Question Bank
S5 EEE

Subject: Power System 1(EET301)

Module 1			
Sl. No	**Questions**	**Marks**	**KU/KTU (Month/Year)**
1	What are the limiting factors in tapping the wind and solar potential?	5	KU May 2019
2	With a neat sketch explain the principle of working of a High Head Hydro-electric Power Station.	5	KU May 2019
3	With the help of a block diagram explain wind power generation	5	KU Dec 2018 KTU dec 2021
4	Enlighten upon the various components and their operation in a hydroelectric power plant for energy production.	5	KU Dec 2018 KTU dec 2021
5	Explain Nuclear plants using a neat sketch.	5	KTUDec2017
6	Briefly DescribeSolar power plant withBlock Diagram .	5	KTU April2016
7	ExplainThermal power plants using a neat sketch.	5	KTUDec2017
8	Explain the term Load factor, Load curve and write its features.	5	KTUDec2017 KTUDec2021
9	What is diversity factor ? What is its significance ?	5	KTU April2018
10	Design a capacitor bank for 5HP motor load to improve its power factor from .8 lag to unity	5	KTU April2018

11	Write using figures and equations how the power factor is improved using capacitors in power system.	5	KTUDec2019
12	Explain arrangement and operation of hydro electric power plant	5	KTU sept 2020
13	define diversity factor and prove load factor is improved by an increase in diversity factor	5	KTU sept 2020
14	With a neat schematic diagram explain the working of nuclear power plant	10	KTU dec 2021
15	Exp;lain the design steps of a ground mounted solar farm	7	KTU dec 2021

Module 2

Power Transmission

1	Explain the principle and causes of proximity effect and Ferranti effect using appropriate figures	5	KTU May 2019
2	Derive the inductance of a single phase transmission line with three conductors arranged vertically in Side A and two conductors in Side B. The distance between adjacent conductors in each Side is 6m and that between thesides are 8m. Each conductor is of radius 0.3cm.	5	KTU May 2019
3	State Skin Effect and Ferranti Effect and elucidate them with necessary diagrams	5	KTU Dec 2018
4	Derive the expression for capacitance in a single phase overhead line under the influence of earth effect.	5	KTU Dec 2018
5	Classify transmission lines according to their length and enlist the line models. Derive the ABCD constants for medium lines using nominal π method.	5	KTU Dec 2018
6	A 3 phase 80km long Transmission line has its conductors of 1cm diameterspaced at the corners of the equilateral triangle of 100cm side. Find theinductance per phase of the system.	5	KTUDec2017

7	Derive an expression for the Capacitance per phase of a 3 phase double circuit overhead transmission line with unsymmetrical spacing (Transposed line).	5	KTU April2016
8	A 3phase, 50 Hz, 132 kV OH Line has conductors placed in a horizontal plane4m apart. Conductor diameter is 2 cm. If the line length is 100km calculate thecharging currents per phase assuming complete transposition	5	KTU April2016 KTU dec 2021
9	Evaluate the generalized circuit constants for medium transmission line using Nominal T method. Draw the phasor diagram also.	5	KTUDec2017

10	Derive the L-L Capacitance of a two wire line.		
11	The sending end voltage and receiving end voltage of a 3 phase line are 240 kV and 220kV line to line respectively. Its generalized constants of one phase are: A = D = 0.99 + j0.0132Ω, B = 24.75 + j165 Ω and C = -0.000044 + j0.0011℧. Draw the Receiving end power circle diagram and determine active and reactive power received when the angle between sending end and receiving end voltage phasors is 30°.	5	KTUDec2017
12	A 3phase, 50 Hz, 150 km overhead transmission line has the following distributed constants per phase: Resistance/km = 0.10, Reactance/km'= 0.50, Susceptance/km = 3x10-6 S. If the line delivers 50 MW at 110 kV and 0.8 p.f. lagging. Determine: i) Sending end current ii) Sending end voltage for this load. Use Nominal n method.	5	KTU April2016
13	The receiving end voltage of an uploaded line may be greater than the sending end voltage.explain this phenomenon	5	KTU sept 2020
14	Derive capacitance of single phase transmission line considering effect of earth	5	KTU sept 2020
15	Derive the expression for inductance of a single phase overhead transmission line	5	KTU dec 2021

16	Derive the expression for capacitance of three phase transmission line with symmetrical spacing and unsymmetrical spacing	14	KTU dec 2021
17	concept of self GMD nd mutual GMD of overhead lines		KTU dec 2021
18	What is meant by transposition of lines?what are its advantages		KTU dec 2021
Module 3			
1	What are the critical voltages in the formation of Corona? What is the effect of Corona?	5	KTU May 2019
2	Following results are obtained by making experiments on three phase, three core metal sheathed cable: (a) Capacitance between all the three bunched conductors and sheath is 1.2 micro Farad. (b) Capacitance between any one conductor and sheath and the other two being insulated is 0.8 micro Farad. Calculate the capacitance (C) between any two conductors when the third conductor is connected to the sheath	5	KTU May 2019
3	A transmission line conductor at a river crossing is supported from two towers at a height of 45m and 75m above the water level. The span length is 300m. Weight of the conductor is 0.85kg/m. Determine the clearance between the conductor and water at a point midway between towers if the tension in the conductor is 2050kg.	5	KTU May 2019
4	Comment on the effect of wind and ice loading on transmission line with respect to change in sag calculation.	5	KTU Dec 2018
5	Illustrate the methods used for improving string efficiency of overhead line insulators.	5	KTU Dec 2018

6	Derive the expressions for capacitance and insulation resistance of a single core cable.	5	KTU Dec 2018
7	Explain the advantages and disadvantages of corona.	5	KTU Dec 2018
8	State the methods of improving string efficiency.	5	KTUApril2018
9	Explain kelvins law and limitations	5	KTU SEP 2020
10	describe corona and limitations	5	KTU SEP 2020
11	A string has five suspension discs. The capacitance between each unit and earth is one-fifth of the mutual capacitance: i) Find the voltages across different discs as percent of total string voltage ii) Find the string efficiency.	5	KTU SEP 2020
12	What is meant by sag ?Derive the expression for sag when the supports are equal	7	KTU dec 2021
13	What are FACTS devices .how are they classified,working of any FACT devices with help of diagram	7	KTU dec 2021
14	What do you menat by surge impedence loading.and intersheath grounding	7	KTU dec 2021
Module 4			
1	What is the expansion of FACTS? What are the devices used as FACTS devices? Why are they significant in the present scenario?	4	KTU May 2019
2	What are the advantages and disadvantages of HVDC transmission systems?	4	KTU May 2019
3	What are the advantages of bundling of conductors?	2	KTU May 2019

