Code No. 11372/CBCS/BL

FACULTY OF ENGINEERING

BE I –Semester (CBCS) (Main & Backlog) Examination, May / June 2019

Subject: Engineering Physics - I

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part-A, & any five Questions from Part-B

PART-A (20 Marks)

1. A Biprism is placed 5 cm from a slit illuminated by sodium light $\left(\lambda = 5890 A^{o}\right)$ The width of the fringes obtained on a screen 75 cm from the biprism is 9.42×10^{-2}cm. What is the distance between the two coherent sources?
2. What do you mean by diffraction grating?
3. Define (i) Population inversion (ii) pumping.
4. List some of the application of holography.
5. Mention different types of optical fibers.
6. Write the applications of ultrasonics.
7. What is an ensemble? Mention different types of ensembles.
8. Distinguish between Bose-Einstein and Fermi-Dirac statistics.
9. State pointing theorem.
10. Mention the properties of wave function.

PART-B (50 Marks)

11. Describe and explain the formation of Newton's Rings in reflected light. Prove that, in reflected light diameter of the dark rings are proportional to the square root of natural numbers. (10)

12. (a) Describe the construction and working of Laurent's half shade polarimeter. (7)
    (b) Explain the construction of Half wave plate. (3)

13. (i) What is numerical operture and acceptance angle? Derive an expression for acceptance angle. (7)
    (ii) Mention some of the applications of optical fibers (3)

14. (i) Obtain an expression for Maxwell-Boltzmann distribution function. (7)
    (ii) Deduce Rayleigh Jean Law and Wein's law from Planck's law. (3)

15. (i) Explain the de-Broglie concept of matter waves and derive an expression for de-Broglie wavelength. (7)
    (ii) Deduce an expression for schroedinger time-department wave equation. (3)

16. (i) Explain the diffraction due to double slit and obtain intensity equation. (7)
    (ii) Obtain the relation between Einstein's Coefficients. (3)

17. (i) Explain the method of determining the wavelength of ultrasonics by Debye-shears method. (6)
    (ii) Write the Maxwell's equation in integral and differential forms. (4)

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Code No: 11046/BL

FACULTY OF ENGINEERING

BE 2/4 (Civil) II – Semester Examination, May / June 2019

Subject: FLUID MECHANICS - I

Time: 3 Hrs **Max Marks: 75**

Note: Answer all questions from PART – A & answer any FIVE questions from Part- B

PART – A (10 x 2.5 = 25 Marks)

1. Define the terms density, specific weight. Give the relation between them.
2. Differentiate between steady flow & unsteady flow.
3. Define the terms hydraulic gradient line and total energy line. Show the graphical representation.
4. Differentiate between free vortex and forced vortex motions.
5. Differentiate between simple manometer and differential manometer.
6. If an error of 5% is observed in head measurement over a rectangular notch, determine the corresponding error in discharge measurement.
7. What are isothermal and adiabatic processes?
8. Define stagnation point and stagnation pressure.
9. What is Reynold' s number? Classify the flows based on Reynold' s number.
10. What do you mean by pipes in series and parallel?

PART – B (50 Marks)

11. (a) Define Bulk modulus of elasticity. Derive a relationship between surface tension and pressure inside a soap bubble. (5)
    (b) A rectangular plate 0.5m x 0.5m dimension weighing 500N slides down an inclined plane making 30^0 angle with the horizontal at a velocity of 1.75 m/s. If the 2 mm gap between the plate and the inclined surface is filled with lubricating oil, find its viscosity and express it in Poise and N-s/m^2. (5)

12. (a) Explain with neat sketches the terms stream line, path line and streak line and stream Tube. (5)
    (b) The velocity components in two dimensional incompressible flow are, $u = y^3 + 3x - 3x^2y$ and $v = 3yx^2 - 6y - x^3$. Is the flow continuous? Is the flow irrotational? (5)

13. (a) Derive Bernoulli's equation along a streamline stating the assumptions. (5)
    (b) A pipe bend tapers in the direction of flow with a diameter of 300 mm and carries water at a pressure of 19.6 kN/m^2. The velocity of flow is 3.5 m/s. If the axis of the pipe is bent by 45^o, find the magnitude and direction of the resultant force on the bend. (5)

