

Power System Analysis
(Electrical & Electronics Engineering)

Max. Marks: 70

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

1. a) Prove $Y_{br} = KY_{Bus}K_t$ using non-singular transformation 7M
 b) Form Y_{Bus} for the network whose data is given in Table (take bus 1 as reference)

Element	Self		Mutual	
	Bus Code	Impedance	Bus Code	Impedance
1	1-2	0.6	1-2(1)	0.2
2	1-2	0.4		
3	1-3	0.5		
4	2-4	0.2	2-4(4)	0.1
5	2-4	0.4		
6	3-4	0.5		

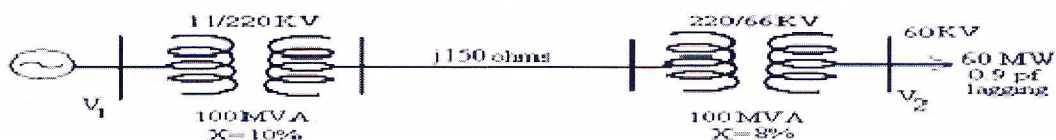
7M

2. a) Explain the merits and demerits of building Z_{bus} Algorithm 7M
 b) Build a Z_{bus} for the 3-bus system connection given as:

Element	Bus code	Impedance
1	1-2	$j0.1$
2	1-2	$j0.25$
3	1-3	$j0.1$
4	2-3	$j0.1$

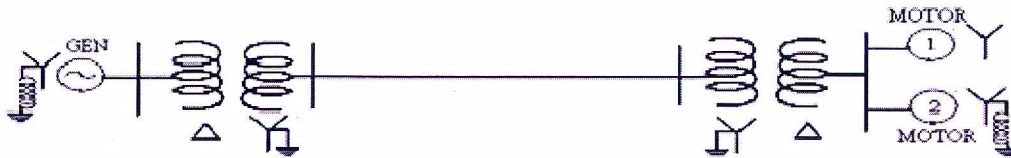
7M

3. a) Derive the basic equations for load flow studies and also write the assumptions and approximations to get the simple equations 7M
 b) Draw flow chart for load flow solution by Gauss-Seidel iterative method using Y_{bus} 7M
4. a) Derive necessary expressions for the off-diagonal and diagonal elements of the sub matrices J_1, J_2, J_3 and J_4 for carrying out a load flow study on power system by using N-R method in polar form. 7M
 b) Explain decoupled load flow method to find the solution of a system with the help of flow chart 7M
5. a) What are the types of series reactors? Explain its applications 7M
 b) A load of 60 MW at 0.9 power factor lagging is tapped from the 66KV substation which is to be maintained at 60 KV as shown in fig. Calculate the terminal voltage of the synchronous machine. Represent the transmission line and transformers by series reactance's only



7M

6. a) Derive the equation for fault current and line to ground voltages during single line to ground fault using symmetrical components 7M
- b) A 25 MVA, 11 KV, Three phase generator has a sub transient reactance of 25%. The generator supplies two motors over a transmission line with transformers at both ends as shown in one line diagram of the following fig the motors has rated inputs of 15 and 7.5 MVA, both 10 KV with 30% sub transient reactance the three phase transformers are both rated 30MVA, 10.8/121 KV, connection Δ -Y with leakage reactance of 15% each. the series reactance of line is 150 ohms. Draw the positive and negative sequence networks of the system assume negative sequence reactance is equal to its sub transient reactance



7. a) Define steady state stability limit. (b) Derive steady state stability limit of a line with generalized circuit constants of A, B, C and D if sending end and receiving end voltages are V_s and V_r . 7M
- b) A 50 Hz four pole turbo generator rated 100MVA, 11 KV has an inertia constant of 8.0MJ/MVA.
- Find the stored energy in the rotor at synchronous speed.
 - If the mechanical input is suddenly raised to 80 MW for an electrical load of 50 MW, find the rotor acceleration, neglecting mechanical and electrical losses.
 - If the acceleration calculated in part b is maintained for 10 cycles find the change in torque angle and the rotor speed in revolutions per minute at the end of this period. 7M
8. a) What are the assumptions made in deriving swing equation 7M
- b) How do you define the transient stability of a power system? How can you model the transmission line, load and alternators in transient stability studies 7M