4	List the advantages and disadvantages of HVDC transmission.	5	KTUDec2018
5	With the aid of single line diagrams, differentiate between mono polar and bipolar types of HVDC links. Comment on their use in the system.	5	KTUDec2018
6	Discuss the various conductor materials used for overhead lines. What are their relative merits and demerits?	5	KTUDec2018
7	Draw the configuration of FC+TCR. Explain its operation.	4	KTUDec2018
8	Explain different Configurations of HVDC systems ?	5	KTUApril2018
9	Explain different types of DC links.	5	KTUDec2017
10	Draw the configuration of FC+TCR. Explain its operation.	5	KTU SEPT 2020
11	A 2.2 km long, 11 kV, 3 phase, 3 – core, belted cable gave the following results in a test for capacitance: Capacitance between two conductors joined to sheath and the third conductor is 1.5μF and capacitance between all the three conductors joined and sheath is1.8 μF. Find: i) Effective capacitance of each core to neutral and ii) Capacitance between any two cores	6	KTU SEPT 2020
12	construction and working of SF6 circuit breaker. Requirement of protective relay.	14	KTU DEC 2021
13	Explain the significant features of a Microprocessor based relay and its working?	8	KTU DEC 2021
14	Working of surge diverter.Difference between switching and lightning surges	8	

Module 5			
1	What are the essential qualities required by any insulating medium used for arc quenching? What are the usual insulating media used?	5	KTU May 2019
2	Explain the significant features of a Microprocessor based relay.	5	KTU May 2019
3	With a neat sketch explain the principle of operation of an Air Blast Circuit Breaker	5	KTU May 2019
4	Explain the principle of operation of a static over current relay.	5	KTU May 2019
5	Discuss the problems associated with capacitive current chopping.	5	KTU Dec 2018

6	With a neat diagram, explain the arc extinction in VCB.	5	KTU Dec 2018
7	Derive the expression for Rate of Rise of Restriking Voltage.	5	KTU Dec 2018
8	Drive the Essential Qualities of Protective relays.	5	KU Dec 2015
9	Define the terms Restriking voltage, Recovery voltage, Zones of protection,properties of SF6 gas	5	KTU May 2017
10	What are the essential qualities required by any insulating medium used for arc quenching?	5	KTU Sep 2020
11	Describe the essential qualities of protective relays	5	KTU Sep 2020
12	Explain phase and amplitude comparator	5	KTU Sep 2020
13	Derive the expression for most economical value of power factor which may be attained by a consumer.	7	KTU Dec 2021

14	Write short note on distribution automation system.	4	KTU Dec 2021
15	What do you meant by an aerial bunched cable? Compare its adv and disadvantages.	5	KTU Dec 2021
16	Different types of distribution system.	5	KTU Dec 2021
17	What is the effect of power factor on cost of generators?	5	KTU Dec 2021

QUESTION BANK

S5 EEE

Subject: (EET303) Microprocessors and Microcontrollers

Sl.No.	Question	Marks	Year
	MODULE 1		
1.	Explain demultiplexing of Address/Data Bus.	5	2017(April)
2.	Write a delay subroutine program in 8085 for 0.4 ms. Assume the clock frequency as 3 MHz.	5	2017(April)
3.	Differentiate between maskable and non-maskable interrupts and list the interrupt related instructions.	5	2017(April)
4.	Explain the architecture of 8085 microprocessor with the help of a neat functional block diagram.	10	2017(April),2019,2020(Sep)
5.	Draw and explain the timing diagram of LDAX D.	10	2017(April)
6.	a) Explain different addressing modes in 8085 with examples. b) Explain the terms Machine cycle and T-states.	6 4	2017,2018
7.	Explain the PUSH and POP instructions of 8085 with example.	5	2018(April)
8.	a) Define instruction cycle and machine cycle.	4	2018(April)
9.	Draw and explain the timing diagram for the instruction MOV C, A (opcode: 4FH), stored in location 6000H.	10	2018(April)
10	Explain the following pins in 8085 Microprocessor. i) HOLD ii) READY iii) TRAP iv) ALE	10	2018(Dec)
11.	a) Explain CALL & RETURN instructions in 8085.	5	2018(Dec)
12.	Draw the timing diagram of instruction STA 4500H.	10	2019(Dec)
13.	The contents of accumulator and B-register are $2A_H$ and AB_H respectively. Find the contents of A-register and flags after the execution of instruction ADD B.	5	2019(May)

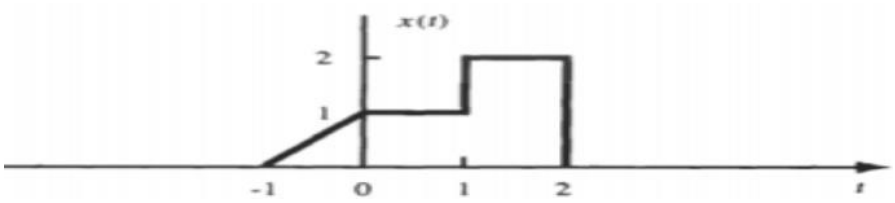
14.	Illustrate the application of SIM instruction in 8085 microprocessor	5	2020(Sep)
MODULE 2			
1.	Differentiate between maskable and non-maskable interrupts and list the interrupt related instructions.	5	2017,2018
2.	Difference between Microprocessor and Microcontroller.	5	2017,2018,2019 ,2020
3.	Write a program to sort an array of 10 numbers in ascending order.	6	2018(April)
4.	a) Draw the control word format for the I/O mode of 8255. b) Draw a neat circuit to interface 8 switches and 8 LEDs with 8085. Program port A (00H) as input and port B (01H) as output. Write a program to read continuously from port A and display at port B.	4 6	2018(April)
5.	a) Explain with suitable diagram, how an ADC can be interfaced with 8085 Microprocessor.	5	2018(Dec)
6.	Write an ALP in 8051 to add two 32 bit numbers & store the result.	10	2018(Dec)
7.	Explain subroutine CALL and RET instructions in 8085	5	2019(Dec)
8.	Write an ALP in 8085 to find the largest number from an array of numbers.	6	2019(Dec),2020 (Sep)
9.	Write an ALP in 8085 to convert Binary number to BCD number.	10	2019(Dec)
MODULE 3			
1.	Write an ALP using 8051 to generate a square wave of 50% duty cycle	5	2017(April)
2.	Explain SFR's of 8051.	5	2017(April)
3.	Draw the interrupt structure of 8085.	5	2017(April)
4.	Design memory systems to interface 2K ROM and 2K RAM using 2K x 8 bit memory chips.	5	2017(April)
5.	a) Give the current trends and challenges in the field of Embedded Systems. b) Describe the Embedded System product development model.	5	2017(April),202 0(Sep)

