

LEVEL :- THIRD **PROGRAM : I.E. & ENTC**
COURSE CODE :- EIF406
COURSE NAME :- ELECTRONICS CIRCUIT DESIGN
MAX. MARKS : 80 **TIME : 3.45 HRS.** **DATE :- 22/06/2022**

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S	SECTION - I				Co ITF 409	Mar ks
Q.1		Attempt any FOUR :		R/ U/ A			08
	a)	Draw pin diagram of IC723		R	2		
	b)	For Design of power supply using π -section filter, select diode if dc output is 30V and I_{dc} is 100mA (use bridge rectifier)		A	2		
	c)	Draw symbol of UJT and Zener diode		R	1		
	d)	Define the specifications of diode with respect to i) Maximum forward current (I_F) ii) Reverse Recovery time (t_{rr})		U	1		
	e)	Draw the circuit diagram of Bootstrapped source follower.		R	3		
	f)	Calculate gain of common emitter amplifier if $R_c=4K\Omega$ and $R_L = 5K\Omega$ (Use transistor BC 146)		A	3		
Q.2		Attempt any FOUR :					16
	a)	Compare FET and BJT with respect to i) Thermal stability ii) Input impedance iii) Noise level iv) Controlled device		R	1		
	b)	Design a current source using 78xx series for the reference voltage of 5V that will deliver 0.5A current to the 10Ω load		A	2		
	c)	Explain the types of transformer.		U	1		
	d)	Design a common source amplifier circuit to provide a gain of 10V at peak output voltage of 2V with biasing circuit to provide $V_{GSQ} = 1.74V$ with output resistance $R_L=120k$ and supply voltage of 20V with the lower 3db frequency of 50Hz		A	3		
	e)	Design an emitter follower regulator to operate from unregulated supply of 18V to produce output of 12V at 50mA		A	2		
	f)	Design a full wave rectifier with an LC filter to supply 20V dc at 200mA with a ripple content of 1% (Use bridge rectifier)		A	2		
Q.3		Attempt any TWO :					16
	a)	Design a Zener regulator to provide 16V output from 20V unregulated power supply. Also calculate line and load regulation.		A	2		
	b)	Design a two stage RC-coupled amplifier for output voltage of $9V_{PP}$ at $3k-\Omega$ load, band - width = 50 Hz to 50 kHz. Use $V_{CC} = 18V$ and source resistance $R_S=600\Omega$		A	3		
	c)	Draw the circuit diagram of bootstrapped emitter follower circuit and write all design steps of bootstrapped emitter follower circuit.		U	3		

QN		S	SECTION - II			R/ U/ A	Co ITF 409	Mar ks
Q.4			Attempt any FOUR :					08
	a)		Define oscillator. Write formula for frequency of Hartley oscillator.		R	5		
	b)		List the performance parameters of power amplifier.		R	4		
	c)		Draw circuit diagram of complementary symmetry class - AB power amplifier		U	4		
	d)		Give the classification of multivibrator. Draw the output waveform of any one multivibrator.		R	6		
	e)		Draw circuit diagram of Colpitts oscillator using op-amp.		U	5		
	f)		State design steps of Monostable multivibrator using IC 555		R	6		
Q.5			Attempt any FOUR :					16
	a)		Design Wien bridge oscillator using op-amp for variable output frequency $F_o = 1 \text{ kHz}$ to 5 kHz , for peak output of 10V .		U	5		
	b)		Give comparison of class - A, B and AB, C-power amplifiers (any 4 points)		R	4		
	c)		Draw circuit diagram of Colpitts oscillator using transistor, Write design steps of it.		U	5		
	d)		Design a Monostable multivibrator using IC 741 op-amp for pulse duration of 100msec with the reference voltage of 5V . Use $\pm V_{CC} = \pm 15\text{V}$.		A	6		
	e)		Design a transformer coupled class - A amplifier to meet the requirements as $P_o = 2\text{W}$ at across 4Ω load resistance R_L . Use $V_{CC} = 12 \text{ V}$.		A	4		
	f)		Design Hartley oscillator using transistor, for $F_o = 5\text{MHz}$, $V_o(P) = 4\text{V}$, $R_L = 2.2\text{K}\Omega$. DC analysis only.		A	5		
Q.6			Attempt any TWO :					16
	a)		Design a class - AB Push - pull Power amplifier for $P_o = 200\text{mw}$, loud speaker impedance = 4Ω $V_{CC} = 9\text{V}$.		A	4		
	b)		Design a RC phase shift oscillator using transistor for the output frequency of oscillations of 10kHz with load impedance of $5\text{K}\Omega$ and peak to peak output voltage $\geq 5\text{V}$. Use $V_{CC} = 12 \text{ V}$.		A	5		
	c)		i) Draw circuit diagram of Bistable multivibrator using op-amp. ii) Design asable multivibrator using op-amp IC741 for output frequency $F_o = 2\text{kHz}$ and peak-to-peak output voltage of 5V . The supply voltage = $\pm 15\text{V}$.		U A	6 6		

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EVEN TERM END EXAM JUNE/JULY-2022

EXAM SEAT NO.

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LEVEL :- FIRST

PROGRAM : IE / E & TC

COURSE CODE :- EIG107/EIF107

COURSE NAME BASIC ELECTRICAL ENGINEERING

MAX. MARKS : 80 TIME : 03Hrs.45 min. DATE :- 05/07 / 2022

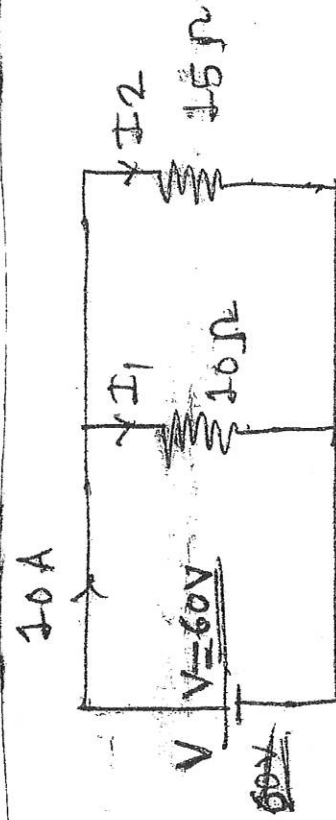
Instruction :-

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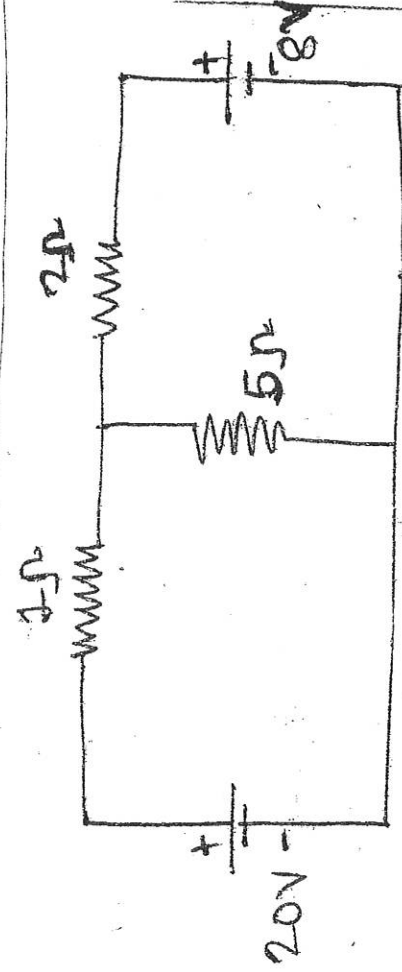
QN	S Q N	Question Text	R/ U/ A	Co EIG 107	Ma rks
Q.1		Attempt any FOUR :			08
	a)	State Ohm's Law of electric circuit.	R	1	
	b)	Define resistance and state its unit.	R	1	
	c)	Define reluctance. State its unit.	R	2	
	d)	Draw Hysteresis loop for hard steel and silicon steel.	R	2	
	e)	State the expression to determine energy stored in a magnetic field.	R	3	
	f)	State Fleming's right hand Rule.	R	3	
Q.2		Attempt any FOUR :			16
	a)	Distinguish between direct current and alternating current (any four point	U	1	
	b)	A resistance of 10Ω is connected with 15Ω . If current through the combination is 10A. Calculate current through each resistance. Refer – fig. No.1	A	1	
	c)	Classify magnetic materials with two examples each.	A	2	
	d)	State any four significance of hysteresis loop.	R	2	
	e)	Draw and explain B-H curve of magnetic material.	U	2	
	f)	Explain the generation of single phase AC supply by an elementary alternator with neat sketch.	U	3	
Q.3		Attempt any FOUR :			16
	a)	Derive an expression for equivalent resistance in parallel connection.	U	1	
	b)	Find the current through 5Ω resistor using Kirchhoff's Law. Refer Fig. No.2	A	1	
	c)	Compare magnetic circuit and electric circuit on any four points.	U	2	
	d)	A coil of 500 turns and resistance of 200Ω is wound uniformly on an iron ring of mean circumference 50cm and cross sectional area 4cm^2 . It is connected to 24VDC supply. Relative permeability at material is 800. Find i) MMF ii) Current passing through coil.	A	2	

P.T.O

	e)	Explain self induced emf and mutually induced emf with neat sketch.	U	3	
	f)	A conductor of 1.5m length moves at right angles to a uniform magnetic field of flux density 1 Tesla with a velocity of 100m/s. Calculate the emf induced in it. Find also the value of induced emf when the conductor moves at an angle of 30° to the direction of field.	A	3	
Q.4		Attempt any FOUR:			08
	a)	State the working principle of the transformer.	R	6	
	b)	Define rms value for the AC waveform.	R	4	
	c)	Which type of circuit shows lagging power factor?	R	5	
	d)	Define inductive reactance and state its unit.	U	4	
	e)	State the types of earthing.	R	6	
	f)	State the relationship between line current and phase current for star and delta connection.	U	5	
Q.5		Attempt any FOUR:			16
	a)	Draw schematic representation of i) DC shunt motor ii) DC series motor.	U	6	
	b)	Draw and explain circuit with resistance, inductance and capacitance in series with concept of power factor.	U	5	
	c)	For Purely capacitive circuit i) Draw circuit diagram with AC supply. ii) Draw waveform of voltage and current. iii) Write equation of current. iv) Draw phasor diagram.	A	5	
	d)	Draw sinusoidal alternating voltage quantity and label on it cycle, periodic time and peak value.	U	4	
	e)	Draw circuit diagram of resistive load i) Star connected load. ii) Delta connected load.	R	5	
	f)	An alternating voltage is represented by $V=141.4 \sin(\omega t + 60^\circ)$. Calculate frequency, time period, rms value and phase voltage.	A	4	
Q.6		Attempt any FOUR:			16
	a)	Two sine waves are represented by expression $i_1 = 20 \sin(\omega t + \pi/3)$ and $i_2 = 30 \sin(\omega t + \pi/4)$. Find $i_1 + i_2$.	A	4	
	b)	Define the following terms related to the alternating quantity i) Phase ii) Phase difference iii) Frequency iv) Amplitude.	A	4	
	c)	For purely inductive circuit i) Draw circuit diagram with AC supply. ii) Draw waveforms of voltage and current. iii) Write equation of current. iv) Draw phasor diagram.	A	5	
	d)	Explain single phase squirrel cage induction motor with its basic working principle and construction by drawing neat labelled diagram.	A	6	
	e)	Explain the concept of Lagging and Leading phase angle by waveform.	R	4	
	f)	State the formula for circuit with resistance and capacitance in series for the following terms: i) Capacitive reactance ii) Impedance iii) Active power iv) Reactive power.	A	5	



Q.No. 2 (b) Fig. No. 1



Q.No. 3 (b) Fig No 2

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EVEN TERM END EXAM JUNE/JULY-2022

EXAM SEAT NO.

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LEVEL :- **THIRD**

PROGRAM : **I.E. & E & TC**

COURSE CODE :- **EIG309/EIF309**

COURSE NAME **MICROCONTROLLERS**

MAX. MARKS : **80** TIME : **03.45 HRS.** DATE :- **25/06 / 2022**

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
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- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S Q N	Question Text	R/ U/ A	Co EIG 309	Ma rks
Q.1		Attempt any FOUR :			08
	a)	State the function of Address Bus and Control Bus.	R	1	
	b)	Describe the function of SWAP A instruction of 8051.	U	3	
	c)	List the various menus (tabs) seen on Keil IDE compiler.	R	1	
	d)	State the function of MUL AB and DIV AB instruction.	U	3	
	e)	Draw the format of SECON ^{1610P} register in 8051 microcontroller.	R	2	
	f)	Enlist Assembler directives of 8051 family.	U	3	
Q.2		Attempt any FOUR :			16
	a)	Develop a program to arrange ten numbers in array stored in the external memory location 3000H in descending order. Write comments in program.	A	3	
	b)	Compare between microprocessor and microcontroller.(Any four points)	U	1	
	c)	Draw a labelled pin diagram of 8051 Microcontroller.	U	2	
	d)	Differentiate 8051, PIC, AVR, ARM microcontroller with respect to i) No. of bit ii) Memory capacity iii) Memory Architecture iv) No. of timer counters.	U	1	
	e)	Develop a program to add 16 bit numbers stored in internal RAM location 30H onwards. Store the result at 50H and 51H. Draw the flowchart.	A	3	
	f)	Explain the function of following register of 8051 microcontroller i) Program counter ii) Stack pointer iii) Data pointer iv) Accumulator.	U	2	
Q.3		Attempt any FOUR :			16
	a)	Draw the internal memory organization of 8051. Explain function of bit addressable area and general purpose area.	U	2	
	b)	Describe accessing of stack in 8051.	U	3	
	c)	Explain power saving options of 8051 microcontroller.	U	2	
	d)	Compare Von Neuman and Harvard architecture (any four points)	U	1	

	e)	Develop a program to add two 8 bit BCD numbers stored at 40H and 41H, store the result at 60H and 61H.	A	3
	f)	Analyze the following program CLR C MOV A, # 4CH SUBB A, # 6EH JNC NEXT CPL A INC A NEXT: MOV R1, A	A	4
Q.4		Attempt any FOUR :		08
	a)	Draw the format of SCON Register.	R	5
	b)	List the various modes of timer in 8051 microcontroller.	R	5
	c)	Draw interfacing diagram of 4 x 4 keyboard matrix with 8051 microcontroller.	U	6
	d)	Draw the format of PCON register.	R	5
	e)	State the use of pull-up register connected to Port-0 pins.	R	4
	f)	Find the number of steps for revolution (360°) of stepper motor with steep angle of 7.5° and 1.5° .	A	6
Q.5		Attempt any FOUR :		16
	a)	Draw and explain the internal port structure of port -0 of 8051 microcontroller.	U	4
	b)	Draw interfacing of LED with 8051 and write an ALP to toggle LED connected to P2.1.	A	4
	c)	Develop an ALP to generate square wave of 3KHz using 8051 microcontroller on port pin P2.6. (Assume crystal frequency = 11.0592 MHz)	A	4
	d)	Explain the concept of interrupts and polling and list the various sources of interrupts in 8051.	U	5
	e)	Write an ALP to display "GPKP" on 16 x 2 LCD display. (Assume suitable Pins of 8051)	A	6
	f)	Write an ALP to send letter "Y" on serial port of 8051 at 9600 baud rate (Assume XTAL = 11.0592 MHz)	A	5
Q.6		Attempt any FOUR :		16
	a)	Explain the working of timer model ^{mode-1} with logical diagram.	U	4
	b)	List software and hardware interrupts used in 8051 with their vector addresses and priorities.	R	5
	c)	Develop a program to generate 50% duty cycle square wave on pin P1.2 using interrupt delay. (Assume XTAL = 11.0592 MHz)	A	5
	d)	Draw the interfacing of stepper motor and write an ALP to rotate in anticlockwise direction.	A	6
	e)	Draw interfacing of 7 segment display with 8051 and write a program to display 0 to 9 numbers on it.	A	4
	f)	Draw the interfacing of program memory and data memory with 8051.	U	5

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EVEN TERM END EXAM JUNE/JULY-2022

EXAM SEAT NO.

