

**VIDYA ACADEMY OF SCIENCE AND TECHNOLOGY
TECHNICAL CAMPUS, KILIMANOOR**

(A Unit of Vidya International Charitable Trust)

Accredited by NAAC with B++ Grade



**QUESTION BANK
S7 ECE (2019 Batch)**

Sl No.	Subject Code	Subject Name	Page no
1	ECT 401	Microwave and Antenna	3
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ECT 401 Microwave and Antenna

Sl No	Module 1	Marks	Year
1	Derive an expression for aperture area of an antenna.	3	Model Qns
2	(i) Obtain the radiation resistance of a thin dipole antenna of length $\lambda/15$. (ii) Find HPBW of an antenna which has a field given by: $E(\theta) = \cos^2\theta$, for $0 \leq \theta \leq 90^\circ$.	3	Model Qns
3	Define the terms (i) Retarded potential (ii) Antenna field zones	4	Model Qns
4	Derive expressions for the Far Field components and Radiation Resistance and Directivity of a short dipole antenna.	10	Model Qns
5	State and prove Helmholtz theorem	7	Model Qns
6	(i) Compute the radiation resistance, power radiated and efficiency of an antenna having total resistance of 50Ω and effective height of 69.96m and a current of 50A (rms) at 0.480MHz. (ii) Calculate the effective aperture of a short dipole antenna operating at 100 MHz.	7	Model Qns
Module 2			
1	Why Log Periodic antenna is called as Frequency Independent antenna, explain?	3	Model Qns
2	Briefly explain about Inverted F antenna.	3	Model Qns
3	Explain the working of a parabolic dish antenna. Write down the expression for gain, HPBW and BWFN.	6	Model Qns
4	Design a rectangular microstrip antenna using a dielectric substrate with dielectric constant of 2.2, $h = 0.1588$ cm so as to resonate at 10 GHz.	8	Model Qns
5	Explain the working of a Log periodic dipole array and explain its design steps.	7	Model Qns
6	Explain axial mode helical antenna. Write down the expression for gain, HPBW, BWFN and radiation resistance of axial mode helical antenna.	7	Model Qns
Module 3			
1	Explain (i) Pattern Multiplication (ii) Grating lobes	3	Model Qns
2	Demonstrate the working principle of Phase Arrays.	3	Model Qns
3	Derive expression for array factor of N isotropic sources for end-fire array and also the expression for major lobe, minor lobes and Nulls of the array.	14	Model Qns
4	Explain Chebyshev array and write down the expression for array factor.	7	Model Qns
5	Design a Broadside Array and plot its radiation pattern.	7	Model Qns
Module 4			
1	Show that the axial electric field of TWT varies with convection current.	7	Model Qns
2	Explain the electronic admittance of the gap in the case of reflex klystron. With admittance diagram explain the condition required for oscillation in a reflex Klystron.	7	Model Qns
3	A reflex klystron operates under the following conditions: $V_0=500V$, $R_{sh} = 10K\Omega$, $f_r = 8$ GHz, $L=1$ mm, $e/m = 1.759 \times 10^{11}$ (MKS system) The tube is oscillating at f_r at the peak of the $n = 2$ or mode. Assume that the transit time through the gap and beam loading to be neglected. Determine: - (a) The value of the repeller voltage V_r . (b) The direct current necessary to give a microwave gap voltage of 200V. (c) The electronic efficiency under this condition.	7	Model Qns
4	Assuming pi mode of oscillations explain how a magnetron can sustain its oscillations using the cross field.	7	Model Qns
5	Derive the resonant frequency of a rectangular cavity resonator.	3	Model Qns