6.	a) Explain Assembler, Compiler, Linker and Loader. b) Draw the block diagram of 8255.	5 5	2017(April) 2017(April)
7.	With neat block diagram, explain the architecture of 8051.	10	2017(April),2018,2019
8.	Explain PSW of 8051	5	2018(April)
9.	Discuss about various Bit handling instructions of 8051.	5	2018(April)
10.	Draw the TMOD register of 8051. Indicate which mode and which timer are selected for each of the following i) MOV TMOD, #01H ii) MOV TMOD, #20H iii) MOV TMOD, #12H	5	2018(April)
11.	With a neat diagram explain water fall model. What are its disadvantages?	10	2018(April)
12.	Explain with neat diagram the RAM of 8051.	5	2018(Dec)
13.	What are the demerits of Waterfall Model?	2	2018(Dec),2019,2020(Sep)
14.	Explain briefly the control word in 8255 PPI	5	2019(Dec)
15.	Explain I/O ports and its functions in 8051.	5	2019(Dec)
16.	List the field of applications for an embedded system.	5	2019(Dec)
17.	Explain the Life cycle management of embedded product development.	10	2019(Dec)
18.	Explain the Mode 1 operation of 8255	5	2020(Sep)
	MODULE 4		
1.	Explain the function of TMOD and TCON registers of 8051 Microcontroller	5	2017(April)
2.	a) Explain the addressing modes of 8051 with examples	6	2017(April),2020(Sep)
3.	a) Draw the detailed architecture of 8051 microcontroller. b) Explain the assembler directives of 8051.	6 4	2018(April),2019(May)
4.	Explain the following instructions in 8051. (i)MOV A,@R_0(ii) JNB TF_0, again	4	2019(Dec)
5.	Write an ALP in 8051 to add two 16 bit numbers.	5	2019(May)
6.	a) Explain different bit jump and byte jump instructions in 8051.	4	2019(May)

7.	Explain SCON and SBUF registers in 8051.	6	2019(May)
8.	List any five bit manipulation instructions of 8051	5	2020(Sep)
9.	Write an ALP in 8051 to divide two numbers and store the result in memory locations 4500 and 4501	5	2020(Sep)
10.	a) List the various registers of 8051 (5) b) Explain SCON register 8051	5 5	2020(Sep)
MODULE 5			
1.	a) Explain how serial port programming is done in 8051.	4	2017(April)
2.	Show how an LCD can be interfaced with 8051 and also write a program to send 'Y', 'E', 'S' to LCD continuously.	10	2017(April)
3.	Explain DAC interfacing with 8051 and write an ALP to generate a saw tooth waveform.	10	2018(April)
4.	Write an ALP in 8051 to generate a square wave of 50% duty cycle on bit 0 of port 1 using Timer 0.	5	2019(Dec)
5.	Find the values of TMOD registers to operate as timers in the following modes (i)Mode 1 Timer 1 (ii) Mode 2 Timer 0	5	2019(Dec)
6.	Write an ALP in 8051 to create a square wave with ON time 3ms and OFF time 10ms, on all pins of port 0. Assume XTAL-11.05MHz.	10	2019(May)
7.	a) Explain the port structure of 8051. (4) b) Write a program to serially output "A" at 9600 baud rate	4 6	2020(Sep)
8.	a) Differentiate between AJMP, LJMP and SJMP (3) b) Write a timer program to output a square pulse at 50% duty cycle through P3.1 (7)	3 7	2020(Sep)

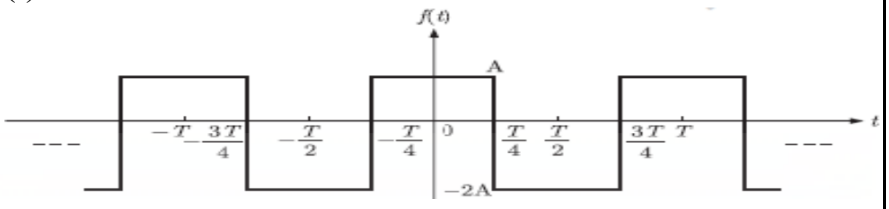
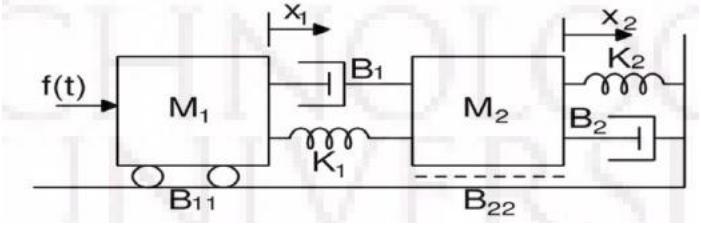
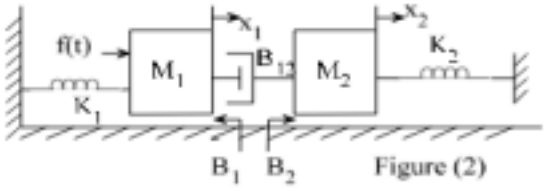
EET305 : Signals & Systems
MODULE I

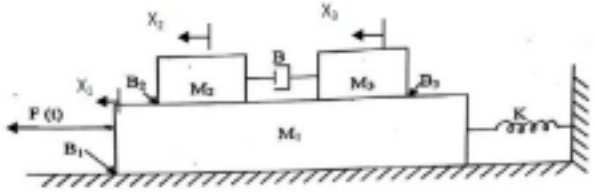
Sl. No	Questions	Marks	KTU/ KU (Month /Year)
1	Check the Linearity and time in variance of the system y(t)=t^2 x(t), where x(t) & y(t) are the inputs and outputs respectively.	5	KTU APRIL 2018
2	Define unit step function and plot x(t) and x(2t), if x(t) = u(t+2)-u(t-2)	5	KTU Dec 2015
3	Check whether the given signal x(t) is energy or power signal. Find the energy & power of the signal x(t)=e^- 5t * u(t)	4	KTU june 2017
4	The impulse response of a LTI system is h(t) = (2+e^- 3t) u(t).Check whether the system is (i)Stable (ii) Causal (iii) Memory or memory less	6	KTU Dec 2018
5	Find the response of a LTI system with the impulse response h(t) = e^-2t * u(t) for an input x(t)=t u(t)	4	KTU Dec 2017
6	Distinguish between Energy & Power signals. Give an example for each category	4	KTU Dec 2016
7	Evaluate the fundamental period of the signal x(t) = 2 Sin(2t+1) +3 Sin(4t-1)	4	KU APRIL2 018
8	Check whether the system y(t) = x(t).x(t-1) is (I) Linear (ii) Causal (iii) Time variant	6	KTU Dec 2017
9	Plot the signal x(t) = u(t+1) +2.u(t)-u(t-3)-2 u(t-5)	4	KU Dec 2017
10	Given x1(n) ={1,1,1} and x2(n) = {1,2} .Find the convolution of the sequences graphically	5	KU Dec 2018
11	Explain different types of signals with example	10	KTU May 2019

