Dated: 18.02.2022   **Maximum Marks: 10**   **Time Allowed: 45 minutes.**

NOTE: ATTEMPT ANY TWO (02) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.		Description	Marks	CLO	Taxonomy level
01	(a)	What is thermodynamics system? Also describe their types with few examples in detail.	02	1	C1
	(b)	Briefly describe phase diagram and use of steam table. Also give thermodynamics applications in engineering field.	03	1	C1
02	(a)	Define Thermodynamic process and cycle. Also derive following expression for determining work done of Adiabatic process. $$W.D = \frac{P_1 V_1 - P_2 V_2}{\gamma - 1}$$	03	1, 3	C2
	(b)	A gas is hyperbolically from a pressure and a volume of 100 KN/m² and 0.056 m³ respectively, to a volume of 0.007 m³. Determine the final pressure and the work done on the gas.	02	2	C3
03		Write short note on any two of the following: (a) Working substance and heat engine (b) Intensive and extensive properties (c) First law of thermodynamic with few examples (d) Enthalpy and entropy	05	1	C1

The End

Dated: 17/02/2022   Maximum Marks: 20   Time Allowed: 01 Hour.

NOTE: ATTEMPT ANY TWO QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q#	Question	Marks	CLO	Level
Q.01(a)	Define following terms. (i) Ductility, (ii) Toughness, (iii) Shear stress	3	1	1
(b)	A steel wire two meters long and 3 mm in diameter is extended by 0.75 mm when a weight W is suspended from the wire. If the same weight is suspended from a brass wire, 2.5 meter long and 2 mm in diameter, it is elongated by 4.64 mm. Determine the modulus of elasticity of brass, if that of steel is $2.0 \times 10^5 \, N/mm^2$.	7	2	3
Q.02(a)	What is thermal stress? Develop expressions for thermal stress and strain for a simple bar of length L under the change in temperature.	3	1	2
(b)	A steel bar 15 m long is at a temperature of 15°C. Find the free expansion of the length when the temperature is raised to 65°C. Find, also the thermal stress produced when; (i) Expansion in the bar is prevented, (ii) The rod is permitted to expand by 4 mm. Take, $a = 12 \times 10^{-6} \, /°C$ and $E = 200 \, GN/m^2$.	7	2	3
Q.03	Find the moment of Inertia of a rectangular lamina of width b and depth d, (i) about Centroidal axis xx parallel to the width (ii) about an axis LL passing through the bottom edge.	10	2	2

Good Luck

QUAID-E-AWAM UNIVERSITY OF ENGINEERING SCIENCE & TECHNOLOGY NAWABSHAH
Department of Mechanical Engineering
Mid Semester Examination

Batch: 20ME	Subject: Computer System & Programming
Date of Conduct: 14.02.2022	Total Marks: 10

Attempt any two questions, all carry equal marks.

Q #	Statement	CLO mapping	marks
1.	What is an Algorithm? Explain pre programming phase and how does it help in Programming.	CLO-1	(05)
2.	Write a C++ program to print your introduction in 5 lines on output screen.	CLO-1	(05)
3.	What is a Fractional decimal number? Convert (10110101): into decimal number.	CLO-1	(05)

Good Luck

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH.

SUBJECT: ELECTRONIC ENGINEERING

Dated: 16-02-2022.   Maximum Marks: 10   Time Allowed: 45 Minutes.

NOTE: ATTEMPT ANY TWO (02) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

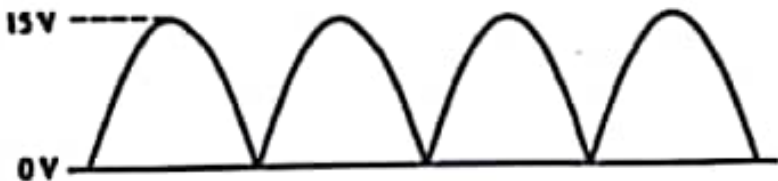| Q. No.	Questions	Marks	CLO	PLO	Taxono Leve
01.	**How** are p-type and n-type semiconductors formed? Also **explain** how to forward and reverse bias a diode?	(05)	1	1	C-2
02.	**Discuss** operation of bridge full wave rectifier. **Find** the average value of the full-wave rectified voltage as shown in given figure.	(05)	1	1	C-2
03.	Briefly **describe** basic structure and operation of Bipolar Junction Transistor (BJT). **Determine** the dc current gain (β_{DC}) and the emitter current (I_E) for a transistor where base current and collector current are 50 µA and 3.65 mA respectively.	(05)	1	1	C-2

THE END

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

MID-SEMESTER EXAMINATION OF FIRST SEMESTER – SECOND YEAR (3ʳᵈ SEMESTER) 2022, 20-BATCH B.E (ME)

SUBJECT: <u>COMPLEX VARIABLES & TRANSFORM</u>

Dated: 15.02.2022   Maximum Marks: 20   Time Allowed: 01 Hour.

