AR18

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular Examinations, February-2022
TRANSPORTATION ENGINEERING-II
(Civil Engineering)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Discuss about factors responsible for the development of creep and effects of creep?	6M
	b)	Write about the functions and requirement of the good ballast.	6M
		(OR)	
2.	a)	Write about the functions and Requirements of the Sleepers?	6M
	b)	Discuss about the Basic Requirements of an Ideal Alignment?	6M

UNIT-II

3.	a)	Describe the different types of station yards?	6M
	b)	Define rail joint. Explain the different categories of rail joints with neat sketch	6M
		(OR)	
4.	a)	Explain shortly i) Cant deficiency ii) Negative super elevation	4M
	b)	If a 8° curve track diverges from a main curve of 5° in an opposite direction in the layout of a B.G. yard, calculate the superelevation and the speed on the branch line, if the maximum speed permitted on the main line is 45km.p.h.	8M

UNIT-III

5.	a)	Explain i) Starter signal ii) Outer signal iii) Home Signal	6M
	b)	Describe the different types of turnouts and draw a neat sketch of left hand turnout.	6M
		(OR)	
6.	a)	Write down the objects of signaling and engineering principle of signaling?	6M
	b)	What are the essential requirements and characteristics of Good crossing?	6M

UNIT-IV

7.	a)	List the factors to be considered for the selection of site for a commercial airport.	4M
	b)	The length of a runway at mean sea level, standard temperature and zero gradients is 1650m. The site has an elevation of 340m, with a reference temperature of 33.6ºC. The runway has to be constructed with an effective gradient of 0.25%. Determine the actual length of the runway at site	8M
		(OR)	
8.	a)	Write shortly about the Aircraft Characteristics which affect the planning and design of airports.	7M
	b)	What are the factors that influence the airport site selection?	5M

UNIT-V

9.	a)	Draw a neat sketch of artificial harbour, explain the various components.	7M
	b)	Define break water. Explain any one type.	5M
		(OR)	
10.	a)	Write about the dry and wet docs	6M
	b)	Explain in Detail about Classification of good ports?	6M

CODE: 18EEE441   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular Examinations, February-2022

POWER SYSTEM OPERATION AND CONTROL
(Electrical and Electronics Engineering)

Time: 3 Hours   **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Derive the coordination equation of economic dispatch by considering transmission line losses.   6M

   b) Incremental fuel costs in Rs/MWh for a plant consisting of two units are   6M

   $$\frac{df_1}{dpg_1} = 0.2\,pg_1 + 40 \qquad \frac{df_2}{dpg_2} = 0.25\,pg_2 + 30$$

   Assume both units are operating at all times and total load varies from 40MW to 250MW and maximum and minimum loads are to be 125 and 20MW respectively. How will the loads be shared between the two units as the system load varies in steps of 50MW over full range? What are the corresponding values of the plant incremental costs

(OR)

2. a) Derive the loss coefficients of the transmission network.   6M
   b) The fuel inputs of two thermal plants are given by   6M

   $$C_1 = (0.015P_1^2 + 16P_1 + 50)\ Rs/hr$$
   $$C_2 = (0.025P_2^2 + 12P_2 + 50)\ Rs/hr$$

   Where P is in MW The loss coefficients of the system are given by $B_{11}=0.005$, $B_{12}=-.0012$ and $B_{22}=0.022MW$. determine the economic operating schedule and the corresponding cost of generation if the transmission line losses are co-ordinate

UNIT-II

3. a) Explain the need of unit commitment problem.   4M
   b) Explain the dynamic programming method of solving unit commitment.   8M

(OR)

4. a) Explain the constraints in unit commitment problem.   5M
   b) Explain problem formation of short term Hydro Thermal scheduling   7M

UNIT-III

5. a) Explain different parts of speed governing system.   7M
   b) Two generators rated 300MW and 600MW are operating in parallel. The drop characteristics of their governors are 4% and 5% respectively from no- load to full load. Assuming that the generators are operating at 50 Hz at no load, How should be a load of 600MW be shared between them?   5M

