Code No: 11373/BL

FACULTY OF ENGINEERING

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

subject: Engineering Chemistry- I

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

Note: Answer all questions from Part-A & Any Five questions from Part-B

PART-A Marks: 20

1. What is an extensive property? 2M
2. The efficiency of an engine is 0.42. Calculate the heat that must be withdrawn from the reservoir at higher temperature to produce 203 cal. of work? 3M
3. Define the term degrees of freedom with an example? 3M
4. What is a condensed phase rule? 1M
5. Define priming and foaming? 2M
6. Why do we express hardness of water in terms of $CaCO_3$ equivalent? 2M
7. Differentiate between homo polymer and co-polymer? 2M
8. Why raw rubber needs vulcanization? 2M
9. Name any two extreme pressure additives? 2M
10. Define Refractory? 1M

PART – B (50 Marks)

11. A) State and explain first law of thermodynamics. 4M
    B) State Carnot's theorem. Describe Carnot's cycle for establishing the maximum convertibility of heat into work? 6M

12. A) What is the Eutectic system? Explain Pb-Ag system with the help of a neat phase diagram 6M
    B) Write short notes on safety fuses and solders? 4M

13. A) What is the principle of EDTA method? Describe the estimation of hardness of water by EDTA method? 5M
    B) 50ml of a sample of water consumed 15ml of 0.01 M EDTA before boiling and 5ml of the same EDTA after boiling. Calculate the total, permanent& temporary hardness of water? 5M

14. A) Write the structure, properties and uses of the following polymers
    i) Nylon- 6, 6 ii) Buna-s 6M
    B) What are conducting polymers? Write its applications. 4M

15. A) What is lubrication? Explain the mechanism of Hydrodynamic lubrication. 6M
    B) What are the requirements of a good refractory? 4M

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16. A) What is the criteria for spontaneity of a thermo dynamic process in terms of the Change of entropy and free energy? 5M

B) What are the specifications of potable water 5M

17. A) Write a short note on 6M
    i) Viscosity
    ii) Saponification number
    iii) Acid value

B) Explain the differences between addition and condensation polymerization with suitable examples. 4M

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Code No. 11053/BL

FACULTY OF ENGINEERING

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

Subject: Electronic Engineering - II

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

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

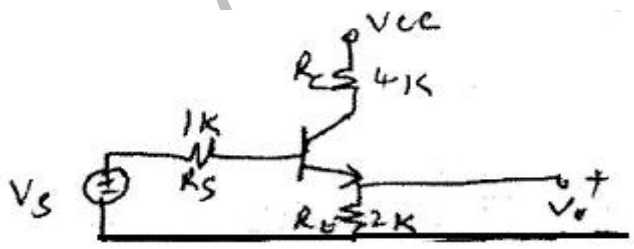
PART - A (25 Marks)

1. What are interacting and no interacting stages in cascaded amplifier?
2. How gain of amplifier remain constant at mid-frequencies?
3. What are the effects of negative feedback in amplifier?
4. What is the effect of negative voltage series feedback on R_i and R_o of amplifier?
5. Give classification of oscillators?
6. Draw circuits of Hartley Oscillator?
7. Classify amplifiers based on location of Q-point?
8. What is cross-over distortion in power amplifiers?
9. Draw a two level clipper and explain briefly?
10. Explain concept of clamping with waveforms?

PART - B (5x10 = 50 Marks)

11 .Derive expressions for Mid-band gain and upper cut-off frequency for a single stage RC coupled BJT amplifier?

12. Find G_{msf} and R_{if} for the circuit shown. Assume suitable data?



13 Derive expressions for frequency for frequency of oscillations and conditions for RC phase shift BJT oscillator?

14. Draw circuit of class-B push-pull power amplifier, explain operation and find its efficiency?

15 a) Obtain response of a RC low pass circuit for pulse input?

b) RC low pass circuit acts as integrator- explain?

16. a) Explain Cascading of amplifiers?

b) Write about stability of oscillators?