6 What are re-entrant cavities? Show that they support infinite number of resonant frequencies. 3 Model Qns

Module 5

1 Explain with figure a ferrite isolator can support only forward direction waves. 3 Model Qns

2 Write a short note on Phase shifter. 3 Model Qns

3 Explain the working of a microwave amplifiers using MESFET 8 Model Qns

4 Explain the constructional features of two-hole directional coupler and derive the S Matrix. 6 Model Qns

5 Draw the J-E characteristics of Gunn diode and explain its operation. 10 Model Qns

6 Discuss the constructional features of magic tees and derive its S Matrix. Why are they called so? 4 Model Qns

ECT 423 Computer Networks

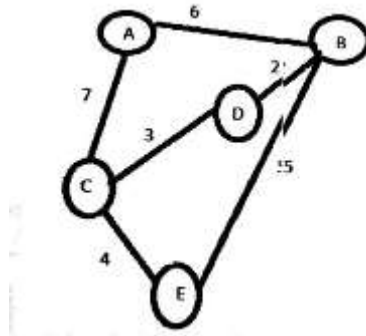
MODULE 1		MARKS	YEAR
1	Compare and contrast circuit switching and packet switching	3	Model
2	Explain the concept of FTTH internet access	3	Model
3	How layered architecture helps in the efficient communication between hosts?	4	Model
4	Explain the functions performed by the layers in the internet protocol stack	10	Model
5	Describe any one of the mail access protocols.	6	Model
6	Explain protocol Standardization	3	
7	Explain DNS	10	
8	Explain the importance of layering	3	

MODULE 2		MARKS	YEAR
1	How does the process-to-process delivery service is achieved in transport layer?	3	Model
2	Describe stop and wait protocol for reliable data transfer	3	Model
3	Explain how TCP provides a flow control service to its applications.	5	Model
4	Compare and contrast TCP and UDP. Also explain the TCP segment structure	9	Model
5	With the help of a neat diagram explain the operation of selective repeat ARQ	7	Model
6	Explain TCP congestion in detail	10	

MODULE 3		MARKS	YEAR
1	Give the basic blocks in router architecture	3	Model
2	What are the different error reporting messages in ICMP	3	Model
3	Explain the datagram format in IPv4	7	Model
4	Describe the internets address assignment strategy using classless interdomain routing	7	Model

5 Describe the process of assigning IP address to a host in an organization using DHCP protocol 5 Model

Consider the following network. Compute the shortest-path from the node D to all other nodes using Dijkstra's shortest path algorithm. (Numbers indicated shows the link costs).



6 9 Model

7 Explain the frame format of IPv6 7

8 Explain OSPF 7

9 Distinguish between broadcast and multicast routing 5

MODULE 4

MARKS YEAR

1 Explain the frame structure of Ethernet 3 Model

2 Compare and contrast different random-access protocols 3 Model

3 Explain the multiple access protocol used in IEEE 802.3 7 Model

4 Explain error detection mechanism using CRC with an example 7 Model

5 Derive the efficiency of slotted ALOHA 7 Model

6 Explain how the physical address of a host is being mapped from its IP address using address resolution protocol. 7 Model

7 Explain CSMA/CD 7

8 Explain MPLS 7

MODULE 5

MARKS YEAR

1 Customers arrive in a restaurant at a rate of 5 per minute, and wait to receive their order for an average of 5 minutes. Customers eat in the restaurant with a probability of 0.5, and 3 Model

carry their order out without eating with probability 0.5. What is the average number of customers in the restaurant?

2	Define M/G/I queue	3	Model
3	State and prove Little's theorem	7	Model
4	Explain the IEEE 802.11 MAC protocol	7	Model
5	Derive an expression for the average packet delay in a Go-back-N ARQ system	7	Model
6	Describe how a wireless station associates with an access point (AP) as per IEEE 802.11 protocol	7	Model
7	Explain Poisson's theorem	5	