III B.Tech II Semester Regular & Supplementary Examinations May 2015

Power System Operation and Control
(*Electrical & Electronics Engineering*)**Time: 3 hours****Max Marks: 70***Answer any FIVE of the following*
All questions carry equal marks (14 Marks each)

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1. a) What is an incremental fuel cost? How is it used in thermal plant operation? 7M
- b) Name the components of production cost and explain. 7M
2. a) Give various uses of general loss formula and state the assumptions made for calculating B_{mn} coefficients. 7M
- b) The fuel cost for a two unit steam power plant are given by

$$C_1 = 0.1 P_1^2 + 25 P_1 + 1.6 \text{ Rupees/hour}$$

$$C_2 = 0.1 P_2^2 + 32 P_2 + 2.1 \text{ Rupees/hour}$$
 Where p's are in megawatt. If there is an error of 1% in the representation of the input data, find the loss in operating economy for a load of 250 MW. 7M
3. Explain about Hydro thermal co-ordination with necessary equations. 14M
4. a) Derive the small signal transfer function with block diagram of speed governing system. 7M
- b) Draw the block diagram of IEEE type-I excitation model and explain. 7M
5. a) With a first order approximation explain the dynamic response of an isolated area for load frequency control. 7M
- b) Develop the model of single control area and obtain its block diagram representation. 7M
6. a) For two-area load frequency control with gain blocks, derive an expression for steady values of change in frequency and tie line power for simultaneously applied unit step load disturbance inputs in the two areas. 7M
- b) Explain load frequency control problem in a Multi-area power system. 7M
7. a) Explain series and shunt compensation in power system. 7M
- b) Compare the different types of compensating equipment for transmission systems. 7M
8. a) Explain about restructuring power system. 7M
- b) Write the key issues of the deregulation of the power systems. 7M

Utilization of Electrical Energy
(Electrical & Electronics Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE of the following
All questions carry equal marks (14 Marks each)

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1. a) What is an electric drive? Classify various types of electric drives and discuss their merits and demerits
b) Discuss various factors which effect the selection of motor for a particular drive
2. a) Explain the procedure for design of heating element
b) A 20 KW single phase, 220V resistance oven employs circular nichrome wire for its heating element. If the wire temperature is not to exceed 1127°C and the temperature of the charge is to be 427°C , calculate the size and length of wire required. Assume $e = 0.9$ and radiation efficiency $K = 0.6$.
3. Explain the following
 - i) Steam Welding
 - ii) Projection Welding
 - iii) Butt Welding
4. a) What is photometry? Describe photovoltaic method of photometry and discuss its limitations.
b) Determine the height at which a light source having uniform spherical distribution should be placed over a floor in order that the intensity of horizontal illumination at a given distance from its vertical line may be greatest.
5. a) Explain the operation of sodium vapour lamp with neat diagram
b) A building measuring $30\text{m} \times 20\text{m}$ is to be floodlit on the front side with brightness of 25 lumen/sq.metre. Coefficient of reflection of building surface is 0.25. Lamps of 500 W having lumens output of 8000 each are used. Assuming beam factor as 0.6, waste light factor 1.2 and maintenance factor as 0.75, determine the number of lamps required.
6. Explain the various methods of electric braking. State the conditions to be fulfilled for each method of braking.
7. A 200/tonne motor coach train has four motors each developing a shaft torque of 5000 N-m during the acceleration period. The gear ratio of motors is 3.6:1 and gear efficiency 90%. The wheel diameter is 91.5 cms, train resistance 40 Newton per tonne and allow 10% for the effect of rotational inertia. Determine the time taken by the train to attain a speed of 40 km.p.h. starting from rest on a gradient 1 in 200.
8. a) Define the term Coefficient of adhesion and explain the factors on which it depends.
b) Write a short note on specific energy consumption.

