UNIT I - FUNDAMENTALS

Green IT Fundamentals: Business, IT, and the Environment –Green computing: carbon foot print, scoop on power –Green IT Strategies: Drivers, Dimensions, and Goals – Environmentally Responsible Business: Policies, Practices, and Metrics

PART A

Q.No	Questions	BT Level	Competence
1.	Define Green computing.	BTL1	Remember
2.	What are the 3Rs of Green IT?	BTL1	Remember
3.	List any two differences between EI and BI.	BTL1	Remember
4.	What are the major factors that contribute to carbon emissions in an organization?	BTL1	Remember
5.	Explain how a Green IT strategy benefits an organization.	BTL2	Understand
6.	Give the major IT areas influencing the environment.	BTL2	Understand
7.	What is ERBS?	BTL1	Remember
8.	List four layers of a comprehensive Green IT vision.	BTL1	Remember
9.	Explain the challenges of the carbon economy.	BTL2	Understand
10.	Define carbon footprint.	BTL1	Remember
11.	Explain the concept of Business Intelligence.	BTL2	Understand
12.	Compare any two environmental practices of a green organization.	BTL2	Understand
13.	Describe the impact of BI on EI.	BTL2	Understand
14.	Give elements of an ERBS in Green Strategy Mix.	BTL1	Remember
15.	Explain drivers for environmental responsibility in business.	BTL2	Understand
16.	What are the steps in developing an ERBS?	BTL2	Understand
17.	State any two green organizational goals from policy development.	BTL1	Remember
18.	Explain the impact of Lean on Green.	BTL2	Understand
19.	State any two environmentally responsible business policies.	BTL1	Remember
20.	Define green sustainable policy.	BTL1	Remember
21.	Interpret the need for green computing.	BTL2	Understand
22.	List Green IT drivers.	BTL1	Remember
23.	Explain the 5 M's of carbon metrics.	BTL2	Understand
24.	What are the types of carbon emissions under scopes?	BTL1	Remember

PART -B

1.	**Explain** with a neat diagram, how Information technology influences business, society, and environment.	13	BTL4	Analyze
2.	**Analyze the** challenges of carbon economy.	13	BTL4	Analyze
3.	**Explain** Interplay of business and environment through information technology.	13	BTL4	Analyze

4.a	**Examine** the Green Enterprise Characteristics.	07	BTL3	Apply
4.b	**Classify** the impact of Business to Environmental Intelligence	06		
5.a	Explain Green IT Drivers?	07	BTL4	Analyze
5.b	**Explain** the impact of Business to Environmental Intelligence	06		
6.a	Explain about the Environmental factors influencing organization's business strategies over next 3–5 years.	08	BTL4	Analyze
6.b	**discuss** Green IT Strategies: Range of Impact.	05		
7.	**Discuss in details about** the impact of Green IT policies in three ways (length, breadth, depth).	13	BTL4	Analyze
8.a	**Illustrate** Economy, people, processes, and technology dimensions in an ERBS.	08	BTL3	Apply
8.b	**Classify** the Drivers and Factors lead to an ERBS.	05		
9.	**Explain** the concepts of steps Developing an ERBS.	13	BTL4	Analyze
10.	**Apply** the Various Green policies that are implemented through practices, and proved through metrics.	13	BTL3	Apply
11.	**Explain** Coverage of carbon metrics.	13	BTL4	Analyze
12.a	**Summarize** KPIs in Green Strategies.	07	BTL3	Apply
12.b	**Apply** the steps to find actors and goals.	06		
13.	**Describe and** Discuss the importance of consortiums in an 8+ year Green IT strategy.	13	BTL4	Analyze
14.	**Explain** the four dimensions a long which an organization can transform to a green organization?	13	BTL4	Analyze
15.	**Classify** about carbon emissions in IT?	13	BTL3	Apply
16.	**Explain** in detail about policies, practices, and metrics of ERBS?	13	BTL4	Analyze
17.	**Explain** about Green IT Dimensions, Drivers, and Goals?	13	BTL4	Analyze
	PART -C			
1.	**Explain** the impact of the Global Financial Crises (GFC) on existing or potential green initiatives?	15	BTL4	Analyze
2.a	**Discuss** the following KPI Problems My organization will reduce 10% over its last year's energy bill. This reduction is aimed over next 3 years, at the end of which, we will review all factors associated with this reduction.	07	BTL5	Evaluate
2.b	My organization will reduce production machines operation hours by 20% via intense focus on idling times of the machines over the next 3 years. At the end of the 3-year period, all factors impacting operation and production costs will be reviewed against their carbon costs.	08		
3.	Discuss any three elements in the mind map of a Chief Green Officer.	15	BTL4	Analyze
4.	**Assess** the Measurement of Carbon Footprint of an Organization.	15	BTL5	Evaluate
5.	**Explain** in detail about Environmentally Responsible Business?	15	BTL4	Analyze