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LEVEL :- FOURTH PROGRAM : IE & E & TC

COURSE CODE :- EIF401

COURSE NAME POWER ELECTRONICS - I

MAX. MARKS : 80 TIME : 03.45 HRS. DATE :- 25/06 / 2022

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
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7) SQN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S Q N	SECTION - I				R/ U/ A	Co EIF 401	Ma rks
Q.1		Attempt any FOUR :						08
	a)	Draw the symbol of UJT and DIAC.				R	1	
	b)	State any two advantages of pulse gate triggering.				R	2	
	c)	Which type of commutation method is used in following circuit?				A	3	
		i) Class -A ii) Class -C iii) Class -F iv) Class -D						
	d)	List any four ideal switch characteristics.				R	3	
	e)	Compare PUT and UJT (any 2 points)				U	2	
	f)	Draw a neat circuit diagram of class E commutation.				R	3	
Q.2		Attempt any FOUR :						16
	a)	Describe any four specifications of SCR.				U	1	
	b)	Explain dv/dt triggering of thyristor.				U	2	
	c)	Explain class -C commutation with neat circuit diagram.				U	3	
	d)	Draw and explain V-I characteristics of DIAC.				U	1	
	e)	Explain TRIAC triggering using DIAC.				U	2	
	f)	Compare SCR and TRIAC (any 4 points)				U	1	
Q.3		Attempt any FOUR :						16
	a)	Draw construction of SCR using two transistor models. Explain its operation.				U	1	
	b)	Draw and explain UJT relaxation oscillator with waveforms. Also write expression for its time-period.				U	2	
	c)	Compare natural and forced commutation (any 4 points)				U	3	
	d)	Describe any two modes of operation of TRIAC.				U	1	
	e)	Explain the requirements of pulse to trigger SCR successfully.				U	2	
	f)	Draw and explain class B commutation with waveforms.				U	3	

P.T.O.

Q.N	S Q N	SECTION -II		R/ U/ A	Co EF 401	Ma rks
Q.4		Attempt any FOUR :				08
	a)	Define i) Controlled rectifier. ii) Uncontrolled rectifier.		R	5	
	b)	If a strain efficiency is 60% then calculate derating factor.		A	4	
	c)	Explain the concept of source.		U	6	
	d)	Draw single phase half wave controlled rectifier with resistive load.		R	6	
	e)	Enlist two advantages of 3 phase uncontrolled rectifier.		R	5	
	f)	Explain AC phase control principle.		U	6	
Q.5		Attempt any FOUR :				16
	a)	Define i) String efficiency ii) Derating factor.		R	4	
	b)	Draw and explain single phase half wave controlled rectifier with inductive load.		U	6	
	c)	Draw the vector diagram and circuit diagram of uncontrolled bridge rectifier.		R	5	
	d)	Enlist four reasons of connecting thyristors in series or parallel connection.		R	4	
	e)	Define i) PIV ii) TUF		R	5	
	f)	Explain the two quadrant operation of controlled rectifier.		U	6	
Q.6		Attempt any FOUR :				16
	a)	In a static equalizing network, derive the equation to find the value of V_D .		A	4	
	b)	Explain working of 3 phase half wave uncontrolled rectifier.		U	5	
	c)	With the help of circuit diagram and waveform, explain single phase fully controlled rectifier bridge converter with freewheel diode.		U	6	
	d)	Find out the value of capacitor in dynamic equalizing circuit.		A	4	
	e)	State four advantages of delta-star connection.		R	5	
	f)	Draw the circuit of single phase full wave controlled rectifier in i) Symmetrical configuration. ii) Asymmetrical configuration.		R	6	

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EVEN TERM ENDE EXAM-JUNE –JULY 2022

EXAM SEAT NO.

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LEVEL :- THIRD **PROGRAM : IE&ENTC**

COURSE CODE :- EIG306/EIF306

COURSE NAME :- DIGITAL TECHNIQUES AND APPLICATION

MAX. MARKS : 80 **TIME : 3.45 HRS.** **DATE :- 24/06/2022**

Instruction :-

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QN	S Q N		R/ U/ A	Co EIF 306	Mar ks
Q.1		Attempt any FOUR :	A		08
	a)	Convert the following numbers to equivalent number system i) $(312.78)_{10} = (?)_2$ ii) $(11011.011)_2 = (?)_{10}$	A	1	
	b)	Define i) Noise margin ii) Fan – out	R	3	
	c)	Perform $(1101)_2 - (1010)_2$ using 2's complement methos.	A	1	
	d)	List any four characteristics of ECL family	R	3	
	e)	Draw symbol of EX-OR gate with its truth table.	R	2	
	f)	Add following binary numbers i) $(10010)_2 + (10011)_2$ ii) $(1110)_2 + (0110)_2$	A	1	
Q.2		Attempt any FOUR :			16
	a)	State and prove De-Morgan's second theorem. Write its logical equation and truth table for 3 variables.	U	2	
	b)	Convert $(01101)_2$ to i) Gray code ii) $(?)_{10}$ iii) Excess – 3 code iv) $(?)_{16}$	A	1	
	c)	Compare CMOS and ECL with the help of i) Fanin ii) Fan – out iii) Noise margin iv) Propagation delay.	U	3	
	d)	Simplify the following function using K-map $F(A,B,C,D) = \Sigma m(1,5,6,12,13,14)$.	A	2	
	e)	Draw a circuit diagram and explain working of TTL NAND gate.	U	3	
	f)	BCD subtract the following using 10's complement method. i) $(95)_{10} - (62)_{10}$ ii) $(15)_{10} - (45)_{10}$	A	1	
Q.3		Attempt any FOUR :			16
	a)	Draw 3 input ECL NOR gate and explain its working.	U	3	
	b)	Convert the following equation into canonical SOP from i) $Y = AB + \overline{AC} + BC$	A	2	
	c)	Explain TTL to CMOS interfacing	U	3	
	d)	Convert the following i) $(B4D)_{16} = (?)_{10}$ ii) $(7204)_8 = (?)$ iii) $(01101011101)_2 = (?)_{16}$ iv) $(342)_{10} = (?)_8$	A	1	
	e)	Explain working of CMOS inverter with neat circuit diagram.	U	3	
	f)	Draw the logical diagrams of OR and NOR gates using only a universal NAND gate.	U	2	

P.T.O.

	S Q N		R/ U/ A	Co EFF 306	Mar ks
4	4	Attempt any FOUR :			08
	a)	Draw the half adder using gates with its truth table.	U	4	
	b)	Design 1:4 DeMux using 1:2 DeMux (only diagram)	A	4	
	c)	Draw D Flip flop & its truth table	R	5	
	d)	List modes of operations of shift registers	R	5	
	e)	Give classifications of memory	R	6	
	f)	Draw circuit diagram of Weighted resistor DAC	R	6	
5		Attempt any FOUR :			16
	a)	Design full adder using half adders & Explain it.	U	4	
	b)	Explain ALU IC 74181	R	4	
	c)	Draw circuit diagram of S.R. Flip Flop. Explain its working operation.	U	4	
	d)	Describe Race around condition in JK Flip Flop	U	5	
	e)	Explain single slope ADC with the help of its block diagram.	R	6	
	f)	List types of RAM & explain any two types.	R	6	
6		Attempt any TWO four :			16
	a)	Draw block diagram of IC 74185A. Design 8 bit Binary to BCD converter using IC 74185A	U	4	
	b)	Design 16 to 1 multiplexer using logic gates with its truth table.	A	4	
	c)	Draw full subtractor & explain with the help of its truth table.	U	4	
	d)	Explain Flash memory	A	5	
	e)	Design 3 bit synchronous counter using JK Flip Flop	A	5	
	f)	Draw logic diagram & truth table of i) IC (7474) ii) IC (7476)	R	5	

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EVEN TERM END EXAM JUNE – JULY 2022

EXAM SEAT NO.

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LEVEL :- **FIFTH**

PROGRAM : **IE/ENTC**

COURSE CODE :- **EIF404**

COURSE NAME :- **PRINCIPLES OF CONTROL SYSTEM**

MAX. MARKS : **80** TIME : **3.45 HRS.** DATE :- **23/06/2022**

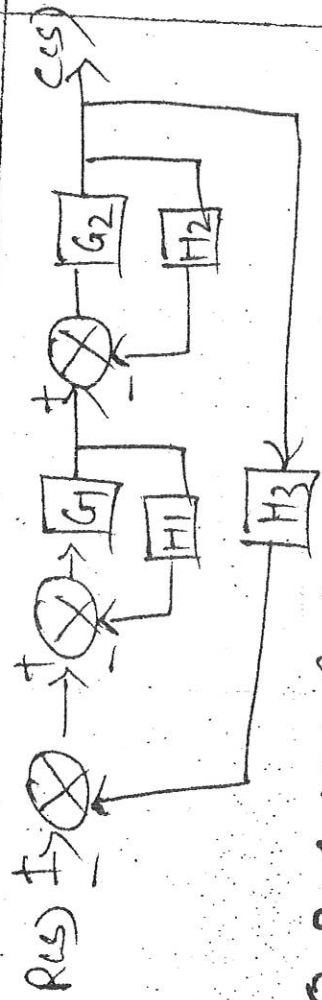
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SECTION – I

QN	S Q N		R/ U/ A	Co EIF 404	Mar ks
Q.1		Attempt any FOUR :			08
	a)	Define control system. State two examples for the same.	R	1	
	b)	State any two block diagram reduction rules.	R	1	
	c)	Define a) Poles ii) Zeros.	R	2	
	d)	Define i) Delay time ii) Rise time.	R	2	
	e)	State any two advantages of Frequency response analysis.	R	3	
	f)	Define Gain Margin.	R	3	
Q.2		Attempt any FOUR :			16
	a)	Derive the transfer function for given system (ref dia.2.1)	A	1	
	b)	For given electrical system, derive $\frac{V_{oc}}{V_{ic}}$ (ref dig 2.2)	A	1	
	c)	Draw the standard test signals used in time domain analysis & state mathematical statement for each.	U	2	
	d)	Derive an expression for unit step response of first order system. Draw it's response curve.	A	2	
	e)	Explain step wise procedure for constructing magnitude Bode plot.	U	3	
	f)	By correlating time & frequency response specification derive following expression for second order canonical system. $W_r = W_n \sqrt{1 - 2\xi^2}$	A	3	
Q.3		Attempt any FOUR :			16
	a)	Compare Linear time varying & time in varying system. (Any four points)	U	1	
	b)	Determine transfer function for given system. (net diagram 3.2)	A	1	
	c)	For given transfer function T.F $\frac{K(S+6)}{S(S+2)(S+8)(S^2+7S+12)}$ Find i) Poles ii) Zeros iii) Characteristic equation iv) Pole – zero plots	A	2	
	d)	Define i) Type '0' system ii) Type '1' system iii) Steady state error iv) Characteristic equation	R	2	

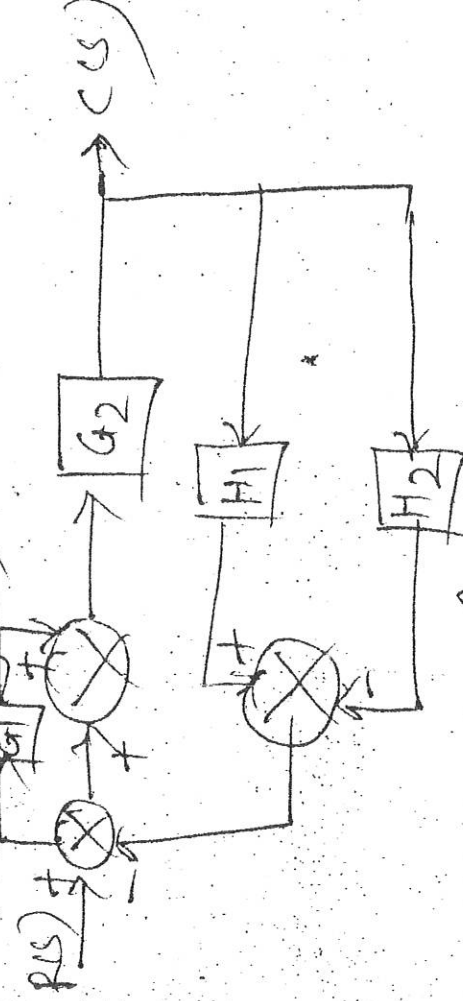
e)	State any four Frequency response specifications.	R	3	Mar ks 08
f)	For the system having open loop transfer function $G(s)H(s) = \frac{10}{S(S+1)(S+10)}$ plot magnitude bode plot on semilog paper	A	3	
S Q N	SECTION - II	R/ U/ A	404	
	Attempt any FOUR :			08
a)	Define stable system.	R	4	
b)	Find stability by Routh's stability criterion $2S^3+4S^2+4S+12=0$	A	4	
c)	Define absolute stability.	R	4	
d)	Define servo systems.	R	5	
e)	List two servo components.	R	5	
f)	Draw block diagram of process control system.	R	6	
	Attempt any FOUR :			16
a)	Explain unstable system with necessary conditions and draw Locations of roots in S-plane	U	4	
b)	Compare between armature controlled D.C. servomotor and field controlled D.C. servomotor (any four points)	U	5	
c)	Explain with neat diagram of Rotary encoder.	U	5	
d)	Find the restrictions on 'K' so that the system whose transfer function is given below is absolutely stable.	A	4	
	$G(S) = \frac{K}{S(1+0.5S)(1+0.1S)}$			
	$H(S) = 1$			
e)	Explain proportional controller using op-amp.	U	6	
f)	State any two advantages of Integral controller action mode and two disadvantages of Integral controller action mode.	U	6	
	Attempt any TWO :			16
a)	I) Compare P.I and D Control action on the basis of i) Nature of output ii) Response of error iii) Equation iv) Application II) Draw and explain ON-OFF controller with standard equation and waveforms.	U	6	
b)	i) Draw and explain a neat sketch of synchro as an error detector. ii) Draw and explain potentiometer as an error detector.	U	5	
c)	i) $S^6+5S^5+10S^4+24S^3+20S^2+15S+10$ ii) $S^4+S^3-3S^2-S+2$ By means of Routh's stability criterion, determine the stability of the above systems.	A	4	



Q.2. (a) Dig (2.1)



Q.2 (b) Dig (2.2)



Q.3 (b) Dig (3.2)

GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

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EVEN TERM END EXAM JUN/JULY 2022

EXAM SEAT NO.