EET 435 Renewable Energy systems

Sl No	Question		Marks
1	Differentiate between flat plate collectors and solar concentrators.	KTU MODEL QUESTION	3
2	Discuss advantages and limitations of conventional energy sources.	KTU MODEL QUESTION	3
3	a) With the aid of a neat diagram, explain type solar thermal electric plant b) Define (i) Open Circuit Voltage (ii) Short circuit Current (iii) Fill factor and (iv) Efficiency of the solar cell	KTU MODEL QUESTION	9 5
4	a) Compare the components and working of a standalone and grid connected PV system. b) How energy resources are classified. Compare conventional and non-conventional sources of energy resources.	KTU MODEL QUESTION	5 9

MODULE 2

1	With the help of a block diagram explain the working of a hybrid OTEC.	KTU MODEL QUESTION	3
2	List out the advantages and disadvantages of a tidal power plant.	KTU MODEL QUESTION	3
3	What are the site selection criteria explain the working of Anderson cycle based OTEC system. Explain how biofouling affects efficiency of energy conversion and how can it be minimised?	KTU MODEL QUESTION	14
4	Explain the principle of operation of a tidal power. Draw the layout of a double basin tidal power plant and label all the components. Explain the function of each component	KTU MODEL QUESTION	14

MODULE 3

1	Discuss the different types of wind turbine rotors used to extract wind power.	KTU MODEL QUESTION	3
2	The Danish offshore wind farm has a name plate capacity of 209.3 MW. As of January 2017 it has produced 6416 GWh since its commissioning 7.3 years ago. Determine the capacity factor of above wind farm.	KTU MODEL QUESTION	3
3	a) Prove that the maximum wind turbine output can be achieved when, where respectively. b) What is pitch control of wind.	KTU MODEL QUESTION	10

			4
4	<p>a) Determine the power output of a wind turbine whose blades are 12m in diameter and when the wind speed is 6m/s, the air density is maximum power coefficient of the wind turbine is 0.35.</p> <p>b) Explain the parts, their function and working of a wind power plant. What are the site selection criteria of a wind power.</p>	KTU MODEL QUESTION	5 9

MODULE 4

1	What are the factors that affect biogas generation	KTU MODEL QUESTION	3
2	Discuss the process of biomass to ethanol conversion	KTU MODEL QUESTION	3
3	<p>a) With a neat schematic diagram, explain the biomass gasification based electric power generation system</p> <p>b) Explain the how urban waste is converted into useful energy</p>	KTU MODEL QUESTION	5 9
4	<p>a) Compare the construction and performance of floating drum type and fixed dome type biogas plants with the help of neat sketches</p> <p>b) Explain the importance of biomass programme in India.</p>	KTU MODEL QUESTION	10 4

MODULE 5

1	What are the components of micro hydel power plant	KTU MODEL QUESTION	3
2	Enumerate the design and selection of different types of turbines used for small hydro plants	KTU MODEL QUESTION	3
3	<p>a) Explain the operation of a phosphoric acid fuel cell with the help of a suitable diagram.</p> <p>b) What are the different methods used for the production and storage of hydrogen</p>	KTU MODEL QUESTION	7 7
4	<p>a) Draw the layout of a mini hydro project and explain its working</p> <p>(b) Describe the working and constructional features of PEM fuel cell</p>	KTU MODEL QUESTION	7 7

MCN 401 Industrial Engineering Safety

MODULE 1			
SL.NO	QUESTIONS	MARK	
1	Differentiate Unsafe act and Unsafe conditions with suitable examples	3	MODEL
2	Discuss the significance of a safety committee in improving the safety performance of an industry	3	MODEL
3	List the various accident causation theories and explain any one in details.	14	MODEL
4	Discuss the significance of safety policy in reducing the accidents.	4	MODEL
5	Safety and productivity are the two sides of a coin'. Are you agreeing with this statement? Explain with your arguments.	10	MODEL
6	Discuss the role of management, supervisors, workmen, unions, government and voluntary agencies in safety.	14	MODEL
7	Write down the needs, types and advantages of safety committee?	14	MODEL
8	Write down the needs of safety in industries?	7	MODEL
9	Define the following terms a) Industrial safety b) Accident c) Injury d) Unsafe act e) Unsafe Condition f) Dangerous Occurrence g) Reportable accidents	(7*2=14)	MODEL
10	Write down the responsibilities of a safety officer?	3	MODEL
11	The protection of workers from occupational accidents and diseases is the primarily the responsibility of management. Discuss the role of management to achieve this objective?	14	MODEL
MODULE 2			
1	Which are the different types of permit? Highlight its suitability	3	MODEL
2	Which are five 'S' used in housekeeping?	3	MODEL
3	Classify the personal protective equipment. List the suitability of at least fifteen types of PPEs.	10	MODEL