(OR)

6. a) Explain the necessity of maintaining constant frequency in power system operation. 6M
   b) Develop dynamic response of a load frequency control of an isolated power system 6M

UNIT-IV

7. a) Derive an expression for steady state change of two area control system 6M
   b) Derive the expression for the change in tie-line power when the loads change in the control areas 6M

(OR)

8. Explain two area control load frequency system with block diagram and derive the expression for $ACE_1(s)$ and $ACE_2(s)$ 12M

UNIT-V

9. a) What is load compensation? Explain its objectives in power systems. 6M
   b) Classify different methods of reactive power control in transmission line and explain any one method 6M

(OR)

10. a) Explain the uncompensated and compensated transmission lines. 6M
    b) Explain the need of FACTS devices in power system and mention different types of it. 6M

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AR18

CODE: 18MEE421 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular Examinations, February,2022
PROJECT MANAGEMENT AND OPERATIONS RESEARCH
(Mechanical Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What are the stages of project management? 6M
    b) What are the project contract types? 6M

(OR)

2. a) What are the 4 main roles in a project team? 6M
    b) How to motivate and inspire your team to achieve better results. 6M

UNIT-II

3. 12M

Activity	1-2	1-4	2-3	3-5	3-8	4-8	5-6	5-8	6-7	7-8	7-9	8-9	9-10
Duration (days)	4	36	2	15	10	2	4	9	9	9	8	20	20

From the above data find critical path by constructing network diagram. Determine project completion time. Compute float of non-critical activities

(OR)

4. The data related to a small project consisting of different activities are given below 12M

Activity	Normal Duration	Normal cost	Crash Duration	Crash cost
(1,2)	8	100	6	200
(1,3)	4	150	2	350
(2,4)	2	50	1	90
(2,5)	10	100	5	400
(3,4)	5	100	1	200
(4,5)	3	80	1	100

Indirect cost = Rs.70 per day. For the above given data draw the network and find the optimum duration and cost.

UNIT-III

5. Use simplex method to solve: 12M

Maximize $z = 3X_1 + 2X_2$

subject to: $-X_1 + 2X_2 \leq 4$

$3X_1 + 2X_2 \leq 14$

$X_1 - X_2 \leq 3$

$X_1, X_2 \geq 0$

(OR)

6. Strong Book Binder has one printing machine, one binding machine, and the manuscripts of a number of different books. Processing times are given in the following table: **12M**

Book	Time in Hours	
	Printing	Binding
A	5	2
B	1	6
C	9	7
D	3	8
E	10	4

We wish to determine the order in which books should be processed on the machines, in order to minimize the total time required.

UNIT-IV

7.	Determine an initial basic feasible solution to the following transportation problem by using (a) the least cost method, and (b) Vogel's approximation method.	12M

Destination

		D_1	D_2	D_3	D_4	Supply
	S_1	1	2	1	4	30
Source	S_2	3	3	2	1	30
	S_3	4	2	5	9	40
	Demand	20	40	30	10	

(OR)

8.	Solve the following assignment problem.					12M

From --To	A	B	C	D	E
I	3	5	8	4	5
II	5	2	7	4	5
III	8	7	7	8	6
IV	4	4	8	9	8
V	5	5	6	8	6

UNIT-V

9.	A factory has 1000 bulbs installed. Cost of individual replacement is USD. 3/- while that of group replacement USD 1/-per bulb respectively. It is decided to replace all the bulbs simultaneously at fixed interval & also to replace the individual bulbs that fail in between. Determine optimal replacement policy. Failure probabilities are as given below:	12M

Week	1	2	3	4	5
Failure Probability (P)	0.10	0.25	0.5	0.7	1.0

(OR)

10.	a)	Explain the concept of a game.	4M
	b)	Explain the following terms: strategy, pay-off matrix, saddle point, pure strategy and mixed strategy	8M

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Time: 3 Hours   Max Marks: 60

