

USN						BETCKE105/BETCK105E

First Semester B.E./B.Tech. Degree Supplementary Examination, June/July 2024

Renewable Energy Sources

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. VTU Formula Hand Book is permitted.

3. M: Marks, L: Bloom's level, C: Course outcomes.

			Module – 1	M	L	C					
b. Discuss the renewable energy availability in India and Worldwide. 10 L2 CO1	Q.1	a.	Briefly explain the following principles of renewable energy, energy and	10	L2	CO1					
Q.2 a. With neat sketch, briefly explain (i) Solar energy (ii) Wind energy 10 L2 CO1 b. Explain in detail the concept of Internet of Energy. 10 L2 CO1 Module - 2			sustainable development and renewable energy and social implications.								
Q.2 a. With neat sketch, briefly explain (i) Solar energy (ii) Wind energy 10 L2 CO1 b. Explain in detail the concept of Internet of Energy. 10 L2 CO2		b.	Discuss the renewable energy availability in India and Worldwide.	10	L2	CO1					
b. Explain in detail the concept of Internet of Energy. Module - 2											
Module - 2 Q.3 a. With the help of neat sketch, explain the construction and working of pyrheliometer. b. With the help of neat sketch, explain solar flat plate collector. 10 L2 CO2	Q.2	a.	With neat sketch, briefly explain (i) Solar energy (ii) Wind energy	10	L2	CO1					
Q.3 a. With the help of neat sketch, explain the construction and working of pyrheliometer. b. With the help of neat sketch, explain solar flat plate collector. 10 L2 CO2		b.	Explain in detail the concept of Internet of Energy.	10	L2	CO1					
b. With the help of neat sketch, explain solar flat plate collector. OR Q.4 a. Explain the principle and working of solar photo voltaic cell with the help of neat sketch. b. List the advantages, disadvantages and applications of solar photovoltaic cell. Module – 3 Q.5 a. Explain with neat sketch the basic components of the wind energy conversion system. b. Compare horizontal axis and vertical axis window turbines. C. List the major problem associated with wind energy conversion systems. OR Q.6 a. Explain in detail the photosynthesis process. Not with the help of neat diagram, explain downdraft gasifier. DR Q.7 a. Explain with a neat sketch single basin and double basin tidal power plant. DR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. DR Q.9 a. Explain the different problem associated with OTEC. DR Q.9 a. Explain the different classification of fuel cells. DR Q.9 a. Explain the different classification of fuel cells. OR Q.9 a. With the help of neat diagram, explain electrolysis method of producing by drydrogen (H ₂). CO1 OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). CO2 CO3 CO3 CO4 CO5 CO5 CO6 CO7 CO7 CO7 CO7 CO8 CO7 CO8 CO9 CO9 CO9 CO9 CO9 CO9 CO9											
b. With the help of neat sketch, explain solar flat plate collector.	Q.3	a.	With the help of neat sketch, explain the construction and working of	10	L2	CO ₂					
Q.4 a. Explain the principle and working of solar photo voltaic cell with the help of neat sketch. b. List the advantages, disadvantages and applications of solar photovoltaic cell. Module – 3 Q.5 a. Explain with neat sketch the basic components of the wind energy conversion system. b. Compare horizontal axis and vertical axis window turbines. c. List the major problem associated with wind energy conversion systems. OR Q.6 a. Explain in detail the photosynthesis process. b. With the help of neat diagram, explain downdraft gasifier. Q.7 a. Explain with a neat sketch single basin and double basin tidal power plant. b. Explain the advantages and disadvantages of tidal power plant. OR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. b. Explain the different problem associated with OTEC. Module – 5 Q.9 a. Explain the different classification of fuel cells. b. Explain the concept of zero energy. c. Define and explain a fuel cell. OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). b. List the advantages and problem associated with hydrogen energy. OS L2 CO1 OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂).											
Q.4 a. Explain the principle and working of solar photo voltaic cell with the help of neat sketch. b. List the advantages, disadvantages and applications of solar photovoltaic cell. D. L. CO2 cell.		b.	With the help of neat sketch, explain solar flat plate collector.	10	L2	CO2					
Description of neat sketch. Description											
b. List the advantages, disadvantages and applications of solar photovoltaic cell. Module - 3 Separation Separation	Q.4	a.		10	L2	CO2					
Cell. Module -3 Coordinate Section Module -1 Coordinate Coordinate Module -1 Coordinate Coordinate Module -1 Coordinate Coordinat											
