

CODE: 2000HS04**R20****SET - 2**

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution – UGC, Govt. of India)

(Affiliated to JNTU, Hyderabad, Approved by AICTE - - ISO 9001:2015 Certified)

Accredited by NBA & NAAC – ‘A’ Grade

National Ranking by NIRF - Rank band (151-300), MHRD, Govt. of India

B.TECH III YEAR II SEMESTER REGULAR EXAMINATIONS, APRIL/MAY-2024 MANAGEMENT SCIENCE

(COMMON TO ECE,EEE)

[Time: 3 Hours]

[Max. Marks: 70]

PART – A

(5 x 2 = 10M)

- Note:** 1. This Part consists of 8 QUESTIONS.
2. Answer any 5 questions. Each question carries 2 Marks .

1	A	What is Decentralization?	2M	BTL1
	B	Define Six Sigma	2M	BTL2
	C	Discuss about the Job Production	2M	BTL2
	D	Illustrate the Merit Rating	2M	BTL1
	E	List out the types of HRM Managers	2M	BTL1
	F	Illustrate the Project Management	2M	BTL4
	G	What is Project Cost Analysis?	2M	BTL1
	H	Define Balanced Score Card	2M	BTL2

PART –B

(5 x 12 = 60M)

- Note:** 1. This Part consists of 10 QUESTIONS
2. Answer any 1 question from each Section. Each question carries 12Marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	How do functional areas of management differ from management functions? Discuss the major functional areas of management	6M	BTL5
2.B	Critically examine the Herzberg's two -factor theory. Make a comparison between theories of Herzberg and Maslow	6M	BTL3

(OR)

3.A	Explain 14 Principles of Scientific Management Theory.	6M	BTL2
3.B	What do you mean by Leadership style? How can leadership styles be decided based on the use of power and authority	6M	BTL4

SECTION - II

4.A	Explain the types of Plant Layout in manufacturing organizations.	6M	BTL2
4.B	Discuss the Product Life Cycle with suitable example	6M	BTL5

(OR)

5.A	Define Work Study and explain the steps involved in Method study	6M	BTL2
5.B	Explain the ABC Analysis and EOQ	6M	BTL2

SECTION - III

6.A	Compile the Human Resource Management Functions	6M	BTL6
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6.B	Assess the Performance Appraisal Methods in Multinational Company.	6M	BTL5
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(OR)

7.A	Distinguish between Recruitment and Selection.	6M	BTL4
7.B	What do you mean by Job Evaluation and its Pros and Cons	6M	BTL2

SECTION – IV

8.A	Discuss PERT AND CPM in detail manufacturing organization.	6M	BTL4
8.B	Explain the Project Cost Analysis and Merits and Demerits.	6M	BTL6

(OR)

9.A	Discuss the Techniques in PERT		6M	BTL5
9.B	Calculate the critical path for the following projects activities:		6M	BTL4
	Activity	Predecessors	Duration(days)	
	A	Nil	3	
	B	A	4	
	C	A	5	
	D	A	4	
	E	B	2	
	F	D	9	
	G	C, E	6	
	H	F, G	2	

SECTION – V

10.A	Elaborate the Mission, Goals, Policy and Strategy.	6M	BTL4
10.B	Write Steps in Strategy Formulation and Implementation	6M	BTL3

(OR)

11.A	Explain the SWOT Analysis of an Automobile Industry	6M	BTL5
11.B	Distinguish between Bench Marking and Balanced Score Card	6M	BTL4

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B.TECH III YEAR II SEMESTER REGULAR END EXAMINATIONS, APRIL/MAY - 2024 POWER ELECTRONICS (EEE)

[Time: 3 Hours]

[Max. Marks: 70]

PART – A

(5 x 2 = 10M)

- Note:** 1. This Part consists of 8 QUESTIONS.
2. Answer any 5 questions. Each question carries 2 Marks .

1.	A	Write any two differences between a power diode and power BJT.	2M	BTL3
	B	Write any two points on the requirement of gating circuits?	2M	BTL3
	C	Define the term duty ratio in a buck and boost converter?	2M	BTL1
	D	Define 120 degree and 180 degree mode of conduction in an inverter?	2M	BTL1
	E	How a multiple PWM helps to improve the performance of an inverter compared to single PWM?	2M	BTL3
	F	State any two applications of voltage source inverters?	2M	BTL3
	G	Write two important points on circulating current mode of operation in cyclo-converter?	2M	BTL3
	H	State any two advantages and disadvantages of cyclo-converters?	2M	BTL3

PART – B

(5 x 12 = 60M)