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LEVEL :- **THIRD** PROGRAM : **INDUSTRIAL ELECTRONICS**

COURSE CODE :- **IEG310 / ETF 310**

COURSE NAME :- **ELECTRICAL MACHINES**

MAX. MARKS : **80** TIME : **3.45 HRS.** DATE :- **22/6/2022**

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S Q N	Section- I				R/ U/ A	Co IEG 310	Mar ks
Q.1		Attempt any FOUR :						08
	a)	State working principle of DC Generator.				R	1	2
	b)	Write any two applications of Isolation Transformer.				R	1	2
	c)	State any two parts of DC Motor.				R	1	2
	d)	List the various losses take place in transformer.				R	2	2
	e)	Write two applications of Repulsion type single phase Induction motor				R	3	2
	f)	State any four applications of AC series motor.				R	3	2
Q.2		Attempt any FOUR :						16
	a)	Rewrite any two applications for - i) DC shunt Motor ii) DC series Motor				U	1	4
	b)	Prepare the EMF equation of a transformer with neat sketch.				A	2	4
	c)	Distinguish between core type transformer and shell type transformer on any four particulars.				U	2	4
	d)	Explain with neat sketch the construction and working of shaded pole single phase induction motor.				U	3	4
	e)	Calculate the value of the efficiency at full load, if a 500 KVA, 3 phase, 50Hz, transformer has line voltage ratio of 33/11 KV and it is connected in Δ/λ . The resistance per phase are for H.V. 35Ω and L.V. 0.876Ω and iron losses is 3050W.				A	2	4
	f)	Classify different types of single phase Induction Motor and draw the schematic representation of two pole single phase Induction motor.				A	3	4

Q.3	Attempt any FOUR :				16
a)	Prepare the function of following parts of DC Motor. i) Pole Shoe ii) Commutator iii) Brushes iv) Yoke	A	1	4	
b)	Explain working of split phase single phase Induction motor with neat vector diagram.	U	3	4	
c)	Prepare any four constructional features and four applications of pulse transformer.	A	2	4	
d)	Prepare any four disadvantages of AC series motor as compared with DC series motor and where AC series motor is used.	A	3	4	
e)	Classify the various types of single phase induction motor. Discuss any two application of these motors.	A	3	4	
f)	Discuss various losses are obtained in transformers and write any four importance earthing used in transformer.	U	2	4	
QN	S Q N	R/ U/ A	Co IEG 310	Mar ks	
Q.4	Section- II Attempt any FOUR :			08	
a)	Find admittance of coil having resistance of 4 ohm and inductance of 1 milihenry.	A	4	2	
b)	Write down condition to be satisfied by the R-L-C parallel circuit for resonance.	R	4	2	
c)	If the circuit has equivalent impedance of $4 + j6\Omega$ across open circuited load terminals than what will be value of load impedance to absorb maximum power from source.	A	5	2	
d)	An electric iron of 250 watts is utilized for 200 hrs in a month, how much units of energy is consumed?	A	6	2*	
e)	Write down equations for total reactive power in a three phase circuit and also write down its unit.	U	6	2	
f)	Write down equations of three phase voltages generated in three phase alternator.	U	6	2	
Q.5	Attempt any FOUR :			16	
a)	Write down values of following parameters at resonance in RLC parallel circuit. i) Impedance ii) Currents iii) Resonant frequency iv) Q factor	U	4	4	
b)	Find current through Z_L using Thevenins theorem in a circuit shown in Fig.A	A	5	4	
c)	Using Superposition theorem find current through $(2 + j3)\Omega$ branch in a circuit shown in Fig. B	A	5	4	
d)	Find Z_{in} for the circuit shown in Fig. C	R	5	4	
e)	Write down relation between line and phase values of voltages and currents in three phase 4 wire star connected system.	A	5	4	
f)	Write down equations for active and apparent powers in 3 phase Delta connected system and 3 phase star connected system. Also write down their units.	U	6	4	

Q.6	Attempt any FOUR :			16
	a)	Find current through each branch of the circuit shown in fig D	A	4
	b)	Find current through each branch of the circuit shown in fig E and draw complete phasor diagram to show branch currents and total current through the circuit.	A	4
	c)	Using KCL & KVL find current through each branch of the circuit shown in fig. A	U	4
	d)	State and explain Norton's Theorem to solve A.C. circuit	R	4
	e)	An installation consumes electricity as follows i) 60Watts – Tube light -6 hours daily ii) 60Watts- fan -8 hours daily iii) 1000 watts -geyser - 2 hours daily at the rate of Rs. 3.75 per unit .Find electricity charges for the month of April	A	4
	f)	Write down advantages of poly phase system of supply	U	4

Q. N.	S.Q. N.	Question text	Cognit ion Level R/U/A	CO Code	Marks out of
Que-5(B)	Fig.(A)				
Que-5(C)	Fig.(B)				
Que-5(D)	Fig.(C)				
Que-6(a)	fig(D)				
Que-6(b)	fig(E)				

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EVEN TERM END EXAM JUN/JULY 2022

EXAM SEAT NO.

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LEVEL :- THIRD PROGRAM : INDUSTRIAL ELECTRONICS

COURSE CODE :- IEG310 / ETF 310

COURSE NAME :- ELECTRICAL MACHINES

MAX. MARKS : 80 TIME : 3.45 HRS. DATE :- 22/6/2022

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

		Section- I			
QN	S Q N		R/ U/ A	Co IEG 310	Mar ks
Q.1		Attempt any FOUR :			08
	a)	State working principle of DC Generator.	R	1	2
	b)	Write any two applications of Isolation Transformer.	R	1	2
	c)	State any two parts of DC Motor.	R	1	2
	d)	List the various losses take place in transformer.	R	2	2
	e)	Write two applications of Repulsion type single phase Induction motor	R	3	2
	f)	State any four applications of AC series motor.	R	3	2
Q.2		Attempt any FOUR :			16
	a)	Rewrite any two applications for - i) DC shunt Motor ii) DC series Motor	U	1	4
	b)	Prepare the EMF equation of a transformer with neat sketch.	A	2	4
	c)	Distinguish between core type transformer and shell type transformer on any four particulars.	U	2	4
	d)	Explain with neat sketch the construction and working of shaded pole single phase induction motor.	U	3	4
	e)	Calculate the value of the efficiency at full load, if a 500 KVA, 3 phase, 50Hz, transformer has line voltage ratio of 33/11 KV and it is connected in Δ/λ . The resistance per phase are for H.V. 35Ω and L.V. 0.876Ω and iron losses is 3050W.	A	2	4
	f)	Classify different types of single phase Induction Motor and draw the schematic representation of two pole single phase Induction motor.	A	3	4

Q.3	Attempt any FOUR:		16
a)	Prepare the function of following parts of DC Motor. i) Pole Shoe ii) Commutator iii) Brushes iv) Yoke	A	1
b)	Explain working of split phase single phase Induction motor with neat vector diagram.	U	3
c)	Prepare any four constructional features and four applications of pulse transformer.	A	2
d)	Prepare any four disadvantages of AC series motor as compared with DC series motor and where AC series motor is used.	A	3
e)	Classify the various types of single phase induction motor. Discuss any two application of these motors.	A	3
f)	Discuss various losses are obtained in transformers and write any four importance earthing used in transformer.	U	2
Q.4	Section- II	R/ U/ A	Co IEG 310
			Mar ks

Q. N.	S.Q. N.	Question text	Cognit ion Level R/U/A	CO Code	Marks out of
Q. 4	4	Attempt any 04 a) List the types of alternator according to the motor construction b) state the relation between line & phase values of voltage & current in star & delta connection c) Define synchronous speed of 3 ϕ induction motor. d) List the types of starter used for 3 ϕ Induction motor e) Define step angle for stepper motor. f) List the applications of servo motor	A U R A	TEG 310 -04 TEG 310 -04 -05 -05 -06 -06	16
Q. 5	5	Attempt any 04 a) Draw the construction & working principle of DC servo motor b) Describe the production of rotating magnetic field by 3 phase supply in 3 phase winding	U U	TEG 310 -06 TEG 310 -05	16

Q. N.	S.Q. N.	Question text	Cognit ion Level R/U/A	CO Code	Marks out of
		1) List the advantages of stationary armature in 3ϕ alternator 2) Draw & explain star-delta starter used for three phase induction motor 3) Draw & explain in brief variable reluctance stepper motor 4) Explain with neat diagram construction of three phase alternator.	U	TEA310-04	TEA310-04
Q. 6		Attempt any 04 explain with neat diagram $\uparrow$ single phase AC servo motor 1) List the various parts of three phase induction motor & state their functions. 2) with neat diagram state the relation betⁿ line & phase value of voltage & currents in star & delta connection. 3) Explain excitation system for 3ϕ alternator 4) List the application of 3ϕ induction motor (both squirrel cage & slip ring induction motor) 5) with neat diagram explain permanent magnet stepper motor with two phase windings.	U	TEA310-06	16
			U	TEA310-04	TEA310-04
			A	TEA310-05	TEA310-05
			U	TEA310-04	TEA310-04
			A	TEA310-05	TEA310-05
			U	TEA310-06	TEA310-06

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EVEN TERM END EXAM JUNE/JULY-2022

EXAM SEAT NO.

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LEVEL :- **THIRD** PROGRAM : **ELECTRONICS AND TELECOMMUNICATION**
COURSE CODE :- **ETG311**

COURSE NAME **BASIC OF POWER ELECTRONICS**

MAX. MARKS : **40** TIME : **02.30 HRS.** DATE :- **22/06 / 2022**

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S	R/ U/ A	Co ETG 311	Mar ks
Q.1				12
			Attempt any FOUR :	
	a)	R	1	
			Define latching current and holding current.	
	b)	U	1	
			Draw the symbol of TRIAC, UJT, PUT and SCR.	
	c)	A	2	
			How the operation of PUT differ from that of the UJT?	
	d)	A	3	
			Mention the required conditions for the successful communication.	
	e)	A	3	
			Why natural communication is not possible in d.c. circuit?	
	f)	A	5	
			How free-wheeling diode improves the input power factor in controlled rectifier?	
Q.2				16
			Attempt any FOUR :	
	a)	R	1	
			Explain transistor analogy of SCR.	
	b)	U	2	
			Draw and explain the circuit of PUT relaxation oscillator with its waveform.	
	c)	R	3	
			Describe the operation of class-C commutation with its circuit diagram.	
	d)	R	4	
			Explain the equalizing circuit for series connection of SCRs.	
	e)	U	5	
			Explain the circuit of half wave controlled rectifier with free-wheeling diode with its circuit diagram and output waveforms.	
	f)	R	5	
			Draw the circuit of full wave bridge converter with resistive load with explain them with output waveform.	
Q.3				12
			Attempt any FOUR :	
	a)	R	1	
			Draw the V-I characteristic, its circuits diagram of DIAC. Explain them with layer diagram.	
	b)	R	2	
			Explain the UJT with its construction and characteristics.	
	c)	U	2	
			Describe resistance capacitance firing circuit with its circuit diagram and voltage waveform.	
	d)	U	4	
			Explain Dynamic equalizing network for series connection of SCRs.	
	e)	R	5	
			Explain the circuit of half-wave controlled rectifier with resistive load with its circuit diagram and waveform.	
	f)	R	5	
			Draw the circuit of full wave Bridge controlled rectifier with inductive load. Explain them with its output waveform.	

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LEVEL :- **FIFTH** PROGRAM : **INDUSTRIAL ELECTRONICS**

COURSE CODE :- IEF502

COURSE NAME :- PLC

MAX. MARKS : 80 TIME : 3.45 HRS. DATE :- 30/06/2022

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Applying

SECTION - I

QN	S Q N	SECTION - I	R/ U/ A	Co IEF 502	Mar ks
Q.1		Attempt any FOUR :	A		08
	a)	List any four advantages of PLC.	R	1	
	b)	State the classification of PLC based on types & size.	R	1	
	c)	State four logical instructions.	R	3	
	d)	Draw block diagram of discrete input modules.	U	2	
	e)	Give the specifications of analog output module.	R	2	
	f)	Enlist Relay type instructions of PLC with symbols.	R	3	
Q.2		Attempt any FOUR :			16
	a)	Explain the following i) Sequencer Instructions. ii) PID Instructions.	U	3	
	b)	Draw the architecture of PLC & explain function of any two blocks.	U	1	
	c)	Explain the PLC characteristics, Rack and redundancy.	U	1	
	d)	Explain the data handling instructions in PLC (Any two with examples)	U	3	
	e)	Draw the block diagram of Discrete output module and explain it.	U	2	
	f)	Describe sinking and sourcing output module.	U	2	
Q.3		Attempt any FOUR .			16
	a)	Explain PLC operating cycles.	U	1	
	b)	Describe Evolution and Role of PLC in automation.	U	1	
	c)	Explain any four I/O module selection criteria.	U	2	
	d)	Define the following terms w.r.t discrete I/O module. i) Module Load ii) Input Threshold Voltages. iii) Inrush Current iv) Input ON/OFF delay	U	2	
	e)	Describe the operation of up-counter giving example.	U	3	
	f)	If source 'A' contains integer value 88 and source 'B' contains integer value 08. Calculate the output for following instructions in PLC: i) ADD ii) SUB iii) MUL iv) DIV	A	3	

QN	S	SECTION - II	R/ U/ A	Co IEF 502	Ma rks
Q.4		Attempt any FOUR :			08
	a)	List different programming languages of PLC.	R	4	
	b)	State important reasons for grounding P.L.C installation properly.	U	6	
	c)	Draw the ladder diagram for $Y=(A+B) CD$	A	4	
	d)	Enlist any four industrial applications of PLC.	R	5	
	e)	Develop a ladder diagram that will copy the stored value at address N7:56 into address N7:60	A	4	
	f)	Name the input devices and output devices that are required to control temperature of oven.	U	5	
Q.5		Attempt any FOUR :			16
	a)	Explain input and output troubleshooting methods using module LED status.	U	6	
	b)	Draw the ladder diagram for two lamps red and yellow having following conditions. i) When start button is pressed, red lamp is ON. ii) After 10 sec. when red lamp is ON, yellow lamp is ON. iii) When stop button is pressed both lamp should be OFF.	A	4	
	c)	Develop ladder diagram for the following oven temperature controller: An analog thermocouple interface module is used to monitor the current temperature of oven. The set point temperature is 400°F. Electric heaters will be turned ON if temperature of the oven drops to less than 396°F and stay ON till temperature rises above 404°F.	A	5	
	d)	Describe the following parameter considered while PLC installation. i) Enclosure ii) Master Control Relay (MCR)	U	6	
	e)	Draw the ladder diagram for following logic gates. Also draw its truth table. i) Ex-OR ii) NAND	U	4	
	f)	Develop a ladder diagram for two motor operation for a start switch starts motor 1 and motor 2. The stop switch stops motor 1 first and after 25 seconds motor 2 stops. Mention input and output address.	A	5	
Q.6		Attempt any TWO :			16
	a)	Draw the ladder diagram for elevator control system which uses following equipments output elements:- M1 – Motor to drive the platform UP M2 – Motor to drive the platform DOWN input elements. LS ₁ – NC Limit switch to indicate UP position. LS ₂ – NC Limit switch to indicate DOWN position. START – NO push button. UP – NO push button for UP command. DOWN – NO push button for DOWN command. Also explain function of each range. Mention input and output address.	A	5	
	b)	i) Develop the ladder diagram for following boolean equations:- $Y_1 = (ABC+D) (E\bar{F})$ $Y_2 = (A+B) (\bar{C}+D)$ $Q = Y_1.Y_2$ ii) Design a ladder diagram for 4:1 Multiplexer. Mention input and output address.	A	4	
	c)	i) Explain in brief the maintenance guidelines for PLC ii) Describe the troubleshooting method used for finding fault in ladder program.	U U	6 6	

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EVEN TERM END EXAM JUNE/JULY-2022**EXAM SEAT NO.**

