Hall Ticket Number :										

R-15

Code: 5G264

III B.Tech. II Semester Regular & Supplementary Examinations May 2019

Switch Gear and Protection

(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) Explain the following terms
   (i) Restriking voltage (ii) RRRV (iii) Recovery voltage (iv) Fuse 8M

   b) In a 132kV system, the reactance and capacitance up to the location of circuit breaker is 5Ω and 0.003μF respectively. Calculate value of critical resistance for suppressing transient oscillations. 6M

OR

2. a) Explain the principle, operation, advantages and disadvantage of oil circuit breaker? 8M

   b) In a short circuit test on a 220 kV. 3-phase CB with earthed neutral the following results were obtained. Fault p.f. is 0.4, recovery voltage is a 0.9 time of full line value, the breaking current is symmetrical and the restriking transient had a natural frequency of 10kHz. Determine RRRV, assuming that short circuit is an earthed fault. 6M

UNIT–II

3. a) Explain in detail the different comparators. 7M

   b) An IDMT type over-current relay is used to protect a feeder through 500/1 A CT. The relay has a Plug setting of 125% and TMS is 0.3. Find the time of operation of the Said relay if a fault current of 5000A flows through the feeder. Make use of the Following characteristics

PSM	2	3	5	8	10	15
Time for unity TMS(100% current)	10	6	4.5	3.2	3	2.5

7M

OR

4. a) Discuss the different types of distance relays? Compare their merits and demerits. 7M

   b) Discuss the principle of operation and construction of attracted armature relay with relevant diagram 7M

UNIT–III

5. a) Discuss the generators protection schemes against
   (i) stator faults (ii) rotor faults 8M

   b) An 11KV, 120MVA, star connected alternator has reactance of 1.5 per unit per phase and a negligible resistance. If is protected by a merz-price balance current system which operates when out of balance current exceeds 10% of the full load current. If the neutral point is earthed through a resistance of 4Ω, find the proportion of windings is protected against earth fault. 6M

OR

6. a) Explain the percentage differential relay protection for star/delta transformer with relevant diagram showing all essential details. 8M

   b) A 3-Ø transformer rated for 33/11KV is connected star/ delta and the corresponding CT on the LV side has a ratio of 300/5. Determine the ratio of transformer on the HV side. 6M

UNIT–IV

7. a) Explain the translay protection scheme for feeders. 7M

   b) Discuss the over-current protection scheme for ring mains. 7M

OR

8. a) With neat sketch ,discuss the differential scheme for bus-bar protection 7M

   b) Explain 3-zone protection using distance relays for transmission lines. 7M

UNIT–V

9. a) What are the characteristics of lightning arresters? 5M

   b) Explain the different methods of neutral grounding. 9M

OR

10 Write short notes on the following :

   a) Resistance grounding 4M

   b) Perterson coil grounding 5M

   c) Zinc-oxide lightning arrester 5M

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Hall Ticket Number :										

R-15

Code: 5G262

III B.Tech. II Semester Regular & 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)

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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

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Hall Ticket Number :										

R-15

Code: 5GA61

III B.Tech. II Semester Regular & Supplementary Examinations May 2019

Management Science

(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. Explain in detail, the meaning, nature, objectives and elements of Management.

OR

2. Define Management. Explain in detail, the various functions of Management

UNIT–II

3. Write a detailed note on the need for inventory control. Also discuss the various methods of inventory control.

OR

4. Discuss in detail, the concept of Product Life Cycle with a suitable example.

UNIT–III

5. Write a various detailed note on the various functions of Human Resource Management.

OR

6. Write a detailed note on the meaning, objectives and significance of Industrial Relations.

UNIT–IV

7. Write a detailed note on the various sources of financing.

OR

8. Write a detailed note on PERT and outline the significance and advantages of the same.

UNIT–V

9. Write a detailed note on the nature and significance of Value Analysis.

OR

10. Discuss in detail, with a suitable example, the role of Ethics in Business.

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Hall Ticket Number :										