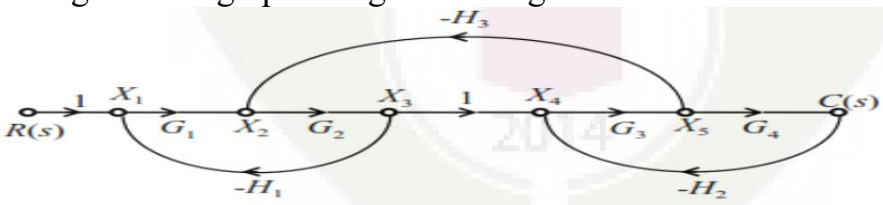
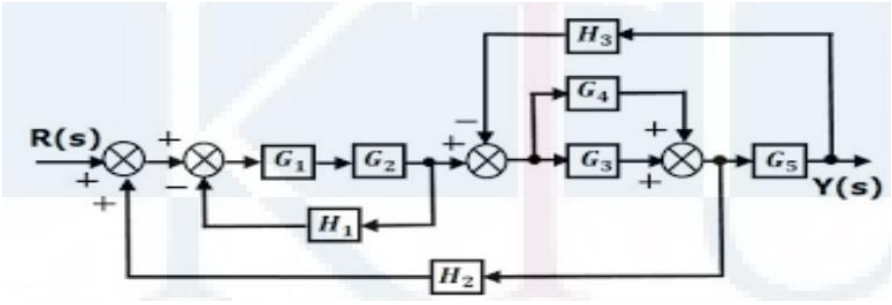
12	Define LTI system. Check Causality, time invariance and linearity of the system x(n)=x(n^2)	10	KTU May 2019
13	Check whether the following system is static, causal, linear and time invariant: $y(t) = \|x(t)\|$	8	KTU June 2020
14	Find the convolution of x1(t) and x2(t) for the following signals: $x_1(t) = e^{-at}u(t); x_2(t) = e^{-bt}u(t)$	6	KTU June 2016
15	With suitable examples differentiate between: i. Odd and even signals, ii. Causal and non causal systems.	7	KTU May 2020
16	The signal x(t) is given below. Plot x(t-1)+ x(-t+2) 	7	KTU June 2017
17	What is the output sequence of a LTI system with impulse response h(n)={3,2} to the input x(n) ={1,2,3,3}	5	KTU APRIL2 018
18	Check the causality and stability of the systems whose impulse responses are given (i)h(t)=e^at u(t) (ii) h(n)=2^n u(-n) (a<0)	4	KTU Dec 2019
19	For the following system described by differential equation,find the impulse response,if the system is (i) Stable (ii)	10	KTU Dec 2017
20	Causal Derive the condition for stability of a discrete time LTI system in terms of its impulse response.	4	KTU APRIL2018
21	Find the output of an LTI system whose impulse response is h(t) to the input x(t).h(t) = u(t)-u(t-1)	8	KTU Dec 2017
22	For an LTI system, unit impulse response is given by h(t)=e^at u(t), a>0. Obtain step response of the system.	6	KTU Dec 2017

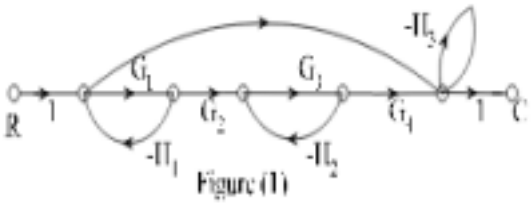
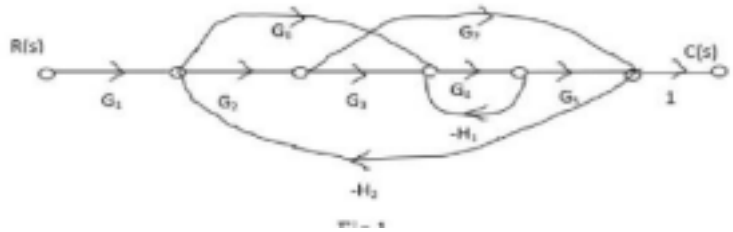
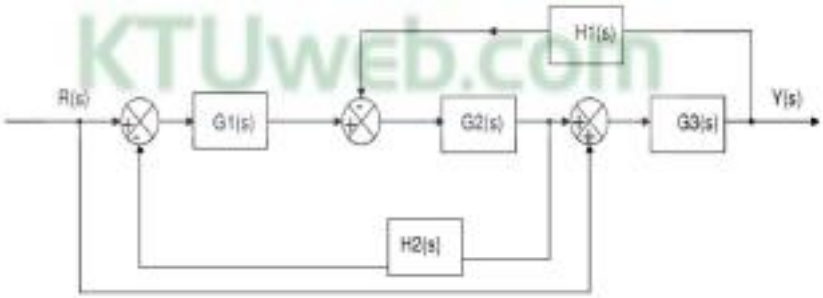
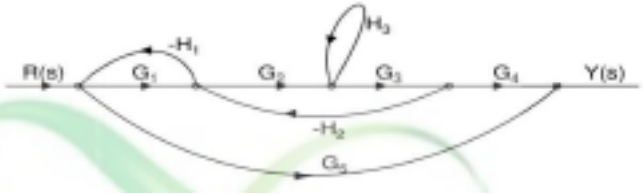
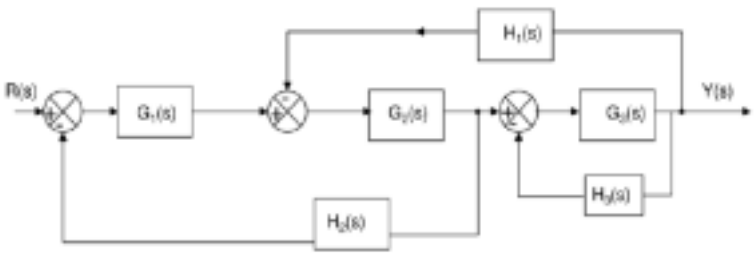
23	Obtain the differential equation representation of the circuit.	4	KTU APRIL2018
24	Using Laplace transform ,solve the differential equation obtained for the above and get voltage across the capacitor.	6	KTU Dec 2019
25	Find x(t)* h(t) where x(t) =u(t)-u(t-2),h(t) = e^-2t u(t) and * represents the convolution operator.	5	KTU Dec 2020
26	What you mean by Convolution Sum. Finf the convolution sum of x(n)=2∂(n+1)-∂(n)+∂(n-1)+3∂(n-2)	5	KTU May 2019