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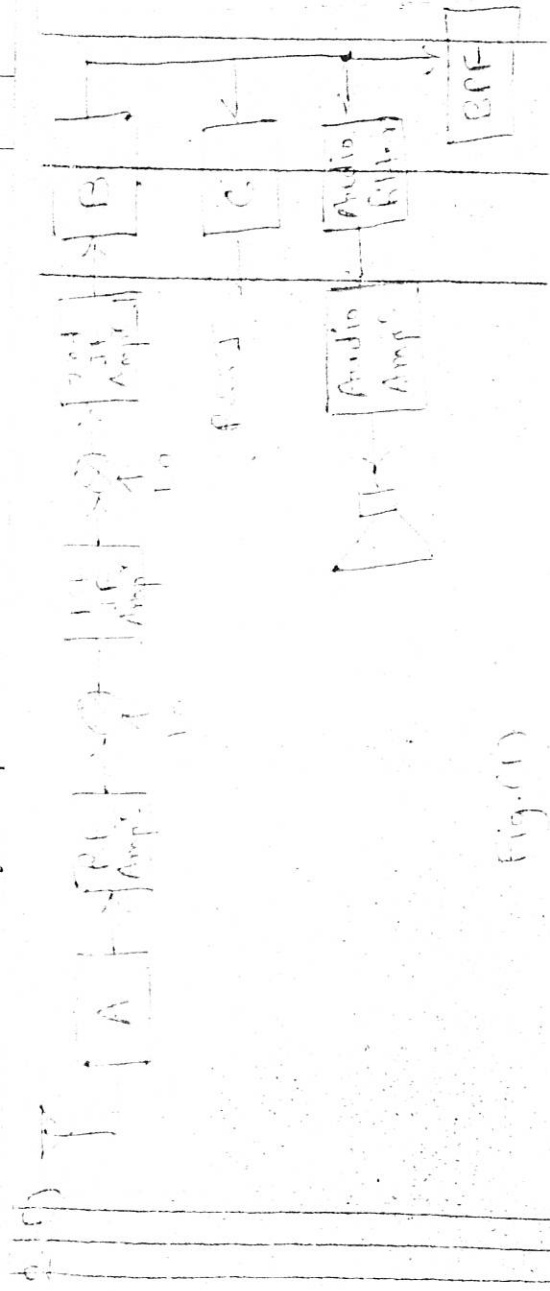
LEVEL :- FIFTH **PROGRAM : ELECTRONICS & TELECOMMUNICATION****COURSE CODE :- ETF501****COURSE NAME MOBILE COMMUNICATION****MAX. MARKS : 80** **TIME : 03.45 HRS.** **DATE :- 30/06/2022****Instruction :-**

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN		S	SECTION -I		R/ U/ A	Co ETF 501	Ma rks
Q.1			Attempt any FOUR :				08
	a)		Define i) Mobile switching center. ii) Transceiver.		R	1	
	b)		Draw a diagram of control unit of mobile.		R	2	
	c)		State the function of RSSI signal.		R	2	
	d)		Define cluster. Draw frequency reuse pattern for cluster size 7.		R	3	
	e)		State any two advantages of microcell zone concept.		R	3	
	f)		State the role of hand off mechanism in cellular system.		R	3	
Q.2			Attempt any FOUR :				16
	a)		Describe with diagram cellular telephone system.		U	1	
	b)		Compare between N-AMPS and GSM with following points. i) Year of Introduction ii) Multiple access. iii) Modulation iv) Channel bandwidth.		U	1	
	c)		Draw block diagram of transmitter unit of mobile and explain it.		U	2	
	d)		Illustrate with neat diagram, proper and improper hand-off procedure.		U	3	
	e)		Describe the effect of co-channel interference on system capacity.		U	3	
	f)		Identify given diagram shown in Fig.(1). Name the blocks A,B & C and write the function of A,B & C.		A	2	
Q.3			Attempt any FOUR :				16
	a)		Draw a timing diagram illustrating a cell is made from landline telephone to mobile.		U	1	
	b)		Describe AMPS mobile radio system in detail.		U	1	
	c)		Draw and explain block diagram of logic unit of mobile handset.		U	2	
	d)		Explain how repeaters used for range extension.		U	3	
	e)		Identify the diagram shown in Fig. (2). And explain it. Write two advantages if it.		A	3	
	f)		Explain with diagram soft hand-off. Write any two advantages of it.		U	3	

P.T.O.

Q.N		SECTION -II		Marks	
Q.4		Attempt any FOUR :		08	
	a)	Define authentication center (AC).		4	
	b)	State any four features of IS-95.		5	
	c)	Enlist two telephone and two ISDN services provided by GSM.		4	
	d)	State the types of modulation is used in IS-95 and GSM.		5	
	e)	Write the features of UMTS (Any four)		6	
	f)	State any four Bluetooth applications.		6	
Q.5		Attempt any FOUR :		16	
	a)	Draw SS7 protocol architecture and give the function of Message Transfer Protocol (MTP)	U	6	
	b)	Draw forward channel structure of IS-95 and write function of each channel bit.	U	5	
	c)	Give the classification of GSM logical channels and explain.	R	4	
	d)	Draw and explain Bluetooth architecture.	U	6	
	e)	Explain location updating in GSM with neat diagram.	U	4	
	f)	Describe the call processing in IS-95 CDMA.	U	5	
Q.6		Attempt any FOUR :		16	
	a)	Differentiate GSM and IS-95 with respect to i) Frequency range ii) Channel bandwidth iii) Radio interface iv) Hand off.	U	4	
	b)	Describe working of mobile IP with suitable diagram.	U	6	
	c)	Draw the IS-95 system architecture and explain VLR & HLR.	U	5	
	d)	Describe operation of WLL with suitable diagram.	U	6	
	e)	Draw and explain GSM radio subsystem.	U	4	
	f)	Which system is best from GSM, IS-95 and 3G W-CDMA? Justify your answer with any four points.	A	5	



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EVEN TERM END EXAM June-July-2022

EXAM SEAT NO.

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LEVEL :- FOURTH

PROGRAM : E. & T.C. / I.E.

COURSE CODE :- EIF402

COURSE NAME EMBEDDED SYSTEM

MAX. MARKS : 80 TIME : 3.45 HRS. DATE :- 28/06 / 2022

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Figure to the right indicate marks.
- 3) Illustrate your answers with sketches wherever necessary.
- 4) Use of non-programmable pocket calculator is permissible.
- 5) Mathematical and other tables shall be made available on request.
- 6) Assume additional suitable data necessary.
- 7) Use of Mobile is strictly prohibited.

QN	S N	Section- I	R/ U/ A	Co EIF 402	Marks
Q.1		Attempt any FOUR :			
	a)	State any four advantages of C programming language over assembly for embedded system programming.	U	1	08
	b)	Describe the utility and advantage of 'reg51.h' header file in C programming.	R	1	02
	c)	State the steps to find the value to be loaded in timer registers TL and TH of 8051 for a desired time delay.	R	2	02
	d)	Draw the format of TCON SFR and state the significance of each bit.	R	2	02
	e)	State all the 8051 interrupts with unique numbers associated with each interrupt for programming in C. Also state the importance of IE SFR.	R	3	02
Q.2		Write a C program to enable all the interrupts of 8051.	R/U	3	02
		Attempt any FOUR :			
	a)	List the bitwise operators in C and Explain its use with a suitable example.	U	1	16
	b)	Write a C program to convert packed BCD 0X29 to ASCII and display the ASCII bytes on port 0 and port 1.	A	1	04
	c)	Write the crystal frequency = 11.0592 MHz, Calculate the TH ₁ value needed to have the following band rates- i) 19200 ii) 9600 iii) 2400 iv) 1200	U	2	04
	d)	Enlist the steps involving in transmission and reception of data through serial port of 8051.	U	2	04
	e)	Write a C program to generate a square wave at port pin P2.7 which is half the frequency of the square wave applied at INT0 (P3.2) pin.	U/A	3	04
	f)	Enlist and explain the steps involving in executing any interrupt of 8051.	U	3	04
Q.3		Attempt any TWO :			
	a)	Write a C program to perform the checksum operation to ensure data integrity. If the data is good, send ASCII character 'G' to port 0, otherwise send ASCII character 'B' to port 0. Data given 0X25, 0X62, 0X3F, 0X52, 0XF8	A	2	16
					08

P.T.O.

Q.4	S Q N	b)	Assume a door sensor is connected to pin P2.7. Monitor the status of the door sensor and transmit following message to serial port of 8051. If door sensor = 0, send message "CLOSED" If door sensor = 1, send message "OPENED" Configure serial port with mode 1 and 9600 baud rate. Assume crystal frequency = 11.0592 MHz.	A	2	08
		c)	Write a C program using interrupts to do the following- i) Generate a square wave of 20KHz frequency on port pin P1.1 using timer 0 in 8 bit auto-reload mode. ii) Use timer 1 as an event counter to count up a 1 Hz pulses being fed at T1 pin and display the count on port 0. Assume crystal frequency = 11.0592MHz.	A	3	08
Q.5	Q.4	Section- II				
			Attempt any FOUR :	R/U/A	Co EIF 402	Mar ks
Q.6	Q.5	a)	State functions of RS & EN pins of LCD.	R	4	08
		b)	Give functions EOC & SOC pins in ADC - 0808/0809	R	4	02
Q.6	Q.5	c)	Which register is used to select AM/PM mode in RTC?	R	5	02
		d)	In DS 12887 how many pins is designated as address / data pins.	R	5	02
Q.6	Q.5	e)	State selection criteria for ADC.	R	6	02
		f)	Give selection criteria for Drivers.	R	6	02
Q.6	Q.5		Attempt any FOUR :			16
		a)	Write 'C' program to generate sine wave from DAC 0808.	U/A	4	04
Q.6	Q.5	b)	Write 'C' program to generate square wave from DAC 0808.	U/A	4	04
		c)	Write 'C' program to display message "WEL" on 1 st line & "COMI" on 2 nd line of LCD.	U/A	4	04
Q.6	Q.5	d)	Write 'C' program to rotate stepper motor in anti-clock wise direction. Use 0.9° step angle.	U	5	04
		e)	Draw an interfacing diagram DC motor L293D with 8051 Microcontroller	R	5	04
Q.6	Q.5	f)	Draw 8051 Microcontroller based data acquisition system for parameter like temperature, angular displacement etc. with proper lable.	U	6	04
			Attempt any FOUR :			16
Q.6	Q.5	a)	Write Algorithm and Flowchart to read a data from ADC 0808.	U	4	04
		b)	State No. of port lines required for keyboard matrix having following keys 1) 16 2) 256 3) 64 4) 144	U	4	04
Q.6	Q.5	c)	Write 'C' program to rotate DC motor in counter clock wise direction.	U/A	5	04
		d)	Write a 'C' program display time in AM/PM mode using RTC 12887	A	5	04
Q.6	Q.5	e)	Write a 'C' program to generate 64Hz square wave on SQW pin of DS12887 RTC.	U	6	04
		f)	State the steps involving the design of sensor interfacing with 8051 Microcontroller.	U	6	04

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EVEN TERM END EXAM JUNE – JULY 2022

EXAM SEAT NO.

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LEVEL :- THIRD PROGRAM : IE/ENTC

COURSE CODE :- EIG307/EIF307

COURSE NAME :- LINER INTEGRATED CIRCUITS

MAX. MARKS : 80 TIME : 3.45 HRS. DATE :- 29/06/2022

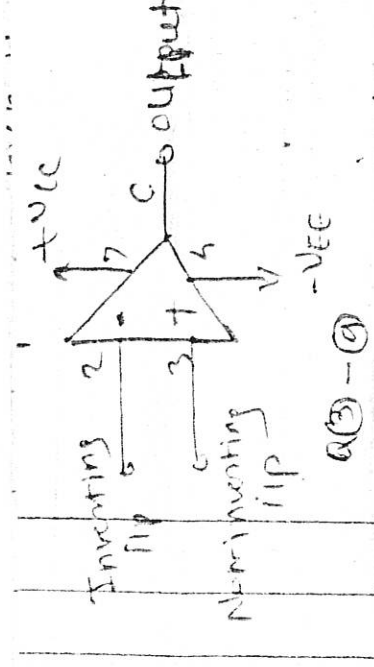
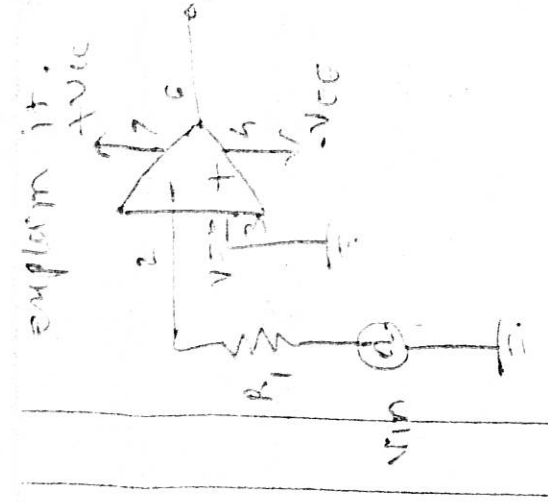
Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S Q N		R/ U/ A	Co EIG 307	Mar ks
Q.1		Attempt any FOUR :			08
	a)	Draw the circuit diagram of Dual Input unbalanced output differential amplifier	U	1	
	b)	State any two application of Instrumentation amplifier.	R	3	
	c)	Explain Virtual ground concept with help of circuit diagram.	U	2	
	d)	State any two application of voltage comparator.	R	3	
	e)	Define Inverter and draw the circuit diagram of it.	R	2	
	f)	Determine the output voltage for open loop differential amplifier with $v_1 = 2V_{dc}$ and $v_2 = 1V_{dc}$. Assume OP-amp is IC $\mu A741$.	R	3	
Q.2		Attempt any FOUR :			16
	a)	Derive the output expression of I to V convertor with help of circuit diagram	A	3	
	b)	Define the following term with respect to Op-Amp. i) Input offset current. ii) CMRR iii) Input capacitance iv) Input offset voltage	R	1	
	c)	Derive the output expression of closed loop non-inverting amplifier.	A	2	
	d)	Identify the given circuit diagram? Draw the waveform of it and explain it.	A	3	
	e)	Explain the differential amplifier with help of circuit diagram and classify it.	U	1	
	f)	For inverting summing amplifier having input V_1 , V_2 , and V_3 where $V_1 = 1V$, $V_2 = 2V$, $V_3 = 5V$; $R_f = 10K\Omega$ and $R_1 = 1K\Omega$. Determine the output voltage? Draw the designed circuit.	R	3	
Q.3		Attempt any FOUR from following.			16
	a)	Identify the given diagram shown below and explain it.	A	1	
	b)	Explain an ideal integrator with help of its circuit diagram and waveform.	U	2	
	c)	Explain inverting precision half wave rectifier with help of circuit diagram and waveform.	U	3	
	d)	Define the subtractor circuit and draw the circuit diagram of it and explain it.	A	1	
	e)	Identify the practical and ideal value of SVRR and Input bias current and define it.	A	3	
	f)	Draw and explain window detector with help of circuit diagram and waveform.	R	3	

Q.4	Attempt any FOUR :			08
a)	Draw pin diagram of IC 566	R	2	
b)	State the Barkhausen's criteria for oscillations in an oscillator.	R	2	
c)	Give the classification of filters.	R	2	
d)	Define the astable multivibrator.	R	2	
e)	Draw pin diagram of IC 555.	R	2	
f)	List any two applications of IC 555.	R	2	
Q.5	Attempt any FOUR :			16
a)	Describe the operating principle of Wien bridge oscillator using IC 741. Give the expression for the frequency of oscillation.	A	4	
b)	State advantages & disadvantages of RC-phase shift oscillator.	R	4	
c)	Define following terms w.r.t. filter i) Roll of rate ii) Q-factor iii) Bandwidth iv) cut-off frequency.	R	4	
d)	Sketch ideal frequency response for i) Low pass filter. ii) High pass filter. iii) Band pass filter. iv) Band stop filter.	U	4	
e)	With the help of circuit diagram describe operation of first order Low Pass Butterworth filter.	U	4	
f)	With neat functional Block diagram of IC 555, state function of each block.	U	4	
Q.6	Attempt any FOUR :			16
a)	Describe the operation of Astable multivibrator using IC 741. Also draw its circuit diagram.	A	4	
b)	Differentiate between RC phase shift oscillator & Wien bridge oscillator (any 4 points)	U	4	
c)	Compare between Active & Passive filter (any 4 points)	U	4	
d)	For a second order low-pass filter, calculate the cut-off frequency if $R_2 = R_3 = 33k\Omega$ & $C_1 = C_2 = 0.002\mu F$	A	4	
e)	Draw & describe the working of first order Wide Band Reject Filter.	U	4	
f)	State the functions of following pin of IC 555 i) Trigger ii) Reset iii) Threshold iv) Discharge	R	4	

Q.3)-A



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EVEN TERM END EXAM JUNE – JULY 2022

