Code No. 3083

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) II – Semester (Main) Examination, May / June 2017

Sub: Fluid Mechanics – I

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1	Distinguish between uniform flow and steady flow.	2
2	What are the forces considered in deriving the Euler's equation of motion?	2
3	Define absolute pressure.	2
4	A jet flies at 1400 km/h through air at a temperature of -7^{o}C. Calculate the Mach number and Mach angle.	2
5	Define hydraulic gradient.	2
6	Define surface tension and compressibility.	3
7	Define momentum equation and how it is useful in fluid mechanics.	3
8	Distinguish between the manometer and micro manometer.	3
9	Define stagnation point and state its relevance in fluid mechanics.	3
10	List out the minor losses in pipes.	3

PART – B (5x10 = 50 Marks)

11	a)	Define bulk modulus of elasticity and vapour pressure. Explain the significance of vapour pressure in engineering applications.	5
	b)	A flat plate 0.1 m^2 area is pulled at 30 cm/sec relative to another plate located at a distance of 0.01 cm from it, the fluid separating them being water with (μ=0.001 N-s/m^2). Find the force and power required to maintain this velocity.	5
12	a)	Derive Bernoulli's equation from Euler's equation of motion in 3-D clearly stating the assumptions involved.	5
	b)	A 60^{o} reducing bend is connected in a pipe line, the diameter at inlet and outlet of the bend being 50 cm and 25 cm respectively. Find the force exerted by the water on the bend if the intensity of pressure at inlet of the bend is 180 kN/m^2. The rate of flow is 1 m^3/s.	5
13	a)	Explain the working of Rotameter with neat sketch.	5
	b)	Through a 15x10 cm venturimeter oil flows upwards at the rate of 800 lpm. Throat section is 13 cm above the inlet. Specific gravity of oil is 0.8. What is the difference in pressure between inlet and throat if Cs is 0.97.	5

14 a) Derive Bernoulli's equation for compressible flow when the process is adiabatic. 5

b) A supersonic plane flies at 1700 KMPH in air having a pressure of 28 KPa (abs) and density of 0.439 kg/m^3. Calculate
i) Temperature
ii) Pressure and
iii) Density of air at a stagnation point on the nose of the plane. (Take K=1.4 and R=278 J/kg^{o}K). 5

15 a) Derive Darcy's Weisbach equation for the loss of head due to friction in a pipe. 5

b) In a pipe of 150 mm diameter, the maximum velocity of flow is found to be 1.5 m/s. If flow in the pipe is laminar, find
i) Average velocity and the radius at which it occurs, and
ii) The velocity at 40 mm from the wall of the pipe. 5

16 a) Derive Bernoulli's equation for Isothermal process. 5

b) Derive the continuity equation in three dimensional Cartesian coordinate system for a fixed region. 5

17 Write short notes on Two of the following: 10
a) Bourdon gauged
b) Convective and local acceleration
c) Stagnation properties.

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Code No. 3091

FACULTY OF ENGINEERING

B.E. 2/4 (EEE / Inst.) II – Semester (Main) Examination, May / June 2017

Sub: Electromagnetic Fields

Time: 3 Hours **Max.Marks: 75**

Note: i) Answer all questions from Part – A and any five questions from Part – B.
ii) Missing data, if any, may suitably be assumed.

PART – A (25 Marks)

1	Which field is called as conservative field?	2
2	What is the significance of divergence?	3
3	Define electric field intensity. Express it in its distributed form.	2
4	What are field lines? How do they differ from lines of force?	2
5	What are the limitations of Magnetic Scalar Potential?	2
6	Give the significance of displacement current.	2
7	Write the formulae for energy storage in case of electric and magnetic fields.	3
8	Find the skin depth for copper at 10 MHz and 60 Hz, the conductivity 5.8×10^7 S/m.	3
9	Write the Poisson's and Laplace's equations and give your inference.	3
10	What is Uniform Plane Wage Propagation?	3

PART – B (5x10 = 50 Marks)

11	a)	Derive an expression for E at a point due to infinite sheet charge.	5
	b)	Find the potential and volume charge density at (1,2,3) in free space for given the potential field $V=4yz / x^{2+1}$.	5
12	a)	Establish Poisson's and Laplace's equation from Gauss law.	5
	b)	Given the potential field $V = (50 \sin^{-}) / r^2$ in free space.	
		i) Determine whether V satisfies Laplace's equation	
		ii) Find the total charge stored inside the spherical shell $1 < r < 2$.	5
13	a)	What is Poisson's Equation for magneto static field use the equation to derive the Ampere's circuital law in differential and integral form.	5
	b)	Find the field intensity at a point on the axis 8m from the center of circular coil of area 185 cm^2 and carrying a current of 60A.	5
14		List all Maxwell's equations and write their word statement also	
		i) Both in point form and integral form	5
		ii) For time varying and time invariant fields.	5
15		Determine whether the following pair satisfy all Maxwell's equations in the region where ± =0; $\epsilon = 3.5\epsilon_o$; $\mu=10\mu_o$; $E = 8y\, a_y$ and $H = 4x\, a_x$. Write inferences.	10
16	a)	Transform the vector $A = 2a_x – 3a_y – 1a_z$ to spherical coordinate at point P (2,3,5).	5
	b)	Find the insulation resistance of a coaxial cable per unit length whose radii are R_1 and R_2; ϵ is the permittivity of the medium between the cylinders.	5
17		Give a brief treatise on the following:	
	a)	Wave Equation for free space	5
	b)	Magnetic Boundary conditions.	5