- Note:** 1. This Part consists of 10 QUESTIONS
2. Answer any 1 question from each Section. Each question carries 12Marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Draw and explain briefly the VI characteristics of power MOSFET	6M	BTL2
2.B	Explain protection circuits in brief?	6M	BTL2

(OR)

3.A	Explain the two transistor analogy of an SCR?	6M	BTL2
3.B	How a UJT work as a triggering device? Explain briefly?	6M	BTL3

SECTION - II

4.A	Explain the RLE load controlled by a single phase controlled rectifier.	6M	BTL2
4.B	Write the principle of operation of a three phase fully controlled converter?	6M	BTL3

(OR)

5.A	Explain the effect of source and load inductance on a rectifier?	6M	BTL2
5.B	Draw and briefly explain single phase dual converter?	6M	BTL2

SECTION - III

6.A	Draw and explain buck converter for its output voltage and current parameters.	6M	BTL2
6.B	Briefly explain in four points the Morgan's chopper	6M	BTL2

(OR)

7.A	Draw and explain boost converter with various modes of operation?	6M	BTL2
7.B	Write any two points on Jone's chopper with circuit diagram?	6M	BTL3

SECTION – IV

8.A	State the importance of an Inverter considering any two applications?	6M	BTL3
8.B	Explain 120 degree mode of operation of an inverter?	6M	BTL2

(OR)

9.A	Explain 180 degree mode of operation of an inverter?	6M	BTL2
9.B	Write four points on sinusoidal PWM?	6M	BTL3

SECTION – V

10.A	Explain single phase AC voltage controller with RL load voltage and load current waveforms	6M	BTL2
10.B	Explain the modes of operation of a TRIAC fed RL load converter for its output voltage and current equations?	6M	BTL2

(OR)

11.A	What is the principle of operation of a cyclo-converter? Draw the single phase voltage and current waveforms for step down cyclo-converter?	6M	BTL3
11.B	State the differences between AC Voltage controller and Cyclo-converter based on it's principle of operation?	6M	BTL3

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B.TECH III YEAR II SEMESTER REGULAR END EXAMINATIONS, APRIL/MAY - 2024

POWER SYSTEM OPERATION AND CONTROL

(ELECTRICAL AND ELECTRONICS ENGINEERING)

[Time: 3 Hours]

[Max. Marks: 70]

PART – A

(5 x 2 = 10M)

- Note:** 1. This Part consists of 8 QUESTIONS.
2. Answer any 5 questions. Each question carries 2 Marks

1	A	How is the real power in a power system controlled?	2M	BTL1
	B	Summarize the advantages of multi area operation.	2M	BTL2
	C	What are the sources of reactive power? How it is controlled?	2M	BTL1
	D	Express coordination equation taking losses into account.	2M	BTL1
	E	List the few constraints that are accounted in unit commitment problem	2M	BTL1
	F	Differentiate unit commitment and economic load dispatch.	2M	BTL1
	G	State the advantages of computer control.	2M	BTL2
	H	Mention four types of SCADA system and its application area.	2M	BTL1

PART – B

(5 x 12 = 60M)

- Note:** 1. This Part consists of 10 QUESTIONS
2. Answer any 1 question from each Section. Each question carries 12Marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Show that the steady change in frequency in load frequency control of an isolated power can be reduced to zero if the change in controlling force applied to the speed changer is equal to the change in load demand.	6M	BTL3
2.B	Two generators rated 300 MW and 400 MW respectively are operating in parallel. The droop characteristics of their governors are 4% and 6% respectively from no load to full load. The speed changers of the governors are set so that a load of 400 MW is shared among the generators at 50 HZ in the ratio of their ratings. What are the no load frequencies of the generators?	6M	BTL4

(OR)

3.A	Model the speed governing system with neat diagram and develop the transfer functions of generator load model and turbine model.	6M	BTL3
3.B	Draw the block diagram of load frequency control in two area control system and explain.	6M	BTL2

SECTION - II

4.A	Discuss in detail about the generation and absorption of reactive power in power system Components	6M	BTL3
4.B	What is static VAR compensator? Where it is used? Explain its operation.	6M	BTL4

	Also state the merits of static VAR compensator over the other methods of voltage control.		
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(OR)

5.A	With a neat sketch, explain how a on load tap changing transformer works.	6M	BTL2
5.B	Derive the equations to get the relation between voltage, power and reactive power at a node.	6M	BTL4

SECTION - III

6.A	Derive the solution of the economic load dispatch problem of a two Generators system considering the transmission losses?	6M	BTL3
6.B	Explain the term “incremental operating cost” of power system related with economic dispatch?	6M	BTL2

(OR)