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Explain the process of fabrication for CMOS technology with neat diagrams?   6M
    b) Explain the NMOS enhancement mode fabrication process.   6M
                                        (OR)
2. a) Explain the CMOS P-well fabrication process   6M
    b) Distinguish between bi-polar and CMOS technology in brief?   6M

UNIT-II

3. a) Derive an equation for trans conductance of an n-channel enhancement MOSFET 6M
        operating in active region?

    b) Explain the operation of CMOS inverter with neat diagram.   6M
                                        (OR)
4. a) Derive the expression for the threshold voltage of MOSFET?   6M
    b) What is meant by latch up problem, how do you prevent it?   6M

UNIT-III

5. a) Explain lambda based design rules in VLSI circuit design?   6M
    b) Design a stick diagram for NMOS EX-OR gate?   6M
                                        (OR)
6. a) Draw the static logic CMOS circuit for **Y= (ABCD)'**?   4M
    b) Draw the CMOS logic circuit for the Boolean Expression **Z = [A (B+C) +DE]'**?   8M

UNIT-IV

7. a) Explain different wiring capacitances used in gate level design?   6M
    b) Discuss how constant voltage scaling affects the current and power characteristics   6M
        of MOSFET.
                                        (OR)
8. a) Describe any eight scaling factors for device parameters.   10M
    b) What are the effects of scaling of threshold voltage (Vt)?   2M

UNIT-V

9. a) Write short notes on design capture tools?   6M
    b) Explain the design strategies for test?   6M
                                        (OR)
10. a) Write short notes on design verification tools?   6M
    b) Explain about chip level test techniques?   6M

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Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Write about any three applications of image proessing.	6M
	b)	Explain the basic Relationship between pixels. How they are useful in image processing.	6M

(OR)

2.	a)	Draw the block diagram representing the steps in Digital image processing	12M

UNIT-II

3.	a)	Explain about arithmetic / logical operations on images.	6M
	b)	How to reduce the noise using smoothing spatial filters?	6M

(OR)

4.	a)	Illustrate some of the basic gray level transformations in the spatial domain?	6M
	b)	What is a histogram, explain the role of histogram in image enhancement?	6M

UNIT-III

5.	a)	Explain different types of Image compression algorithms.	6M
	b)	Differentiate lossy compression over error-free approaches?	6M

(OR)

6.	a)	What is image compression and how does image compression work	6M
	b)	Outline the image compression models (source encoder and decoder, channel encoder and decoder) with the help of a block diagram	6M

UNIT-IV

7.	a)	Describe about the concept of set theory with respect to images.	4M
	b)	What is Dilation and erosion of an image explain with examples	8M

(OR)

8.	a)	Explain in detail about Boundary Extraction, Thinning, Thickening, Pruning with examples.	12M

UNIT-V

9.	a)	Classify the detection of discontinuities and explain each detection in detail?	6M
	b)	Differentiate region-based segmentation from edge based segmentation in detail?	6M

(OR)

10.	a)	Define image segmentation? Write a short note on image segmentation techniques?	6M
	b)	Outline the concept of region splitting and merging with an example	6M

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AR16

CODE: 16EE4024   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, February-2022

POWER SYSTEM OPERATION AND CONTROL
(Electrical and Electronics Engineering)

Time: 3 Hours   **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain the step by step procedure for computing economic allocation of generation in a thermal station when transmission losses neglected .	6M
	b)	In a thermal power station, incremental cost are given by the following equations: $dC_1/dP_1 = Rs.(0.15P_1+12)$; $dC_2/dP_2 = Rs.(0.05P_2+14)$; $dC_3/dP_3 = Rs.(0.21P3+13)$; Where P_1, P_2 and P_3 are the loads in MW. Evaluate the economical load allocation between the three units, when the total load on the station is 300 MW.	8M

(OR)

2.	a)	Derive general transmission line loss formula and state assumptions made in calculating B- coefficients.	7M
	b)	Explain how the incremental production cost of a thermal power station can be determined.	7M