	MODULE - II		
1	Obtain the exponential Fourier series of the signal x(t) = {1,1,1,1,2,2,2,2}	5	KTU APRIL2018
2	Find the Fourier transform of e^-a|t|	5	KTU APRIL2018
3	Sketch the magnitude & phase spectrum of the signals (I) x(t)=A e^a|t| (a>0)	4	KTU APRIL2018
4	What you mean by aliasing.	4	KTUMay 2020
5	Find the Fourier transform of sgn(t).Plot its magnitude & Phase response		July201 7
6	Show that x(t)=2Hx(-w).	4	KTU July201 7
7	Using matrix method find the convolution of x(n) ={1,4,3,1} and h(n) = {1,2,3,2}	5	KTU July201 7
8	Give any five properties of nonlinear systems.	5	KTU Dec 2017

9	Using matrix method find the convolution ofx[n] = {1, 4,3, 1}and y[n] = {1, 2, 3, 2}	5	KTU APRIL20 18
10	Find the exponentil Fourier Transform of Cos wt	5	KTU May 2019
11	State and prove properties of Fourier Transform	5	KTU May 2019
12	Find the trigonometric Fourier series for the periodic signal f(t) 	9	KTU June 2017
13	State and prove time shifting property of Fourier transform.	5	KTU APRIL2 018
14	Derive the transfer function X2(s)/ F(s) for the mechanical 	7	KTU Dec 2015
15	A system is described by the following differential equation: $\frac{d^2y(t)}{dt^2}+7\frac{dy(t)}{dt}+12y(t)=x(t); y(0^-)=-2, \frac{dy}{dt}(0^-)=0$ Determine the response of the system to a unit step applied at t=0.	7	KTU june 2017
16	Obtain the electrical analogous of the mechanical system shown in Figure (2). Use force-voltage analogy.  Figure (2)	6	KTUDec2017
17	Write the differential equations governing the mechanical system and hence draw the electrical analogous circuit using F-V analogy and F-I	6	KTU Dec2019

	 analogy		

	MODULE - III		
1	Check stability of the system represented by the following characteristic equation, using Routh stability criterion: $3s^4+10s^3+5s^2+5s+2=0$	6	KTU APRIL 2018
2	How frequency response can be obtained from poles and zeros?	5	KTU Dec 2015
3	Determine the transfer function of the system represented by the signal flow graph using Mason's gain formula. 	9	KTU june 2017
4	Determine the overall transfer function Y(s)/R(s) using block diagram reduction. 	8	KTU May 2020
5	Find the overall transfer function of the signal flow graph shown in Figure (1) using Mason's gain formula.	5	KTUDec2017

	 Figure (1)		
6	Obtain the closed loop transfer function C(s)/R(s) using Mason's gain formula for a system whose signal flow graph is shown in Fig. 	5	KTUApril2018
7	Obtain the transfer function using block diagram reduction techniques. 	5	KTU Dec2018
8	For the signal flow graph shown below, determine the transfer function. 	5	KTU Dec2018
9	Obtain the overall transfer function using block reduction techniques? 	6	KTU Dec2019

10	Explain Mason's gain formula?	5	KTU Dec2019
11	Determine the unit impulse response for the system with $T(s) = \frac{2}{(s^2 + s - 12)}$	3	July2017

MODULE - IV			
1	State & prove following properties of Z transform: (I) Multiplication by n (ii) Accumulation (iii) Convolution	6	KTU APRIL2018
2	Find inverse Z Transform of X(Z) = z/{2z^2 – 3z +1} .|z| <1/2	4	KTU APRIL2018
3	An LTI system is described by the difference equation y(n)-9/4y(n-1)+1/2y(n-2)=x(n)-3x(n-1) Determine h(n) for the following condition (I) The system is	10	KTU Dec2017
4	stable (ii)Causal Find the Z transform and ROC of x(n) =(1/3)^n u(n)	5	KTU Dec2017
5	Find the inverse Z transform of X(z) = 3Z^-1/(1-z^- 1)(1-2z^-1)	5	KTU Dec2017
6	Write down the properties of ROC for Z transform	6	KTU July 2017
7	Find the Z transform of the sequence x(n)={1,2,3,- 1,5,6}	5	KTU July 2017
8	Verify the time shifting property of Z transform and hence find the Z transform of x(n)=a^n+1 u(n+1)	4	KTU July 2017

9	State and prove sampling theorem	10	KTU APRIL 2018
10	The impulse response of a system is given by h(n)={2,3,1}.Find the response of the system when it is excited by the input x(n) = u(n-1)-u(n-5)	6	KTU APRIL 2018
11	Explain energy spectral density & power spectral density	4	KTU APRIL 2018
12	Determine the Fourier series representation of the following discrete time signal and sketch the frequency spectrum x(n)={. 1,2,-1,1,2,-	10	KU April 2016
13	1,1,2,-). a) Find x(t) * h(t) where, x(t) = u(t) — u(t — 2), h(t) = e"“"u(t)and * represents the convolution operator.	10	KTU April 2018
14	a) The impulse response of a system is given by h(n) = Find the response of (6) the system when it is excited by the input x(n) = u(n	5	KTU Dec 2017
15	— 1) — u(n — 5). Obtain Discrete Fourier transform of the following signals: i)x{n] = 0.5u[n] ii) x[n] = 0.5/n	10	KTU July 2017
16	Determine the stability of the following discrete transfer function: H(z)= z24+0.7Z+0.1 H (z) = z24+2.5z+1	10	KTU Dec 2017
17	Determine the convolution sum of two sequences x(n)={1,4,3,2} and h(n)={1,3,2,1} using graphical method.	8	KTU May 2019
18	Determine the z-transform of x(n)=(1/2)n u(-n).	6	KTU Dec2017
19	Explain the aliasing effect in sampled data systems.	5	KTU Dec2018
20	Determine the inverse z-transform of the following functions: $i) X(z) = \frac{2z^{-1}}{(1-\frac{1}{4}z^{-1})^2}; ROC: \lvert z\rvert > \frac{1}{4}, and, ii) F(z) = \frac{3z^{-1}}{(1-z^{-1})(1-2z^{-1})}; ROC: \lvert z\rvert > 2$	9	KTU May 2020

