

IV B.Tech I Semester Supplementary Examinations, March 2013
ELECTRICAL DISTRIBUTION SYSTEMS
(Electrical & Electronics Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Define coincidence factor and contribution factor.
(b) Obtain the relation between the load factor and loss factor. [6+10]
2. (a) Explain radial type primary feeder with neat diagram.
(b) Assume that feeder has a length of 2 miles and that the new feeder uniform loading has increased to 3 times the old feeder loading. Determine the new maximum length of the feeder with the same percent voltage drop if the new feeder voltage level is increased to 34.5kV from the previous voltage level of 12.47kV. [8+8]
3. Derive the equation for 'k' constant in voltage drop calculations of substation supplied with 'n' primary feeders. [16]
4. Illustrate the computation of the voltage drop of a balanced three phase feeder, supplied at one end in terms of the load and the line parameters. [16]
5. What are common types of faults in a single phase 2-wire and 3-wire system. Explain how fault current is computed with proper single line diagrams. [16]
6. (a) Explain the salient points in general co-ordination procedure.
(b) Explain Fuse-Recloser coordination. [8+8]
7. (a) Compare and explain the role of shunt and series capacitors in power factor correction.
(b) Explain how reduction in line current and hence power losses is obtained with p.f improvement. [8+8]
8. (a) Write a short notes on any two methods of voltage control?
(b) Write the ways to improve the distribution system overall voltage regulation? [10+6]



IV B.Tech I Semester Supplementary Examinations, March 2013
ELECTRICAL DISTRIBUTION SYSTEMS
(Electrical & Electronics Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What is meant by load modeling and give their characteristics?
(b) Define the following:
 - i. Coincidence factor
 - ii. Load factor
 - iii. Loss factor
 - iv. Contribution factor. [8+2×4]
2. (a) Assume that the service area of a given feeder is increasing as a result of new residential developments. Determine the new load and area that can be served with the same percent voltage drop if the new feeder voltage level is increased to 34.5 kV from the previous voltage level of 12.47kV.
(b) Discuss in detail the factors which influence the selection of primary feeder rating. [8+8]
3. Show that percentage $VD_n = \frac{2}{3} k DI_n^3 \tan(360^\circ/2n)$ for a substation service area served with 'n' primary feeders. [16]
4. A 1- Φ feeder circuit has total impedance $(1+j3)$ ohms, receiving end voltage is 11kV and current is $50\angle -30^\circ$ A. Determine:
 - (a) p.f. of load
 - (b) load p.f. for which the drop is maximum
 - (c) load p.f. for which impedance angle is maximum and derive the formula used. [16]
5. Describe the principle of operation of:
 - (a) fuses
 - (b) Circuit breakers
 - (c) Line sectionalizer
 - (d) circuit recloser. [4×4]
6. (a) What is the data required for the general coordination procedure?
(b) Explain Fuse-Recloser coordination procedure. [8+8]

7. A 37.3KW induction motor has a p.f 0.9 and efficiency 0.9 at full load , power factor 0.6 and efficiency 0.7 at half load. At no load, the current is 25% of the full load current and p.f 0.1. capacitors are supplied to make the line power factor 0.8 at half load. With these capacitors in circuit , Find the line power factor at :
- (a) Full load and
 - (b) no load. [8+8]
8. (a) Write short notes on any two methods of voltage control?
- (b) Voltage control and p.f. correction are necessary in power systems? Explain. What are the disadvantages of low voltage and low p.f. of the system? [6+10]

IV B.Tech I Semester Supplementary Examinations, March 2013
ELECTRICAL DISTRIBUTION SYSTEMS
(Electrical & Electronics Engineering)