EXAM. SEAT NO.						
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LEVEL: -THIRD PROGRAM: **IE & ENTC**
COURSE CODE: - EIG303/EIF303
COURSE NAME: - **ELETRONIC MEASURING INSTUMENTS.**
MAX. MARKS: **80** TIMES: **3HRS 45 MIN.** DATE: - **01/07/2022**

Instruction:-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN - Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S	R/ U/ A	Co EIG/ EIF 303	Mar ks
Q.1		Attempt any FOUR :		08
	a)	State any four units of measuring fundamental quantities.	R	1
	b)	Define standards and name any 2 types.	R	1
	c)	Draw the diagram of Wheatstone's bridge.	R	2
	d)	State the types of AC bridges.	R	2
	e)	State any two advantages of digital instruments.	R	3
	f)	Define the term. i) Average value ii) RMS value	R	3
Q.2		Attempt any FOUR :		16
	a)	Explain any four dynamic characteristics of instruments.	U	1
	b)	Explain Kelvin's bridge with neat diagram.	U	2
	c)	Derive the equation for frequency measurement using Wein's bridge with neat diagram.	U	2
	d)	Explain inductance comparison bridge with neat diagram.	U	2
	e)	Draw and explain Successive approximation type digital voltmeter with neat block diagram.	U	3
	f)	Explain any four selection criteria for transducer	U	3
Q.3		Attempt any FOUR .		16
	a)	Explain various types of standards with their classification.	U	1
	b)	Explain how unknown capacitor can be measured using Schering's bridge.	A	2
	c)	State any four applications of Maxwell's bridge.	R	2
	d)	Draw and explain basic block diagram of digital frequency meter.	U	3
	e)	Distinguish between ADC and DAC (any four points)	U	3
	f)	Draw and explain the construction of RTD with neat diagram.	U	3

P.T.O

Q.4		Attempt any FOUR :			08
	a)	List any two functions of DSO			
	b)	Write the function of event marker in strip chart recorder.	R	4	
	c)	Draw the diagram of passive voltage probe.	R	6	
	d)	State the need of signal generator.	R	4	
	e)	Compare strip chart recorder and X – Y recorder (Any two points)	R	5	
	f)	State the function of accelerating anode.	U	6	
Q.5		Attempt any FOUR :	R	4	
	a)	Draw the constructional diagram of CRT and state two materials used for display in CRT screen.			16
	b)	Draw the neat labelled block diagram of function generator and explain how sine wave generated.	U	4	
	c)	Compare between active and passive voltage probes on the basis of i) Block diagram ii) Definition iii) Components used iv) Application	U	5	
	d)	Explain in detail spectrum analyzer.	U	4	
	e)	Explain with the help of block diagram X – Y recorder.	U	5	
	f)	Draw neat labelled block diagram of vertical deflection system & describe it's operation.	U	6	
Q.6		Attempt any FOUR :	U	4	
	a)	State the procedure for measurement of frequency using CRO with diagram.			16
	b)	Write any four applications of each of i) Circular chart recorder ii) Strip chart recorder.	A	4	
	c)	Explain how a CRO can be used to test: i) Diode ii) Transistor.	U	6	
	d)	Compare between time domain & frequency domain on the basis of i) Definition ii) Waveform iii) Example iv) Cost	A	4	
	e)	Draw neat labelled block diagram of digital storage oscilloscope	U	5	
	f)	Write any four specifications of function generator.	U	4	
			A	6	

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EVEN TERM ENDE EXAM JUNE/JULY-2022

EXAM SEAT NO.

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LEVEL :- FIRST

PROGRAM : IE / E & TC

COURSE CODE :- EIG103/EIF103

COURSE NAME BASIC ELECTRONICS

MAX. MARKS : 80 TIME : 03.45 HRS. DATE :- 28/06 / 2022

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S Q N	Question Text	R/ U/ A	Co EIG 103	Ma rks
Q.1		Attempt any FOUR :			08
	a)	Define doping and state the types of impurities.	R	1	
	b)	State any two applications of Zener diode.	R	1	
	c)	Give the classification of rectifier.	R	2	
	d)	Draw the symbol of NPN and PNP transistor.	R	3	
	e)	State the modes of transistor operation.	R	3	
	f)	State the need of filter.	U	2	
Q.2		Attempt any FOUR :			16
	a)	Draw and explain V-I characteristics of P-N junction diode.	U	1	
	b)	Explain the formation of N-type extrinsic semiconductor with suitable diagram.	U	1	
	c)	Define following terms with respect to Rectifier. i) Ripple Factor. ii) Peak Inverse Voltage. Iii) Transformer utilization Factor. iv) Rectifier efficiency.	R	2	
	d)	Draw and explain with neat and labelled diagram and waveforms the working of full wave center tap rectifier.	U	2	
	e)	A transistor has $\beta=140$. Calculate the approximate collector current (I_C) and base currents I_B if the emitter current is 8mA.	A	3	
	f)	Draw and explain output characteristics of transistor in CB configuration.	U	3	
Q.3		Attempt any FOUR :			16
	a)	Draw and explain the operation of Zener diode in avalanche breakdown.	A	1	
	b)	Compare Conductor, Insulator and Semiconductor on the basis of following parameters, i) Forbidden gap ii) Example iii) Conductivity iv) Resistivity.	A	1	
	c)	Draw and explain shunt capacitor filter with respect to full wave bridge rectifier.	A	2	
	d)	Explain the operation of full wave bridge rectifier with suitable waveforms and circuit diagram.	A	2	
	e)	Explain switching action of transistor with the help of suitable circuit diagram.	U	3	
	f)	For a certain transistor $\alpha=0.97$ and $I_C=3.5mA$. Calculate I_B and I_E .	A	3	

P.T.O

Q.4	Attempt any FOUR ; State disadvantages of fixed bias circuit		08
a)	Enlist different methods of biasing.	R	4
b)	State the types of FET.	R	5
c)	State the need of regulated power supply.	R	6
d)	List the types of biasing circuits with respect to transistor. (any two)	U	4
e)	Define operating point of transistor.	U	4
f)	Draw the symbol of P-Channel and N-Channel MOSFET.	U	5
Q.5	Attempt any FOUR ; depletion		16
a)	State and explain the types of coupling in multistage amplifier.	U	4
b)	Define "Biasing of Transistor". Explain in brief voltage divider bias circuit.	U	4
c)	Define parameters of JFET i) μ , g_m and r_d . ii) Derive relation between μ , g_m and r_d .	U	5
d)	Explain the working principle of N-Channel enhancement MOSFET with a neat and labelled diagram.	U	5
e)	Draw circuit of Zener diode as a voltage regulator and explain its working.	U	6
f)	Draw the block diagram of DC regulated power supply and explain the function of each block.	U	6
Q.6	Attempt any FOUR ;		16
a)	Draw the circuit of two stages RC coupled amplifier and sketch its frequency response.	A	4
b)	Draw and explain DC load line for transistor as an amplifier and locate 'Q' point on it.	A	4
c)	State applications of JFET (any four points)	A	5
d)	Compare JFET and MOSFET (any four points)	A	5
e)	Sketch functional pin diagram of IC 78XX and explain the function of each pin.	A	6
f)	Sketch and explain pin diagram of IC723.	A	6

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EVEN TERM END EXAM JUNE – JULY 2022

EXAM SEAT NO.

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LEVEL :- FIFTH

PROGRAM : IE

COURSE CODE :- IEF501

COURSE NAME :- POWER ELECTRONICS-II

MAX. MARKS : 80 TIME : 3.45 HRS. DATE :- 27/06/2022

Instruction:-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
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- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

		SECTION - I			
QN	S Q N		R/ U/ A	Co IEF 501	Mar ks
Q.1		Attempt any FOUR :			08
	a)	Draw output V-I characteristics of IGBT.	R	1	
	b)	Define i) Chopper ii) Cycloconverter.	R	2	
	c)	State the need of SMPS	R	3	
	d)	Draw symbol of i) GTO ii) IGBT	R	1	
	e)	Give classification of chopper.	R	2	
	f)	State the need of AC voltage regulator.	R	3	
Q.2		Attempt any FOUR :			16
	a)	Draw constructional diagram of GTO. Explain its operating principle.	U	1	
	b)	Explain Jones chopper with neat circuit diagram.	U	2	
	c)	Explain operating principle of servo type regulator with circuit diagram.	U	3	
	d)	Give two applications of each i) IGBT ii) GTO	R	1	
	e)	With neat circuit diagram explain single phase bridge cycloconverter.	U	2	
	f)	Differentiate between SMPS and linear regulator. (Any 4 points)	U	4	
Q.3		Attempt any FOUR :			16
	a)	Draw and explain parallel turn off chopper	U	2	
	b)	Draw constructional diagram of power MOSFET and explain its operating principle.	U	1	
	c)	Draw and explain operation of 3- Φ to 1- Φ cycloconverter.	U	2	
	d)	Explain solid state type regulator with neat circuit diagram.	U	2	
	e)	Compare step – down and step – up chopper. (Any 4 points)	U	2	
	f)	Explain the following power supply requirements. i) Regulated output. ii) Isolation. iii) Multiple outputs. iv) Efficiency.	U	3	

P.T.O.

Q/N		S Q N	SECTION - II			R/ U/ A	Co IEF 501	Mar ks
Q.4			Attempt any FOUR :			A		08
	a)		Define inverter.			R	1	
	b)		State the principle of induction heating.			R	2	
	c)		State operating principle of snubber circuit.			R	3	
	d)		Classify inverters.			R	1	
	e)		State the need of UPS			R	2	
	f)		Enlist two applications of inverter and give two specifications of inverter.			R	1	
Q.5			Attempt any FOUR :					16
	a)		Draw and explain simple bridge inverter with resistive load.			U	1	
	b)		Draw basic block diagram of UPS and explain it.			U	2	
	c)		With neat circuit diagram, explain spike suppressor.			U	3	
	d)		Draw a circuit diagram of PWM inverter and explain it with waveforms.			U	1	
	e)		Define optoisolator. Explain pulse transformer.			U	3	
	f)		Explain bridge inverter with Mc Murray commutator.			U	1	
Q.6			Attempt any TWO :					16
	a)		Explain zero voltage switching in resonant inverters.			U	1	
	b)		Explain the applications of induction heating. 1) Surface hardening 2) Brazing			U	2	
	c)		Explain Mc - Murray Bedford bridge inverter.			U	1	
	d)		Explain over voltage crowbar protection with circuit diagram			U	3	
	e)		With neat circuit diagram, explain line interactive UPS.			U	2	
	f)		With neat circuit diagram, explain current fold back circuit.			U	3	

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EVEN TERM ENDE EXAM JUNE-JULY-2022

EXAM SEAT NO.

LEVEL :- **FOURTH** PROGRAM : **ELECTRONICS AND TELECOMMUNICATION**
COURSE CODE :- **ETF403**
COURSE NAME **DATA COMMUNICATION & NETWORKING**
MAX. MARKS : **80** TIME : **3.45 HRS.** DATE :- **27/06 / 2022**

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

		Section- I			
QN	S Q N		R/ U/ A	Co CEG 306	Mar ks
Q.1		Attempt any FOUR :			08
	a)	Enlist four standard organization of data communication.	R	1	2
	b)	Draw star topology. Give its two advantages.	R	2	2
	c)	Define switching. Classify it.	R	3	2
	d)	Give need for frame relay.	R	3	2
	e)	Compare LAN and MAN on the basis of i) Data rate ii) Area covered.	R	3	2
	f)	Enlist one advantage and one disadvantage of message switching.	R	2	2
Q.2		Attempt any FOUR :			16
	a)	Explain time and frequency domains of periodic analog signal.	U	3	4
	b)	Compare between Router and Bridge on the basis of 1) layer in OSI model 2) Operation 3) Types 4) Application	U	2	4
	c)	Draw and explain frame relay frame format.	U	3	4
	d)	Explain in short i) Repeater ii) Gateway with respect to network devices.	U	2	4
	e)	Draw and explain block diagram of data communication system.	U	1	4
	f)	Explain concept of ATM.	U	3	4
Q.3		Attempt any FOUR :			16
	a)	Explain any one impairment caused in data communication.	U	1	04
	b)	Draw and explain functional block diagram of MODEM.	U	2	04
	c)	With suitable diagram, explain virtual circuit packet switching.	U	3	04
	d)	Define i) Latency ii) Jitter	R	1	04
	e)	Draw architecture of TCP/IP model and state function of each layer.	U	3	04
	f)	Compare message switching and packet switching (any 4 points)	A	2	04

Section- II							
QN	S	Q	N		R/ U/ A	Co MEF 406	Mark s
Q.4				Attempt any FOUR :			08
	a)			Define single bit error and burst error.	R	4	02
	b)			State difference between forward error correction and error detection by retransmission.	U	4	02
	c)			Explain the term – flow control.	R	4	02
	d)			List any two goals of fast ethernet.	R	6	02
	e)			State common uses of Telnet.	R	5	02
	f)			Explain the term URL..	R	5	02
Q.5				Attempt any FOUR :			16
	a)			Explain working of SMTP.	R	5	04
	b)			Explain HTTP request / response model.	R	5	04
	c)			Describe standard Ethernet MAC sublayer firewalls.	R	6	04
	d)			Explain working of packet- filtering firewalls.	R	6	04
	e)			Explain necessity of sequence number for a frame for noisy channel.	U	4	04
	f)			Describe simple protocol for noiseless channel.	U	4	04
Q.6				Attempt any TWO :			16
	a)			Explain role of SNMP.	U	5	08
	b)			Explain procedure for error detection using cyclic redundancy check.	U	4	08
	c)			Explain role of MAC sublayer of 802.11.	U	6	08

GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

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EVEN TERM END EXAM JUNE/JULY-2022

EXAM SEAT NO.