17. Write short notes on

a. crystal oscillator

b. class-D operation

c. local versus global feedback

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Code No.11063/BL

FACULTY OF ENGINEERING

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

Subject: Switching Theory and Logic Design

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

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

Part – A (25 Marks)

1. Convert the following decimal into indicated base: 175.175 to binary.
2. Develop 3-bit Gray Code?
3. Using K-map simplify the following Boolean function f (A,B,C) = m(0,2,3,4,6)
4. Draw the NOR logic diagram for the compliment of the function
   $f(A,B,C,D)=\Sigma m(5,6,7,10,11,13,14,15)$
5. Design a Full Subtractor logic circuit using Half Subtractor logic Circuits?
6. Explain about Static-I and Static -0 Hazard with examples?
7. List out the differences between Synchronous and Asynchronous sequential circuits?
8. Write excitation table of T and D Flip-flops?
9. List out types of shift registers and mention their applications?
10. Draw the pin configuration of IC 7474?

Part – B (50 Marks)

11. a) Implement the switching function f = xy + x'y' + y'z using 6M
    i) Baic Logic gates only (ii) OR and Inverter gates only
    iii) AND and Inverter gates only
    b) State and Prove De-Morgan's theorems for 3 – variables? 4M

12. a) Simplify the following logic function using K-map and implement it with NAND gates only. f(a, b, c, d) = m(1, 3, 5, 7, 9, 15) + d(4, 6, 12, 13) 5M
    b) Simplify the following logic function using K-map and implement it with NAND gates only. f(w, x, y, z) = m(1, 3, 5, 10, 11, 12, 13, 14, 15) 5M

13. a) Design a full adder using IC 74138? 5M
    b) Design 4-bit Gary to binary converter using with truth table, K-maps and logic circuits? 5M

14. a) Explain JK Flip-Flop operation? Derive its truth table, characteristic table, characteristic equation and excitation table? 5M
    b) Convert SR Flip-Flop into JK Flip-Flop using truth table and excitation tables? 5M

15. Design a 3-bit UP/DOWN Counter and implement it using JK Flip-flop? 10M

16. a) Explain the operation of Carry look ahead Adder? 5M
    b) Simplify the Boolean expression f(A,B,C) = (A'+B) (A+B+C)C' and realize using NAND gates only? 5M

17. a) Simplify the following logic function using K-map and implement it with NAND gates only f(a, b, c, d) = m(0, 6, 8, 13, 14) + d(2, 4, 10) 5M
    b) Explain the operation of 2's complement. 5M
    ADD/Subtract with the help of a neat sketch.

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Code No. 11067/BL

FACULTY OF ENGINEERING

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

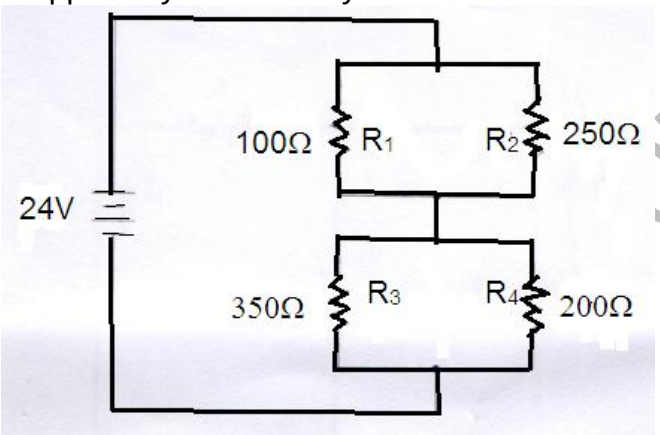
Subject : Electrical Circuits & Machines

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

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

PART – A (25 Marks)

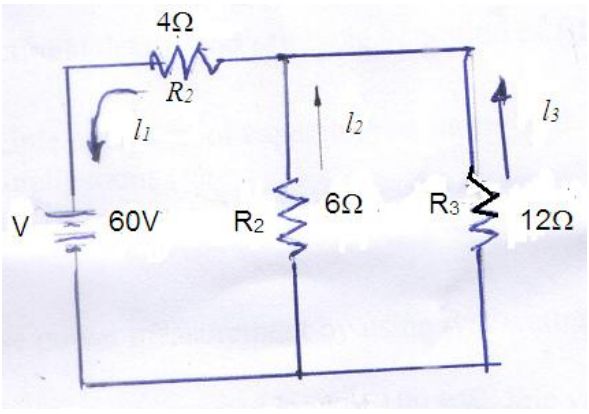
1 Determine current supplied by 24 V battery for the circuit show below. (3)