7.A	With the help of flowchart explain Economic dispatch by λ iteration method without loss.	6M	BTL3
7.B	Derive an expression for economic distribution of load between generating units including the effect of transmission losses. The fuel cost in Rs/h for a three thermal plants are given by $F_1 = 350 + 7.2P_{G1} + 0.004P_{G1}^2$ Rs/hr, $F_2 = 500 + 7.3P_{G2} + 0.00P_{G2}^2$ Rs/hr, $F_3 = 600 + 6.74P_{G3} + 0.003P_{G3}^2$ Rs/hr. P_{G1} , P_{G2} , P_{G3} are in MW. Find the optimal schedule and compare the cost of this to the case when the generators share the load equally if i) $P_D = 450$ MW ii) $P_D = 800$ MW.	6M	BTL6

SECTION – IV

8.A	Explain the problem of unit commitment. Discuss the constraints in solving the unit commitment problem.	6M	BTL2
8.B	What is priority list method of unit commitment? Explain it with an example.	6M	BTL4

(OR)

9.A	Explain the priority list method for unit commitment problem.	7M	BTL2
9.B	Define and explain the terms Spinning Reserve.	5M	BTL4

SECTION – V

10.A	Discuss various functions of SCADA with neat diagram.	6M	BTL3
10.B	Evaluate the major functions of system security control.	6M	BTL4

(OR)

11.A	Infer short notes on energy control centre EMS and its functions.	8M	BTL3
11.B	Explain the factors affecting power system security.	4M	BTL2



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B.TECH III YEAR II SEMESTER REGULAR END EXAMINATIONS, APRIL/MAY - 2024

POWER SYSTEM PROTECTION

(ELECTRICAL AND ELECTRONICS ENGINEERING)

[Time: 3 Hours]

[Max. Marks: 70]

PART – A

(5 x 2 = 10M)

- Note:**
1. This Part consists of 8 QUESTIONS.
 2. Answer any 5 questions. Each question carries 2 Marks

1	A	What is the primary purpose of power system protection?	2M	BTL1
	B	What are time-current characteristics in over-current protection?	2M	BTL1
	C	What are the functions of grounding in power system?	2M	BTL1
	D	List the advantages of carrier current protection in power system protection.	2M	BTL2
	E	Compare Amplitude and Phase comparators.	2M	BTL2
	F	What is meant by MHO relay?	2M	BTL1
	G	What is meant by a circuit breaker? Explain its function	2M	BTL1
	H	What is the basic function of Fuse?	2M	BTL1

PART – B

(5 x 12 = 60M)

- Note:**
1. This Part consists of 10 QUESTIONS
 2. Answer any 1 question from each Section. Each question carries 12Marks.
 3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Explain about classification of protective relays and schemes in detail.	6M	BTL2
2.B	How do current transformers (CTs) and potential transformers (PTs) contribute to the operation of protective relays?	6M	BTL3

(OR)

3.A	Explain the concept of zones of protection and their significance in designing effective protective schemes.	6M	BTL2
3.B	Describe the operating principles of electromagnetic relays and their typical applications in power system protection.	6M	BTL3

SECTION - II

4.A	Discuss the challenges and strategies involved in the protection of ring mains in power systems.	6M	BTL2
4.B	Compare between Impedance relay, reactance relay, and MHO relay.	6M	BTL3

(OR)

5.A	Elaborate on various methods for protection of feeders.	6M	BTL4
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5.B	Explain about effect of line length and source impedance on the performance of distance relays.	6M	BTL2
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SECTION - III

6.A	Describe the differential pilot wire method of protection of feeder.	6M	BTL3
6.B	Explain the working principle of buch-holtz relay with neat diagram?	6M	BTL2

(OR)

7.A	Explain the different techniques used for protecting transformers against internal and external faults.	6M	BTL2
7.B	Discuss the concept of frame leakage protection and its significance in AC machine protection schemes.	6M	BTL3

SECTION – IV

8.A	What are the merits and demerits of static relays over electromagnetic relays?	6M	BTL3
8.B	Describe the construction and working of Microprocessor based relay.	6M	BTL3

(OR)

9.A	Describe the operating principle, constructional features and area of applications of static relay.	6M	BTL3
9.B	List out the advantages of directional relays, and distance relays.	6M	BTL2

SECTION – V

10.A	Explain the terms recovery voltage, restriking voltage and RRRV.	6M	BRL2
10.B	Describe the different types of fuses and their applications.	6M	BRL3

(OR)

11.A	Write short notes on the following. (i) Resistance switching (ii) Current chopping.	6M	BTL2
11.B	Discuss the operating principle of SF6 circuit breaker.	6M	BTL3

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B.TECH III YEAR II SEMESTER REGULAR END EXAMINATIONS, APRIL/MAY - 2024

POWER SYSTEM II

ELECTRICAL AND ELECTRONICS ENGINEERING)

[Time: 3 Hours]

[Max. Marks: 70]

PART – A

(5 x 2 = 10M)

- Note:** 1. This Part consists of 8 QUESTIONS.
2. Answer any 5 questions. Each question carries 2 Marks .