14. (a) A 200 mm x 100 mm venture meter is provided in a vertical pipe carrying water in the upward direction. A differential mercury manometer connected to the inlet and throat gives a reading of 200 mm. Find the rate of flow. Assume C_d = 0.9 (5)
    (b) Derive the discharge expression for triangular notch. (5)

Contd..2

15. (a) Define stagnation pressure and derive an expression for stagnation pressure for compressible fluids in terms of Mach number. (5)

    (b) Calculate Mach number at a point on a jet propelled aircraft which is flying at 900 km/hr at sea level where air temperature is $15^{o}C$. Take k = 1.3 and $R = 285\ J/kg^{o}K$. (5)

16. (a) Derive an expression for the velocity distribution for viscous flow through a circular pipe. Also sketch the velocity and shear stress distribution across the section of the pipeline. (5)

    (b) Two reservoirs with a level difference of 40m are connected by a 3 km long, 0.9 m diameter with a friction factor (f) equal to 0.021. Determine the flow rate in the pipe line connecting the two reservoirs. (5)

17. Write short notes on (3) + (3) + (4)

    (a) Flownet,

    (b) Pitot tube

    (c) Minor losses

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Code No. 11054 / BL

FACULTY OF ENGINEERING

BE 2/4 (EEE/Inst.) II – Semester (Backlog) Examination, May / June 2019

SUBJECT: Electromagnetic Fields

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

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

PART – A (25 Marks)

1. Given vectors **A= 3a_x +4a_y+a_z** **B= 2a_y-5a_z** find the angle between **A & B.** 3
2. Find **E** at (2, π/2, 0) for the given potential V= $\frac{10}{r^2}sin\theta cos\theta$ 3
3. Write Ohms law in point form and define current density 2
4. Define Dielectric strength and write the value for permittivity for free space. 2
5. Write the formula for Lorentz force equation. 2
6. Define magnetic torque and write its formula and is it a vector or scalar quantity. 3
7. Derive $\nabla \times E = -\frac{\partial B}{\partial t}$ 3
8. Define Permeance and Flux Density with respect to magnetic circuits. 2
9. Define Reflection and Transmission Co-efficients. 2
10. State Image theory. 3

PART – B (5x10 = 50 Marks)

11 a) Derive coulomb's law and Field Intensity in vector form. 5

b) planes x=2, y=-3 respectively carry charges 10 nC/sqrm and 15 nC/sqrm. If the line x=0, z=2 carries a charge of 10 π nC/m. Find **E** at (1,1, -1) due to these 3 charges. 5

12 a) Derive Uniqueness theorem. 5

b) Derive Capacitance of Co-Axial Cable. 5

13 a) Derive Biot-savarts law 5

b) A circular loop located at $x^2+y^2=9$, z=0 carries a direct current of 10A along a_ϕ . Find H at (0,0 ,4) and (0,0, -4). 5

14. Write Maxwell's equation for TVF in differential and integral form 10

15 a) Derive poynting vector. 7

b) In a non-magnetic medium E= 4sin (2π 10^7t- 0.8x) a_z V/m find ϵ_r and ¦ . 3.

16 Explain Moments of Methods**.** 10

17 a) Determine the self-Inductance of Co-axial cable of inner radius 'a' and outer radius 'b' . 7

b) Derive Continuity equation. 3

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Code No. 11060/BL

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) II – Semester (Backlog) Examination, May / June 2019

Subject: Networks & Transmission Lines

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

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

PART – A (25 Marks)

1) Define characteristic impedance. Can a network have two characteristic impedances? Justify your answer. 3

2) Explain asymmetrical networks with suitable examples. 2

3) Mention the advantages and disadvantages of m- derived filter over constant K- filter. 3

4) What is notch filter? Mention its applications. 2

5) Design a symmetrical π attenuator with an attenuation of 60 dB having nominal characteristic resistance of 600 Ω. 3

6) What are inverse networks? Explain with example. 2

7) Briefly explain continuous loading, patch loading and lumped loading. 3

8) Define phase velocity and group velocity. 2

9) Show that quarter wave transformer acts as impedance inverter? 3

10) How Smith chart is used to find the admittance of normalized impedance Z = R + JX. 2

PART – B (50 Marks)

