PSN COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution Affiliated to Anna University)

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Department of Electrical and Electronics Engineering

QUESTION BANK

Degree/Branch: B.E / EEE

Semester: VII

Subject Code/Title: 504020 / Conservation and Utilization of Electrical Energy

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Unit I- Conservation			
Economics of generation – definitions- load and load duration curves- Need for electrical energy conservation – Energy conservation Techniques – energy efficient equipment –energy management – Energy conservation at home- Introduction to energy auditing - Energy audit at industries			
Part A (2 marks)			
Q. No	**Questions**	**BT Level**	**Competence**
1	Define load factor.	**BTL1**	**Remember**
2	State diversity factor	**BTL1**	**Remember**
3	Describe Economics of generation	**BTL1**	**Remember**
4	Define load curve	**BTL1**	**Remember**
5	Describe Load duration curve	**BTL1**	**Remember**
6	Define Tariffs and list out various types.	**BTL2**	**Understand**
7	Express the objectives of tariff	**BTL1**	**Remember**
8	Describe Energy management	**BTL1**	**Remember**
9	Define Energy audit.	**BTL1**	**Remember**
10	Define power factor.	**BTL1**	**Remember**
11	Express the need for power factor correction.	**BTL2**	**Understand**
12	Detail the importance of electrical energy conservation.	**BTL2**	**Understand**
Part B (16 marks)			
Q. No	**Questions**	**BT Level**	**Competence**
1	Define the following terms a) maximum demand b) load factor c) diversity factor d) connected load	**BTL1**	**Remember**
2	Explain the various types of tariff system	**BTL1**	**Remember**
3	Define the cost of electrical generation? Explain the various types of cost associated with power generation.	**BTL1**	**Remember**
4	Describe power factor and how does power factor can be improved in industry?	**BTL4**	**Analyze**
5	Explain in details about energy audit, energy conservation and energy management	**BTL1**	**Remember**
6	Explain the need of energy conservation and methods of implementing the energy conservation	**BTL3**	**Apply**
Unit II- Illumination			
Introduction - definition and meaning of terms used in illumination engineering - classification of light sources - incandescent lamps, sodium vapour lamps, mercury vapour lamps, fluorescent lamps – design of illumination systems - indoor lighting schemes - factory lighting halls - outdoor lighting schemes - flood lighting - street lighting - energy saving lamps, LED and its advantages over conventional lightings.			
Part A (2 marks)			

Q. No	Questions	BT Level	Competence
1	Define plane angle and solid angle	**BTL1**	**Remember**
2	Define luminous flux	**BTL1**	**Remember**
3	Define candle power, lumen, lumens intensity, illumination	**BTL1**	**Remember**
4	Define depreciation factor	**BTL1**	**Remember**
5	State the properties of good lighting scheme.	**BTL1**	**Remember**
6	State the importance of lighting	**BTL1**	**Remember**
7	Define photometry.	**BTL1**	**Remember**
8	Define the law of inverse square	**BTL1**	**Remember**
9	State the lamberts cosine law of illumination	**BTL1**	**Remember**
10	Name the different type of lamp in electric lighting	**BTL1**	**Remember**
11	Express the different types of arc lamp	**BTL1**	**Remember**
12	List out the advantages of energy efficient lamp	**BTL2**	**Understand**
Part B (16 marks)			
Q. No	**Questions**	**BT Level**	**Competence**
1	Explain in detail the law of illumination	**BTL1**	**Remember**
2	Explain the various methods of lighting calculation	**BTL1**	**Remember**
3	Explain the various factors to be considered while designing of illumination system	**BTL1**	**Remember**
4	List the various types of lamp which are commercially available and explain the construction and working of lamp in detail	**BTL1**	**Remember**
5	Explain about photometry.	**BTL1**	**Remember**
Unit III- Heating and Welding			
Introduction - advantages of electric heating – modes of heat transfer - methods of electric heating - resistance heating - arc furnaces - induction heating - dielectric heating - electric welding – types - resistance welding - arc welding - power supply for arc welding - radiation welding.			
Part A (2 marks)			
Q. No	**Questions**	**BT Level**	**Competence**
1	List out the requirement of good heating material used in electric resistance heating	**BTL1**	**Remember**
2	List out the various losses of electric heating	**BTL1**	**Remember**
3	Classify the methods of electric heating.	**BTL1**	**Remember**
4	Describe the indirect resistance heating	**BTL1**	**Remember**
5	Describe the direct resistance heating?	**BTL1**	**Remember**
6	State the basic principle of induction heating?	**BTL1**	**Remember**
7	State the basic principle of dielectric heating?	**BTL1**	**Remember**
8	List out the different types of resistance welding?	**BTL1**	**Remember**
9	Classify the resistance welding?	**BTL1**	**Remember**
10	State the requirements of good welding?	**BTL1**	**Remember**