LEVEL :- **FIFTH** PROGRAM : **ELECTRONICS AND TELECOMMUNICATION**
COURSE CODE :- **ETF502**
COURSE NAME: **OPTICAL FIBER COMMUNICATION**
MAX. MARKS : **80** TIME : **03.45 HRS.** DATE :- **27/06 / 2022**

Instruction :-

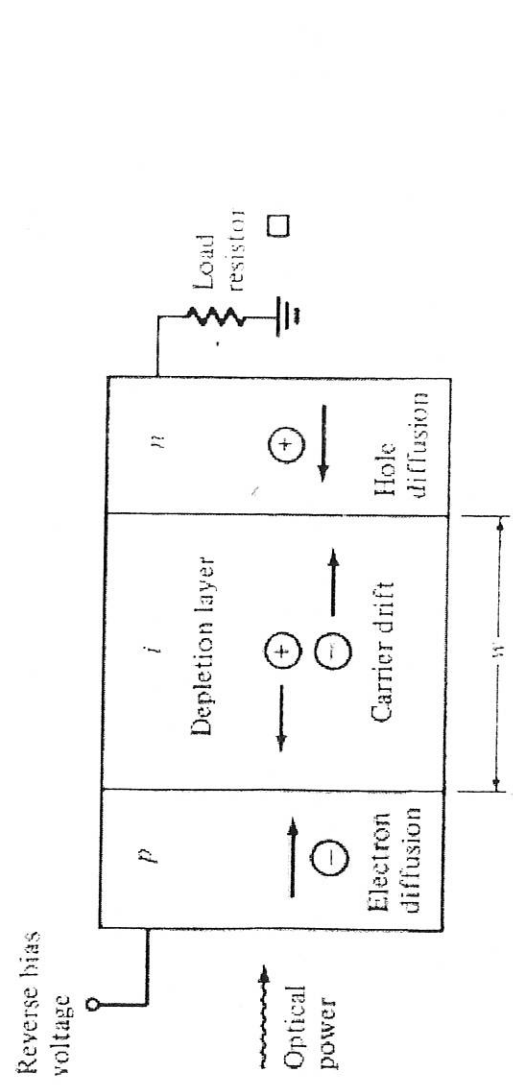
- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S Q N	SECTION -I	R/ U/ A	Co MTF 404	Ma rks
Q.1		Attempt any FOUR :			08
	a)	List down various losses in optical fibers.	R	3	
	b)	State advantages of optical fiber.	R	2	
	c)	Draw the diagram indicating Reflection and Refraction of light ray at a material boundary.	R	1	
	d)	Define the term attenuation.	R	3	
	e)	List the types of optical fiber connectors.	R	2	
	f)	State Snell's law.	R	1	
Q.2		Attempt any FOUR :			16
	a)	Explain scattering losses in optical fiber communication.	U	3	
	b)	Explain light propagation in step index fiber in detail.	U	2	
	c)	Explain any one method of numerical aperture measurement.	U	3	
	d)	Calculate the numerical aperture and acceptance angle for an optical fiber. Given that refractive indices of the core and the cladding are 1.45 and 1.40 respectively.	A	1	
	e)	Compare step index and graded index fiber. (Any four points)	U	2	
	f)	Define the term splicing and explain any one type of splice.	U	2	
Q.3		Attempt any FOUR :			16
	a)	Draw electromagnetic spectrum which shows region used for optical fiber communication.	U	1	
	b)	Explain intramodal and intermodal dispersion technique.	U	3	
	c)	Compare plastic fiber and glass fiber. (Any four points)	U	2	
	d)	Draw setup for eye-pattern measurement and eye pattern showing performance parameters.	U	3	
	e)	Draw and explain optical fiber structure in detail.	U	2	
	f)	Enlist fiber bend losses and explain them in detail.	U	3	

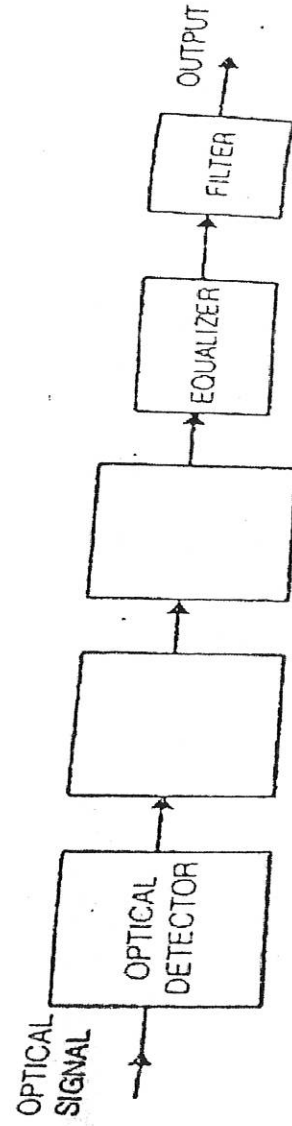
P.T.O.

Q.N	S Q N	SECTION -II		R/ U/ A	Co EFF 502	Ma rks
Q.4		Attempt any FOUR :		A		08
	a)	State the function of optical photodetector. List its types.		R	5	
	b)	Differentiate between homojunction LED and heterojunction LED. (any two points)		U	4	
	c)	Identify whether following statement is true or false. Justify the answer. "LASER works on the principle of spontaneous emission".		A	4	
	d)	Draw the block diagram of optical fiber communication system.		U	6	
	e)	Give advantages of APD over PN-photo diode.		R	5	
	f)	Compare between FDM and WDM with any two points.		U	6	
Q.5		Attempt any FOUR :		A		16
	a)	Identify the type of photo-detector shown below. Explain its construction in brief. (Refer fig. attached)		A	4	
	b)	Draw and explain construction of gain guided LASER.		U	4	
	c)	Describe any four industrial application of fiber optic communication.		U	6	
	d)	With the help of proper graph, describe the I-V characteristics of PIN diode.		U	5	
	e)	Differentiate between LED and LASER with respect to following points:-i) Principle of operation ii) Spectral width iii) Data Rate iv) Driving circuitary.		A	4	
	f)	Explain the following points with respect to source limitation in Optical Fiber Communication i) Power ii) Thermal Behavior.		U	6	
Q.6		Attempt any FOUR :				16
	a)	Explain with neat diagram construction of edge emitting LED.		U	4	
	b)	With the help of suitable diagram explain the operation of avalanche photodiode.		U	5	
	c)	Identify the missing block and state the function of each block. (Refer fig. attached)		A	6	
	d)	Draw and explain output power and output spectrum characteristics of LED.		U	4	
	e)	Describe speed of response of PIN photodiode.		U	5	
	f)	With the help of energy band diagram, discuss concept of direct and indirect bandgap semiconductor.		U	4	

P.T.O.



Q.5 (a)



Q.6. (c)

GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

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EVEN TERM END EXAM June-July-2022

EXAM SEAT NO.

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LEVEL :- THIRD PROGRAM : ELECTRONICS AND TELECOMMUNICATION

COURSE CODE :- ETG 310

COURSE NAME DIGITAL COMMUNICATION

MAX. MARKS : 80 TIME : 3 HRS 45 MIN. DATE :- 06/07/ 2022

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Figure to the right indicate marks.
- 3) Illustrate your answers with sketches wherever necessary.
- 4) Use of non-programmable pocket calculator is permissible.
- 5) Mathematical and other tables shall be made available on request.
- 6) Assume additional suitable data necessary.
- 7) Use of Mobile is strictly prohibited.

QN	SN		R/ U/ A	Co ETG 310	Marks
Q.1		Attempt any FOUR :			08
	a)	Define channel noise and state its effects.			
	b)	State the role of predictor in DPCM effects.	R	1	02
	c)	Define the term – pulse modulation. Give classification of pulse modulation.	R	1	02
			R	2	02
	d)	Draw the nature of waveform if data bit sequence 11001010 is to be transmitted by BPSK transmitter.	A	3	02
	e)	Describe Aliasing effect with neat diagram.	R	2	02
	f)	Draw the constellation diagram for 8-QAM system.	A	1	02
Q.2		Attempt any FOUR :			16
	a)	Draw block diagram of BFSK transmitter and receiver.	U	3	04
	b)	Draw block diagram of QPSK transmitter. Explain its working principle.	U	3	04
	c)	Compare analog pulse modulation and digital pulse modulation w.r.t. following points i) Principle of operation . ii) Output of transmitter. iii) Examples. Iv) Bandwidth requirement.	A	2	04
	d)	Draw the block diagram of digital communication system and describe the function of channel encoder.	U	1	04
	e)	Explain the terms companding with neat diagram.	U	2	04
	f)	Compare QAM with QPSK (any four points)	A	3	04
Q.3		Attempt the FOUR :			16
	a)	Describe generation of BASK signal with the help of block diagram.	U	3	04
	b)	Draw the block diagram of PCM transmitter and describe the function of each block.	U	2	04
	c)	Compare PAM and PWM w.r.t. following points i) varying parameter ii) Immunity towards noise iii) Bandwidth requirement iv) Signal-to-noise ratio.	A	2	04
	d)	Define i) Bit rate. Ii) Baud rate. Also state the unit of both.	R	1	04
	e)	Distinguish between M-ary PSK and M-ary FSK techniques . (Any four points.)	A	3	04
	f)	List any four advantages and disadvantages of digital communication system.	R	1	04

P.T.O.

QN	S QN		R/U/ A	Co ETG 310	Mar ks
Q.4		Attempt any FOUR :			08
	a)	Define different types of errors.	R	4	02
	b)	State sources encoding theorem.	R	4	02
	c)	Write the difference between multiplexing and multiple access.	U	5	02
	d)	Why is synchronization needed in TDM?	U	3	02
	e)	List applications of spread spectrum modulation.	A	6	02
	f)	Compare slow frequency hopping with fast frequency hopping.	U	6	02
Q.5		Attempt any FOUR :			16
	a)	Describe FH-SS system with block diagram of transmitter.	U	5	04
	b)	Compare FDM and TDM system.	U	5	04
	c)	Explain the concept of Wavelength Division Multiplexing.	R	5	04
	d)	Draw unipolar RZ, Polar NRZ, Polar RZ and Manchester line codes for data stream 1101001.	A	4	04
	e)	Describe the working of CRC generator with the help of diagram.	U	4	04
	f)	Assume that a 7 bit even parity Hamming code 1110101 is received. Check wheather received code is correct.	A	4	04
Q.6		Attempt any FOUR :			16
	a)	Construct a CRC codeword for data 100100. Assume that the divisor is 1101.	A	4	04
	b)	A discrete memory less source has five message symbols S0, S1, S2, S3 and S4 with corresponding probabilities as 0.08, 0.2, 0.12, 0.4 and 0.15 . Derive Huffman code for this source.	A	4	04
	c)	Draw a suitable diagram of FDM transmitter and explain.	U	5	04
	d)	Describe synchronous TDM technique.	U	5	04
	e)	Explain 3 bit P-N sequence generator used in spread spectrum techniques.	U	6	04
	f)	Define Direct Sequence Spread Spectrum modulation technique. Draw DSSS transmitter and receiver.	U	6	04

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EVEN TERM END EXAM JUNE/JULY-2022

EXAM SEAT NO.

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LEVEL :- **FIFTH**

PROGRAM : **ELECTRONICS & TELECOMMUNICATION**

COURSE CODE :- **ETF506**

COURSE NAME **AUDIO & VIDEO ENGINEERING**

MAX. MARKS : **80** TIME : **03hrs.45 min.** DATE :- **02/07 / 2022**

Instruction :-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S Q N	SECTION -I			R/ U/ A	Co ETF 506	Ma rks
Q.1		Attempt any FOUR:					08
	a)	List the types of Loudspeakers.			R	1	
	b)	Define 'stereophony' and draw basic stereophonic system.			R	1	
	c)	Explain compression system.			R	2	
	d)	Define the Aspect ratio.			R	3	
	e)	Explain Interlaced Scanning.			R	3	
	f)	Define compatibility.			R	3	
Q.2		Attempt any FOUR:					16
	a)	Describe the working of three way crossover network circuit with neat diagram.			U	1	
	b)	Draw the block diagram of HiFi amplifier and write the controls available on it.			A	1	
	c)	Describe Graphic Equalizer with neat diagram.			U	1	
	d)	Give the objectives of JPEG and draw the Architecture of JPEG			U	2	
	e)	Describe the Architecture of MPEG.			U	2	
	f)	Write the MPEG.Z system working.			A	2	
Q.3		Attempt any FOUR:					16
	a)	Describe the composite Video signal with its neat diagram.			U	3	
	b)	Write any four CCIR-B standards for colour signal transmission and reception.			A	3	
	c)	Draw the Vestigial sideband modulation and demonstrate it.			A	3	
	d)	Explain what is blanking pulse and colour burst signal.			U	3	
	e)	Describe Grassman's Law and generation of secondary colours.			U	3	
	f)	Explain hue, saturation and luminance.			R	3	

P.T.O.

QN		S Q N	SECTION –II		R/ U/ A	Co ETF 506	Ma rks
Q.4			Attempt any FOUR :				08
		a)	Define negative modulation with waveforms.		R	4	
		b)	Give the function of delay line in PAL system.		R	5	
		c)	List four applications of CCTV.		R	6	
		d)	Write any two drawbacks of deltagun picture tube.		R	4	
		e)	Draw diagram for separation of U & V signals.		R	5	
		f)	State the use of splitters in cable T.V.		R	6	
Q.5			Attempt any FOUR :				16
		a)	Draw and explain the working principle of PIL picture tube.		U	4	
		b)	Draw and explain block diagram of LNBC.		U	6	
		c)	Compare NTSC and PAL with following points. i) Colour sub carrier ii) Video BW iii) Polarity of modulation iv) Phase distortion and its effect.		U	5	
		d)	Draw block diagram of colour TV transmitter.		U	4	
		e)	Draw and explain burst pulse blanking circuit.		U	5	
		f)	With net diagram, explain working of LCD TV.		U	6	
Q.6			Attempt any FOUR :				16
		a)	Compare positive and negative modulation (Any four points)		U	4	
		b)	Draw block diagram of colour TV receiver (PAL-D type)		U	5	
		c)	List any four advantages of plasma T.V.		R	6	
		d)	Draw circuit of ACC amplifier and explain it.		U	5	
		e)	With block diagram, explain Direct to Home System. (DTH)		U	6	
		f)	Describe the generation of EHT with diagram in colour T.V. Receiver.		U	5	

EVEN TERM END EXAM JUNE – JULY 2022

EXAM. SEAT NO.					
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LEVEL: -THIRD PROGRAM: IE / ENTC

COURSE CODE: - EIG302/EIF302

COURSE NAME: - APPLIED ELECTRONICS

MAX. MARKS: 80 **TIMES: 3Hrs.45 Min.** **DATE: - 07/07/2022**

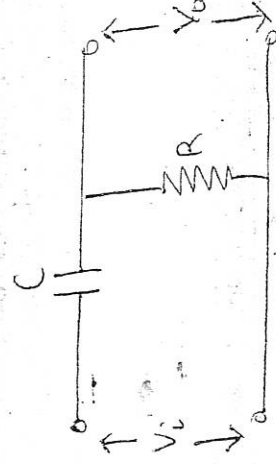
Instruction:-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
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- 6) Use of Mobile is strictly prohibited.
- 7) QN - Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Appl

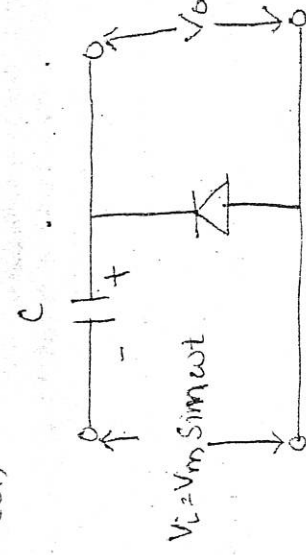
QN	S		R/ U/ A	Co EIG 302	Mar ks
Q.1		Attempt any FOUR :			08
	a)	State function of clipper circuit. Give its classification.	R	3	
	b)	Define the term positive feedback. List the circuit which uses positive feedback.	R	1	
	c)	Give the function of waveshaping circuits and enlist its types.	R	3	
	d)	State the difference between oscillator and amplifier with two points.	U	2	
	e)	Identify the name and function of circuit shown in fig Q.1. (e)	A	3	
	f)	Draw the circuit diagram of Wein Bridge oscillator using BJT.	R	2	
Q.2		Attempt any FOUR :			16
	a)	Explain operation of Tuned – collector oscillator with neat circuit diagram.	U	2	
	b)	In a colpitts oscillator, $C_1=0.001\mu\text{F}$, $C_2=0.01\mu\text{F}$ and $L=10\mu\text{H}$. Find the frequency of oscillation and feedback factor.	A	2	
	c)	Describe the operation of biased -Series positive clipper with neat circuit diagram and waveforms.	U	3	
	d)	Compare positive and negative feedback w.r.t. following points. i) Overall phase shift. ii) Feedback signal and input signal phase relation. iii) Voltage Gain. iv) Stability.	U	1	
	e)	Explain the operation of circuit which will generate triangular waveform from square wave. Also draw respective circuit diagram and necessary waveforms.	A	3	
	f)	An amplifier with negative feedback give an output of 12.5V with an input of 1.5 V when feedback is removed, it requires 0.25V input for the same output. Find the value of voltage gain without feedback and feedback fraction.	A	1	
Q.3		Attempt any FOUR			16
	a)	Describe the operation of current series feedback with the help of block diagram.	U	1	
	b)	With the help of neat circuit diagram explain operation of Hartley oscillator using transistor.	U	2	
	c)	Draw the circuit diagram of a diode clipper to clip a 5V Sine wave input signal at 12V. Describe the operation of drawn circuit with necessary waveforms.	A	3	

d)	Identify the name of circuit shown in Fig. Q3(d). Explain operation of given circuit with necessary waveforms.	A	3	
e)	Compare between voltage series and current shunt feedback w.r.t. following points. i) Gain ii) Input Resistance iii) Output Resistance iv) Bandwidth	U	1	
f)	For RC phase shift oscillator the component values are : $R = 8.2K\Omega$, $C = 0.01\mu F$, $R_1 = 1.2K\Omega$ and $R_f = 39k\Omega$. Calculate the frequency of oscillation. Give any four applications of RC oscillator.	U	2	
Q.4	Attempt any FOUR :			08
a)	List four applications of power amplifier.	R	4	
b)	Draw circuit diagram of monostable multivibrator using BJT.	R	5	
c)	Draw the circuit diagram of Miller Sweep generator.	R	6	
d)	State the efficiency of Class- AB and Class- C power amplifier.	R	6	
e)	List applications of voltage time base generator.	R	6	
f)	State need of power amplifier.	R	4	
Q.5	Attempt any FOUR :			16
a)	Explain single tuned amplifier with neat circuit diagram and frequency response.	U	4	
b)	Explain concept of cross – over distortion in power amplifier.	U	4	
c)	Determine the period and frequency of oscillation for an astable multivibrator with components values $R_1 = 2K\Omega$, $R_2 = 20K\Omega$, $G = 0.01\mu F$, $C_2 = 0.05\mu F$	U	6	
d)	Explain Bootstrap sweep generator.	U	6	
e)	Draw and explain Schmitt trigger operation with waveform	U	5	
f)	Explain following terms with neat diagram. i) Sweep time ii) Retrace time.	U	6	
Q.6	Attempt any FOUR :			16
a)	Explain class B – push pull amplifier with neat circuit diagram.	U	4	
b)	A monostable multivibrator is required to convert 100KHz, 30% duty cycle square wave to a 100KHz, 50% duty cycle square wave. Find the values of R_3 if $C = 1nF$.	A	5	
c)	Compare class A and class B power amplifier on the basis of : i) Efficiency ii) Power dissipation in transistor. iii) Conduction angle for collector current. iv) Position of Q- point.	A	4	
d)	Explain working of transistor as switch.	U	5	
e)	Draw circuit diagram of current sweep generator & list its applications.	U	6	
f)	Explain UJT as sweep generator.	U	6	