2 Write expressions for active and reactive power. (2)
3 Define regulation and efficiency of transformer. (3)
4 Give the advantages of 3-phase supply system over 1-phase system. (2)
5 Explain the action of commutator in DC machines. (2)
6 Draw torque Vs current and speed Vs current characteristics of DC shunt motor. (3)
7 Mention the application of capacitor start motor. (2)
8 Why I – Phase induction motors are not self starting? (3)
9 What will happen if an 3-phase induction motor runs at synchronous speed? (2)
10 Define frequency of rotor currents of 3-phase induction motor and what is its value at stand still. (3)

PART – B (50 Marks)

11 (a) Determine current l_T, l_2 and l_3 for the circuit shown below. (5)



(b) State and explain Kirchoff's laws. (5)

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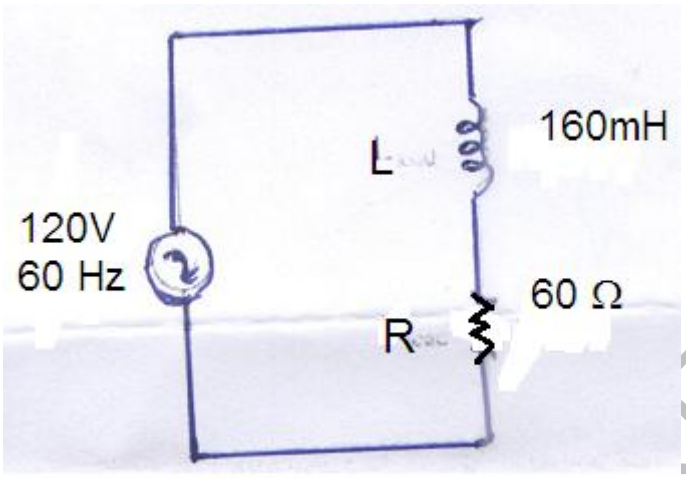
12 (a) Find current, p.f, and active power for circuit show below. (5)



(b) Derive the expression for energy stored in inductor. (5)

13 (a) The maximum efficiency of a 300 KVA, 3300/440 V, 50Hz, I-phase transformer is 98.5% and occurs at ¾ full load upf. If the impedance is 0.06Ω referred to the 400 V side, calculate the regulation at full load and 0.75 pf lagging. (5)

(b) Explain OC and SC tests of a 1-phase transformer. (5)

14 (a) The resistance of the field circuit of a shunt excited D.C. generator is 200 Ω. When the output of the generator is 100 KW, the terminal voltage is 420 V and the generated emf 490 V. Calculate (i) the armature resistance, (ii) The value of generated emf when the output is 50 KW, if the terminat voltage is 480 V. (5)

(b) Explain the 3 point starter to start the D.C. motor with the help of neat schematic diagram. (5)

15 (a) Explain slip torque characteristics of an 3-phase induction motor. (5)

(b) A 25 HP, 400 V, 50 Hz, 6 – pole, 3 – phase induction motor runs at 960 rpm on full load. The startor loss is 350 W and full load efficiency is 89%. Calculate full load slip and rotor cupper losses. (5)

16 (a) Explain constructional details and principle operation of BLDC motor. (5)

(b) Explain the principle operation of capacitor run motor with neat schematic diagram and mention its applications. (5)

17 (a) Explain 3-phase power measurement by using two wattmeter method. (5)

(b) A balanced 3-phase star connected load of 100 kW, line voltage and line current are 11 kV and 100 A respectively. Find the circuit constants per phase for lagging pf load. (5)

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Code No. 11072 / BL

FACULTY OF ENGINEERING

BE 2/4 (A.E) II Semester (Backlog) Examination, May/June 2019

Subject: Automotive Petrol Engines

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

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

PART – A (25 Marks)

1 Define volumetric efficiency & compression ratio.
2 Indicate sequence of firing order for 6-cylinder engine.
3 What is Rich mixture? When it is required?
4 What are the advantages of MPFI system?
5 Draw a neat sketch of spark plug and indicate its parts.
6 What are the main requirement of an ignition system?
7 What are the stages of combustion in SI engines?
8 Draw any two combustion chambers used in SI engines?
9 What is Mist lubrication system?
10 What are the drawbacks of air cooling system?

PART – B (50 Marks)

11 Derive an expression for thermal efficiency of Otto cycle and also Drive expression for Mean effective pressure.

12 (a) With a neat sketch explain working principle of Mechanical feed pump.
(b) With a Neat Sketch explain MPFI system.