Module - 3 Explain with neat sketch the basic components of the wind energy conversion system. December 200 Compare horizontal axis and vertical axis window turbines. December 200 Compare horizontal axis and vertical axis window turbines. December 200 Compare horizontal axis and vertical axis window turbines. December 200 Compare horizontal axis and vertical axis window turbines. December 200 Compare horizontal axis and vertical axis window turbines. December 200 Compare horizontal axis and vertical axis window turbines. December 200 Compare horizontal axis and vertical axis window turbines. December 200 Compare horizontal axis and vertical axis window turbines. December 200 De		b.		10	L2	CO2					
Q.5 a. Explain with neat sketch the basic components of the wind energy conversion system. b. Compare horizontal axis and vertical axis window turbines. c. List the major problem associated with wind energy conversion systems. OR Q.6 a. Explain in detail the photosynthesis process. b. With the help of neat diagram, explain downdraft gasifier. OR Q.7 a. Explain with a neat sketch single basin and double basin tidal power plant. b. Explain the advantages and disadvantages of tidal power plant. OR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. DESTINATION OF TOOLS OF TOOL											
conversion system. b. Compare horizontal axis and vertical axis window turbines. c. List the major problem associated with wind energy conversion systems. OR Q.6 a. Explain in detail the photosynthesis process. b. With the help of neat diagram, explain downdraft gasifier. Module – 4 Q.7 a. Explain with a neat sketch single basin and double basin tidal power plant. DR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. DR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. DR Q.9 a. Explain the different problem associated with OTEC. Define and explain a fuel cell. OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). D. List the advantages and problem associated with hydrogen energy. OS L2 CO1 Define and explain a fuel cell. DR Q.10 b. List the advantages and problem associated with hydrogen energy. OS L2 CO1 CO1 CO1 CO2 CO3 CO3 CO3 CO4 CO5 CO5 CO5 CO5 CO6 CO6 CO7 CO7 CO7 CO7 CO7 CO7		ı									
b. Compare horizontal axis and vertical axis window turbines. c. List the major problem associated with wind energy conversion systems. OR Q.6 a. Explain in detail the photosynthesis process. b. With the help of neat diagram, explain downdraft gasifier. Nodule - 4 Q.7 a. Explain with a neat sketch single basin and double basin tidal power plant. b. Explain the advantages and disadvantages of tidal power plant. OR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. b. Explain the different problem associated with OTEC. Nodule - 5 Q.9 a. Explain the different classification of fuel cells. B. Explain the concept of zero energy. C. Define and explain a fuel cell. OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). List the advantages and problem associated with hydrogen energy. OS L2 CO1	Q.5	a.	1	10	L2	CO ₃					
c. List the major problem associated with wind energy conversion systems. OR Q.6 a. Explain in detail the photosynthesis process. b. With the help of neat diagram, explain downdraft gasifier. Module – 4 Q.7 a. Explain with a neat sketch single basin and double basin tidal power plant. b. Explain the advantages and disadvantages of tidal power plant. OR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. b. Explain the different problem associated with OTEC. D.9 a. Explain the different classification of fuel cells. D. Explain the concept of zero energy. c. Define and explain a fuel cell. OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). D. List the advantages and problem associated with hydrogen energy. OS L2 CO1 CO2 CO3 CO3 CO3 CO3 CO4 CO4 CO5 CO5 CO5 CO5 CO5 CO6 CO5 CO6 CO7 CO7 CO7 CO7 CO7 CO7 CO7				0.5		666					
OR Q.6 a. Explain in detail the photosynthesis process. D. With the help of neat diagram, explain downdraft gasifier. Module – 4 Q.7 a. Explain with a neat sketch single basin and double basin tidal power plant. DR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. DR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. DR Q.9 a. Explain the different classification of fuel cells. DR Q.9 a. Explain the concept of zero energy. C. Define and explain a fuel cell. DR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). DR Q.10 b. List the advantages and problem associated with hydrogen energy. DS L2 CO1 CO2 CO3 CO3 CO3 CO3 CO4 CO4 CO4 CO5 CO4 CO4 CO5 CO5			1								
Q.6 a. Explain in detail the photosynthesis process. 10 L2 CO3		c.	05	L2	CO3						
b. With the help of neat diagram, explain downdraft gasifier. Module - 4	0.6	10	Τ.Δ	COA							