UNIT II - GREEN ASSETS AND MODELING			
Green Assets: Buildings, Data Centers, Networks, and Devices - Green Business Process Management: Modeling, Optimization, and Collaboration – Green Enterprise Architecture – Environmental Intelligence Green Supply Chains – Green Information Systems: Design and Development Models.			
PART – A			
1.	Define Green Assets.	BTL1	Remember
2.	Explain types of assets in Green IT.	BTL2	Understand
3.	Explain the role of green mobile.	BTL2	Understand
4.	What are Green Data Centers?	BTL1	Remember
5.	Define Carbon Emitting Bit.	BTL1	Remember
6.	List factors influencing a green data center.	BTL1	Remember
7.	State tools used for measuring carbon emissions.	BTL1	Remember
8.	List Green Process Categories.	BTL1	Remember
9.	Explain Green Business Process Management.	BTL2	Understand
10.	Interpret two factors of Green BPM.	BTL2	Understand
11.	Distinguish between coupling and cohesion.	BTL2	Understand
12.	When are patterns used?	BTL1	Remember
13.	Explain Green Enterprise Architecture.	BTL2	Understand
14.	Define Enterprise Architecture.	BTL1	Remember
15.	State the types of responsibilities in Green IT.	BTL1	Remember
16.	What are the benefits of VPN?	BTL2	Understand
17.	Define Green Information System.	BTL1	Remember
18.	What is Regulatory Standards Portal?	BTL1	Remember
19.	Explain the major phases in GIS.	BTL2	Understand
20.	What is SCM?	BTL1	Remember
21.	List key elements of a Green Data Center.	BTL1	Remember
22.	Define Green Re-engineering.	BTL1	Remember
23.	Explain the concept of Environmental Intelligence.	BTL2	Understand
24.	State two uses of Green Re-engineering.	BTL1	Remember
PART -B			

1.a	Explain in detail about the major activities relating to the infrastructure assets.	08	BTL4	Analyze
1.b	Explain types of Assets (Categories) and their Impact on the Environment.	05		
2.a	**Explain** the Green data center influencing factors.	05	BTL4	Analyze
2.b	**Explain** in detail A carbon-emitting bit.	08		
3.	**Demonstrate** Polices and Practice of Green P-O-D in the Context of Devices and Peripherals.	13	BTL3	Apply
4.	**Generalize** your idea on Green Business Process Management.	13	BTL6	Create