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Assume that a load of 100kW is connected at the riverside substation. The 15min. weekly maximum demand is given as 75kW, and the weekly energy consumption is 4200kWh. Assuming a week is 7 days, find the demand factor and the 15min. weekly load factor of the substation.
(b) Classify different types of distribution loads and specify their voltage levels. [8+8]
2. Explain the different types of primary feeders in distribution system. [16]
3. Compare the four and six feeder patterns of substation service area if they are thermally loaded. [16]
4. (a) Prove the power loss due to the load currents in the conductors of single phase lateral ungrounded neutral case is 2 times large than one in the equivalent three phase lateral.
(b) Prove the power loss due to load currents in the conductors of the single phase two-wire ungrounded lateral with full capacity neutral is 6 times larger than the one in the equivalent 3- Φ , 4 wire lateral. [8+8]
5. (a) Explain when Maximum faults and Minimum faults occur in distribution system.
(b) The per unit positive, negative and zero sequence impedances of a distributed network are 0.08, 0.08 and 0.05 respectively. Determine the fault current for L-L and L-G faults. [10+6]
6. Explain general coordination procedure and explain Recloser-Recloser coordination. [16]
7. (a) A 440V,3-ph distribution feeder having a load of 100KW at lagging p.f and the load current is 200A if it is desired to improve the p.f, Determine the following:
 - i. The uncorrected p.f and reactive load.
 - ii. The new corrected p.f after installing a shunt capacitor of 75KVAR.(b) Explain about series compensation. [10+6]
8. (a) Briefly explain the line drop compensation on voltage control.
(b) Voltage control and p.f. correction are necessary in power systems? Explain. What are the disadvantages of low voltage and low p.f. of the system? [6+10]

Code No: M0228/R07

Set No. 3



IV B.Tech I Semester Supplementary Examinations, March 2013
ELECTRICAL DISTRIBUTION SYSTEMS
(Electrical & Electronics Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Why loads are classified in distribution systems and how they are classified? Also explain their different characteristics. [2+4+10]

2. (a) Explain basic design practice of the secondary distribution system.
(b) List out the various factors which influences the primary feeder loading. [8+8]

3. (a) Discuss various factors to be considered in loading a substation.
(b) Give detailed analysis of square shaped service area of substation. [6+10]

4. Derive the expression for voltage drop and power loss for 3 phase balanced system and non-three phase system. Compare both of them. [16]

5. (a) Explain when Maximum faults and Minimum faults occur in distribution system.
(b) The per unit positive, negative and zero sequence impedances of a distributed network are 0.08, 0.08 and 0.05 respectively. Determine the fault current for L-L and L-G faults. [10+6]

6. (a) Explain general coordination procedure.
(b) Explain Fuse- Circuit breaker coordination. [8+8]

7. (a) How is economical p.f arrived at for a given distribution system with different loads.
(b) Explain shunt capacitors compensation. [8+8]

8. (a) Define:
 - i. Voltage Regulation
 - ii. Voltage drop
 - iii. Nominal voltage
 - iv. Rated voltage
 - v. Utilization voltage
 - vi. Maximum voltage
 - vii. Minimum voltage.
(b) Explain the line drop compensation on voltage control. [8+8]



IV B.Tech I Semester Supplementary Examinations, March 2013
POWER PLANT ENGINEERING
(Common to Mechanical Engineering and Mechatronics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Why the development of Nuclear power is slow in india?
(b) What is the present position of power in india? Why india will not free from power crisis in future? [6+10]
2. (a) Describe burning sequence of coal in 'overfeed' and 'under feed' slothers?
(b) What are the requirements of burners used for firing pulverised coal? [8+8]
3. Describe the procedure for testing diesel power plant performance. How is plant maintenace is carried out. [16]
4. (a) Draw the arrangement of combined cycle and explain its working.
(b) List out the advantages of combined cycle. [16]
5. (a) Explain various safety measures required to be taken for safe operation of a hydraulic power plant.
(b) How are dams classified? [8+8]
6. (a) List out the advantage and disadvantage of wind power.
(b) Explain the present wind power position in India. [8+8]
7. Explain with the help of the neat diagram the construction and working of the nuclear power plant. [16]
8. (a) What are the main pollutants from a power station? What is meant by air pollution?
(b) What are the effects of SO₂, NO₂ and hydrocarbons on human and vegetation? [8+8]

IV B.Tech I Semester Supplementary Examinations, March 2013
POWER PLANT ENGINEERING
(Common to Mechanical Engineering and Mechatronics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Name and explain the various sources of energy.
(b) what are the various types of solid fuels? Describe. [8+8]
2. (a) Briefly describe different types of coal.
(b) What is fluidised bed combustion system. Sketch and describe FBC system? [6+10]
3. (a) What are the advantages of diesel power plant?
(b) Explain with necessary diagram different fuel injection systems used in diesel engine plant. [6+10]
4. In a gas turbine power plant working on Joule cycle, air is compressed from 1 kg/cm² and 17⁰C through a pressure ratio of 6. It is then heated in the combustion chamber to 200⁰C and expanded to a pressure of 1kg/cm². Calculate the following
(a) Cycle efficiency
(b) Work ratio
(c) Specific work out put. [16]
5. Draw a neat sketch of a power house and describe the main features of sub-structure and super structure. [16]
6. What central arrangements are used with a wind mill when the speed of wind exceeds the rated speed? Illustrate your answer with a neat sketch. [16]
7. Explain the properties of moderator used in nuclear reactor. Explain the operation of a sodium graphite reactor with a sketch. [16]
8. (a) What do understand by acid rains? What are the reasons of this? How are they controlled?
(b) Explain the pollution due to nuclear power plant. [8+8]