Module – 4 Q.7 a. Explain with a neat sketch single basin and double basin tidal power plant. b. Explain the advantages and disadvantages of tidal power plant. OR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. b. Explain the different problem associated with OTEC. D.9 a. Explain the different classification of fuel cells. D.9 a. Explain the concept of zero energy. C. Define and explain a fuel cell. OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). D. List the advantages and problem associated with hydrogen energy. OS L2 CO1	Q.6										
 Q.7 a. Explain with a neat sketch single basin and double basin tidal power plant. b. Explain the advantages and disadvantages of tidal power plant. CO4 CO4 DR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. b. Explain the different problem associated with OTEC. DE Explain the different classification of fuel cells. Explain the concept of zero energy. CO5 Define and explain a fuel cell. DR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H₂). D. List the advantages and problem associated with hydrogen energy. DE IL2 CO1 		b.		10	L2	CO3					
b. Explain the advantages and disadvantages of tidal power plant. OR Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. b. Explain the different problem associated with OTEC. Module – 5 Q.9 a. Explain the different classification of fuel cells. b. Explain the concept of zero energy. c. Define and explain a fuel cell. OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). b. List the advantages and problem associated with hydrogen energy. OS L2 CO1	0 =	ı		4.0		CO.1					
Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. b. Explain the different problem associated with OTEC. 10 L2 CO4 Module – 5 Q.9 a. Explain the different classification of fuel cells. b. Explain the concept of zero energy. c. Define and explain a fuel cell. OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). b. List the advantages and problem associated with hydrogen energy. OS L2 CO5 OR Q.10 b. List the advantages and problem associated with hydrogen energy. OS L2 CO1	Q. 7	+									
 Q.8 a. With the help of neat sketch, explain the principle of working of OTEC. b. Explain the different problem associated with OTEC. Q.9 a. Explain the different classification of fuel cells. b. Explain the concept of zero energy. c. Define and explain a fuel cell. Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H₂). b. List the advantages and problem associated with hydrogen energy. D.5 L2 CO1 		b.		10	LZ	CO4					
 b. Explain the different problem associated with OTEC. 10 L2 CO4 Module – 5 Q.9 a. Explain the different classification of fuel cells. b. Explain the concept of zero energy. c. Define and explain a fuel cell. Define and explain a fuel cell.	0.0			10	Τ.Δ	004					
Module – 5 Q.9 a. Explain the different classification of fuel cells. b. Explain the concept of zero energy. c. Define and explain a fuel cell. OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). b. List the advantages and problem associated with hydrogen energy. OS L2 CO5 L2 CO5 L3 CO1	Q.8										
 Q.9 a. Explain the different classification of fuel cells. b. Explain the concept of zero energy. c. Define and explain a fuel cell. OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H₂). b. List the advantages and problem associated with hydrogen energy. OS Define and explain a fuel cell. OB L2 CO1 CO1 L2 CO1 		D.		10	L2	CO4					
b. Explain the concept of zero energy. c. Define and explain a fuel cell. OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). b. List the advantages and problem associated with hydrogen energy. 06 L2 CO5 CO5 CO5 CO5 CO5 CO5 CO5 CO5	0.0	00	Τ.Δ	CO5							
c. Define and explain a fuel cell. OR OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). b. List the advantages and problem associated with hydrogen energy. 06 L2 CO1	Q.9	a.									
OR Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). b. List the advantages and problem associated with hydrogen energy. OR Lost the help of neat diagram, explain electrolysis method of producing hydrogen (H ₂). CO1		1									
 Q.10 a. With the help of neat diagram, explain electrolysis method of producing hydrogen (H₂). b. List the advantages and problem associated with hydrogen energy. D. List the advantages and problem associated with hydrogen energy. 											
hydrogen (H ₂). b. List the advantages and problem associated with hydrogen energy. 05 L2 CO1	0.10	I _		10	Τ.Δ	CO1					
	Q.10	a.	hydrogen (H ₂).	10	L2						
c. List the application of Hydrogen energy. 05 L2 CO1		b.		05	L2	CO1					
		c.	List the application of Hydrogen energy.	05	L2	CO1					

* * * * *