Code : 1G468

R-11

III B.Tech. II Semester Regular Examinations, May 2015

Computer System Architecture
(Electrical & Electronics Engineering)

Max. Marks: 70

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

1. a) Explain about tri-state buffers. Explain the construction of bus with tri-state buffers. 8M
b) Explain about error detection code using odd parity bit. 6M
2. a) Explain any four memory reference instructions in detail. 7M
b) Explain instruction cycle with the help of a flow chart. 7M
3. What is an addressing mode? Explain various addressing modes with suitable examples. 14M
4. a) Explain address sequencing in microprogrammed control unit. 7M
b) Explain about the functioning of a control unit. 7M
5. a) Draw a flow chart which explains multiplication of two signed magnitude fixed point numbers. 6M
b) Multiply 10111 with 10011 with the Booth multiplication algorithm. 8M
6. a) Explain memory hierarchy 4M
b) Explain Associative memory in detail. 10M
7. a) What is Direct Memory Access? Explain the working of DMA. 7M
b) Draw the flow chart for CPU-IOP communication 7M
8. a) Explain the concept of Parallel Processing 7M
b) Briefly explain about all inter connection structures 7M

Managerial Economics and Financial Analysis
(Common to EEE & CSE)

Time: 3 hours

Max Marks: 70

Answer any FIVE of the following
All questions carry equal marks (14 Marks each)

* * * * *

1. Define Managerial Economics? Briefly explain its Nature and Scope?
2. What is Law of Demand? Explain about law of demand and its exceptions?
3. From the following calculate Break Even in terms of Units and sales volume.
Selling Price per unit Rs.60
Variable Cost per unit Rs.40
Total Fixed Cost Rs.40000
4. What is perfect Competition and how price is determined in case of Perfect Competition?
5. Define Public Sector Enterprise? Explain its Merits and De-merits?
6. Charan and Co. has at hand two proposals namely M&N. The cost of the proposals in both cases is Rs. 5,00,000. A discount factor of 12% may be used to evaluate the proposals. The cash flows after taxes are as under:

Year	1	2	3	4	5
M	150000	200000	250000	150000	100000
N	50000	150000	200000	300000	200000

Which one will you recommend under Net Present Value Method?

7. What do you mean by the term Accounting? Briefly explain about concepts and conventions of Accounting?
8. The following Balance Sheet belongs to Bindu Ltd.,

Share Capital [2000 Shares of 2,00,000 Rs. 10 each]		Land and Building	1,50,000
Reserves	50,000	Machinery	75,000
Bills Payable	50,000	Stock (inventory)	2,00,000
Creditors	1,86,000	Debtors	50,000
		Bank	10,000
		Cash	1,000
	4,86,000		4,86,000

calculate the Following Ratios

- a. Current Ratio b. Acid Test Ratio c. Cash Position Ratio

Microprocessors and Microcontrollers
(Electrical & Electronics Engineering)

Max. Marks: 70**Time: 03 Hours**

Answer any five questions

All Questions carry equal marks (14 Marks each)

1. With a neat sketch explain in detail the internal architecture of 8086 microprocessor. 14M

2. a) What are assembler directives? Explain. 7M
b) Write an ALP to perform addition of two Hexa decimal numbers. 7M

3. a) Explain seven segment display interfacing with 8086 microprocessor with neat diagram. 7M
b) Briefly explain the methods of I/O Interfacing. 7M

4. a) Explain the architecture of 8257. 7M
b) Differentiate SRAM and DRAM. 7M

5. a) Explain about the priority based interrupt controls. 7M
b) With a pin diagram explain 8259 PIC microcontroller. 7M

6. a) Explain the standards of RS-232C. 7M
b) Explain Serial and Parallel data transfer schemes. 7M

7. a) Explain the Addressing modes of 8051 microcontroller. 6M
b) Explain the following registers
(i) SCON
(ii) TCON
(iii) TMOD
(iv) PCON 8M

8. a) Explain important features of ARM microcontroller. 4M
b) Explain with a neat sketch the pin diagram and internal architecture of ARM. 10M