IV B.Tech I Semester Supplementary Examinations, March 2013
POWER PLANT ENGINEERING

(Common to Mechanical Engineering and Mechatronics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Describe different equipments used for coal unloading at the plant site.
(b) Discuss different types of coal conveyors? Indicate the use of each. [8+8]
2. Describe the working of hot - lime soda process with a neat sketch giving different chemical reactions. What are the advantages and disadvantages of the system?[16]
3. A four stroke diesel engine gives the following test results at a speed of 450 rpm.
Mean effective pressure = 8 bar
Cylinder bore = 22 cm
Stroke length = 26 cm
Specific fuel consumption = 0.4 kg/kw-hr
Calorific value of fuel = 42000 kJ/kg
Mechanical efficiency = 38%
determine
(a) BP
(b) IP
(c) Indicated thermal efficiency
(d) Brake thermal efficiency. [16]
4. (a) Write short notes on:
i. Inter cooler
ii. Heat exchanger
(b) With the aid of neat sketches briefly describe different arrangements of power plant. [8+8]
5. What topographical features are infavour of underground power house? What are the different types of under ground power stations? Draw neat layout of each. [16]
6. What is the basic difference between thermo-electric and thermionic conversion systems? Explain the working of thermionic systems with neat sketches and explain the effects of those factors which control the power generation capacity. [8+8]
7. (a) What factors are considered in selecting an economical site for nuclear power plant.
(b) List out the advantages and disadvantages of nuclear plants over conventional thermal plants. [8+8]

Code No: M0328/R07

Set No. 3

8. (a) Explain briefly the following:
- i. Capital or fixed cost
 - ii. operational cost
- (b) What are the effects of SO₂, NO₂ and hydrocarbons on the human and crop lives? [8+8]



IV B.Tech I Semester Supplementary Examinations, March 2013
POWER PLANT ENGINEERING
(Common to Mechanical Engineering and Mechatronics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Draw a line diagram of hydraulic ash handling system. Discuss its merits with other systems.
(b) How ash handling system differs from dust handling system. [10+6]
2. (a) Describe the working of demineralizing water treatment system with a neat sketch.
(b) List out merits of this system over other systems. [10+6]
3. (a) Explain the main features of super charging with the help of P-V diagram.
(b) What is the difference between mechanical super charging and turbo charging? What is the effect of inter cooling in turbo charging? [6+10]
4. (a) Write short notes on:
 - i. Inter cooler
 - ii. Heat exchanger(b) With the aid of neat sketches briefly describe different arrangements of power plant. [8+8]
5. (a) Explain with a diagram pumped storage plant.
(b) What is a surge tank? Explain with a diagram inclined surge tank. [8+8]
6. (a) What are the factors affecting the suitability of site for tidal power plant?
(b) Differentiate single basin and double basin systems. [8+8]
7. (a) How nuclear reactors are classified?
(b) With the help of a neat diagram explain sodium graphite reactor. [8+8]
8. (a) Explain
 - i. Plant use factor
 - ii. Plant capacity factor
 - iii. load factor.(b) A central power station has annual factors as follows: Load factor =60%
Capacity factor= 40%
Use factor=50%
Power station has a maximum demand of 15MW. Determine
 - i. Annual energy production

Code No: M0328/R07

Set No. 4

- ii. Reverse capacity over and above peak load
- iii. Hours per year not in service.