5.	**Explain** in detail how can Cloud computing help reduce carbon emissions?	13	BTL4	Analyze
6.a	**Give Green** Process Categories and their Carbon Impact.	08	BTL4	Analyze
6.b	Discuss the Individual, organizational, and collaborative green Processes.	05		
7.	**What** is Green BPM? Discuss the role Green BPM plays in the reduction of an organizational carbon footprint.	13	BTL4	Analyze
8.	**Discuss** in detail about Various views of a comprehensive Green enterprise architecture: mapping design.	13	BTL4	Analyze
9.a	**Illustrate** Evolving Green Systems Architecture with help of diagram.	08	BTL4	Analyze
9.b	**Classify** Various aspects of a Green solutions.	05		
10.	**Explain** the Environmental Intelligence.	13	BTL4	Analyze
11.a	**Examine** in detail about Deployment diagram for GIS.	07	BTL1	Remember
11.b	**Describe** the concepts Component diagram for GIS.	06		
12.	**Discuss** in detail about the role of SCM systems in the GEA.	13	BTL2	Understand
13.a	**Explain** the Elements of a Green ICT information portal.	07	BTL4	Analyze
13.b	**Analyze** Supplier Contract Conditions in the Context of Environmental Intelligence.	06		
14.	**Analyze** the Sequence diagram (dynamic model) for "emissions check".	13	BTL4	Analyze
15.	**Discuss** about Green Supply Chain Management (SCM)?	13	BTL4	Analyze
16.	**Illustrate** in detail about Green Information System (GIS)?	13	BTL3	Apply
17.	**Briefly explain** about Environmental Intelligence Domain (EI Domain)?	13	BTL4	Analyze
	PART C			
1.	**Determine** how the efficient use of Green assets could lead to reduction in energy consumption?	15	BTL5	Evaluate
2.	**Generalize** the concept of reengineering of the processes of a digital library.	15	BTL4	Analyze
3.	**Create** a architecture and explain with an Example the Green Enterprise Architecture.	15	BTL6	Create
4.	**Draw and** explain Use case diagram for green organizational portal?	15	BTL4	Analyze

5.	**Compose** about Green Enterprise Architecture (GEA) and Green Solution Architecture (GSA).	15	BTL5	Evaluate

UNIT III - GREEN FRAMEWORK			
Virtualizing of IT systems –Role of electric utilities, Telecommuting, teleconferencing and teleporting -Materials recycling –Best ways for Green PC –Green Data center –Green Grid			
PART – A			
1.	Define Virtualization.	BTL1	Remember

2.	List types of virtualization.	BTL1	Remember
3.	Explain benefits of telecommuting.	BTL2	Understand
4.	What is Telecommuting Class Diagram?	BTL1	Remember
5.	State any three tips for Green PC.	BTL1	Remember
6.	List challenges in telecommuting.	BTL1	Remember
7.	Define EPEAT.	BTL1	Remember
8.	List three biggest energy hogs in a computer system.	BTL1	Remember
9.	Explain virtualization techniques (any two).	BTL2	Understand
10.	State the formula for DCIE.	BTL1	Remember
11.	Give advantages of using a green PC.	BTL2	Understand
12.	State difference between Server & Application Virtualization.	BTL1	Remember
13.	List benefits of a Green Data Center.	BTL1	Remember
14.	State the concept of energy usage in data center.	BTL1	Remember
15.	Differentiate Telecommuting & Teleconferencing.	BTL2	Understand
16.	Explain Power Usage Efficiency (PUE).	BTL2	Understand
17.	State two features of IBM virtualization systems.	BTL1	Remember
18.	Define Green Grid.	BTL1	Remember
19.	Explain Green Grid framework.	BTL2	Understand
20.	What is material recycling?	BTL1	Remember
21.	Give advantages of teleconferencing.	BTL2	Understand
22.	Explain Consolidation and Virtualization.	BTL2	Understand
23.	What is the role of a Hypervisor?	BTL1	Remember
24.	List six steps in recycling.	BTL1	Remember

PART-B				
1.a	**Describe storage** Virtualization.	06	BTL3	Apply
1.b	**Describe** the concepts Client Virtualization	07		
2.	**What** is Virtualization? **Explain** Server virtualization in Detail.	13	BTL4	Analyze
3.	**Describe** how to Assess the greenness of your data center.	13	BTL3	Apply
4.a	Write down the Tips to start moving your data center towards green environment.	04	BTL3	Apply
4.b	**Describe** how you will Optimize your data center cooling.	09		
5.	**E**xplain the Green Home Office - Telecomm Central.	13	BTL4	Analyze

6.a	**Analyze** the concepts of Managing the Challenges of Telecommuting.	07	BTL4	Analyze
6.b	**Explain** establishing expectations in telecommuting.	06		
7.a	**Explain** in detail about understanding how you use devices for green PC.	06	BTL4	Analyze
7.b	**Explain** in detail about Developing computer habits that save energy for green PC.	07		