MODULE - V			
1	State the properties of DFT (no proof required)	6	KTU APRIL2018
2	Obtain the DFT of the following signals: (i) x[n]=(0.5)6n u(n) (ii)x[n] = 0.5^|n|	4	KTU APRIL2018
3	Determine the stability of the following discrete transfer function (I) H(z)=z/z^2+0.7z+0.1	5	KTU APRIL2018
4	Give any five properties of non linear systems	5	KTU APRIL2018
5	Determine the Fourier series representation of the following signal and sketch the frequency spectrum x(n)={.....1.2.-1,1,2,-1,1,2,-1. }	10	KTU Dec 2017
6	The input to the sytem is x(n) ={1,2,0,2} h(n)={5,a,3} and output y(n) ={5,12,7,16,4,6} Using fourier transform find the value of "a'	4	KTU Dec 2017
7	For any periodic sequence find the Fourier coefficients and sketch the magnitude spectrum	7	KTU Dec 2017
8	y(n) = y(n -1) +5 y(n — 2) + x(n) — 3x(n- 1) Specify the ROC of H(z), and determine h(n) for the following conditions i) The system ts stable ii) The system is	10	KTU April 2018
9	causal Write short notes on Random Signals & Random Process	4	KTU May 2019
10	Determine the DTFT of x(n)= 2^n u(n)	6	KTU May 2019

QUESTION BANK

Subject: EET 307 SYNCHRONOUS & INDUCTION MACHINES

S5 EEE

Sl.no	Question	Marks	Year
MODULE 1			
1	Write any four advantages of short pitched coils in alternators	5	KTU MAY 2017
2	Explain the ASA method of determining the voltage regulation in alternators	5	KTU MAY 2017
3	Derived from the fundamentals, generalized equation of the emf generated in a non salient pole synchronous generator, taking into account the effect of 5th and 7th harmonic components	10	KTU MAY 2017
4	Explain the effect of armature flux on main field flux when an alternator is operating at 1) Lagging pf 2) Unity pf State the reason for accounting the reason for armature reaction as a fictitious reaction in calculations	10	KTU MAY 2017
5	Enumerate various methods for minimizing harmonics in alternators.	5	KTU MAY 2017
6	Explain various types of armature winding of an alternator	5	KTU JULY 2017
7	Find the distribution and pitch factor of a 3Φ, 4 pole, 24 slots alternator having its armature coils short pitched by one slot	5	KTU JULY 2017
8	A 0.5 MVA, 1.1KV, 50 Hz, 3Φ, star connected alternator has Ra and Xs per phase as 0.1Ω and 1.5Ω respectively. Find its voltage regulation at different power factor of (i) unity (ii) 0.9 lag and (iii) 0.8 lead at full load	5	KTU JULY 2017
9	Draw the phasor diagram of a salient pole alternator working at lagging power factor and derive an expression for internal power factor angle ψ.	5	KTU APRIL 2018
10	Two 100 MW alternators operate in parallel. At no load both machines operate at 50Hz. The maximum load that can be shared without overloading either of the machines is 180 MW and this happens at 48 Hz. Find how will they share a total load of 160	10	KTU APRIL 2018

	MW		
11	Prove that even harmonics will not be present in a full pitched winding	5	KTU APRIL 2018
12	The armature of the 60Hz 11kV 450 rpm star connected alternator has 8 conductors per slot. The winding is short chorded by 3 slots to eliminate 5th harmonics completely. Find the flux per pole to generate rated voltage on open circuit	10	KTU APRIL 2018
13	List the causes of harmonics in alternators and suggest ways to mitigate them.	5	KTU DEC 2021
14	A 3-Φ, 10 pole alternator has 2 slots/ pole/ phase on its stator with10 conductors per slot. The air gap flux is sinusoidally distributed and equals 0.05 Wb. The stator has a double layer winding with a coil span of 1500. If the alternator is running at 600 rpm,calculate the emf generated /phase at no load.	9	KTU DEC 2021
15	With the help of neat diagrams, explain the effects of armature reaction in alternators under lagging, leading and unity power factors.	14	KTU DEC 2021
16	List the advantages of stationary armature type alternators over rotating armature types.	3	KTU DEC 2021
17	Define coil pitch factor and distribution factor of an alternator.	3	KTU DEC 2021
MODULE 2			
1	What are the different methods of finding the voltage regulation of an alternator?	5	KTU JULY 2017
2	Describe the slip test method for finding the Xdand Xq of synchronous machines	5	KTU JULY 2017
3	Explain the two reaction theories of salient pole alternators.	10	KTU JULY 2017
4	A 220V, 6 pole, 50 Hz, star connected alternator gave the following test results: -	10	KTU JULY 2017