NOTE: ATTEMPT ANY TWO (02) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. 01 (a) Define the Laplace transforms and also find the Laplace transform of any two of *(05)*
the following functions:

1. $f(t) = e^{2t}(5\sin 3t + 4\cos 5t)$

2. $f(t) = \sin\sqrt{t}$ and also deduce the Laplace transform of $g(t) = \dfrac{\cos\sqrt{t}}{\sqrt{t}}$

3. $f(t) = \dfrac{1 - J_o(t)}{t}$

(b) Evaluate the improper integral by using the Laplace transform method:

$\int_0^\infty te^{-2t}\sin(3t)\,dt$

(05)

Q. 02   Find the inverse of following functions. *(10)*

1. $F(s) = \dfrac{3s+7}{s^2 - 2s + 7}$ by using partial fraction method

2. $F(s) = \dfrac{1}{s^2(s+1)^2}$ by using Convolution theorem

3. $F(s) = \ln\left(1 + \dfrac{1}{s^2}\right)$ by using properties

Q. 03   Solve the ordinary differential equation by using Laplace transform method. *(10)*

$\dfrac{d^2 y}{dt^2} + \dfrac{dy}{dt} + y = e^{2t}, \quad y(0) = 0, \quad y'(0) = 0$

<u>The End</u>

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

FINAL SEMESTER REGULAR EXAMINATION OF FIRST SEMESTER–SECOND YEAR OF 20-BATCH, B.E (ME)

SUBJECT: MECHANICS OF MATERIALS I

Dated: 02-06-2022　　　　　Maximum Marks: 60　　　　　Time Allowed: 03 Hour.

NOTE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q#	Question	CLOs	Taxonomy Level	PLOs	Marks
Q.01	Develop expressions to calculate variations in shear force and bending moments along the length of beam for following cases, also draw corresponding S.F and B.M diagrams. (i) Cantilever carrying point at its free end (ii) Simply supported beam subjected to point load at its mid span	2	3	3	12
Q.02	Develop the formulae for slope and deflection for a cantilever beam subjected to a concentrated load at its free end using double integration method.	2	3	3	12
Q.03	A hollow column of internal diameter 20mm and external diameter 40mm has a total length of 5m. Find buckling load for the column with: (a) one end fixed other free (b) Both ends fixed and (c) Both ends hinged, Take $E = 2 \times 10^5$　N/mm²	3	4	2	12
Q.04(a)	Define torsion in circular shafts and write the assumptions on which torsion equation is based.	1	1	1	6
(b)	Develop an equation to investigate Torsion in circular shafts	2	3	3	6
Q.05	A cast iron water main 12 meters long of 500 mm inside diameter and 25mm wall thickness runs full of water and is supported at its ends. Calculate the maximum stress in the metal if density of cast iron is 7200kg/m³ and that of water is 1000kg/m³.	3	4	2	12

THE END

Dated: 26.05.2022   Maximum Marks: 60   Time Allowed: 3 Hours.

NOTE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.		QUESTION	CLOs	Taxonomy Level	PLOs	Marks
Q. 01	(a)	Solve the one dimensional heat equation. $\frac{\partial u}{\partial t} = k\frac{\partial^2 u}{\partial x^2}$ for $0 \le x < \infty$ with $t > 0$ subject to the conditions $u(x,0)=0$, $u_x(0,t)=-a$, $u(x,t)$ is bounded by using suitable transform.	2	C3		06
	(b)	Find the Fourier sine and cosine transform of $f(x)=x^{a-1}$.	2	C2		06
Q. 02	(a)	Using passevals identity show that $\int_0^\infty \left(\frac{\sin x}{x}\right)^2 dx = \frac{\pi}{2}$	2	C2		06
	(b)	Show that: $F_s\{xf(x)\} = -\frac{d}{ds}F_c(s)$	2	C2		06
Q. 03	(a)	Show that the real and imaginary parts of the function $w = \log z$ satisfies Cauchy-Riemann equations where $z \ne 0$ and also find its derivative.	2	C2		06
	(b)	Show that the function $u = \frac{1}{2}\log(x^2+y^2)$ is harmonic. Find its harmonic conjugate.	2	C2		06
Q. 04	(a)	Evaluate the line integral $\int_c z^2 dz$ where c is the boundary of a triangle with vertices 0, $1+i$, $-1+i$ clockwise.	1	C1		06
	(b)	Evaluate $\int_c \frac{e^z}{(z-1)(z-4)} dz$, where $c:|z|=2$ using Cauchy integral formula.	2	C2		06
Q. 05	(a)	Determine the residue of $f(z) = \frac{z^3}{(z-1)^4(z-2)(z-3)}$ at its simple poles.	1	C1		06
	(b)	Evaluate the integral $\int_c \frac{4-3z}{(z-1)(z-2)} dz$ where $c:|z|=\frac{3}{2}$ using residues theorem.	2	C2		06