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Code No. 3097

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) II – Semester (Main) Examination, May/ June 2017

Sub: Networks and Transmission Lines

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1 Define iterative and Image impedances of a asymmetrical network. (2)
2 What are passive four terminal networks? Give the properties of the network. (3)
3 What are the limitations of constant –k filters. How are the limitations overcome? (3)
4 Draw and bring out the characteristic of Notch filter. (2)
5 What are the properties of Positive Real Function? (3)
6 What are Inverse networks? Give example. (2)
7 What type of distortions exist in transmission lines. (3)
8 Write on important specifications of telephone cable. (2)
9 Why is a one fourth wavelength TL act as a impedance inverter. (3)
10 Define phase and group velocity. (2)

PART – B (5x10 = 50 marks)

11 a) Differentiate symmetrical and asymmetrical networks and explain the propagation and impedance parameters. (5)
b) Find the Open and Short circuit impedances of a T network. Prove the product of Zoc and Zsc is equal to Zo^2 (5)

12 a) Derive the relation for conversion of T-π network (4)
b) Given Zoc= 800 ohms and Zsc = 600 ohms for a T network, find the parameters R1 and R2 Draw the circuit. (6)

13 a) What is the optimum value of 'm' in m-derived filters. How is the value decided (4)
b) Design a low pass composite filter with fc= 2000 hz, fα=2050 hz and Rk = 500 ohms (6)

14 a) List the electrical characteristics of attenuators. Explain the difference between Decibel and Neper. (5)
b) Why are matching networks required? Draw and Explain the design criterion of ' L' matching network. (5)

15 a) What are Primary and Secondary parameters of a Transmission line. Obtain attenuation and phase constants in terms of Primary and Secondary parameters. (5)
b) Derive the condition for distortion -less transmission line. (5)

16 a) Briefly explain the characteristics of 1/8 and 1/2 wavelength Transmission lines. (4)
b) For a low loss line with Zo= 70 ohms, Zr=115-j80. Find the following: (6)
i) Standing wave ratio
ii) Maximum and minimum Line impedance.

17 Write notes on the following:
a) Campbell formula
b) Single and Double stub matching (10)

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Code No. 3105

FACULTY OF ENGINEERING

B.E. 2/4 (M/P) II – Semester (Main) Examination, May / June 2017

Sub: Basic Electronics

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1	Define drift current and diffusion current.	2
2	What is meant by doping? Why it is necessary?	3
3	Classify the regions of operation of BJT.	2
4	Draw the small signal model of FET.	3
5	What is meant by feedback? Why it is necessary?	3
6	What is meant by Barkhausen criteria?	2
7	What are the ideal characteristics of OP-AMP?	2
8	Give the truth table of full subtractor.	3
9	Draw V-I characteristics of SCR.	2
10	Differentiate photo diode and photo transistor.	3

PART – B (5x10 = 50 Marks)

11 a) A specimen of Silicon square cross section of 4cm x 4cm has length of 5 cm. It is subjected to voltage of 2v across its length and current flowing through it is 6mA. Determine
   i) Concentration of free electrons
   ii) Drift velocity of electron.
   b) Explain how zener diode works as voltage regulator with its circuit.

12 a) Explain the input and output characteristics of CE configuration.
   b) Define the parameters of FET.

13 a) Explain Wien bridge oscillator with its circuit diagram. Derive frequency of oscillation and for the circuit.

   b) What is frequency of RC phase shift oscillator using BJT?

14 a) Explain the applications of Op Amp with its proper equations?
   b) Explain instrumentation amplifier.

15 Explain working of LVDT. Derive gauge factor.

16 a) Derive the ripple factor for full wave rectifier with capacitor filter.
   b) Explain Transistor as an amplifier.

17 Write short notes on:
   a) LC and RC oscillators
   b) Full adder
   c) UJT.

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Code No. 3107

FACULTY OF ENGINEERING

B.E. 2/4 (AE) II – Semester (Main & Backlog) Examination, May / June 2017

Sub: Thermal Engineering

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1 Define thermodynamic system and classify the different types of systems.