11 Obtain the expressions for characteristic impedance of a symmetrical T network Z_{OT} and symmetrical π network $Z_{O\pi}$ and hence show that $Z_{OT}\ Z_{O\pi} = Z_1Z_2$ where Z_1 and Z_2 are the total series and total shunt arm impedances. 10

12. Design a composite high pass filter to operate into a load of 600 Ω and have a cut off frequency of 1.2 KHz. The filter is to have one constant K-Section, one m-derived section with f_∞ = 1.1 KHz and two terminating half sections with m = 0.6. 10

13 a) Design a full series equalizer for design resistance of 600 Ω and attenuation of 15 dB at 1000Hz. 4

b) Differentiate between various methods of network synthesis. 6

14 a) Deduce the general transmission line equations in terms of sending end voltage, sending end current, characteristic impedance and propagation constant. 6

b) A transmission line has a characteristic impedance of 710 $\angle -15^0$ at 1 KHz. At this frequency, attenuation constant and phase shift constant are found to be 0.01 Neper and 0.035 Rad / Km respectively. Calculate the primary constants of the line. 4

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15 a) Define VSWR and reflection coefficient. Obtain the relation between them. 4

b) A line of characteristic impedance of 50 Ohm is terminated by a load of (100+ j 140) Ohm. Design a single stub matching section using Smith chart to operate at 200 MHz. 6

16 a) An L-network has a series arm of 300 Ω and shunt arm of 600 Ω. Determine its iterative impedance. 4

b) Describe the distortions that occur in a transmission line. Derive the condition for distortion-less transmission line. 6

17 a) Explain the properties and applications of Smith chart. 5

b) Design an L – matching loss less network to match 400 Ω Source to 100 Ω load at 5 MHz. 5

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Code No. 11068/BL

FACULTY OF ENGINEERING

B.E 2/4 (M/P) II – Semester (Backlog) Examination, May / June 2019

Subject : Basic Electronics

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

Note: Answer all questions from Part – A & Any five questions from Part – B.

Part - A (25 Marks)

1. Write the differences between extrinsic and intrinsic semiconductors. 2
2. Define knee voltage 2
3. Define the following a) Trans conductance b) Drain resistance 2
4. What is Stability factor of BJT? 2
5. What is a Bark hausen criterion? 2
6. What are the advantages and disadvantages of Negative feedback 3
7. What are the characteristics of and ideal op – amp? 3
8. Draw the basic logic gates? Write their truth tables 3
9. What is SCR? Draw its symbol and write any two Uses 3
10. What is thermo couple? 3

Part - B (50 Marks)

11. Draw a neat circuit for HWR. Derive the Idc, Vdc, Irms, Ripple Factor, PIV. 10
12. a) Compare CE, CB, CC for BJT 5
    b) Draw a neat circuit for CS JFET. Explain Drain and Transfer characteristics 5
13 Draw a neat circuit diagram of the Colpitts oscillator and derive the frequency of oscillations and condition for oscillations 10
14. Draw a neat circuit for instrumentation amplifier. Derive the equation for the output 10
15. a) Explain the construction and working of the CRO. 5
    b) What are the uses of CRO in different Aspects of our daily life? 5
16. a) Explain the construction working of UJT 5
    b) Explain the V-I Characteristics of UJT 5
17. Write short notes on
    a) Need for filters 3
    b) Photo diode 3
    c) Thermal runaway

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Code No. 11070 / BL

FACULTY OF ENGINEERING

B.E. 2/4 (AE) II - Semester (Backlog) Examination, May / June 2019

Subject : Thermal Engineering

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

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

PART – A (25 Marks)

1 What is Thermodynamic equilibrium?
2 What is closed and open system give examples?
3 What is Clausius inequality?
4 Define entropy.
5 Explain air standard Brayton cycle.
6 Draw P-V graph of Rankine cycle.
7 Define volumetric efficiency of Reciprocating air compressor.
8 Define COP and Unit of refrigeration.
9 Define a composite wall.
10 Define Planks law of Radiation.

PART-B (50 Marks)

11 (a) Derive the expression for steady flow energy equation for one inlet and one outlet.
(b) Explain Zeroth law of Thermodynamics.

12 (a) Explain Carnot cycle with the help of T-S diagram.
(b) A Carnot cycle operates between source and sink temperatures of 250^{o}C and -15 ^{o}C. If the system receives 90kJ from the source find (i) Efficiency of the system (ii) Net work transfer (iii) Heat rejected to sink.