11	Compare DC welding and AC welding.	**BTL4**	**Analyze**
Part B (16 marks)			
Q. No	**Questions**	**BT Level**	**Competence**
1	List out the different method of electric heating describe briefly the methods direct and indirect resistance heating	**BTL1**	**Remember**
2	Describe the construction and operation transformer used for electric arc furnace.	**BTL1**	**Remember**
3	Name and describe various resistance welding process	**BTL1**	**Remember**
4	Describe the various types of electric arc welding process	**BTL1**	**Remember**
5	Discuss the advantages of electrically produced heat sate the properties of good heating element	**BTL1**	**Remember**
6	Briefly explain the working of welding generator.	**BTL1**	**Remember**
Unit IV- Electric Traction			
Fundamentals of electric drive - choice of an electric motor - application of motors for particular services - traction motors - characteristic features of traction motor - systems of railway electrification - electric braking - train movement and energy consumption - traction motor control - track equipment and collection gear.			
Part A (2 marks)			
Q. No	**Questions**	**BT Level**	**Competence**
1	List out the advantages of electric traction steam engine	**BTL1**	**Remember**
2	State the requirements of an ideal traction system	**BTL2**	**Understand**
3	List the various stages of train movement?	**BTL1**	**Remember**
4	Define average speed, Schedule speed?	**BTL1**	**Remember**
5	Define gear ratio?	**BTL1**	**Remember**
6	Describe the electric features of traction motors.	**BTL1**	**Remember**
7	State the need for traction motor control	**BTL1**	**Remember**
8	Explain the various methods of speed control of 3 phase inductor motors	**BTL1**	**Remember**
9	List out the advantages of electric braking	**BTL2**	**Understand**
10	State the various factors to be considered while designing a current collection system in electric traction	**BTL1**	**Remember**
Part B (16 marks)			
Q. No	**Questions**	**BT Level**	**Competence**
1	Discuss the requirements of an ideal traction system	**BTL1**	**Remember**
2	Explain the various types of supply systems used for electric traction.	**BTL1**	**Remember**
3	Explain the mechanics of Train movement.	**BTL1**	**Remember**
4	Explain the importance of speed-time curve.	**BTL1**	**Remember**

5	What is simplified speed- time curve? Explain trapezoidal and quadrilateral approximation?	**BTL1**	**Remember**
6	Discuss the various motors used for traction.	**BTL1**	**Remember**
7	Discuss briefly various methods of speed control of single phase a.c series and 3-phase induction motors.	**BTL1**	**Remember**
8	Explain various methods of electric braking. State the conditions to be fulfilled for each method of braking.	**BTL1**	**Remember**
9	Explain clearly regenerative braking when used for dc shunt motor. How does it differ for dc shunt motor	**BTL4**	**Analyze**
10	Compare the advantages and disadvantages of rheostatic braking and regenerative braking.	**BTL4**	**Analyze**
11	Discuss and compare various arrangements of current collection used in electric traction.	**BTL1**	**Remember**

Unit V - Refrigeration and Air Conditioning

Introduction – Refrigeration cycle – Refrigeration system – Types of refrigerants –Domestic refrigerator – Equipment: Type of Compressors, Condensers, Expansion devices, Evaporators. Water coolers – Air conditioning systems – Air conditioning cycle– Classification of air conditioning systems – Central system – Unitary systems – Load estimation – Heating of building.

Part A (2 marks)

Q. No	Questions	BT Level	Competence
1	List out the types of refrigerants	**BTL1**	**Remember**
2	Define refrigeration.	**BTL1**	**Remember**
3	List out the applications of refrigeration	**BTL1**	**Remember**
4	Differentiate open and closed air refrigeration systems.	**BTL1**	**Remember**
5	State the elements to be used in refrigeration system	**BTL1**	**Remember**
6	Define the term coefficient of performance.	**BTL1**	**Remember**
7	Classify the water cooler	**BTL1**	**Remember**
8	List out the elements involved in air conditioning system	**BTL1**	**Remember**
9	Express the advantages and disadvantages of central system	**BTL4**	**Analyze**
10	State the advantages of unitary system?	**BTL1**	**Remember**

Part B (16 marks)

Q. No	Questions	BT Level	Competence
1	Explain the different types of refrigeration system.	**BTL1**	**Remember**
2	With a neat diagram explain the construction and working of domestic refrigerator.	**BTL1**	**Remember**
3	With a neat diagram explain the construction and working of water cooler.	**BTL1**	**Remember**
4	Briefly explain the air conditioning cycle.	**BTL1**	**Remember**
5	Explain about central system.	**BTL1**	**Remember**

6	Explain about central system.	**BTL1**	**Remember**
7	Explain about unitary system.	**BTL1**	**Remember**
8	Discuss different methods of heating building.	**BTL1**	**Remember**