2 State the zeroth law of thermodynamics. What is its importance?

3 State Kelvin-Planck and Clausius statements of second Law of thermodynamics.

4 Obtain a relationship between the COP of a heat pump and COP of a refrigerator.

5 Draw the P-V and T-S diagram of Rankine cycle.

6 Define saturated steam (dry steam), wet steam and superheated steam.

7 Define volumetric efficiency and isothermal efficiency of a compressor.

8 Sketch the schematic diagram of a vapour compression refrigeration system. Name the important components of this system.

9 Differentiate between free convection and forced convection.

10 Define black body and grey body.

PART – B (5x10 = 50 marks)

11 a) State and explain the first law of thermodynamics. 4

b) A turbine operates under steady flow conditions, receiving steam at the following state: pressure 1.2 MPa, temperature 188^0C, enthalpy 2785 kJ/kg, elevation 3 m and velocity 33.3 m/s. The steam leaves the turbine at the following state: pressure 20 kPa, enthalpy 2512 kJ/kg, velocity 100 m/s and elevation 0 m. Heat is lost to the surroundings at the rate of 0.29 kJ/s. If the rate of steam flow through the turbine is 0.42 kg/s, what is the power output of the turbine in kW? 6

12 a) Explain the Carnot cycle and its process with P-V and T-S diagrams. 5

b) State and explain the Clausius Inequality. 5

13 a) Explain the air standard Brayton cycle with the help of a neat sketch and also draw its P-V and T-S diagrams. 7

b) Explain the effect of inter cooling on Brayton cycle. 3

14 a) Explain briefly the different types of nozzles used in steam power plants. 3

b) Derive an expression for the work done in a single stage compressor without clearance with the help of a P-V diagram. 7

15 a) Discuss the desirable properties of an ideal refrigerant. 4

b) Explain the working of a simple vapour absorption refrigeration system with the help of a schematic diagram. 6

16 a) A steam boiler furnace is made of a layer of fireclay 12.5 cm thick and a layer of red brick 50 cm thick. If the wall temperature inside the boiler furnace is 1100^0C and that on the outside wall is 50^0C, determine the amount of heat loss per square meter of the furnace wall. Take the values of k = 0.533 W/mK for fireclay and k=0.7 W/mK for red brick. 5

b) Explain the different laws of radiation. 5

17 Write short notes on the following:

a) State, property, process and cycle. 4

b) Different Carnot theorems. 3

c) Multistage compression. 3

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Code No. 3111

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) II – Semester (Main & Backlog) Examination, May / June 2017

Subject: Microprocessor and Interfacing

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part A and any five questions from Part B.

PART – A (25 Marks)

1	Differentiate b/w microprocessor and microcontroller.	2
2	Write a short note on partial and absolute addresses.	2
3	Describe the LDA and LXI instructions.	2
4	Write an ALP to find the smaller of two numbers using 8085.	2
5	Write the differences b/w peripheral mapped I/0 and memory mapped I/0.	3
6	Define DMA.	2
7	Write a short note on RI – 231.	3
8	List the addressing modes of 8086.	3
9	Write a short note on the internal memory of 8051.	3
10	Write an ALP to transfer block of data using 8051.	3

PART – B (5x10 = 50 Marks)

11	Draw the architecture of 8085 micro processes and explain.	10
12	a) Explain A/D converter using 8085 micro processes.	6
	b) Define stack and write about the stack instructions with examples.	4
13	Draw and explain the functional block diagram of programmable communication interface.	10
14	Explain the 8253 with a neat diagram.	10
15	a) Draw and explain the interfacing LCD using 8051.	5
	b) Illustrate the 8051 addressing modes.	5
16	Explain the instruction set of 8086 micro processes with examples.	10
17	Write a short note on the following:	
	a) 80386 micro processes	5
	b) IEEE 488.	5

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Code No. 3116

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II – Semester (Main) Examination, May / June 2017

Sub: Computer Organization and Microprocessors

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1	Define pipelining.	2
2	Define memory mapped I/O.	2
3	Explain the function of ALE and IO/M signals in the 8085 architecture.	3
4	What is the difference between SRAM and DRAM?	3
5	Define virtual memory.	2
6	Write an assembly language program to add two 8-bit numbers.	2
7	Write the functions of DMA controller.	2
8	Write the usage of stacks.	3
9	Write about the modes of transfer in 8251.	3
10	Write the differences between multiprocessors and multicomputers.	3

PART – B (5x10 = 50 Marks)

11	Explain the internal architecture of the 8085 microprocessor.	10
12	Write short notes on 8253 timer with diagram.	10
13	a) Explain about interrupts.	2
	b) Write about generations of computer.	8
14	a) Write detail notes on Buses of a Computer System.	4
	b) Explain structure of computer system.	6
15	Write an ALP to multiply two 16-bit numbers with an example.	10
16	Explain the concept of 8251 USART.	10
17	Write in detail about 8255 in BSR mode.	10

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