13 A simple Rankine cycle works between pressures 28bar and 0.06bar, the initial condition of steam being dry saturated. Calculate the cycle efficiency.

14 (a) Classify compressors
(b) Explain the working of vapour absorption system.

15 (a) Explain the phenomenon of development of Thermal Boundary Layer.
(b) Define Black body, white body and Grey body.

16 (a) What is mathematical form of First law of thermodynamics?
(b) What is PMM-II?

17 (a) Explain the process Regeneration for improving efficiency.
(b) Explain reversed Carnot cycle.
(c) Differentiate between free and forced convection.

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Code No.11074/BL

FACULTY OF ENGINEERING

BR 2/4 (C.S.E) II Semester (Backlog) Examination, May / June 2019

Subject: Microprocessor & Interfacing

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

Note: Answer all questions from Part – A & Any five questions from Part – B

Part – A (25 Marks)

1. Specify the complete bit configuration of 8085 Flag Register 2
2. Write about RST Pin of 8085 3
3. List four operations commonly performed by MPU? 2
4. What is the value of 'AX' after executing following instructions? 3
   MOV AH, 00
   MOV AL, 07H
   ADD AL, 03H
   AAA
5. List the Branch related addressing modes? 3
6. Draw the data memory organization in 8051. 2
7. What is key bouncing? 2
8. What is difference between MUL and IMUL instruction in 8086? 3
9. Define Instruction cycle, machine cycle and T state. 3
10. Define Register Relative Addressing Mode of 8086 2

Part – B (50 Marks)

11. Explain the internal architecture of 8085 MPU 10

12. Draw the Timing Diagram of STA2050H Instruction 10

13. a) Write short notes on JMP and CALL Instructions of 8085 microprocessor 4
    b) Explain the interfacing of DAC & ADC 6

14. Define Interrupt and Explain in detail of programmable Interrupt controller 8259A. 10

15. a) Explain 8051 micro controller architecture along with memory organization. 6
    b) Write a ALP to rotate stepper motor in clockwise direction by interfacing with 8051 4

16. Draw and explain Pin diagram of 8086? Also explain the concept of Memory segmentation in microprocessor with diagram. 10

17. Determine the physical address resulting from the following instructions: 10
    a. MOV DL, [BP+SI]
    b. MOV DI, [BX+100h]
    c. SUB BX, AX
    d. MOV[BP+DI+5], AH
    e. MOV AL, [5036h]
    Where BP = 7000h, SI = 0350h, SS = 8000h, BX = 4FFFh, DS = 2000h, DI = 6A00h

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Code No: 11079/BL

FACULTY OF ENGINEERING

BE 2/4 (IT) II – Semester (Backlog) Examination, May / June 2019

Subject: Computer Organization & Microprocessor

Time: 3 Hrs **Max Marks: 75**

Note: Answer all questions from PART – A & answer any FIVE questions from Part- B

PART – A (10 x 2.5 = 25 Marks)

1) Draw the single bus structure. Specify its advantages.
2) Analyze the subroutine operation with example.
3) Write two limitations of 8085 processor.
4) Perform RLC, RAR operation on given data
   00110011 with ci=1
5) Write an assembly language program to perform 2's complement of given number.
6) Interpret the methods to increase the performance of processor.
7) Define locality of reference in cache memory.
8) Write a control word to select counter2 with mode 2 operation to load 16-bit count.
9) Explain null modem connection of RS 232C.
10) Differentiate the modes of USART.

PART – B (50 Marks)

11) (i) Interpret the types of computer with example. (5)
    (ii) Analyze the basic structure of Computer. (5)

12) Evaluate the operation of DMA Controller (8257) and its interfacing with neat sketch. (10)

13) Define mapping. Analyze the different mapping techniques with memory field structure. (10)

14) (i) Write a program to add two 16-bit numbers using 8085. (5)
    (ii) Explain addressing modes of 8085 with example. (5)

15) Explain the operation of 8255(PPI) and its interfacing in detail. (10)

16) Analyze the architecture of 8085 with its block diagram. (10)

17) Write short note on

    (i) Virtual memory (5)

    (ii) Parallel interface (5)

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