 kV, *X* = 150 ohms

Choose 25 kV as the base voltage at the generator *G*1, and 200 MVA as the MVA base. 6M

b) Derive the expression for the fault current, when an unloaded alternator subjected to single line to ground fault. 8M

OR

6. a) The voltages across a 3-phase load are V_a = 300 V, V_b = 300∠– 90° V and V_c = 800 ∠ 143.1° V respectively. Determine the sequence components of voltages. Phase sequence is abc. 7M

b) A 500 MVA, 50 Hz, 3-phase turbo-generator produces power at 22 kV. Generator is Y-connected and its neutral is solidly grounded. It Sequence reactance's are *X*1 = *X*2 = 0.15 pu and *X*0 = 0.05 pu.It is operating at rated voltage and disconnected from the rest of the system (no load). Find the magnitude of the sub-transient line current for single line to ground fault at the generator terminal 7M

UNIT–IV

7. a) Derive the expression for maximum steady state power 8M

b) Explain methods to improve steady state stability limit 6M

OR

8. a) Write short notes on following

i. Power angle diagram

ii. Steady state stability limit

iii. Synchronizing power coefficient 10M

b) List the assumptions used in deriving the power angle equation 4M

UNIT–V

9. a) Explain the effect of fault clearing time on stability 6M

b) Derive the expression for critical clearing angle and time when a 3 phase fault occurs on the transmission line 8M

OR

10. a) Explain equal area criterion in case of "**sudden loss of one parallel lines"** for analyzing transient stability? What happens if mechanical input is larger than maximum power transfer capability after above fault condition occurs? 8M

b) Explain the methods to improve transient stability analysis 6M

***