Q.1. (e)



Q.3. (d)



EVEN TERM END EXAM JUNE – JULY 2022

EXAM. SEAT NO.					
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LEVEL: -THIRD

PROGRAM: IE & ENTC

COURSE CODE: - MEF312/CEF312/EIF312

COURSE NAME: - HIGHER MATHEMATICS

MAX. MARKS: 80 TIMES: 3Hrs.45 Min. DATE: - 04/07/2022

Instruction:-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN - Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S	Q	N		R/ U/ A	Co EIF 312	Mar ks														
Q.1				Attempt any FOUR :			08														
	a)			Express $f(x) = x^3 - 2x^2 + x + 1$ in factorial notation.	U	1															
	b)			Define forward and backward difference.	R	1															
	c)			Prove that $EV = \Delta E = \Delta$	U	1															
	d)			If $u = \log(x^2 + y^2)$ prove that $\frac{d^2 u}{dx dy} = \frac{d^2 u}{dy dx}$	U	2															
	e)			State Euler's theorem on homogeneous function																	
	f)			Find $\frac{du}{dy}$ if $u = x^2 \sin\left(\frac{x}{y}\right)$	R	2															
Q.2				Attempt any FOUR :			16														
	a)			Express $y = 3x^3 + x^2 + x + 1$ in factorial notation and hence show that $\Delta^3 y = 18$	A	1															
	b)			Show that $\Delta^2 \cos 2x = -4 \cos(2x + 2h) \sin^2 h$	U	1															
	c)			Using Newton's backward interpolation formula find $\cos(75^\circ)$ from the following data. <table><tr><td>x</td><td>0°</td><td>30°</td><td>60°</td><td>90°</td></tr><tr><td>cos x</td><td>1</td><td>0.87</td><td>0.5</td><td>0</td></tr></table>	x	0°	30°	60°	90°	cos x	1	0.87	0.5	0	A	1					
x	0°	30°	60°	90°																	
cos x	1	0.87	0.5	0																	
	d)			If $u = e^{xyz}$ the find $\frac{d^3 u}{dx dy dz}$	U	2															
	e)			Show that $JJ^T = 1$ for $x = e^v \sec u, y = e^v \tan u$	A	2															
	f)			If $u = \sin^{-1}\left(\frac{x^2 + y^2}{x + y}\right)$ then show that $x \frac{du}{dx} + y \frac{du}{dy} = \tan u$	A	2															
Q.3				Attempt any FOUR .			16														
	a)			Find the missing terms in the following table using forward difference table. <table><tr><td>x</td><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td><td>30</td></tr><tr><td>y</td><td>9</td><td>-</td><td>12</td><td>18</td><td>-</td><td>25</td></tr></table>	x	5	10	15	20	25	30	y	9	-	12	18	-	25	A	1	
x	5	10	15	20	25	30															
y	9	-	12	18	-	25															

	b)	Estimate $f(1.5)$ from the following data using Newton's forward interpolation formula $\begin{array}{ccccc} X & 0 & 1 & 2 & 3 & 4 \\ F(x) & 0 & 1 & 8 & 27 & 64 \end{array}$	A	1
	c)	If $u = \log\left(\frac{x^3+y^3}{x^2+y^2}\right)$ then by Euler's theorem prove that $x^2 \frac{d^2u}{dx^2} + 2xy \frac{d^2u}{dx dy} + y^2 \frac{d^2u}{dy^2} = -1$	A	2
	d)	Verify $JJ'=1$ if $x=uv, y=\frac{u}{v}$	A	2
	e)	If $u = \sin^{-1}\left(\frac{x}{y}\right) + \tan^{-1}\left(\frac{y}{x}\right)$ then show that $x \frac{du}{dx} + y \frac{du}{dy} = 0$	U	2
	F	Using Lagrange's interpolation formula find the function $f(x)$ $\begin{array}{ccccc} x & 0 & 1 & 3 & 4 \\ f(x) & -12 & 0 & 12 & 24 \end{array}$	A	1
Q.4		Attempt any FOUR :		08
	a)	Find $L \left[e^{3t} \cdot t^4 \right]$	R	3
	b)	Find $L \left[3 - e^{2t} + \cos 4t \right]$	R	3
	c)	Find $L^{-1} \left[\frac{1}{s^2 + 4s + 13} \right]$	U	3
	d)	If $f(x) = e^{-x}$ in $(-a, a)$ find Fourier coefficient a_0 .	R	4
	e)	If $f(x) = 4 - x^2$ in $(0, 2)$ find Fourier coefficient a_0 .	R	4
	f)	If $x^2 = \frac{4\pi^2}{3} + 4 \sum_{n=1}^{\infty} \frac{1}{n^2} \cos nx - 4\pi \sum_{n=1}^{\infty} \frac{1}{n} \sin nx$ Show that $\frac{\pi^2}{12} = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots$	U	4
Q.5		Attempt any FOUR :		16
	a)	Evaluate : $L \left[t^2 \cdot e^{4t} \sin t \right]$	U	3
	b)	Evaluate : $L^{-1} \left[\frac{4s+12}{s^2 - 8s + 16} \right]$	U	3
	c)	Evaluate : $L \left[\frac{1}{t} (\sin^2 t) \right]$	U	3
	d)	Evaluate by applying convolution theorem $L^{-1} \left[\frac{1}{(s+1)(s-2)} \right]$	A	3
	e)	Solve by using Laplace transform method $\frac{dy}{dt} - y = \sin 2t$, if $y(0)=1$	A	3
	f)	Find inverse Laplace transform of $\frac{s^2}{(s+1)^3}$	U	3

Q.6	Attempt any TWO :			16
a)	Find the Fourier series for the function $f(x) = \begin{cases} \pi & 0 < x < 1 \\ 0 & 1 < x < 2 \end{cases}$	A	4	
b)	Obtain Fourier expansion of $f(x) = \left(\frac{\pi - x}{2} \right)^2$ in the interval $0 \leq x \leq 2\pi$. Hence deduce that $\frac{\pi^2}{12} = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots$	A	4	
c)	Find Fourier series for the function $f(x) = \frac{\pi^2}{12} - \frac{x^2}{4}$ in $(-\pi, \pi)$	A	4	

PROGRAM: IE & ETCPROGRAM: IL & ENIC
EIF512

MACRO CONTROLLER

MAX. MARKS: 80 TIMES: 3Hrs.45 Min. DATE: - 04/07/2022

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.

7) QN - Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application,

QN	S Q N	SECTION - I	R/ U/ A	Co EIF 512	Mar ks
Q.1		Attempt any FOUR :			08
	a)	State any four differences among any two microcontrollers from PIC18 family.	R	1	
	b)	Enlist any four peripheral features of PIC18F458 microcontroller.	R	1	
	c)	List SFRs associated with register indirect addressing mode and state the function of each.	R	2	
	d)	Write the steps involved in execution of the following instruction. MOVLW 0X23 SUBLW 0X3F	U	2	
	e)	State the SFRs associated with each port in PIC18 and give the format of each.	R	3	
	f)	State the number of timers available in PIC18F458 with their sizes.	R	3	
Q.2		Attempt any FOUR :			16
	a)	Give the steps involving in Bank switching in PIC18.	U	1	
	b)	Draw the minimum connection diagram of PIC18F458 micro controller.	U/ A	1	
	c)	Draw the format of Program Counter (PC) of PIC18 and explain.	U	2	
	d)	Five BCD data items are stored in RAM locations starting from 30H. Write a program to find the sum of these numbers. The result must be in BCD and store at the locations 60H and 61H.	A	2	
	e)	Draw the block diagram of Timer 2 of PIC18 and explain its operation.	R/ U	3	
	f)	Write a program to toggle bit 2 of PORT A, bit 3 of PORT B and bit 4 of PORT C after every ½ second.	A	3	
Q.3		Attempt any TWO .			16
	a)	i) Draw the structure of PIC18 file register and explain.	U/ R U	1 1	
	b)	i) Write a program for simple time delay subroutine to generate a delay of 150 msec. ii) Write a program to multiply numbers 22H and 0BH and store the result in file register location 20H and 21H.	A A	2 2	
	c)	Assume that the clock pulses are being fed in to T0CKI. Write a program for counter 0 in 8 bit mode to count pulses and display the states of TMR 0 L on Port B. Draw the setup diagram for the above problem.	A	3	

Q.4	Attempt any FOUR :			08
	a) Draw the PIN connection to RS232.	R	4	
	b) Calculate the baud rate error for baud rate of 57600, use BRGH = 0 and assume XTAL = 10MHz.	U	4	
	c) Give importance of RS and R/W pins of LCD.	U	5	
	d) Calculate the I_{out} current for DAC0808 for following digital input. i) 99H ii) C8H.	U	5	
	e) Calculate the number of steps per revolution if steps angle is 45°.	U	6	
	f) Enlist any four applications of stepper motor.	R	6	
Q.5	Attempt any FOUR :			16
	a) Draw interfacing diagram of keyboard with PIC18F.	R	5	
	b) Write a program for PIC18 to turn ON and OFF the relay and draw the interfacing of relay with PIC19F485.	A	6	
	c) Write an ALP for PIC18 to rotate stepper motor in counter clockwise direction.	A	6	
	d) Explain all Pins of DS1306 RTC chip in detail.	R	4	
	e) Draw and explain ADCON1 format in detail.	R	4	
	f) Write a note on compare mode programming and capture mode programming.	R	4	
Q.6	Attempt any FOUR :			16
	a) Explain in detail stand and enhance CCP module.	R	4	
	b) Explain in detail interrupt Vs polling. Also explain sources of interrupts in PIC18.	U	4	
	c) Write an ALP to get data from channels (RA0) of ADC and displays the result on port C and port D. Assume crystal FOSC/4.	A	5	
	d) Draw interfacing diagram of PIC18 to DAC 0808 and write a program to generate sine wave continuously.	A	5	
	e) Draw a neat diagram of interfacing for PIC18 to stepper motor using optoisolator.	R	6	
	f) Draw connection diagram PIC18 with DC motor using L293 to achieve bidirectional control			

EVEN TERM END EXAM JUNE – JULY 2022

EXAM. SEAT NO.					
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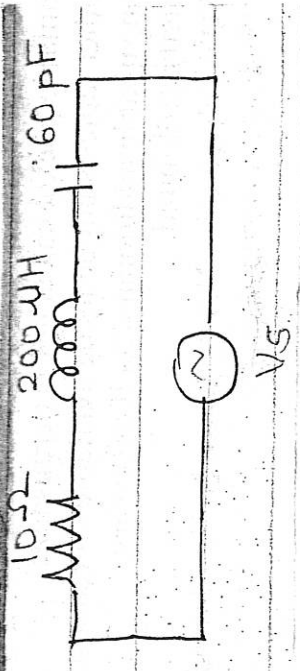
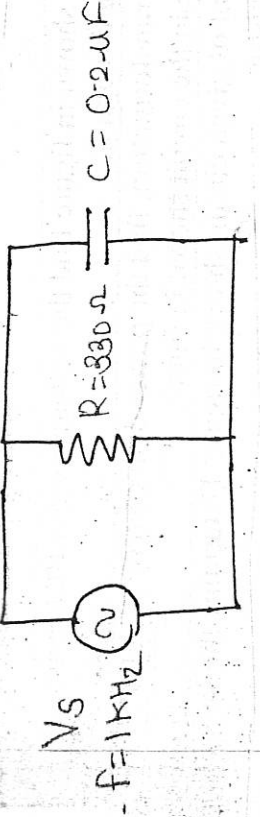
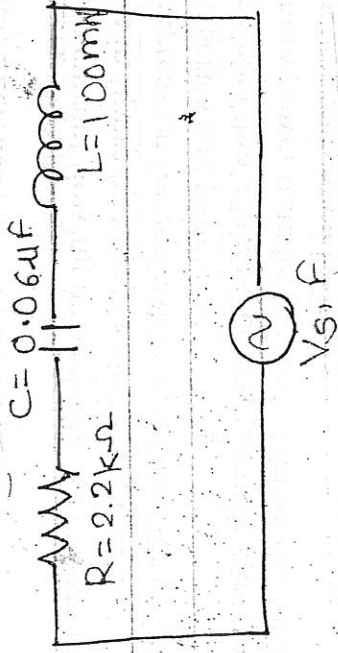
LEVEL: -THIRD
COURSE CODE: -
COURSE NAME: -
MAX. MARKS: 80

PROGRAM: IE & ENTC
EIG308/EE308/EIF308
CIRCUITS & NETWORKS
TIMES: 3Hrs.45 Min. DAT

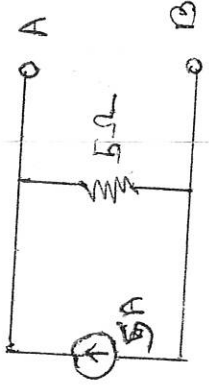
Instruction:-

- 1) Answers of two sections must be written in separate section answer book provided.
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN - Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