13 (a) What are the advantages of Battery ignition system over magneto ignition system? Explain.
(b) With a neat sketch explain centrifugal spark advance mechanism.

14 (a) Explain the various factors that influence the flame speed.
(b) Explain the phenomena of Knock in SI engine.

15 (a) Differentiate between wet sump & dry sump lubrication system.
(b) With a neat sketch explain the working principle of thermosiphon cooling system.

16 With a suitable sketch explain the working principle of Solex – Carburetor.

17 Write short notes on the following:
(a) Valve timing & port timing diagrams.
(b) Electronic ignition system.
(c) Properties of lubricants.

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Code No. 11077/BL

FACULTY OF ENGINEERING

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

Subject: Signals and Systems

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

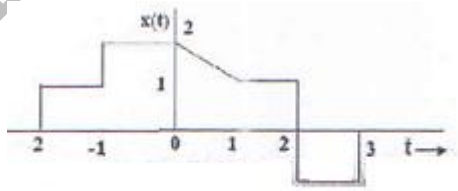
Note: Answer all questions from Part-A & any five questions from Part –B.

Part – A (25 Marks)

1. Draw the signal for $x(t) = u(t+1) - u(t-1)$ 2M
2. Check the stability of system whose impulse response $h(t) = e^{-3t}u(t)$ 2M
3. Write the relation between convolution and correlation? 3M
4. What are the Dirichlet's conditions of Fourier series? 2M
5. Find the Fourier Transform of 1? 3M
6. State the initial and final value theorem for Laplace transform. 2M
7. Write the expression for discrete time fourier series. Write the expression for discrete time fourier series. 2M
8. What is an anti-aliasing filter? 3M
9. Determine the z-transform of $x(n) = \cos \mu n \; u(n)$ 3M
10. Find the DTFT of $(n) = \{1, -1, \; 1, \; -1\}$ 3M

PART – B (50 Marks)

11. a) Sketch (i) $x(-2t)$ (ii) $x(-t+1)$ for the following figure. 5M



b) Derive the condition for stability of a system? 5M

12. a) Explain the signal approximation using orthogonal signal functions. 4M
b) Find the trigonometric Fourier series for the waveform shown in fig.1. 6M

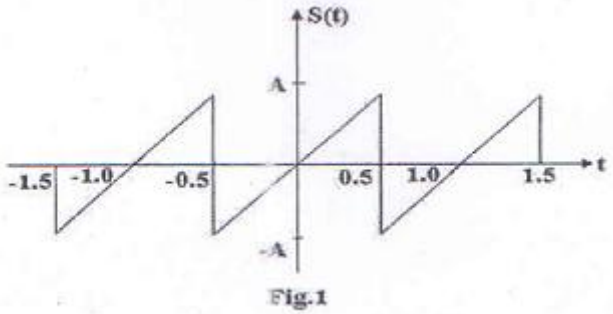


Fig.1

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13. a) State and prove Time shifting and convolution property of Fourier transform. 6M
    b) Obtain Laplace Transform of the signal. 4M
    (i) $x(t) = e^{-2t}\ u(t) + e^{-t} \cos 3t\ u(t)$
    (ii) $x(t) = \sin \mu_o t\, u(t)$

14. a) State and prove sampling theorem for Band limited signals. 6M
    b) Consider an LTI system with input $x(n)$ and the unit impulse response $h(n)$ specified as : $x(n) = 2n\ u(-n)$ and $h(n) = u(n)$ Determine $y(n)$ 4M

15. a) A causal system is represented by the following difference equation. 6M

$$y(n) + \frac{1}{4} y(n-1) = x(n) + \frac{1}{2} x(n-1)$$

    (i) Find the system function H(z) and give the corresponding region of convergence.
    (ii) Find the unit sample response of the system.
    b) Find the DTFT of $x(n) = \{1, 1,\ 1, 1, 1, 1, 0, 0\}$ 4M

16. a) Find the auto correlation function of the square pulse of amplitude A and duration 6M
    b) Find the convolution $x_1(t) = u(t+1)$ and $x_2(t) = u(t-2)$ where $u(t)$ is a unit step function. 4M

17. Write short notes on
    a) Analogy between vectors and signals. 5M
    b) Relation between Laplace transform and Z transform. 5M

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