[8+8]



IV B.Tech I Semester Supplementary Examinations, March 2013
COMPUTER NETWORKS
(Common to Electronics & Communication Engineering, Electronics &
Instrumentation Engineering, Bio-Medical Engineering, Mechatronics and
Electronics & Telematics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Write short notes on the following:
 - (a) Client server model
 - (b) MAN
 - (c) Interfaces and services. [4+6+6]
2. (a) Television channels are 6MHz wide. How many bits/sec can be sent if four level digital signals are used? Assume a noiseless channel
- (b) How does a virtual circuit differ from a physical circuit? What advantages would a virtual circuit provide? [8+8]
3. (a) Explain one-bit sliding window protocol. Give the advantages and disadvantages of one-bit sliding window protocol?
- (b) Discuss the services provided by the data link layer to the network layer? [8+8]
4. (a) What is the prime difference between a token bus and a token ring?
- (b) A large population of ALOHA users manages to generate 50 requests/sec, including both originals and retransmissions. Time is slotted in the units of 40 msec.
 - i. What is the chance of success on the first attempt?
 - ii. What is the probability of exactly k collisions and then a success?
 - iii. What is the expected number of transmission attempts needed? [4+12]
5. Routing can be classified in to two types Source routing and hop-by-hop routing. In source routing, source determines the complete route, places the route in the packet header and intermediate routers just switch packets from one link to other link. In hop-by-hop routing each router maintains a routing table and when packet arrives on input link it places it on output link based on routing table. Compare the relative advantages & disadvantages of these two routing approaches. [16]
6. (a) What do we mean when we say IP is a best-effort delivery service? Explain.
- (b) Which fields in IP header change and which fields are fixed as the packet goes from source to destination?
- (c) How source quench is supported by ICMP?

- (d) What the advantages of IPv6 over IPv4? [4+3+4+5]
7. (a) What is the relation between Virtual path and Virtual circuit? How they are used for cell switching?
- (b) Why AAL 3 & AAL 4 are combined to form AAL 3/4?
- (c) What is SSCOP? [8+4+4]
8. (a) What is MPEG? How audio & Video are encoded using MPEG?
- (b) How video is played on Demand? [8+8]



IV B.Tech I Semester Supplementary Examinations, March 2013
COMPUTER NETWORKS
(Common to Electronics & Communication Engineering, Electronics &
Instrumentation Engineering, Bio-Medical Engineering, Mechatronics and
Electronics & Telematics)

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Compare point -to-point channels with broadcast channels along with suitable examples?
(b) A collection of five routers is to be collected in a point-to-point subnet. Between each pair of routers, the designers may put a high speed line, a medium-speed line, a low-speed line, or no line. If it takes 100ms of computer time to generate and inspect each topology, how long will it take to inspect all of them to find the one that best matches the expected load? [8+8]
2. (a) With a neat diagram discuss about the electromagnetic spectrum?
(b) Make a comparison of circuit switching, message switching and packet switching with a diagram showing the timing of events? [6+10]
3. (a) Discuss the error control technique which is commonly used in data network. What value of N is used in go-back-N ARQ technique used in ARPANET and why?
(b) Imagine that you are writing the data link software for a line used to send data to you, but not from you. The other end uses HDLC, with a 3-bit sequence number and a window size of seven frames. You would like to buffer as many out of sequence frames as possible to enhance efficiency, but you are not allowed to modify the software on the sending side. Is it possible to have a receiver window greater than one, and still guarantee that the protocol will never fail? If so, what is the largest window that can be safely used? [8+8]
4. (a) Compare the five different types of cabling (Ethernet)
(b) A 1-km long, 10-Mbps CSMA/CD LAN (not 802.3) has a propagation speed of 200 m/ μ sec. Data frames are 256 bits long, including 32 bits of header, checksum, and other overhead. The first bit slot after a successful transmission is reserved for the receiver to capture the channel to send a 32-bit acknowledgment frame. What is the effective data rate, excluding overhead, assuming that there are no collisions? [8+8]
5. Consider establishing physical connection, establishing virtual circuit, and using datagrams. In the context of wired networks which one is preferred and why. In the context of mobile networks which one is preferred and why. [16]
6. (a) How Tunneling helps in connecting two different networks?