8.a	**Illustrate** about "Using your monitor with efficiency in mind" in Green PC.	07	BTL3	Apply
8.b	**Illustrate** about "Spotting an energy hog" to make Green PC.	06		
9.a	**Discuss** about how energy is used in a data center.	07	BTL4	Analyze
9.b	**Discuss** the Environmental laws and the company image in data center.	06		
10.	**Discuss** about data center and its uses.	13	BTL4	Analyze
11.	**Illustrate about** Green grid frame work.	13	BTL3	Apply
12.a	**Discuss** in detail about the telecommuting.	08	BTL4	Analyze
12.b	**Discuss** briefly about teleconferencing.	05		
13.	**Analyze** the types of virtualization techniques.	13	BTL4	Analyze
14.a	**Analyze** the roles of electric utilities.	07	BTL4	Analyze
14.b	**Analyze** about green PC.	06		
15.	**Explain** in Detail about material recycling?	13	BTL3	Apply
16.	**Discuss** the best ways to make your PC greener.	13	BTL4	Analyze
17.	**Compose about** virtualizing of IT Systems.	13	BTL5	Evaluate
	PART-C			
1.	**How** IBM Global Technology Services can help with the following categories in your move toward having a green data center: 1. Diagnose 2. Build 3. Cool 4. Virtualize and simplify 5. Manage, measure, and enhance	15	BTL6	Create
2.a	**Explain** your understanding on individual, organizational and collaborative processes.	8	BTL4	Analyze
2.b	**Discuss** why individual green processes are short-term strategies, whereas collaborative green processes are long-term strategies	7		
3.a	**Design** the steps to Speed up your Internet access to get green	8	BTL6	Create
3.b	**Explain** reuse, reduce, recycle in-Making the Case for a New Purchase.	7	BTL4	Analyze
4.	**Design and discuss** about the best ways for Green PC.	15	BTL5	Evaluate

5.	**Briefly explain** the contribution of telecommuting, teleconferencing, and teleporting in conversion of Green IT	15	BTL4	Analyze

UNIT IV - GREEN COMPLIANCE

Socio-cultural aspects of Green IT –Green Enterprise Transformation Roadmap –Green Compliance: Protocols, Standards, and Audits –Emergent Carbon Issues: Technologies and Future			
PART – A			
1.	Define Green IT's social impact.	BTL1	Remember
2.	Define evolving Green HR.	BTL1	Remember
3.	Explain role-based view of Green IT.	BTL2	Understand
4.	Compare Green IT's Social Impact & Social Stakeholders.	BTL2	Understand
5.	List three categories of green-collar workers.	BTL1	Remember
6.	Explain the Green Point method.	BTL2	Understand
7.	Explain strengths and weaknesses of GET processes.	BTL2	Understand
8.	Interpret issues related to a pilot project.	BTL2	Understand
9.	Define green requirements of business.	BTL1	Remember
10.	Explain Corporate Governance in Green IT transformation.	BTL2	Understand
11.	Distinguish equipment lifecycle vs. end-user efficiency diagnosis.	BTL2	Understand
12.	Explain ISO 14001 relevance to Green IT.	BTL2	Understand
13.	Define Green Compliance.	BTL1	Remember
14.	Explain components of ISO 14001.	BTL2	Understand
15.	What is verified & validated in a green audit?	BTL1	Remember
16.	Explain advantages of Green IT audits.	BTL2	Understand
17.	List ways Green IT audits can be applied.	BTL1	Remember
18.	Explain potential for reducing overall carbon emissions.	BTL2	Understand
19.	What is Environmental Intelligence?	BTL1	Remember
20.	List the future dimensions of Green IT.	BTL1	Remember
21.	Explain the four dimensions of GET.	BTL2	Understand
22.	List the five areas of Green Metrics.	BTL1	Remember
23.	State advantages of Green IT.	BTL1	Remember
24.	Explain Greenwashing.	BTL2	Understand