R-15

Code: 5G466

III B.Tech. II Semester Regular & Supplementary Examinations May 2019

Object Oriented Programming Concepts

(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) List and explain the elements of object oriented programming. 7M
   b) Explain merits and demerits of Object Oriented methodology. 7M

OR

2. a) What is an array? How arrays are declared and initialized? Explain with examples. 7M
   b) What is a reference variable? Explain the usage of reference variable. 7M

UNIT–II

3. a) Explain function overloading and operator overloading with examples. 7M
   b) When do you use virtual base class? Explain with suitable example 7M

OR

4. a) Explain 'this' pointer with an example program. 4M
   b) Write a program to display all odd numbered files of a text file. 10M

UNIT–III

5. a) What are the operators available in java? Explain them in detail. 7M
   b) Discuss about primitive data types. 7M

OR

6. a) List five major difference between JAVA and C++. 7M
   b) Write the structure of java program. 7M

UNIT–IV

7. a) What is a package? How do you create a package in JAVA? 7M
   b) How to define a user exception in a program? Illustrate with an example. 7M

OR

8. Give a detail note on interfaces and packages in java with examples. 14M

UNIT–V

9. a) Describe Java's thread model. 7M
   b) Explain thread class extending in JAVA with suitable example. 7M

OR

10. a) What is an applet? Explain its life cycle. 7M
    b) Write a simple applet program to display a string "India won by 6 wickets". 7M

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Hall Ticket Number :										

R-15

Code: 5G261

III B.Tech. II Semester Regular & 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)

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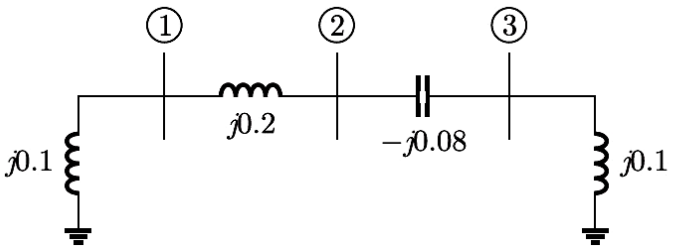
UNIT–I

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



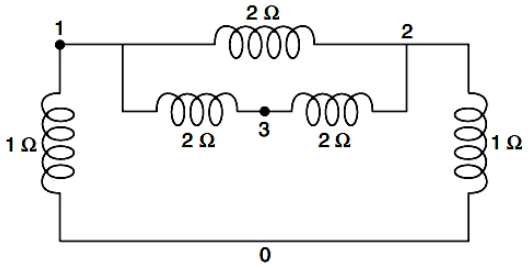
7M

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

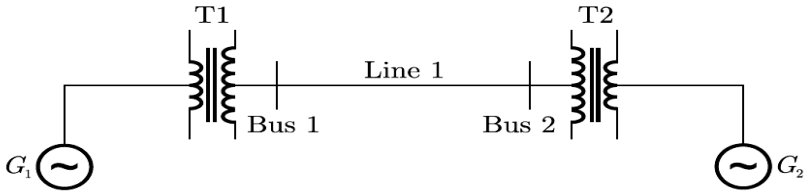
5. a) Draw the impedance diagram for the power system shown in the figure below, the specifications of the components are the following :

*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

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Hall Ticket Number :										

R-15

Code: 5G263

III B.Tech. II Semester Regular & 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)

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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

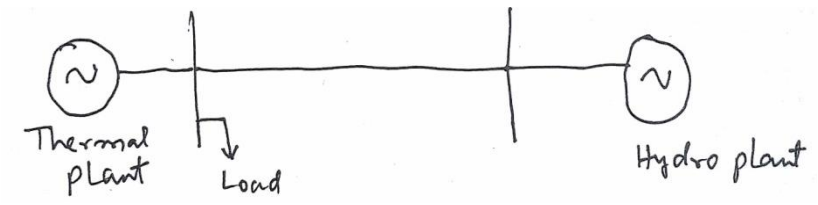

Fig 1 Two Plant System 8M

   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

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