	<table><tr><td>If (A)</td><td>0.2</td><td>0.4</td><td>0.6</td><td>0.8</td><td>1</td><td>1.2</td><td>1.4</td><td>1.8</td><td>2.2</td><td>2.6</td><td>3</td><td>3.4</td></tr><tr><td>Voc (line) (V)</td><td>29</td><td>58</td><td>87</td><td>116</td><td>146</td><td>172</td><td>194</td><td>232</td><td>261</td><td>284</td><td>300</td><td>310</td></tr><tr><td>Vzpf (line) (V)</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>0</td><td>29</td><td>88</td><td>140</td><td>177</td><td>208</td><td>230</td></tr><tr><td>Isc (A)</td><td>6.6</td><td>13.2</td><td>20</td><td>26.5</td><td>32.4</td><td>40</td><td>46.3</td><td>59</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table> Find % voltage regulation at full load current of 40A at power factor 0.8 lag by (i) m.m.f method (ii)ZPF method. Ra=0.06 Ω /phase.		
5	In an alternator a field current of I amp was required to drive rated current on short circuit and a field current of 2.5 times I was required to develop rated voltage on open circuit. Using the emf method, find the voltage regulation of the alternator when delivering rated current at 0.8 pf lag. Assume armature resistance (10) For More Visit : KtuQbank.com B B4811 Pages: 2 Page 2 of 2 = 20% of synchronous impedance. (You can assume any value for rated voltage and rated current. The final answer will be the same)	10	KTU APRIL 2018
6	Give the procedure for experimental determination of synchronous impedance.	5	KTU APRIL 2018
7	State and explain Blondel's Two Reaction Theory.	3	KTU DEC 2021
8	What is meant by synchronization? Lit the conditions to be met while synchronizing an alternator to the common bus bars.	3	KTU DEC 2021
9	A 220V, 6 pole, 50 Hz, star connected alternator gave the following test results: Find % voltage regulation at full load current of 40A at power factor 0.8 lag by (i) m.m.f method (ii) ZPF method. Ra=0.06 Ω /phase.	14	KTU DEC 2021
10	a) Two 3Φ, 6.6 kV star connected alternators supply a load of 3000kW at 0.8 pf lag. The Synchronous impedance/phase of machine A is 0.5 + j 10 Ω and that of machine B is0.4+j12 Ω. The excitation of machine A is adjusted so that it delivers 150 A at a lagging power factor and the governors are so set that the load is equally sharedbetween the machines. Determine the current, power factor and induced emf of each machine. (10) b) With the help of a neat circuit diagram, explain how an	14	KTU DEC 2021

	alternator is synchronized to the bus bars by bright lamp method.		
MODULE 3			
1	Explain the operation of synchronous induction motor	5	KTU MAY 2017
2	Explain the constructional details of a synchronous motor	5	KTU JULY 2017
3	Differentiate between the phenomenon cogging and crawling of an induction motor	5	KTU JULY 2017
4	Explain the effect of excitation on armature current and power factor of a synchronous motor and hence deduce the V and inverted V curves.	5	KTU JULY 2017
5	What are the various methods of synchronization of alternators?	5	KTU JULY 2017
6	Describe the constructional features of 3Φ slip ring induction motor.	5	KTU JULY 2017
7	A 6 pole, 50 Hz, 3Φ, slip ring induction motor, the rotor resistance and the reactance at stand still per phase are 0.3 and 1.5 Ω respectively. The e.m.f between the slip rings on the open circuit is 175V. Calculate (i) Slip (ii) rotor e.m.f/phase (iii) rotor frequency and reactance when the motor runs at a speed of 950 r.p.m.	5	KTU JULY 2017
8	Explain the working of synchronous induction motor	5	KTU APRIL 2018
9	A 400V 50Hz 7.5A 10HP delta connected induction motor was drawing 3A and 540W on no load test. In the blocked rotor test rated current was driven with 100V and the power consumed was 450W. Draw the circle diagram and locate the maximum output point on the diagram. Find out slip efficiency and torque in synchronous watts at this point.	10	KTU APRIL 2018
10	While running at 1440 rpm a 3-ph. The induction motor draws 50 kW from the mains. The stator iron and copper losses amount to 2 kW. Find the rotor copper loss, torque in synchronous watts as well as in Newton Metre. If there is a mechanical loss of 1.08 kW, find the overall efficiency of the motor.	10	KTU APRIL 2018
11	From rotor equivalent circuit of an induction motor derives the expression for torque in synchronous watts.	5	KTU APRIL

			2018
12	Differentiate between slip ring and squirrel cage induction motors.	3	KTU DEC 2021
13	With the help of neat figures, explain why a synchronous motor is not self-starting.	3	KTU DEC 2021
14	a) With the help of a neat circuit diagram, explain how V and inverted V curves are obtained. b) A 2000V, 3-phase, 4 pole star connected synchronous motor runs at 1500 rpm. The excitation is constant and corresponds to an open circuit voltage of 2000V.The resistance is negligible compared to synchronous reactance of 3Ω per phase. Determine power input, power factor, torque developed for an armature current of 200A.	14	KTU DEC 2021
15	a) In rice/flour mills driven by squirrel cage induction motors, the hopper is loaded with the grains only after starting the motor. Similarly, the delivery valve of centrifugal pumps driven by a squirrel cage induction motor is opened only after starting the motor. What is the reason behind this? Justify your answer with a relevant performance curve of squirrel cage induction motor. b) A 6-pole, 50 Hz,3-Φ induction motor running on full load develops a useful torque of 150 Nm at a rotor frequency of 1.5 Hz. Calculate the shaft power output. If the mechanical torque lost in friction is 10 Nm, determine a) rotor copper loss b) input tothe motor c) the efficiency. The total stator loss is 700W.	14	KTU DEC 2021
MODULE 4			
1	Draw the phasor diagram of a 3 phase induction motor at standstill and at full load slip	5	KTU MAY 2017
2	What is meant by cogging in 3 phase induction motor and how it can be eliminated	5	KTU MAY 2017
3	List the various methods adopted for braking of an induction motor	5	KTU JULY 2017
4	a) Draw the circle diagram of a 3Φ, 20 hp,400V,50Hz star connected induction motor with the following test data: - No load test 400V 9A cos Φ=0.2 block rotor test 200V 50A cos Φ=0.4 b) From the above circle diagram obtain (a) line current (b) power factor (c) slip (d) efficiency at full load.	10	KTU JULY 2017

5	What are the different types of starters used for starting a 3Φ induction motor	5	KTU JULY 2017
6	A 3Φ induction motor has a short circuit current 5 times of full load current at 5% slip. Determine the starting torque and starting current if the impressed voltage is reduced to 60% of the normal voltage by using a starting resistance starter. The full load current and torque are 10 A and 10 Nm respectively	5	KTU JULY 2017
7	Draw the schematic diagram of a star-delta starter	5	KTU APRIL 2018
8	Explain any two braking techniques of induction motors.	3	KTU DEC 2021
9	Explain the phenomenon of crawling and cogging in induction motors.	3	KTU DEC 2021
10	For the following test data, calculate (i) line current (ii) power factor (iii) rotor copper loss (iv) slip (v) efficiency (vi) maximum output power (vi) maximum torque and (vii) starting torque: Induction Motor Details: 3.73kW, 200V, 50Hz, 4pole, 3φ star connected No Load Test: 200V, 350W, 5A Blocked Rotor Test: 100V, 26A, 1700W Rotor Copper Loss at standstill is 60% of the total copper loss.	14	KTU DEC 2021
11	Explain the methods of speed control in three phase induction motors.	14	KTU DEC 2021
MODULE 5			
1	Compare the operation of synchronous and induction generator	5	KTU MAY 2017
2	With a sketch describe the principle of working of a shaded pole motor	5	KTU JULY 2017
3	Explain the principle of operation of an induction generator	10	KTU JULY 2017
4	Describe the double field revolving theory of a 1 Φ induction motor	5	KTU JULY 2017
5	Show that the magnetic field produced by a single-phase armature can be modeled as a double revolving field. By drawing torque speed characteristics prove that a single-phase induction motor is not self-starting.	10	KTU APRIL 2018