The End

led: 23.05.2022   Maximum Marks: 30   Time Allowed: 02 H

TE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.	QUESTION	CLOs	Taxonomy Level	PLOs	Ma
1(a)	Describe the difference between pre-test and post-test loops? Discuss in detail the basic types of loops supported in C.	2	C2	1	(C
1(b)	Write a program that determines whether the given number is Prime or not.	2	C2	1	(C
2(a)	Discuss in detail the difference between switch case statement and if-else-if statement. Also write down the syntax of both switch case and if-else-if statement.	2	C2	2	(C
2(b)	What is the advantage of using arrays in C++ programming? Write a program that sums all the elements in the myArray. (int myArray[5]=(10,20,30,40,50);	2	C3	2	(C
3(a)	Functions are most important in any programming languages. Briefly describe the different types of functions supported in C++. Write down the syntax of user defined functions in C++.	3	C3	2	(
3(b)	Write a program that ask user to enter any two numbers, the numbers are then passed as arguments to the user defined function which determine the summation of the two numbers and return result back to the main function.	3	C3	2	(

Good Luck

Dated: 06.06.2022   Maximum Marks: 30   Time Allowed: 02 Hours.

NOTE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.		QUESTION	CLOs	Taxonomy level	PLO	Marks
Q. 01	(a)	What is difference between flow and non-flow process? Describe throttling process, its characteristics and applications.	1	C1	1	06
	(b)	Derive steady flow energy equation (SFEE).	2	C3	3	04
Q. 02	(a)	With the help of figure, define flow work (flow energy). With the help of examples, define reversible and irreversible processes.	1	C1	1	06
	(b)	Water runs through a water main of cross-sectional area 0.4 m² with a velocity of 6 m/s. Calculate the velocity of the water in the pipe when the pipe tapers down to a cross-sectional area of 0.3 m².	3	C4	2	04
Q. 03	(a)	Explain working principle of Otto engine cycle through neat and clean figure.	1	C2	1	04
	(b)	Briefly describe nozzle, diffuser, heat exchanger and turbine with their free sketches and also give their various applications.	1	C1	1	06

Good Luck

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

FINAL SEMESTER REGULAR EXAMINATION OF FIRST SEMESTER – SECOND YEAR, 2022 OF 20-BATCH, B.E (ME)

SUBJECT: **ELECTRONIC ENGINEERING**

Maximum Marks: 30   Time Allowed: 02 H

Dated: 30.05.2022

NOTE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.		QUESTION	CLOs	Taxonomy Level	PLOs	Ma
Q. 01	a)	**Perform** the following as directed. i) $(10010)_2 = (?)_{10}$ ii) $(215)_{10} = (?)_2$ iii) $(8FA)_{16} = (?)_2$ iv) $(4267)_8 = (?)_{16}$	2	C-4	2	0
	b)	Define logic gate. Differentiate truth table and logic symbol for NOR gate and NAND gate?	2	C-4	2	
Q. 02	a)	**Examine** basic rules of Boolean Algebra. Simplify the following expression. $AB+A(B+C)+B(B+C)$	2	C-4	2	
	b)	**Compare** standard forms of Boolean Expressions. Convert the following Boolean expression into standard SOP form. $\overline{ABC} + A\overline{B} + AB\overline{C}D$	2	C-4	2	
Q. 03	a)	**Examine** the function of a Half-Adder and draw its logic diagram?	2	C-4	2	
	b)	**Distinguish** Microprocessor and Microcontroller?	2	C-4	2	

Good Luck