PART-B				
1.a	**Explain** the views of various cross-sections of society on environmental initiatives and role-based view of green it.	08	BTL4	Analyze
1.b	**Explain** the concepts of relative speed of change in green enterprise transformation.	05		
2.a	**What** is green IT influencing working lifestyle?	03	BTL6	Create
2.b	**Create** green user practices that have social impact.	10		
3.	**Illustrate** the subjectivity in green it arises from differencing priorities of the same individual.	13	BTL3	Apply
4.a	**Illustrate** about personalization of the green context by end-users leads to change in attitude.	07	BTL3	Apply
4.b	**Draw** the diagrams for channels of communications in green IT projects.	06		

5.	**Describe** the diagram and short notes on Green Enterprise Transformation.	13	BTL3	Apply
6.a	**Write** short notes on A Green ICT Framework.	03	BTL3	Apply
6.b	**Describe** the Applying the four dimensions to GET.	10		
7.	**Explain** about with detail on enterprise and data center an	13	BTL4	Analyze
8.	**Describe** the detail with example of Green Transformation Process.	13	BTL3	Apply
9.a	With an example, **describe** notations used in Green IT Project Roles.	05	BTL3	Apply
9.b	**Write Short notes** on Responsibility of GTC, Business Architect and Variations and Business Architect and Variations.	08		
10.a	**Explain** the deliverables in a green IT project?	03	BTL2	Understand
10.b	**Differentiate** the relationship between diagnosing equipment lifecycle's carbon efficiencies and diagnosing end-user computing's carbon efficiencies an example.	10		
11.	**Describe** the Planning end-user Green IT transformation.	13	BTL3	Apply
12.	**Discuss** about Enterprise IT Data Center Efficiencies with suitable example.	13	BTL4	Analyze
13.a	**What** is the Purpose of the ISO 14000:2004 family of standards?	04	BTL4	Analyze
13.b	How to draw Green ICT—Business and Economic Trends? **Explain.**	09		
14.	Developed Economies and Developing Economies (BRIC) **Comparison** along Four Dimensions.	13	BTL4	Analyze
15.	**Explain** about Green IT ethics and code of conduct.	13	BTL4	Analyze
16.	**Explain** about emergent carbon issues?	13	BTL4	Analyze
17.	**Illustrate** in detail about Socio-cultural aspects of Green IT?	13	BTL3	Apply
	PART-C			
1.a	**Consider** the Green HR and Changing Organizational Structures Explain and detail notes. a. Organizing the green HR function. b. Potential mapping of green skills to SFIA levels. c. SFIA Skill Set and Green Roles.	10	BTL5	Evaluate
1.b	**Explain** and give the Green Virtual Communities.	05		
2.	**Assess** audits reveal green sophistication of an organization before and after transformation and An integrated model for auditing Green IT systems.	15	BTL6	Create

3.	**Design** the areas of Cloud computing that have the potential for reducing the overall carbon emissions across the industry. Then it obtains the details of the Emerging technologies landscape and Green IT impact and SaaS and cloud computing in Green ICT strategies with neat sketch.	15	BTL6	Create
4.	**Discuss** about Collaborative Environmental Intelligence and specific topics of interest and future investigations in relations with collaborative EI.	15	BTL5	Evaluate
5.	**Explain** about the four dimensions of GET?	15	BTL5	Evaluate

UNIT V CASE STUDIES			
The Environmentally Responsible Business Strategies (ERBS) –Case Study Scenarios for Trial Runs – calculating the carbon footprint – greening mobile devices - CASE STUDIES –Applying Green IT Strategies and Applications to a Home, Hospital, Packaging Industry and Telecom Sector			
1.	List the current business scenario elements in your organization.	BTL1	Remember
2.	Describe the term used by your organization to adopt Green policies.	BTL2	Understand
3.	State ICT practices adopted in your organization.	BTL1	Remember
4.	Explain practices for energy saving in data centers.	BTL2	Understand
5.	Define Compliance Audits.	BTL1	Remember
6.	State basic strategic measures for reducing emissions.	BTL1	Remember
7.	Define business strategy.	BTL1	Remember
8.	List findings of preliminary Green IT audit at GoodMead.	BTL1	Remember
9.	Explain results of initial Green IT audit at the bank.	BTL2	Understand
10.	What are strengths identified in SWOT analysis?	BTL1	Remember
11.	Explain elements of Green Transformation.	BTL2	Understand
12.	List strengths identified in AuPack.	BTL1	Remember
13.	Explain SWOT.	BTL2	Understand
14.	Explain objectives of GoodMead for GET.	BTL2	Understand
15.	What are steps in developing hospital ERBS?	BTL1	Remember
16.	List concepts of AuPack.	BTL1	Remember
17.	State the strategic approach by CGO.	BTL1	Remember
18.	Explain strengths & weaknesses of ZeeTel SWOT.	BTL2	Understand
19.	What is TCCO?	BTL1	Remember
20.	List Data Center changes in GET.	BTL1	Remember
21.	List weaknesses of Green IT.	BTL1	Remember
22.	Explain scenario of ZeeTel Telecom.	BTL2	Understand
23.	List strategic measures to reduce emissions.	BTL1	Remember
24.	State steps to develop hospital ERBS.	BTL1	Remember