UNIT-II

3.	a)	Explain clearly the mathematical formulation of optimal scheduling of hydrothermal system with a typical example.	7M
	b)	Discuss the concept of hydroelectric power plant models in detail.	7M

(OR)

4.	a)	Explain the constraints in unit commitment problem.	6M
	b)	Explain problem formation of short term Hydro Thermal scheduling	8M

UNIT-III

5.	a)	With a neat block diagram explain the load frequency control for a single area system.	6M
	b)	Explain different parts of speed governing system.	8M

(OR)

6.	a)	Explain proportional plus integral load frequency control of a single area system with a neat block diagram.	7M
	b)	Make a comparison between load frequency control and economic dispatch control.	7M

UNIT-IV

7.	a)	Explain the state variable model of two area load frequency controller with integral	7M
	b)	Derive the expression for steady state response of two area system.	7M

(OR)

8	Develop a mathematical model for two-area load frequency control and draw its block diagram.	14M

UNIT-V

9.	a)	Discuss the concept of shunt compensation in detail	7M
	b)	A 440V, 3-Ø distribution feeder has a load of 100 KW at lagging p.f. with the load current of 200A. If the p.f. is to be improved, determine the following: i) Uncorrected p.f. and reactive load ii) New corrected p.f. after installing a shunt capacitor of 75 KVAR.	7M

(OR)

10.	a)	Explain the importance of reactive power and its control in power system.	7M
	b)	What is load compensation? Explain its objectives in power systems.	7M

AR16

CODE: 16ME4029   SET-1
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Supplementary Examinations, February-2022
OPERATIONS RESEARCH
(Mechanical Engineering)

Time: 3 Hours   **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Define Operations research? What are the areas of applications of OR?   4M

   b) Explain various models of operations research.   10M
   ### (OR)
2. a) Explain the significance of Slack and surplus variable.   4M
   b) Solve the given LPP by simplex method?   10M
   Maximize $Z = 3x_1 + 2x_2 + 5x_3$
   Subjected to constraints
   $x_1 + 2x_2 + x_3 \leq 430$, $3x_1 + 2x_3 \leq 460$, $x_1 + 4x_2 \leq 420$ and $x_1, x_2, x_3 \geq 0$

UNIT-II

3. a) Give the generalised mathematical formulation of an assignment problem.   4M

   b) There are three parties who supply the following quantities of coal and three   10M
   consumers who require the coal as follows:
   Party 1: 14 tons   Consumer A: 6 tons
   Party 2: 12 tons   Consumer B: 10 tons
   Party 3: 5 tons   Consumer C: 15 tons
   The cost matrix is given below:

	A	B	C
1	6	8	4
2	4	9	3
3	1	2	6

   Find the schedule of a transportation policy which minimizes the cost by row
   minimal method.
   ### (OR)

4.   A salesman estimates that the following would be cost on his route, visiting the six   14M
cities as shown in the table. Solve it by travelling salesman method.

To city/From city	1	2	3	4	5	6
1	∞	20	23	27	29	34
2	21	∞	19	26	31	24
3	26	28	∞	15	36	26
4	25	16	25	∞	23	18
5	23	40	23	31	∞	10
6	27	18	12	35	16	∞

UNIT-III

5   A machine operator has to perform three operations: turning, threading and   14M
knurling on a number of different jobs. The time required to perform these
operations (in minutes) for each job is known. Determine the order in which the
jobs should be processed in order to minimize the total time required to turn out all
the jobs. Also find the idle times for the three operations.

Job	Time for Turning (minutes)	Time for Threading (minutes)	Time for Knurling (minutes)
1	3	8	13
2	12	6	14
3	5	4	9
4	2	6	12
5	9	3	8
6	11	1	13

(OR)

6. a) Define sequence problem? Give two examples of sequencing problem from your   4M
daily life?

   b) A self service store employs one cashier at its counter. Nine customers arrive on an   10M
average every 5 minutes while the cashier can serve 10 customers in 5 minutes.
Assuming Poisson distribution for arrival rate and exponential distribution for
service time, find
   1. Average number of customers in the system.
   2. Average number of customers in the queue.
   3. Average time a customer spends in the system.
   4. Average time a customer waits before being served.