4	How will you calculate the frequency rate? Explain with an example.	4	MODEL
5	How will you compare the safety performance of two industries? Explain with suitable example	10	MODEL
6	Which are the steps to be followed in confined space entry to protect the life a worker.	4	MODEL
7	Write short notes on safety performance rate <ul style="list-style-type: none"> • Frequency rate • severity rate • incidence rate • activity rate 	3	MODEL
8	Firm A has 60 workers working 48 hours a week and 20 accidents (lost time) resulting in 120 man-days lost. Firm B has 80 workers working 48 hours a week and 30 accidents resulting in 150 man-days lost. Which firm has the better safety performance during the same six months?	14	MODEL
9	What are the industrial models used for in the workplace? Write the methodology for each.	14	MODEL
10	Explain any three types of maintenance and their effects on housekeeping	3	MODEL
11	Using the following data calculate the frequency rate of accident in an industrial plant. a) Number of workers=500 b) Number of disabling injuries per year= 5. c) Average number of hours worked by worker per year=2000.	14	MODEL
12	Discuss the types and hazards of a confined space?	3	MODEL
MODULE 3			
1	List the various safety features of ladders	3	MODEL
2	How safety of the workers can be ensured during a demolition operations.	3	MODEL
3	Discuss the safety and fire protection facilities required for a high rise building as per National building code.	14	MODEL
4	Identify the various hazards during the different stages of building construction.	7	MODEL
5	Discuss the important types of ergonomic hazards associated with industries.	7	MODEL
6	What are safety measures adopted in construction phase?	4	MODEL
7	What is the causes of ergonomics hazards in construction work?	7	MODEL
8	Explain the National Building Code of India	7	MODEL
9	Discuss the safety measures to be followed in blasting and demolition work	14	MODEL
10	What is the relevance of ergonomic construction safety?	7	MODEL

MODULE 4			
1	Which are the hazards associated with manual material handling?	3	MODEL
2	Discuss the safety issues of Gas welding operations.	3	MODEL
3	Which are the various types of machine guarding devices used industries. Discuss the suitability of each machine guarding devices.	14	MODEL
4	With suitable sketches briefly explain seven defects of wire ropes.	14	MODEL
5	What are the various types of Guards?	7	MODEL
6	Explain safety measures needed in turning and grinding.	14	MODEL
7	What are the various material handling equipment?	7	MODEL
8	Explain the safety needed in arc welding and gas welding.	14	MODEL
9	Explain Hearing Conservation Programme in Production industries.	7	MODEL
10	Discuss the safety issues in arc welding operations.	3	MODEL
MODULE 5			
1	Differentiate Hazard and Risk.	3	MODEL
2	Why MSDS is mandatory for chemical products.	3	MODEL
3	Define objectives of dow fire and explotion index	3	MODEL
4	Define material factor for calculation of Dow F & EI	5	MODEL
5	What are the different types of hazards.	10	MODEL
6	Define classes of fires	10	MODEL
7	What are the different types of chemical hazards	10	MODEL
8	What is Hazard and Operability Analysis? How do you conduct a HAZOP analysis?	14	MODEL
9	Define hazard identification methods	14	MODEL
10	Wahat are the risk assessment tools	14	MODEL
11	Discuss about different types of chemical hazards.	14	MODEL
12	What are the different types of fire extinguishers.	14	MODEL