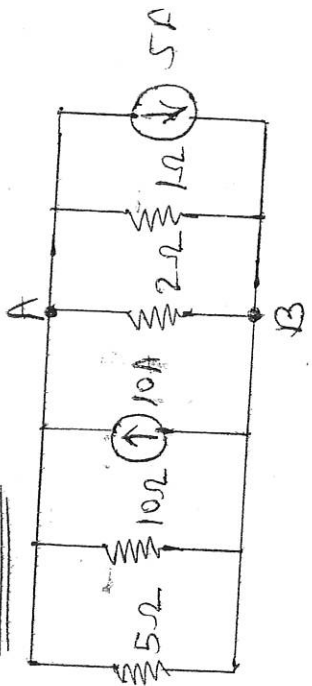
QN	S Q N		R/ U/ A	Co EIG 308	Mar ks
Q.1		Attempt any FOUR :			08
	a)	State Kirchhoff's current law	R	1	
	b)	Determine equivalent voltage source for the current source shown in figure.	A	2	
	c)	State Norton's theorem statement.	R	3	
	d)	Find power in watts if energy equal to 50J is used in 2.5 sec.	A	1	
	e)	State Thevenin's theorem.	R	3	
	f)	Distinguish between simple series & parallel circuit (Any 2 points)	U	2	
Q.2		Attempt any FOUR :			16
	a)	State and explain voltage divider rule with neat example.	U	1	
	b)	Determine the R_L to receive maximum power from source. Also find the maximum power delivered to the load in the circuit shown in fig.	A	3	
	c)	For the circuit shown in figure find the voltage across 10Ω resistor & current passing through it.	A	1	
	d)	Using source transformation, find the power delivered by the 50V voltage source in the circuit shown in figure.	A	2	
	e)	Find the current of given circuit shown in figure. Determine the voltage across each resistor.	A	1	
	f)	Describe the concept of ground in brief.	U	2	
Q.3		Attempt any FOUR .			16
	a)	Find Thevenin's equivalent circuit for the given circuit shown in fig.	A	3	
	b)	Find the voltage across A and B point in the circuit shown in figure.	A	1	
	c)	Determine the current flowing through the 5Ω resistor in the circuit shown in figure by using Norton's Theorem.	A	3	
	d)	Derive the expression for equivalent resistance for resistance connected in series and parallel.	A	2	
	e)	State and explain Ohm's law with neat circuit & equation.	U	1	
	f)	State maximum power transfer theorem. Obtain the formula for maximum power consumed by load.	U	3	

Q.4	Attempt any FOUR :			08
	a) Define time constant and state equation of time constant for capacitor.	R	4	
	b) Define quality factor. State its formula for resonant circuit.	R	5	
	c) Draw frequency response of R-L Low pass filter.	R	6	
	d) Define i) Decibel ii) Roll – off rate	R	6	
	e) Draw circuit diagram for series resonance.	R	5	
	f) Draw circuit diagram for parallel resonant band stop filter.	R	6	
Q.5	Attempt any FOUR :			16
	a) Compare R- L and R – C circuit (Any 04 points)	U	6	
	b) Calculate resonant frequency, quality factor and bandwidth for following circuit.	A	6	
				
	c) A 50 μ f capacitor is connected across a 230V, 50Hz supply calculates:	A	4	
	i) Reactance offered by capacitor ii) Maximum current			
	d) Explain power in inductor and capacitor.	U	4	
	e) Explain concept of magnification in series and parallel resonance circuit.	U	5	
	f) Draw circuit diagram and frequency response of R – L and R – C high pass filter.	U	6	
Q.6	Attempt any FOUR :			16
	a) Explain the use of resonance circuit in filter and IF amplifier.	U	5	
	b) Derive formula for inductive reactance.	A	4	
	c) Determine admittance for the circuit shown below	A	4	
				
	d) Describe parallel resonant band pass filter.	U	6	
	e) Explain with diagram 3db frequency and roll – off rate.	U	6	
	f) For each of following input frequencies find impedance in rectangle & polar form for following figure.	A	4	
				
	i) $F = 4\text{KHz}$ ii) $F = 2\text{KHz}$			

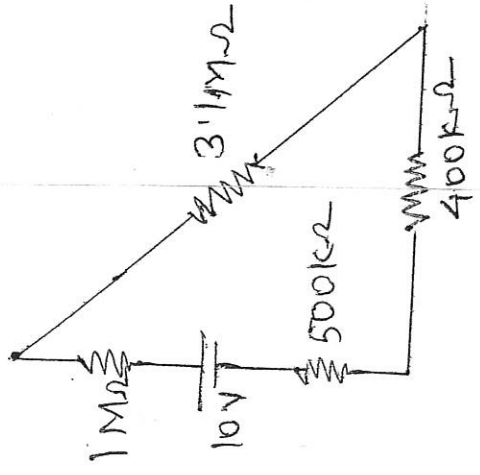
Q.1b



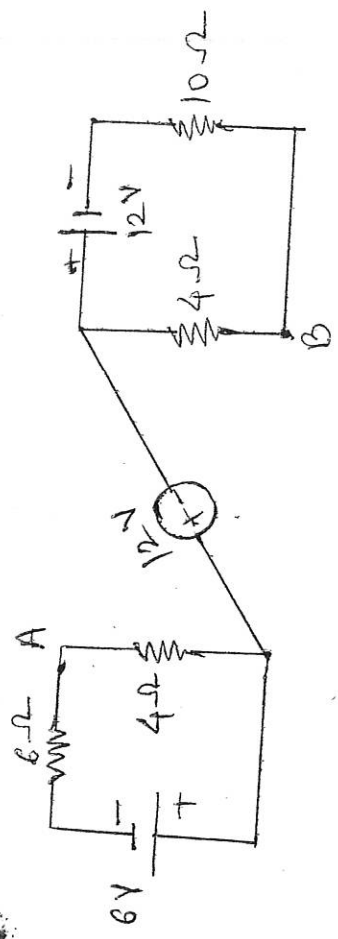
Q.2c



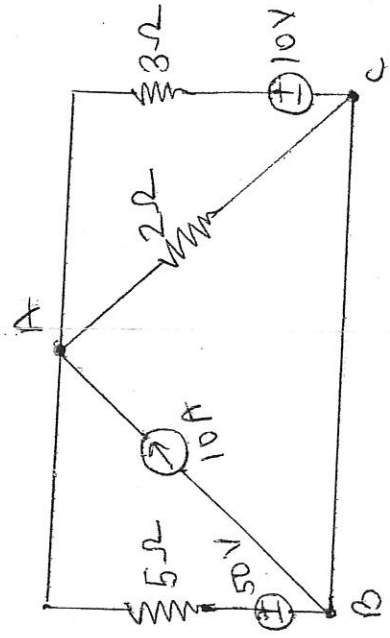
Q.2e



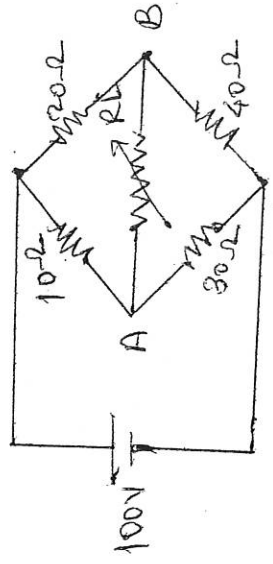
Q.3b



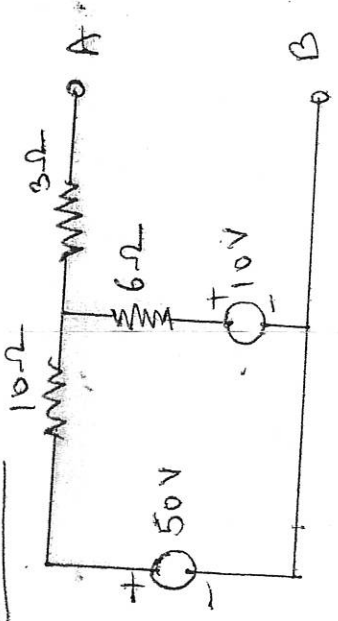
Q.2d



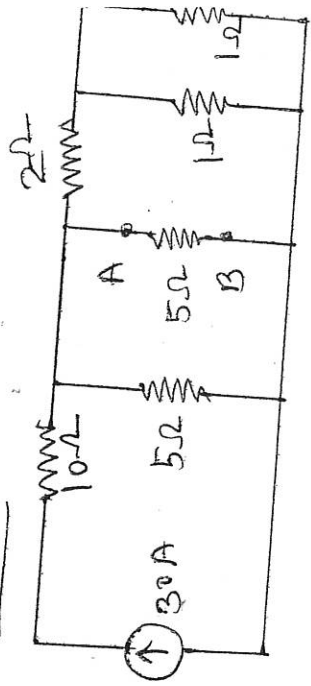
Q.2b



Q.3a



Q.3c



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EVEN TERM END EXAM JUNE – JULY 2022

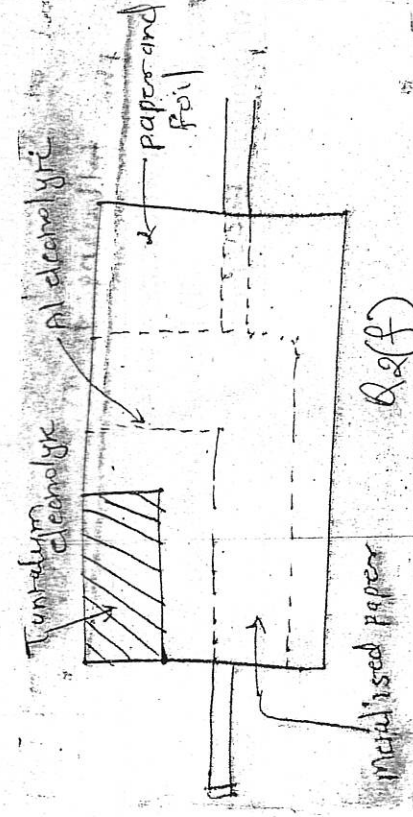
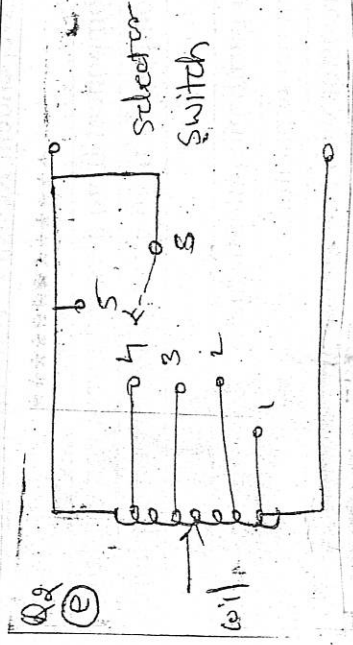
LEVEL: -ONE	PROGRAM: IE & ENTC
COURSE CODE: -	EIG101/EIF101
COURSE NAME: -	ELECTRONIC COMPONENTS AND APPLICATION
MAX. MARKS: 80	TIMES: 3 Hrs. 45Min
Instruction:	DATE: - 12/07/2022

- 1) Answers must be written in the main answer book provided. (and supplements if required)
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
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QN	S
7)	QN - Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

P.T.O.

Q.4	Attempt any FOUR .			16
a)	Give difference in cable and connectors.	U	4	
b)	How do headphone Jacks and Plugs work together?	U	4	
c)	Define for switches?			
	i) Electrical life ii) Mechanical life	R	5	
d)	Draw symbol of seven segment display and name every segment.	R	5	
e)	Write any two advantages of surface mount technology.	R	6	
f)	Define analog IC and give its one example.	R	6	
Q.5	Attempt any FOUR .			
a)	Explain the process of preparation of single sided PCB.	U	6	16
b)	What is an Integrated circuit? Write its advantages over discrete components.	R/ U	6	
c)	With neat schematic diagram, illustrate the working of a relay.	R/ U	5	
d)	Explain working principle of LCD. Give it two applications.	R/ U	5	
e)	Enlist different types of cables. Explain construction of shielded type twin core cable.	R/ U	4	
f)	Explain specifications of connectors.	U	4	
Q.6	Attempt any FOUR .			
a)	Draw wiring diagram of BNC connector. Write frequency range and type of cable for which it is suitable.	U/ A	4	16
b)	Draw optical fiber cable structure. Write its advantage over coaxial cable. (any two)			
c)	Write four types of switches. Give one application of each.	R/ A	5	
d)	Explain construction of Dry Reed Relay with neat diagram.	R/ U	5	
e)	Draw fourteen and sixteen segment.	U	5	
f)	Write names of different base materials and conducting materials used for PCB. State name of any two electrochemical etchants used.	R/ A	6	



GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

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EVEN TERM END EXAM JUNE/JULY-2022

EXAM SEAT NO.

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LEVEL :- **THIRD**

PROGRAM : IE / E & TC

COURSE CODE :- EIG305/EIF305

COURSE NAME ANALOG COMMUNICATION

MAX. MARKS : 80 TIME : 03Hrs.45 min. DATE :- 11/07 / 2022

Instruction :-

- 1) Answers must be written in the main answer book provided.(and supplements if required)
- 2) Illustrate your answers with sketches wherever necessary.
- 3) Use of non-programmable pocket calculator is permissible.
- 4) Mathematical and other tables shall be made available on request.
- 5) Assume and mention suitable additional data if necessary.
- 6) Use of Mobile is strictly prohibited.
- 7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	S Q N	Question Text	R/ U/ A	Co EIG 305	Ma rks
Q.1		Attempt any FOUR :			08
	a)	Determine information carrying capacity of a communication channel if bandwidth of channel is 100 MHz and signal to noise ratio is 30 dB.	A	1	
	b)	Define the term modulation and demodulation.	R	1	
	c)	For 100% modulation, what is relationship between voltage amplitude of sideband frequency and carrier?	R	2	
	d)	A standard AM broadcast station is allowed to transmit modulating frequencies upto 5 KHZ. If AM station is transmitting on a frequency 980KHZ, compute upper and lower sidebands and bandwidth occupied by AM station.	A	2	
	e)	What is modulation index of TV sound if maximum deviation is 25KHZ and Maximum modulating frequency is 15 KHZ?	A	3	
	f)	State Carson's rule to determine bandwidth of an FM signal.	R	3	
Q.2		Attempt any FOUR :			16
	a)	Define Noise factor and Noise figure and describe their significance.	R	1	
	b)	An AM transmitter has carrier power of 30W. The percentage of modulation is 85 percent. Calculate : i) Total power ii) Power in one side band.	A	2	
	c)	Describe advantages and disadvantages of single sideband transmission.	U	2	
	d)	Describe the relationship between total power, carrier power and sideband power in an AM DSBFC wave.	U	2	
	e)	Draw and explain direct method of FM generation using Varactor diode.	U	3	
	f)	Describe two advantages and two disadvantages of FM over AM.	U	3	
Q.3		Attempt any FOUR :			16
	a)	Draw block diagram of electronic communication system. Write function of each block.	U	1	
	b)	State frequency range and give any two applications of MF, HF, VHF, UHF and Microwave.	U	1	

P.T.O

	c)	What is maximum bandwidth of an FM signal with a deviation of 30 KHZ and maximum modulating signal of 5 KHZ? Also calculate modulation index.	A	3
	d)	Draw and explain AM signal in i) Time domain ii) Frequency domain.	A	2
	e)	Draw block diagram of FM transmitter and explain function of each block in brief.	U	3
	f)	Draw and compare FM and PM waveforms for sinusoidal modulating and carrier signal.	R	3
Q.4		Attempt any FOUR :		08
	a)	Define de-emphasis.	R	4
	b)	Draw block diagram of TRF receiver.	R	4
	c)	Define fidelity of receiver.	R	4
	d)	List any two applications of helical antenna.	R	5
	e)	Define non-resonant antenna.	R	5
	f)	Define virtual height.	R	6
Q.5		Attempt any FOUR :		16
	a)	Explain slope detector with diagram.	U	4
	b)	Explain with graph, sensitivity of AM receiver.	U	4
	c)	Draw and explain pre-emphasis circuit.	U	4
	d)	Draw radiation patterns of loop, helical and Yagi-uda antennas.	U	5
	e)	Define following terms : i) Reflection ii) Refraction iii) Diffraction iv) Critical angle.	U	6
	f)	Explain with suitable diagram the ground waves propagation.	U	6
Q.6		Attempt any FOUR :		16
	a)	Explain working of super-hetrodyne receiver with diagram.	U	4
	b)	Explain any one type of AGC circuit with characteristics curve.	U	4
	c)	Describe helical antenna with suitable diagram.	U	5
	d)	Describe parabolic Reflector antenna with neat diagram.	U	5
	e)	Compare between ground wave and space wave propagation. (any four points)	U	6
	f)	Explain critical frequency and skip distance.	U	6