7. a) What are the advantages and applications of group replacement policy?   4M
    b) Solve the following game?   10M

		B			
		I	II	III	IV
A	I	19	6	7	5
	II	7	3	14	6
	III	12	8	18	4
	IV	8	7	13	-1

(OR)

8. a) Give the limitations of game theory in brief.   4M
    b) The cost of the machine is Rs 6100 and its scrap value is only Rs 100. From the   10M
        experience maintenance costs are found to be

Year	1	2	3	4	5	6	7	8
Maintenance Cost (Rs)	100	250	400	600	900	1250	1600	2000

When should be the machine replaced?

UNIT-V

9. For the following activity data draw the network, find the critical path and the   14M
    three floats for each activity:

Activity	1-2	1-4	2-3	3-5	3-8	4-8	5-6	5-8	6-7	7-8	7-9	8-9	9-10
Duration (days)	4	36	2	15	10	2	4	9	9	9	8	20	20

(OR)

10. The time estimates (in weeks) for the activities of a PERT network are given   14M
    below:

Activity	t_o	t_m	t_p
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

a) Draw the project network and identify all the paths through it.
b) Determine the expected project length.
c) Calculate the standard deviation and variance of the project length.

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, February-2022
VLSI DESIGN
(Electronics and Communication Engineering)

Time: 3 Hours   **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Give NMOS fabrication process flow with the help of neat sketches of appropriate diagram masks and cross section at each process steps?   8M
   b) What is Moore's law? Explain its relevance with respect to evolution of technology?   6M

(OR)

2. a) Explain the process of fabrication for CMOS technology with neat diagrams   8M
   b) What are the differences between CMOS and BiCMOS technologies in fabrication?   6M

UNIT-II

3. a) Derive an equation for trans conductance of an n-channel enhancement MOSFET operating in active region?   7M
   b) Explain about BiCMOS inverter with circuit diagrams   7M

(OR)

4. a) Show that the pull up to pull down ratio of an nMOS inverter driven through one or more pass transistors is 8:1.   10M
   b) Explain about CMOS inverter with circuit diagrams   4M

UNIT-III

5. a) Draw the stick diagram and mask layout for CMOS two input NOR gate?   10M
   b) Explain the different design rules for wires and contacts.   4M

(OR)

6. a) Draw the CMOS logic circuit for the Boolean Expression Z = [A(B+C) +DE]'and explain.   7M
   b) What is a stick diagram? Draw the stick diagram and layout for a CMOS XNOR gate.   7M

UNIT-IV

7. a) Describe What is meant by sheet resistance R_s? Explain the concept of R_s applied to MOS transistors   7M
   b) Why we need scaling? Explain in brief the types of scaling indicate the effect of scaling on MOSFET characteristics.   7M

(OR)

8. a) Determine any five scaling factors for device parameters.   10M
   b) Explain briefly about sheet resistance?   4M

UNIT-V

9. a) Elucidate about design capture tools.   7M
   b) Explain about Chip level test techniques in detail.   7M

(OR)

10. a) How Architecture of chip can be tested? Give some example.   10M
    b) Brief the need for CMOS testing?   4M

AR16

CODE: 16CS4025   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, February-2022
IMAGE PROCESSING
(Computer Science and Engineering)

Time: 3 Hours   **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What is digital image processing and its fundamental steps & components?   7M
   b) Describe how the black and white picture different from colour picture in terms of pixel?   7M

(OR)

2. a) Explain Zooming and shrinking and basic relationship between pixels   7M
   b) Describe Spatial and gray level resolution in detail   7M

UNIT-II

3. a) Explain 2D-DFT image transform and its properties   7M
   b) Describe Discrete wavelet Transform   7M

(OR)