1	A	Show the circuit diagram for a medium length nominal T transmission line.	2M	BTL2
	B	Illustrate the need of voltage control.	2M	BTL2
	C	The reactance of a generator designated X'' is given as 0.25 PU based on the generator's nameplate rating of 18 kV, 500 MVA. Solve for X'' on the new base of 20kV, 100 MVA.	2M	BTL2
	D	What is the function of lightning arrester?	2M	BTL1
	E	Define positive and negative sequence impedances.	2M	BTL1
	F	Classify the faults on power system.	2M	BTL2
	G	List the specifications of traveling wave.	2M	BTL2
	H	What is Ferranti effect?	2M	BTL1

PART – B

(5 x 12 = 60M)

- Note:** 1. This Part consists of 10 QUESTIONS
2. Answer any 1 question from each Section. Each question carries 12Marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	A 3-phase, 50 Hz overhead transmission line 150 km long has the following constants: Resistance/km/phase = 0.1Ω , Inductive reactance/km/phase = 0.5Ω , Capacitive susceptance/km/phase = 3×10^{-4} Siemen. If the line delivers 50 MW at 110 kV, 0.8 power factor lagging, determine the sending end voltage and current. Show the phasor diagram. Use nominal π method.	6M	BTL5
2.B	Define A, B, C and D constants of a transmission line? What are their values in short lines?	6M	BTL2

(OR)

3.A	The generalized circuit constants of a transmission line are as follows: $A = D = 0.895 \angle 1.4^\circ$, $B = 182.5 \angle 78.6^\circ \Omega$ If the line supplies a load of 50 MW at 0.9 p.f. and 220 kV, Determine the sending end voltage and hence the regulation of the line.	6M	BTL4
3.B	Develop the expressions for regulation and efficiency of a short transmission line. Show the required circuit and phasor diagram.	6M	BTL3

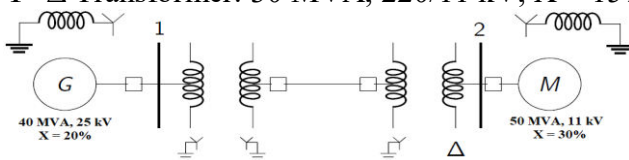
SECTION – II

4.A	Distinguish between series and shunt compensation.	8M	BTL3
4.B	Illustrate the working of synchronous phase modifiers.	4M	BTL5

(OR)

5.A	With the help of a neat diagrams, explain the operation of off-load and on-load tap changing transformers.	8M	BTL3
5.B	Illustrate the load ability characteristics of overhead lines.	4M	BTL5

SECTION – III

6.	Determine the per unit value for each component and develop the impedance diagram. Neglect resistance and use a base of 100 MVA and 220 kV in 50 Ω line. The ratings of the generator, motor and transformers are: Y- Y Transformer: 40 MVA, 33/220 kV, X = 15% Y- Δ Transformer: 30 MVA, 220/11 kV, X = 15%. 	12M	BTL6
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(OR)

7.A	Explain about termination of line with open circuit for travelling wave.	6M	BTL2
7.B	Explain in detail about the concept of attenuation of travelling waves?	6M	BTL2

SECTION – IV

8.A	With the help of a neat diagram, explain the operation of expulsion type lightning arrester.	6M	BTL2
8.B	Illustrate the working of horn gaps and rod gaps.	6M	BTL5

(OR)

9.A	Discuss about volt-time curves.	6M	BTL3
9.B	With the help of a neat diagram, explain the operation of valve type lightning arrester.	6M	BTL5

SECTION – V

10.A	Determine symmetrical components of unsymmetrical phasors.	6M	BTL3
10.B	A 25 MVA, 13.2 kV alternator with solidly grounded neutral has a sub transient reactance of 0.25 PU. The negative and zero sequence reactances are 0.35 and 0.1 PU respectively. Determine the fault current and the line-to-line voltage at the fault when a line-to-line fault occurs at the terminals of the alternator.	6M	BTL5

(OR)

11.A	From fundamentals develop the expressions for fault currents of an unloaded synchronous generator for the L-L-G fault (assume the neutral is grounded through an impedance Z_n).	6M	BTL5
11.B	Discuss about fault limiting reactors and their location.	6M	BTL3