PART-B				
1.	**Explain** the Strategic Measures for Reducing Emissions and Demographic Information for research project Survey.	13	BTL4	Analyze
2.	**Describe** the respondent demographics.	13	BTL3	Apply
3.	**Explain** the Business and Strategy Planning with Respect to the Environment and Technical Strategy and Planning.	13	BTL4	Analyze
4.	**Describe** the different types of the Result of the Initial Green IT Audit Undertaken by the Bank.	13	BTL3	Apply
5.a	**List** the guidelines for Case Study Scenarios for Trial Runs.	07	BTL4	Analyze
5.b	Explain in detail on Environmentally Responsible Business Strategies (ERBS) Research Project Survey.	06		
6.	**Illustrate** the concepts of Bluewaters Travel Agency Carbon Scenario and OpenAir Airline Carbon Scenario.	13	BTL3	Apply
7.a	**Sketch** the guidelines for Preliminary Green Investigation.	07	BTL3	Apply
7.b	**Describe**s the Green business objectives of a hospital	06		
8.a	**Explain** the Strategic Concerns of Management?	07	BTL4	Analyze
8.b	**Explain** the steps are Steps in Developing a Hospital's ERBS?	06		
9.a	**Describe** - Green Transformational Elements.	05	BTL3	Apply
9.b	**Describe** - The Green Transformation Project	08		
10.	Explain how the Green IT can be applied to a product-type company in the manufacturing sector.	13	BTL4	Analyze
11.	**Explain Why** AuPack strategic approach and Diagnosis in AuPack?	13	BTL4	Analyze
12.	**Analyze** about the Mobile Technologies in GET	13	BTL4	Analyze
13.a	**Point** out the features of Technical Dimension in AuPack**.**	05	BTL4	Analyze
13.b	**Explain** about the Enacting GET for ZeeTel.	08		
14.	**Analyze** about the Green IT challenges of an infrastructure-type company in the telecommunications domain.	13	BTL4	Analyze
15.	**describe** in detail about ERBS with a case study scenario?	13	BTL3	Apply
16.	**Explain** AuPack Scenario, strategic approach and SWOT in Green IT?	13	BTL4	Analyze
17.	**Briefly explain** about the application to a home in Green IT Strategies?	13	BTL4	Analyze
PART C				
1.	**Explain** with Suggest a crucial/critical action that could be taken by your organization to use renewable (Green) energy? What are the problems faced by an organization in collecting and validating environmental data (please include comments on methods, technologies, regulators, agencies, and business partners)?	15	BTL5	Evaluate

2.	**Predict** the crucial reasons why a business like yours should adopt environmentally responsible business strategies. How do you believe emerging technologies (such as mobile, Web x.0, Cloud computing) should be incorporated in business to help to reduce the carbon footprint?	15	BTL 6	Create
3.	**Develop** the SWOT of GoodMead Hospital, Strategic Concerns of Management and Lessons Learned in Implementing Green IT Strategies.	15	BTL 6	Create
4.	**Develop** Case Study in Applying Green IT Strategies and Applications to the Telecom Sector	15	BTL 6	Create
5.	**Discuss** in detail about the steps in developing a hospital ERBS?	15	BTL5	Evaluate