- (b) How routing in inter-network is different from routing in subnet? [8+8]
7. (a) Network layer can provide both connection oriented service and connection less service. Similar is the case with Transport layer, then why two different layers are required.
- (b) What are the Transport layers Quality of Service parameters? [8+8]
8. (a) What is multimedia? What are the problems with Audio and Video transfer over computer network?
- (b) How images are compressed using JPEG? [8+8]

IV B.Tech I Semester Supplementary Examinations, March 2013
COMPUTER NETWORKS
(Common to Electronics & Communication Engineering, Electronics & Instrumentation Engineering, Bio-Medical Engineering, Mechatronics and Electronics & Telematics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What are the advantages of having layered architecture? Mention the layers of ISO-OSI reference model?
(b) What is Internet? Mention some of the applications of Internet? [8+8]
2. (a) Television channels are 6MHz wide. How many bits/sec can be sent if four level digital signals are used? Assume a noiseless channel
(b) How does a virtual circuit differ from a physical circuit? What advantages would a virtual circuit provide? [8+8]
3. (a) Discuss the error control technique which is commonly used in data network. What value of N is used in go-back-N ARQ technique used in ARPANET and why?
(b) Imagine that you are writing the data link software for a line used to send data to you, but not from you. The other end uses HDLC, with a 3-bit sequence number and a window size of seven frames. You would like to buffer as many out of sequence frames as possible to enhance efficiency, but you are not allowed to modify the software on the sending side. Is it possible to have a receiver window greater than one, and still guarantee that the protocol will never fail? If so, what is the largest window that can be safely used? [8+8]
4. (a) Discuss the principle of operation of control token MAC method and with the aid of diagram. Explain how it may be used with both a bus and ring network topology ?
(b) A LAN uses Mok and Ward's version of binary countdown. At a certain instant, the ten stations have the virtual station numbers 8, 2, 4, 1, 7, 3, 6, 9, and 0. The next three stations to send are 4, 3, and 9, in that order. What are the new virtual station numbers after all three have finished their transmissions? [8+8]
5. (a) Consider a networking environment which is highly dynamic and in which topology & traffic changes quickly. In such an environment, what are characteristics that should be possessed by a routing algorithm.
(b) How multipath routing helps in such an environment. [10+6]
6. (a) How congestion is controlled in ATM?

Code No: N0421/R07

Set No. 3

- (b) Explain ATM LAN emulation. [8+8]
7. Explain in detail about ATM AAL layer protocols? [16]
8. (a) What are the facilities available on the web for locating information?
(b) How web can be used for e-commerce? [8+8]



IV B.Tech I Semester Supplementary Examinations, March 2013
COMPUTER NETWORKS
(Common to Electronics & Communication Engineering, Electronics &
Instrumentation Engineering, Bio-Medical Engineering, Mechatronics and
Electronics & Telematics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Make a technical comparison between OSI & TCP/IP reference model.
(b) "Novell Netware looks more like TCP/IP than like OSI". Justify. [8+8]
2. (a) Television channels are 6MHz wide. How many bits/sec can be sent if four level digital signals are used? Assume a noiseless channel
(b) How does a virtual circuit differ from a physical circuit? What advantages would a virtual circuit provide? [8+8]
3. (a) Discuss about character stuffing and bit stuffing framing techniques with examples? Mention their advantages and disadvantages?
(b) Discuss about the simple protocol for a noisy channel? [8+8]
4. (a) What is the prime difference between a token bus and a token ring?
(b) A large population of ALOHA users manages to generate 50 requests/sec, including both originals and retransmissions. Time is slotted in the units of 40 msec.
 - i. What is the chance of success on the first attempt?
 - ii. What is the probability of exactly k collisions and then a success?
 - iii. What is the expected number of transmission attempts needed? [4+12]
5. (a) Consider a networking environment which is highly dynamic and in which topology & traffic changes quickly. In such an environment, what are characteristics that should be possessed by a routing algorithm.
(b) How multipath routing helps in such an environment. [10+6]
6. (a) When RARP is required. Explain how it works. What is the limitation of RARP? How BOOTP provides solution for it?
(b) What is the difference between classful addressing and classless addressing? How classless addressing results in decrease in the table size?
(c) Give an argument why the leaky bucket algorithm should allow just one packet per tick, independent of how large the packet is. [6+5+5]
7. (a) Give a potential disadvantage when Nagle's algorithm is used on a badly congested network.

- (b) Consider the effect of using slow start on a line with a 10-msec round trip time and no congestion. The receive window is 24KB and the maximum segment size is 2 KB. How long does it take before the first full window can be sent?
- (c) Suppose that the TCP congestion window is set to 18K bytes and a timeout occurs. How big will the window be if the next four transmission bursts are all successful? Assume that maximum segment size is 1 KB. [6+5+5]
8. (a) How POP works? What are the advantages of IMAP over POP?
- (b) What is the role played by message transfer agent? Explain. [6+10]