6	Differentiate between synchronous and induction generators.	3	KTU DEC 2021
7	What is double field revolving theory?	3	KTU DEC 2021
8	a) Explain the working principle and modes of operation of an Induction Generator. b) With the help of a neat figure, explain the torque-slip characteristics of an induction machine.	14	KTU DEC 2021
9	Explain the working of split phase and capacitor start single phase induction motors with the help of neat circuit diagrams and phasor diagrams. Also mention the applications of each.	14	KTU DEC 2021

QUESTION BANK

Subject: MCN301 DISASTER MANAGEMENT
S5 EEE

MODULE 1			
Sl.No:	**Question**	**Marks**	**Year**
1	Explain the relevance and adverse effects of greenhouse gases.	3	KTU DEC 2021
2	Discuss the two types of monsoons in Indian subcontinent.	3	KTU DEC 2021
3	Categorize the various layers of atmosphere based on their distance from earth and explain the features of each layer with a neat diagram.	8	KTU DEC 2021
4	Define the following terms: a) Disaster b) Hazard c) Risk	6	KTU DEC 2021
5	State and explain crisis counselling. Identify the necessity of crisis counselling.	8	KTU DEC 2021
6	Identify the reasons for the depletion of Ozone layer. Suggest two initiatives which can be implemented at home to prevent this.	6	KTU DEC 2021
7	What is the mechanism by which stratospheric ozone protects from harmful UV rays?	3	KTU Model QP
8	What is disaster? What are their causes?	3	KTU Model QP
9	Explain the different types of cyclones and the mechanism of their formation	10	KTU Model QP
10	Explain with examples, the difference between hazard and risk in the context of disaster management	4	KTU Model QP
11	Explain a) exposure b) resilience c) disaster risk management d) early warning systems e) damage assessment f) crisis counselling g) needs assessment	14	KTU Model QP
12	What is participatory hazard mapping? How is it conducted? Its advantages.	8	KTU Model QP
MODULE 2			
Sl.No:	**Question**	**Marks**	**Year**
1	State the major data requirements of hazard mapping and the 3	3	KTU

	sources for obtaining these data		DEC 2021
2	State the principle of qualitative risk assessment and the method of expressing risk qualitatively.	3	KTU DEC 2021
3	Define hazard mapping. Explain the two approaches of hazard mapping	3	KTU DEC 2021
4	In Kerala for the past 5 years. the average number of road accidents is 44076 per year and 1 death occurs in every 10 accidents. Considering the population as 3.33 crores, assess the risk of being killed in driving an automobile in terms of societal and individual risk.	6	KTU DEC 2021
5	Explain the four different types of vulnerability. List any four socioeconomic indicators of human capital as livelihood asset.	8	KTU DEC 2021
6	What is hazard mapping? What are its objectives?	3	KTU Model QP
7	Explain briefly the concept of disaster risk?	3	KTU Model QP
8	What is participatory hazard mapping? How is it conducted? What are its advantages?	8	KTU Model QP
9	Explain applications of hazard mapping?	6	KTU Model QP
10	Explain the types of vulnerabilities and the approaches to assess them	14	KTU Model QP
MODULE 3			
Sl.No:	**Question**	**Marks**	**Year**
1	State the different types of disaster response	3	KTU DEC 2021
2	List six international relief organizations	3	KTU DEC 2021
3	Explain the core elements of disaster risk management.	10	KTU DEC 2021
4	State the requirements for effective disaster response.	4	KTU DEC 2021
5	Define the term ‘disaster risk reduction’. Explain the measures for disaster risk reduction.	8	KTU DEC 2021
6	List the strategies for disaster risk management before, during and after a disaster	3	KTU Model QP
7	Explain the core elements of disaster risk management	8	KTU

	b. Explain the factors that decide the nature of disaster response		Model QP
8	Explain the factors that decide the nature of disaster response	6	KTU Model QP
9	What is disaster preparedness? Explain the components of a comprehensive disaster preparedness strategy	6	KTU Model QP
10	Explain the different disaster response actions	8	KTU Model QP

MODULE 4

Sl.No:	Question	Marks	Year
1	Distinguish between risk communication and crisis communication.	10	KTU DEC 2021
2	List the structural and nonstructural measures in capacity building	3	KTU DEC 2021
3	Describe the effective ways of promoting stakeholder participation in disaster risk reduction. State its benefits.	8	KTU DEC 2021
4	Explain the basic steps in participatory stakeholder engagement.	6	KTU DEC 2021
5	Explain capacity building , relevance of capacity assessment and the different methods of assessing capacity in disaster risk management.	10	KTU DEC 2021
6	State the barriers to effective communication in disaster management.	4	KTU DEC 2021
7	Briefly explain the levels of stakeholder participation in the context of disaster risk reduction	3	KTU Model QP
8	Explain the benefits and costs of stakeholder participation in disaster management	10	KTU Model QP
9	How are stakeholders in disaster management identified?	4	KTU Model QP
10	What are the steps to effective disaster communication? What are the barriers to communication?	7	KTU Model QP
11	Explain capacity building in the context of disaster management	7	KTU Model QP

MODULE 5

Sl.No:	Question	Marks	Year
1	State the legislations in India on disaster management	3	KTU

			DEC 2021
2	Explain the interrelation of National Disaster Management Policy with other national policies.	3	KTU DEC 2021
3	Explain the common disaster types in India	10	KTU DEC 2021
4	State the objectives and main elements of national disaster management policy	4	KTU DEC 2021
5	State the targets, priorities and guiding principles of Sendai Framework for disaster risk reduction.	8	KTU DEC 2021
6	Explain the institutional arrangement for disaster management in India	6	KTU DEC 2021
9	What are tsunamis? How are they caused?	3	KTU Model QP
10	Explain the earthquake zonation of India	3	KTU Model QP
11	Explain the salient features of the National Policy on Disaster Management in India	14	KTU Model QP
12	Explain the guiding principles and priorities of action according to the Sendai Framework for Disaster Risk Reduction	14	KTU Model QP