4. a) Illustrate Gray level Transformations.   7M
   b) Explain Image Subtraction and Image Averaging.   7M

UNIT-III

5. a) Explain basic concepts of Dilation and erosion, opening and closing related to image morphology.   7M
   b) Explain Boundary extraction algorithm in detail   7M

(OR)

6. a) Describe region filling algorithm in detail   7M
   b) Illustrate convex hull and skeletons in detail.   7M

UNIT-IV

7. a) Explain Redundancy- Coding and Inter-pixel in line with image compression.   7M
   b) Describe Image Compression Models such as the Source Encoder and Decoder   7M

(OR)

8. a) Explain Psychovisual and Fidelity Criteria in line with image compression.   7M
   b) Describe about various lossless compression techniques.   7M

UNIT-V

9. a) What is image segmentation and explain line detection methods   7M
   b) Illustrate edge and boundary detection techniques   7M

(OR)

10. a) Describe edge linking and boundary detection-local processing   7M
    b) Explain region based segmentation techniques   7M

CODE: 13EE4024   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Supplementary Examinations, February-2022

POWERSYSTEM OPERATION AND CONTROL
(Electrical & Electronics Engineering)

Time: 3 Hours   **Max Marks: 70**

PART-A
ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1.
   a) What is connected load?
   b) What is daily load curve?
   c) What is Plant use factor?
   d) How is the real power in a power system controlled?
   e) What is synchronous condenser?
   f) What are the sources of reactive power? How it is controlled?
   g) Define economic dispatch problem
   h) Define unit commitment.
   i) Define state estimation.
   j) Define incremental cost

PART-B

Answer one question from each unit   **[5x12=60M]**
UNIT-I

2.
   a) Derive the expression for transmission loss formula.   7
   b) Incremental fuel costs in Rs/MWh for 2units in a plant are given by   5
$dc_1/dp_1 = 0.15P_1 + 25, dc_2/dp_2 = 0.12P_2 + 15$.
The minimum and maximum loads on each unit are to be 20MW and 125 MW respectively. Determine IFC and allocation of load between units for the minimum cost and load is 150MW. Assume both the units are operating.

(OR)
3.
   a) Derive the condition for optimal allocation of load among the various generating units when losses are neglected.   6
   b) The fuel input per hour of plant 1 and 2 are given as   6
$C_1 = 0.2P_1^2 + 40P_1 + 120$ Rs/h
$C_2 = 0.25P_2^2 + 30P_2 + 150$ Rs/h
Determine the economic operating schedule and the corresponding cost of generation if the max and min loading on each unit is 100MW and 25MW, the demand is 180 MW and transmission losses are neglected. If the load is equally shared by both the units, determine the saving obtained by loading the units as per equal incremental production cost.
UNIT-II

4.
   a) Explain the need for unit commitment.   4
   b) Obtain the condition for economic generation of s hydro thermal plants for short term scheduling.   6
(OR)

| 5 | | State the unit commitment problem and also explain dynamic programming solution method. | 12 |

UNIT-III

| 6. | a) | Draw the block diagram of LFC control of single area and derive the dynamic response. | 6 |
| | b) | Explain proportional plus integral load frequency control of a single area system with a neat block diagram. | 6 |

(OR)

| 7. | a) | With a neat diagram explain briefly different parts of turbine speed governing system? | 6 |
| | b) | Explain the necessity of maintaining constant frequency in power system operation. | 6 |

UNIT-IV

| 8. | | Develop the block diagram model for two area load frequency control system. | 12 |

(OR)

| 9. | ` | Derive an expression for steady state change of frequency and tie –line power transfer of a two-area power system | 12 |

UNIT-V

| 10. | a) | Explain about the losses that occur due to VAR flow in power systems. | 6 |
| | b) | Explain briefly about shunt and series compensation of transmission lines. | 6 |

(OR)

| 11. | a) | Discuss the transmission lines compensation? | 6 |
| | b) | Explain the specifications of load compensator. | 6 |